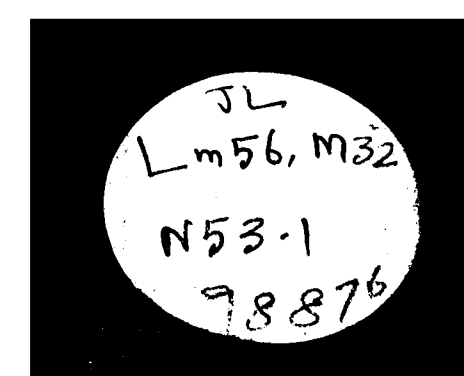




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SEROUS HEPATOSIS: A PATHOGENESIS OF HEPATIC FIBROSIS IN JAMAICAN CHILDREN

PRELIMINARY REPORT*

BY

K. R. HILL, M.D. KATERINA RHODES,† M.B., Ch.B.

J. L. STAFFORD, M.B., Ch.B. AND R. AUB,† M.D.
(Department of Pathology, University College of the West Indies)

[WITH SPECIAL PLATE]

The object of this communication is to report upon a disease of the liver found in Jamaican children ; because of its clinico-pathological features we have proposed the term "serous hepatitis" (Hill, 1951 ; Hill *et al.*, 1951).

In all, 150 cases have been investigated. On clinical analysis it is apparent that they can be classified as conforming to certain different types which are, however, different phases of the same disease with the same underlying pathology. Histologically, this condition resembles that described by Roessle (1930) as "serous hepatitis," or that described by Keschner and Klemperer (1936) as "hepatic oedema."

Three methods of approach were used in the study of these Jamaican children. First, a dietary survey was made ; secondly, all children were subjected to a complete examination in which were included certain biochemical tests for liver function ; and, thirdly, needle-biopsy examination was carried out on approximately 50% of cases, from some of which serial biopsies were taken.

Dietary Survey

This has been previously described by Rhodes (1951). The common background of all these children was a poor dietary history starting in early infancy. Most of them were of good average weight when born, and they were breast-fed for a period varying from four to nine months. In Jamaica, however, complete breast-feeding is stopped early and complementary feeding adopted. This means that the baby receives breast milk about twice during the night, and during the day is fed on cereals such as cornmeal, or rolled oats with or without a little condensed milk.

From the neonatal period, except in a few cases, the babies are given "bush tea," which is an infusion of leaves, flowers, or seeds of various plants. When the babies are weaned they are put on a cornmeal diet, although rolled oats and Robinson's patent barley are also used. The diet is monotonous in the extreme, and one of these highly refined cereals is given meal after meal for months and years on end.

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For economic reasons, and also because of its poor keeping qualities in the Tropics, cows' milk is seldom used, and little, if any, meat, fish, and eggs is eaten. Often the children are given diluted condensed milk, one to two tins a week being shared by the whole family. Children 4 to 5 years and older live on root vegetables such as yams and sweet potatoes and, in addition, cornmeal and rice.

The dietary history as presented above implies a very low protein intake, particularly low in animal or so-called first-class protein, but an adequate calorie intake. Only a few cases of this series (7%) had a very low calorie intake in addition to a low protein consumption, and these, as shown later, presented a modified clinico-pathological picture.

Clinical Findings

The children were between the ages of 4 months and 16 years, the majority being from 1 to 3 years old. Nearly all were from poor homes, and the remainder came from lower middle-class homes in which the standard of intelligence or the knowledge of what comprises a nutritious diet is low ; possibly associated with this is the fact that the familial incidence of the disease is high. The children are predominantly of African extraction, with European, East Indian, and Chinese racial admixtures.

On examination about one-third of the cases were in the acute phase of the disease. About a half of these cases gave a recent history of acute illness such as tonsillitis, whooping-cough, and pneumonia before the onset of gross abdominal enlargement due to ascites and hepatomegaly. The acute illness usually preceded, or sometimes was concurrent with, the liver enlargement. These children were usually normal in physique, and in two or three weeks they recovered from the acute hepatic involvement, though often they had a residual asymptomatic enlargement of the liver. Liver-function tests showed an absolute rise in serum globulin with a reversed albumin/globulin ratio and a lowered serum cholinesterase. Recovery from the acute liver enlargement occurred whether or not treatment was given for this condition.

The other half of the patients in the acute phase had no previous history of infection so far as could be elicited. They had ascites and an enlarged firm liver. The liver-function tests generally showed a lowered serum albumin, often with a low total protein and also a low serum cholinesterase. On a high-protein diet it was two to three months

before they improved from the acute phase. A few apparently recovered completely, but frequently they tended to lapse into the subacute or chronic phase.

All the children in the series were very ill and fretful. The liver was hard, with a smooth outline and a sharp lower edge, and both the left and the right lobes were enlarged. Sometimes the liver was bulging and tender on pressure as if under tension. Occasionally the enlargement was great, up to 12 cm. below the costal margin; a varying degree of ascites was present, and on first paracentesis the protein content was sometimes as high as 2.1 to 2.8%. On subsequent tapping the protein content decreased.

Signs of vitamin deficiency were rare. The appearance of these children was in striking contrast to the usual picture of subnutrition found in the Tropics (Waterlow, 1951).

About one-third of the series were found to be in the subacute stage when first examined. They usually looked well developed, with rounded contours and adequate subcutaneous fat, although on closer examination some had flabby muscles, some were stunted, and many were underweight. The liver was often slightly or moderately enlarged and there was little or no ascites. Liver-function tests generally showed lowered serum albumin and serum cholinesterase. The results of the flocculation tests were not significant. Jaundice was absent, although not infrequently the total serum bilirubin was slightly raised. Many of these subacute cases were, however, asymptomatic, and were found only on routine examination at schools or on investigation of brothers and sisters of affected children. There was no complaint, and the child was usually happy and looked well, had no ascites, but had an enlarged liver. In a recent survey (not connected with this study) of 116 children from two villages, 55% were found to have symptomless liver enlargement.

About one-third of the series were seen in the chronic phase of the disease. They were usually older children with a long medical history. The picture was one of hepatic fibrosis with a large, nodular, or contracted liver, with sometimes an enlarged spleen and clubbing of the fingers and toes, an established collateral circulation, and occasionally jaundice. These children were retarded and of poor nutrition. Two cases have been followed from the subacute stage to the chronic stage over a period of a year.

Eleven cases in the whole series were starved babies with generalized oedema, loss of subcutaneous fat, and signs of vitamin deficiency such as angular stomatitis, depigmentation of the hair, and various dermatoses which have been described in the literature many times as part of the syndrome of kwashiorkor or fatty liver disease. These babies were on a low-calorie diet, and the usual history was loss of appetite for one to three months and subsequent feeding on sweetened "bush tea" as a home remedy. Oedema was always present and not necessarily associated with ascites, the oedema being presumably a starvation phenomenon. These cases had a high mortality, whilst in all the other cases the mortality was low, with a high and prolonged morbidity.

No case in the series showed severe anaemia, but some degree of slight or moderate iron-deficiency anaemia was often seen. Bleeding and coagulation times were normal. Sickling trait was found in 7% of the cases and 11% showed infection with *Ancylostoma duodenale*, *Trichuris trichiura*, or *Ascaris lumbricoides*. Malaria parasites in the blood were demonstrated in three cases.

Histology

Liver-needle biopsies were performed on 75 out of the 150 cases studied; in many cases serial biopsies were obtained. Specimens were fixed in various agents from time to time—for example, formalin, corrosive sublimate, alcohol, and Zenker's solution—but for the majority formal-sublimate solution was found to be the most suitable. Up to 80 serial sections of blocks were cut and sections were

stained routinely with H. and E., periodic acid Schiff (P.A.S.), picro-Mallory connective-tissue stain, and Foote-Wilder reticulin stain; special stains for amyloid, fibrin, glycogen, haemoglobin, and fat were done when indicated.

In 25% of cases an early exudative or transudative lesion was found; this consisted of out-pouring of serous fluid into the perisinusoidal spaces of Disse and around the centrilobular veins (Special Plate, Figs. 1, 2, and 3). In some cases the lesion occupied almost the whole of the liver biopsy section under examination, but in most cases the lesion was focal and multiple, each lesion involving up to one or two lobules. The unaffected liver tissue seemed to be quite healthy, but the liver-cell columns at the site of the actual lesions appeared to be flattened. Whether or not they were in fact compressed or whether they were atrophied or shrunken it is impossible to say at the present stage of this investigation. The Kupffer cells and other endothelial cells often seemed to be swollen, increased in number, and detached.

Generally in the liver sections the sinusoids were dilated and filled with blood; alternatively, the sinusoids were wide open and empty, but this was thought to be artifact due to draining out of the blood at the time of biopsy. In about 15% of cases there were focal areas of fresh haemorrhage at the sites of recent serous exudation. This haemorrhage was thought to be due to trauma at the time of biopsy of unduly fragile and congested capillaries; no focus of old haemorrhage was found, no iron-containing brown pigment or macrophagic reaction was ever observed to suggest haemorrhage as part of the disease process, and in only one or two cases was the haemorrhagic artifact found in serial biopsy after treatment.

In 80% of cases deposition of an eosinophilic coagulum was found in the spaces of Disse (Figs. 3, 4, 5, and 6) and "cuffing" the centrilobular veins. This was associated in about one-third of these cases with oedema of the space of Disse mentioned above, as if the coagulum had been precipitated out of the serous fluid or perhaps the fluid, a sol, had become a gel.

At this stage the study of the chemical nature of the serous fluid has not been established, although we are of the opinion that it is probably initially exudative in character; accordingly the term "exudate" will be used in this context.

Sometimes the serous exudate alternated with the coagulum around the centrilobular veins, giving the lesions a laminated appearance; this was interpreted as indicating repeated attacks of liver disease. Although, however, in about two-thirds of the cases the eosinophilic coagulum was found alone, it was probably secondary to the serous exudation.

The eosinophilic coagulum gave the tinctorial reactions of collagen, and was not digested by trypsin. In appearance it varied from a granular amorphous coagulum to waxy-looking blobs of material; on occasion it had a fibrillary appearance although almost acellular—that is, there were no fibroblasts (Fig. 3). Tinctorially it was not amyloid, paramyloid, or atypical amyloid (Teilum, 1948), or fibrin or haemoglobin; it was not birefringent with Congo-red stain and not metachromatic with toluidine blue.

Reticulin stains (Figs. 7 and 11) revealed a perisinusoidal reticulosis which showed swollen reticulin fibres in the perisinusoidal spaces (at the site of the coagulum), with condensation and possible proliferation, although this latter may be illusory. In places where the coagulum was abundant it could be seen as laminated yellow-coloured blobs adherent to black swollen reticulin fibres (Fig. 6).

In 50% of cases there was distension of the space of Mall in the portal triads by serous exudation (Fig. 8), and in some of these cases there was evidence of a recent deposition of eosinophilic coagulum within the exudate. Often there appeared to be a dilatation of the perivascular and periductal lymphatics.

The coagulum extended from the space of Mall, surrounding the intralobular and interlobular vessels arising from the vessels of the portal triads (Fig. 9).

In 75% of the cases fibrosis of the eosinophilic coagulum was seen. The youngest patient was aged 4 months. Fibroblasts could be seen invading the coagulum around the centrilobular vein and along the spaces of Disse (Fig. 10). In the former there were bands of perivascular fibrosis extending from lobule to lobule (reversed lobulation); in the latter there was perisinusoidal fibrosis distorting the lobule in all directions, and in some cases a vascular short-circuit was produced from portal triad to centrilobular vein. The fibrosis of the coagulum around the intralobular vessels contributed to the further intralobular distortion, whilst the fibrosis of the interlobular vessels produced the appearance of perilobular cirrhosis (Fig. 11).

Of the cases 30% showed extreme fibrosis with distortion, bile-duct proliferation, and nodular hyperplasia, an appearance generally associated with cirrhosis (Figs. 12 and 13).

In general, liver-cell damage was not observed except in cases with marked fibrosis; although at this stage of the investigation special histochemical stains have not been done. The liver cells were often slightly swollen or hydropic in appearance; generally, but not invariably, this was shown to be due to a high glycogen content. In five cases there was fatty metamorphosis, but in three cases this was associated with recent or old-standing serous exudation or deposition of eosinophilic coagulum. Cellular infiltration of portal triads was slight, and was associated with fibroblastic invasion of the eosinophilic coagulum; it was never observed to such an extent as to suggest infective hepatitis.

In summary, the histological picture appeared to show a train of events beginning with serous exudation followed by the deposition of an eosinophilic coagulum which was subsequently invaded by fibroblasts. Often the three processes were taking place concurrently in the same biopsy block of liver tissue but not necessarily at the same site. The end-result was extensive hepatic fibrosis.

A Pathogenesis of Hepatic Fibrosis: A Theory

The structure of the liver lobule is probably similar to that described by Elias (1949a, 1949b). Fig. A, I is a diagrammatic representation of part of a liver lobule (the centrilobular vein, sinusoid, liver cells, and the portal triad). The sinusoid lies in a lacuna which is lined by the liver cells making up the hepatic laminae (hepatic cell columns). The lacunar space between the hepatic laminae and the sinusoid is the perisinusoidal space of Disse. The hepatic laminae are continuous interconnecting sheets of cells and the lacunar spaces formed by them are also interconnecting to form a labyrinth. The capsule of the portal triad is circumscribed by a potential space—the space of Mall—which connects with the space of Disse. Branches of the portal vessels are the interlobular and intralobular vessels. These all pass through the space of Mall to enter the parenchyma, and in so doing carry with them an enveloping potential space which connects with the space of Mall. Structurally the spaces of Mall and Disse may well be a part of the "lymphatic" drainage of the liver.

The first stage of the pathogenesis of hepatic fibrosis is serous exudation into the space of Disse and around the centrilobular vein (Fig. A, II). Subsequently there is a deposition of eosinophilic coagulum in these areas (Fig. A, III).

Serous exudate and coagulum may be deposited in many areas as a result of repeated attacks; the lesions are focal and circumscribed. At the site of an initial lesion the serous exudation spreads out in all planes as the different lacunae interconnect to make up the hepatic labyrinth. The confinement of the exudation to focal areas may be due to the deposition of eosinophilic coagulum restricting the further spread of serous fluid. Thus any newly formed serous exudate will be prevented from flowing in the direction of the centrilobular vein or laterally into adjoining

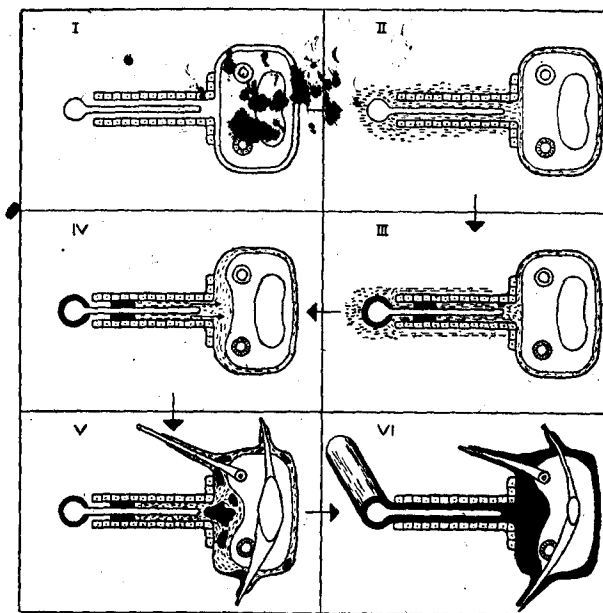


FIG. A.—Diagram showing the various stages of the pathogenesis of hepatic fibrosis. (I) Normal liver lobule with hepatic lacuna between the hepatic laminae; within the lacuna lies the centrilobular vein and sinusoid; the portal triad is shown with peripheral space of Mall which connects with the perisinusoidal space of Disse (lacuna). (II) Serous exudation in perisinusoidal space of Disse. (III) Deposition of coagulum around centrilobular vein and also within the space of Disse. (IV) Distension of space of Mall, following further serous exudation subsequent to the deposition of coagulum. (V) Deposition of coagulum from the serous exudate present in the space of Mall and in the sheaths of the intralobular and interlobular vessels. (VI) Late stage of deposition of coagulum which becomes fibrosed by the invasion of fibroblasts.

lacunae, but rather will be directed into what is probably the natural flow of the liver-tissue fluid, in the direction of the space of Mall in the portal triad. The space of Mall will thus become distended with serous exudate (Fig. A, IV). Subsequently, an eosinophilic coagulum will be deposited around the portal triad and also along the sheath-like spaces enveloping the intralobular and interlobular vessels (Fig. A, V). The sheaths are extensions of the space of Mall.

The next stage is the invasion of the coagulum by fibroblasts; thus there is established a fibrotic cuffing of the centrilobular vein and an intralobular extension of fibrous bands along the space of Disse. At the same time fibroblastic proliferation from the periphery of the portal triads spreads along the interlobular and intralobular vessels (Fig. A, VI).

Subsequent contraction of this fibrous tissue causes lobular distortion and disorganization, which, together with reactive nodular hyperplasia, produce the final picture of diffuse hepatic fibrosis.

Discussion

The series of cases under study illustrate a development of gross hepatic fibrosis beginning as a serous exudation (or oedema), followed by deposition of an eosinophilic coagulum, followed in turn by invasion by fibroblasts.

One outstanding feature of the study was the finding of a serous exudate or transudate and coagulum in the perisinusoidal spaces of Disse and around the centrilobular vein. The source of the serous fluid is, at this moment, undetermined; there are three possibilities: (1) from the sinusoid through the capillary wall; (2) from the liver cells; and (3) from blockage of the normal tissue-fluid drainage—that is, "hepatic lymph" in the spaces of Disse and Mall.

Increase of capillary permeability in the liver due to toxic causes, resulting in serous exudation, is not a new

concept. Roessle (1907, 1930, 1933, 1943) was of the opinion that the escape of serum from damaged capillaries is in the acute stage a serous inflammation. The acute serous inflammation may be followed by a sclerosing lesion; thus the initial stage of cirrhosis is a "serous hepatitis."

This point of view was further elaborated by Eppinger *et al.* (1935), who extended their studies on the escape of serum from capillaries in shock to the general concept of serous inflammation. Eppinger (1949) has lately referred to this condition as "albuminuria into the tissues."

Keschner and Klemperer (1936) have described findings similar to those of Roessle in the perisinusoidal space in 15% of a large series of necropsies; although not agreeing with all Roessle's conclusions, and while preferring the term "hepatic edema" to "serous hepatitis," they concluded that in many cases the hepatic oedema is primarily from toxic causes. They base their conclusion on the association of hepatic oedema with diabetic coma, uraemia, exophthalmic goitre, and thermal burns.

As far back as 1909, Helly had observed the focal flecking of the liver in sepsis, and Keschner and Klemperer (1936) were of the opinion that this was focal hepatic oedema due to generalized toxæmia.

It is interesting to note that Popper (1936b) mentions that Henschen regarded hepatic oedema as a kind of "glaucoma of the liver," and he relieved it in practice by an operation in which he injured the liver surface, thus facilitating the escape of oedematous fluid, with immediate decrease in the size of the liver. Biopsy specimens taken from such a liver with oedema visibly shrank within a few minutes of the operation.

Serous hepatitis has been produced experimentally in dogs by Popper (1936a, 1937), using allyl formate. The lesions produced were similar to those found in serous hepatitis in humans, although there was no certainty in production of the lesions. It would be interesting to note whether the lesions could be produced with 100% certainty if the animals were on low protein diet. Furthermore, the lesions of serous hepatitis have also been produced experimentally by Eppinger and Leuchtenberger (1932) by the intravenous injection of histamine.

Another cause of the escape of serous fluid from the capillaries may be congestion, which probably acts by a hydromechanical effect and/or by increasing capillary permeability due to anoxia. Popper (1948) has reported the agonal changes in human livers following acute heart failure, drowning, and suffocation, in which there is a dilatation of the perisinusoidal spaces usually associated with accumulation of "albuminoid" material. In a series of cases of instantaneous death no such dilatation of the perisinusoidal spaces was seen. Keschner and Klemperer (1936) record a similar finding in 36% of cases after cardiac failure and describe it as a "mechanical oedema." They were of the opinion that the term "serous hepatitis" for such conditions was inappropriate; after all, if the agonal changes are due only to congestion, the so-called exudate is in fact "transudate."

We have in our laboratory a section from a patient dying from acute right-sided heart failure which shows an eosinophilic coagulum around the centrilobular vein. The fact that these changes can occur agonally in acute right-sided heart failure, whether they be from exudates or transudates, none the less supports the theory that the material in the perisinusoidal spaces occurring in the series of biopsies under study may be derived from vascular sources.

Many of our sections show hepatic congestion—so much so that some of the sinusoids are grossly distended and filled with blood or, alternatively, probably owing to artifact, are wide open and empty. This latter condition was described by Roessle (1930). Further, in 15% of our cases there was fresh haemorrhage, interpreted as being due to capillary fragility, associated with trauma at the time of the biopsy. Our reason for this opinion was that we never at any time saw evidence of old haemorrhage such as iron-

containing brown pigment or a macrophagic reaction; further, in only one or two cases, after treatment on a high-protein diet, did we obtain such an artifact, our assumption being that treatment had corrected the abnormal fragility of the capillary wall.

Cardiac failure was not the cause of liver (sinusoidal) congestion in our series of cases. Of the criteria for heart failure laid down by Sherlock (1951), such as crepitations of the lung bases, increased jugular pressure, peripheral oedema, and hepatic tenderness, only the last-mentioned was found clinically; histologically no centrilobular necrosis with graded histological change towards the periphery was found.

Maegraith *et al.* (1949, 1951) have shown that hepatic congestion can be produced in animals by hypersensitivity: this congestion is probably due to constriction within the hepatic venous tree. Essex and Thomas (1950) state that they have produced occlusive spasm of the hepatic veins in dogs and cats following intravenous injection of an extract of *Ascaris suis*, hydatid cyst fluid, and histamine.

Another source of the exudate may be from the liver cells themselves. This view has been put forward by Egér (1950), who suggests that there is a release of fluid from the liver cells into the space of Disse, with subsequent retraction of the liver cells. This gains a little support from the present study by the fact that in the foci of exudation the cells sometimes look flattened as though retracted; however, the cells are often swollen with glycogen or are hydropic, changes which are against the opening of the tissue spaces by the mechanical means of retraction.

Further, it is stated by Selye (1950) that the liver parenchymal cells in such conditions of serous inflammation imbibe serum from the tissue spaces with a rise in their sodium chloride, calcium, and water content, and a decrease in their phosphate and potassium content; this imbibition is a possible explanation of the hydropic appearance of liver cells in some of our cases.

The flattened appearance of the cells may be due to atrophy, but, in general, we have observed it only during the acute phase of serous exudation at the site of the exudation; further proof of this theory that the liver cell is the primary site of the liver lesion must await further investigation along the lines of histochemistry and cell and nuclear counts.

Dilatation of the space of Disse may be caused by blockage of the normal tissue-fluid drainage channels of the liver. Popper (1936b) describes the following morphological triad in serous hepatitis: (a) dilatation of the perisinusoidal space of Disse; (b) oedema of the portal canals; and (c) gall-bladder-bed oedema. In cases under study, dilatation of the perivascular and periductal (bile) lymphatics has been noted in association with the distension of the space of Mall. This, of course, as well as suggesting a block in the lymph drainage, may also indicate an increased production of the tissue fluid.

It is interesting to speculate at this stage whether or not the exudate in the perisinusoidal space flows into the perivascular lymphatics of the portal triads and then finally, as a back-pressure effect, into the peritoneal cavity to produce ascites. It is noteworthy that the ascitic fluid on first paracentesis has often a high protein content (2.1 to 2.8 g.%). Gray (1951) has indicated that the source of the ascitic fluid is an excess of hepatic lymph. The hepatic sinusoids are said to be unusually permeable to albumin both in experimental animals (McKee *et al.*, 1949) and in man (Patek *et al.*, 1948).

Experimentally, support for the theory of the drainage of tissue fluid from the perisinusoidal spaces into the lymphatics of the portal triad is given by the work of Koch-Weser (Popper, 1951), who ligated the common bile duct near the liver in rats and produced lesions resembling serous hepatitis. Several authors, including Bollman (1950) have stated that the bile ducts are surrounded by a plexus

of vessels in which the lymphatics are included. Hence ligation of the common duct will exert a block, producing back-pressure distension of the space of Disse.

In the cases under study no evidence of lymph-duct blockage, either inflammatory or mechanical, has been detected, and the evidence points to overproduction of tissue fluid to explain the dilatation of lymph and tissue spaces.

In summary, the evidence available in this preliminary report is that the serous exudation and the coagulum are produced from vascular sources. Whether this is due to an increase in capillary permeability *per se*, or to congestion producing its anoxic and hydromechanical effects, it is impossible to say at this stage of the investigation.

The possibility that toxic factors are a cause of the increase in capillary permeability *per se* has some support. It is significant that the left lobe appears to be enlarged as much as the right. This lobe may drain the blood of the large gut, and if the latter is a source of bacterial or other toxins then the involvement of the left lobe may be thus explained.

It is to be noted that McFarlane and Branday (1945) and Royes (1948), in their articles on liver disease of Jamaican children, suggest toxins in association with low-protein diet as the aetiological agents. The possible toxicity of the various Jamaican "bush teas" is now being investigated. Further, Watson (1951) has pointed out the efficacy of aureomycin and also of enemata on patients suffering from hepatic coma, and he suggests that the action may be to reduce the toxicity by altering the bacterial flora of the gut.

One constant feature is that the serous exudate and the coagulum are never associated with a cellular infiltrate, which is the usual accompaniment of inflammation. However, according to Selye (1950), the emigration of leucocytes can be inhibited by systemic intoxication with bacterial endotoxins and by anaphylactoid, traumatic, and "toxic" shock.

Increased capillary permeability producing hepatic oedema was found by Keschner and Klemperer (1936) in association with asthma; it has also been produced by Eppinger and Leuchtenberger (1932) by the intravenous injection of histamine. These examples would point to the circulation of a toxic histamine-like substance, and may well suggest further experimental work on the lines of hypersensitivity. It is to be noted that two of our cases with primary tuberculous lesions showed acute hepatic enlargement immediately after the tuberculin test, which, as was expected, was positive. Biopsy of the cases showed the histological picture which we have found associated with acute serous hepatitis.

Whatever the source of the exudate, the fact remains that an exudate and/or coagulum are constantly found, and the question may be asked, "What is the coagulum?" The coagulum gives all the tinctorial reactions of collagen and is not digested by trypsin. Is it in fact collagen, or a precursor of collagen? In many cases the coagulum has the waxy appearance of amyloid with H. and E. stain, and in some cases it has a fibrillary appearance although acellular. Reticulin staining shows the reticulin fibres black and swollen, and adherent to them are blobs of laminated material staining yellow. These blobs are in fact the coagulum. Are they blobs of protein from the serous exudate forming on the side of the swollen reticulin fibres or are they swollen reticulin fibres which are blowing up to bursting point at various places along their lengths owing to imbibition of serous fluid?

The fact that the coagulum is acellular does not preclude the possibility of its being collagen or pre-collagen protein material. Porter and Vanamee (1949) have shown in tissue culture, by studies using the electron microscope, that unit fibrils may combine to form protofibrils of collagen without the intermediary of fibroblasts. Further, Porter (1951), in an extension of these studies, has shown that after being shed from the fibroblasts the collagen fibrils increase in

size by the accretion of a material from the ground substance. This method of accretion may explain the deposition of protein of serous origin on pre-existing connective-tissue fibres in the liver of the cases under study. The possibility of collagen-fibre formation by precipitation in a protein-rich exudate has also been advanced by Klemperer (1951), and Day and Armstrong (1940) have commented on the curious absence of fibroblastic activity in the genesis of cardiac cirrhosis.

Roessle (1930) explains the sclerosis following serous hepatitis due to the intermediation of endothelial proliferation. The endothelial cells (including the Kupffer cells) increase in number and become detached to form a connective-tissue reticulum—"the endothelialite." In the present study some endothelial swelling and proliferation have been noted, and the few cells seen in the perisinusoidal spaces are often endothelial or Kupffer-cell types.

The coagulum, whatever its derivation, is a precursor of fibrosis. Sections have been studied which show what is interpreted to be the fibroblastic invasion of the coagulum—that is, the coagulum is there first and at a later stage it is invaded by fibroblasts. It is tempting at this stage, therefore, to consider the coagulum as collagen protein or pre-collagen and the process of the laying down of the eosinophilic coagulum as a "collagenosis."

So far, the aetiology of the process of events occurring in the liver has not been determined. One salient fact elucidated has been the woefully deficient protein in the diets; this deficiency was not only in total protein but also in first-class protein of animal origin. It is not known whether the lack of single or multiple amino-acids, or the disproportion of protein to carbohydrates, or perhaps a combination of these factors, contributes to the development of liver disease. At this stage it is pertinent to mention that the cases of serous hepatitis differ, both clinically and histologically from those cases of subnutrition with fatty liver disease in the Tropics described as kwashiorkor (Williams, 1933; Trowell, 1949; Davies, 1950; Waterlow, 1951).

It is true that about 7% of the cases conform to the classical description of kwashiorkor. It is of interest that these cases were on a low-calorie as well as a low-protein diet, in contradistinction to the main type of case, which had a low protein but normal calorie intake. Notwithstanding the clinical appearance of starvation and fatty metamorphosis of the liver, evidence of an underlying pathological condition similar to the main group of the cases was found. It is tempting, therefore, to assume that the fatty metamorphosis in these few cases was a side-effect to starvation—that is, deficient calories in the diet.

Mottram (1909) drew attention to the fact that fatty metamorphosis of the liver may be encountered in some cases of starvation, a feature now well recognized in severe deficiency states. Dible (1951) suggests that in such cases the liver cells receive more fat than they are capable of dealing with, and he strongly asserts that there is little evidence that fatty metamorphosis is a precursor of human cirrhosis, as, for example, accepted by Moschowitz (1948), pointing out that the dietary evidence from experimental work cannot be directly applied to man. Hartz (1949) has described a fatty metamorphosis occurring in children in Curaçao which he claims never goes on to cirrhosis.

Liver-cell damage has been noted (using the usual routine staining methods) only in association with marked hepatic fibrosis. Further study is needed to decide whether or not liver-cell damage is an important feature of the disease under investigation. The results of liver-function tests are, except for a persistent lowered serum albumin and serum cholinesterase, equivocal, and do not conform to any set pattern. None the less, functionally the liver cells would be expected to be defective because the exudate and coagulum in the perisinusoidal spaces (haematoparenchymal barrier) must impair the diffusion of nutrients from the blood stream to the cells. Further, the removal of waste products from the cells to the capillaries will also be

impaired, and therefore local intoxication and malnutrition of the parenchymal elements must follow the initial stage of disturbed capillary permeability. This has been pointed out by Eppinger *et al.* (1935), as well as the fact that excessive amounts of serum proteins in the perisinusoidal spaces may well lead to the invasion of the parenchymal cells by serum proteins and by serum enzymes, resulting in damage to the cell (Böck and Popper, 1937).

The final picture of serous hepatitis is diffuse hepatic fibrosis. This has been arrived at by a slowly progressive fibrosis, intralobular and also perilobular in distribution, which occurs in the coagulum deposited in these positions. A theory has been postulated which attempts to explain the pathogenesis of this fibrosis.

Serous hepatitis, then, may well be one of the causes of polylobular cirrhosis, which Dible (1951) refers to as "cryptogenic."

Summary

A liver disease occurring in Jamaican children has been described; because of its clinico-pathological aspects it has been named "serous hepatitis." To date the only aetiological factor which has been ascertained is a low dietary protein intake. It is suggested that toxic factors may also play a part.

Clinically, the condition occurs in children, usually between the ages of 1 and 3 years, who have an enlarged firm liver and ascites; ultimately the appearance may be one of classical hepatic cirrhosis.

Histologically, the disease is a progressive one, passing from an initial exudation or oedema to the deposition of an eosinophilic coagulum which is finally invaded by fibroblasts.

The condition is similar to that described by Roessle (1930) as "serous hepatitis."

A theory of the pathogenesis of liver fibrosis has been postulated.

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TREATMENT AND PROGNOSIS OF ACUTE PERFORATED PEPTIC ULCER

BY

F. AVERY JONES, M.D., F.R.C.P.*

Physician in Charge of Gastro-enterological Department,
Central Middlesex Hospital

AND

R. DOLL, M.D., M.R.C.P.

Associate Physician, Gastro-enterological Department,
Central Middlesex Hospital; Member of the Statistical
Research Unit, Medical Research Council

With the assistance of

KEENA JONES, M.A., and BARBARA WHITE, B.Sc.

During the last decade there has been a striking fall in the fatality of acute perforated peptic ulcer. Whereas before 1942 the operation mortality was commonly 20%, the figure to-day is not more than a quarter of that level. This fall can mainly be attributed to improvements in anaesthesia with the introduction of muscle relaxants and to the use of antibiotics. Deaths from peritonitis in the first week have almost ceased to occur, and fatal cases are now mainly due to concomitant bleeding, intestinal obstruction, and associated diseases. This was demonstrated in the series reported by Avery Jones, Parsons, and White (1950). With the reduction in fatality, interest has been aroused in new methods of management.

Three methods are currently recommended—medical management with gastric aspiration, simple surgical closure, and immediate partial gastrectomy. The choice, in the individual case, must depend on the facilities available, but it will be influenced by knowledge of the immediate and late prognosis in similar cases treated by each method, and it will not necessarily be the same for all patients. It is difficult, on the existing evidence, to assess the relative merits of the three methods, partly because the fatality associated with each method has been rapidly decreasing, and partly because insufficient attention has been paid to the end-results, after the patients have left hospital.

The series reported by Avery Jones, Parsons, and White included 490 patients treated at the Central Middlesex Hospital during 1938–48, the great majority of them by simple surgical closure of the perforation. Since 1948 patients at the hospital have, in the main, continued to be treated by the same method, and the results have been analysed for a further period of three years to see, first, whether the fatality has continued

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to fall; secondly, whether a figure can be obtained for the fatality from surgical closure for comparison with the results obtained by other methods; and, thirdly, whether indications can be defined for the choice of patient to be treated medically with gastric aspiration or by immediate partial gastrectomy.

Immediate Prognosis

Table I shows the number of patients, operated and unoperated, with the corresponding number of deaths each year from 1938 to 1951. Patients diagnosed as having "leaking ulcers" are not included. The table shows that there has been no recognizable change in fatality since the beginning of 1947, when the standard

interest that the sole patient who recovered without operation prior to 1947 was shown radiographically to have a gastric ulcer after recovery from the perforation and died five years later from a slowly growing carcinoma originating in the same part of the stomach.

Surgical Closure of the Perforation

The crude fatality rate is of limited value for comparative purposes, since fatality also depends on a number of factors other than treatment, and these are not always constant. Factors usually considered to influence the fatality of perforated ulcers are the sex and age of the patient, the site of the ulcer, and the duration of the delay between onset and institution of treatment. From the experience of the results in the whole series of surgically treated cases,

TABLE I.—Prevalence and Fatality of Perforated Peptic Ulcers, 1938–51; Operated and Unoperated Cases

Year:	1938	1939	1940	1941	1942	1943	1944	1945	1946	1938–46	1947	1948	1949	1950	1951	1947–51	1938–51
Patients operated on	39	35	32	38	33	44	41	41	46	349	52	54	64	67	83	320	669
No. of deaths	12	8	7	7	11	3	4	5	3	60	3	1	0	3	3	10	70
Patients not operated on*	0	1	0	2	2	3	7	4	7	26	6	3	5	2	4	20	46
No. of deaths	0	1	0	2	2	3	6	4	7	25	5	2	5	2	3	17	42
Total perforations	39	36	32	40	35	47	48	45	53	375	58	57	69	69	87	340	715
No. of deaths	12	9	7	9	13	6	10	9	10	85	8	3	5	5	6	27	112

* Necropsy examinations were performed more frequently in the later years, and it is possible that some fatal perforations were missed in the period 1938–42.

treatment described by Avery Jones, Parsons, and White was adopted. In the five years 1947–51 the total fatality in 340 cases, including those undiagnosed till after death, was 7.9%. The operative mortality in 320 cases was 3.1%. Nineteen patients were treated by immediate partial gastrectomy without a death and 301 were treated by surgical closure of the perforation with 10 deaths, giving a mortality of 3.3%.

Unoperated Cases

Forty-six patients were not operated on. Medical treatment did not include the use of gastric aspiration until after 1946; since then it has been used routinely in cases diagnosed in life. The reasons for which operation was withheld and the results of treatment are given in Table II.

TABLE II

	1938–46		1947–51	
	Cases	Deaths	Cases	Deaths
Perforation undiagnosed	12	12	5	5
Patient too ill	13	12	9	9
Medical treatment preferred	1	1	5	3
Operation refused	—	—	1	0

One diagnostic error was failure to recognize perforation in patients who had recently had a severe haematemesis or melaena; the diagnosis in this group was sometimes particularly difficult because of the presence of peripheral circulatory failure and the lack of abdominal tenderness and rigidity. The double complication was unrecognized in six instances, all during the period 1938–46. Other patients were thought to have coronary thrombosis, mesenteric thrombosis, or carcinoma; others came into hospital unconscious and no diagnosis was made.

The majority of the patients in whom perforation was diagnosed and who were not operated on had peripheral circulatory failure and could not be resuscitated sufficiently for operation; they cannot be used for assessing the results of medical treatment. It is, however, of

it can be shown that differences in the fatality rate in men and women can be adequately explained by the greater proportion of women among patients with gastric perforations and among those in whom operation is delayed more than 12 hours. On the other hand, the age of the patient, the site of the ulcer, and the duration of delay all affected the fatality independently of one another. The results are shown in Table III. The expected numbers of deaths have

TABLE III.—Fatality of Perforated Gastric and Duodenal Ulcers Treated Surgically, 1938–51. Subdivided by Sex and Age of Patient, Site of Ulcer, and Duration of Delay Before Treatment*

Factor Affecting Fatality	No. of Cases	No. of Deaths		Factor Affecting Fatality	No. of Cases	No. of Deaths	
		Obs.	Exp.			Obs.	Exp.
Sex:				Site:			
Male	598	62	62.5	Stomach	122	27	16.4
Female	53	7	6.5	Duodenum	529	42	52.6
Age:				Duration of delay:			
Under 35	146	7	13.1	Less than 6 hr.	370	25	33.6
35–44	155	5	13.6	6–11 hr.	197	15	23.1
45–54	161	19	15.6	12–17 hr.	43	11	7.1
55–64	118	24	16.4	18 hr. and over	41	18	5.2
65 and over	71	14	10.3				

* Eight cases with one death have been omitted because the case records were incomplete, and 10 cases of perforated jejunal ulcer with no deaths have been excluded as being too few for separate analysis.

been calculated by allowing for the effects of all the other factors under consideration. For example, to obtain the expected numbers of deaths in men and in women, the numbers of men and of women with perforations in each age, site, and duration of delay subgroup were multiplied by the fatality rate for persons in that subgroup and the resulting products for each subgroup were added.

The excess mortality from perforated gastric ulcers is striking; it occurred in each age group, but to a significant extent only when the duration of delay was less than six hours (Table IV). The reason for the excess mortality

TABLE IV.—Duration of Delay

Hours:	Less than 6	6–11	12–17	18+
Duodenal perforations:				
Observed deaths	11	9	7	15
Expected	20.5	9.9	7.0	14.2
Gastric perforations:				
Observed deaths	14	6	4	3
Expected	4.5	4.1	4.0	3.8

give much indication of the subsequent course of the disease, but the number of cases in women was small, and it is possible that a sex difference would be revealed by larger numbers. Looked at from the point of view of freedom from symptoms, similar results are obtained. The sex and age of the patient seem to be unimportant, but 32% (12/38) of the patients with histories of one year or less remained symptom-free against 20% (14/71) of those with longer histories, and 30% (20/67) of those who had not had an ulcer diagnosed previously remained symptom-free, against 14% (6/42) of those who had. It can be concluded that symptoms which had lasted for more than a year or which had been severe enough to result in an ulcer having been already diagnosed before the perforation occurred are indications that the course of the ulcer disease will be unsatisfactory if the perforation is treated by simple closure.

Discussion

In recent years immediately good results have been reported with each of the three main methods of treatment; examples are shown in Table XI. The two series

TABLE XI.—Immediate Results of Different Methods of Treatment: Recent Series

Authors	Period of Admission	No. of Cases	No. of Cases Treated by:			General Fatality Rate
			Gastric Aspiration	Surgical Closure	Immediate Partial Gastrectomy	
Taylor (1951)	1946-50	73	72	1	0	9.6%
Heslop, Bullough, and Brun (1952)	1947-51	110	104	6	0	8.2%*
	1946-50	124	20	104	0	9.7%*
Present authors	1947-51	340	20	301	19	7.9%*
Nubser (1951)	1947-50	65	3	0	62	6.2%*
Lowdon (1952)	1951	65	1	13	51	6.2%*

* Including one death from haematemesis a few days after suture of the perforation, excluded from the fatality rate reported by the authors.

reported by Heslop, Bullough, and Brun are of particular interest for comparative purposes, as the patients were treated in neighbouring hospitals. The authors commented that "the two surgical departments of the hospitals concerned are both engaged in general surgery, are roughly the same size, they receive their patients from the same general practitioners of the area, and one of us is the connecting link between the two hospitals in that he is on the staff of both." The separate fatality rates for the groups of patients selected for the different forms of treatment differ greatly—for example, only one death occurred among the 132 patients treated by immediate partial gastrectomy—but the immediate overall fatality rates are strikingly similar.

In these circumstances conclusive evidence of the superiority of one or other method is likely to be obtained only by means of a controlled trial which, because of the low fatality rate now associated with all forms of treatment, would need to be very extensive. In the published reports the low fatality with immediate partial gastrectomy must be partly due to the selection of good-risk cases for operation, just as the high fatality with medically treated cases is often due to the limitation of the method of treatment to patients who are already moribund. We believe, however, that it may be wrong to consider the three possible methods of treatment as rivals; if the maximum immediate and late benefit to the patients is to be achieved, all three may well have a proper place in every series. In our opinion, tentative conclusions about the indications for each method of treatment are justifiable on the basis of the existing evidence. We assess them as follows.

Medical treatment has not been reported to provide a notably better immediate prognosis than the standard surgical treatment; it does not permit patients to be selected for immediate partial gastrectomy after inspection of the ulcer, and there is no reason to suppose that the late prognosis is any better than that achieved by simple surgical closure.

The method is contraindicated in the presence of bleeding or of pyloric stenosis, for a perforation after heavy eating or drinking, and in air-swallowers. Tanner (1951) sums up as follows: "The non-operative treatment demands frequently repeated expert clinical and radiological assessment, and any error in gastric aspiration, any momentary neglect, any lack of skilful observation, may be followed by disaster for the patient. . . . It is only safe in the hands of the enthusiast with ample medical and nursing assistance and is not suitable for routine usage." The method has been shown to be practicable, and is preferable when: (a) efficient surgery is not readily available; (b) other associated diseases—for example, recent coronary thrombosis—greatly increase the risk of surgery; and (c) perforation has occurred at gastroscopy, when the stomach is empty; for experience has shown that the perforation in this last group is often no longer detectable by the time laparotomy is performed.

Immediate partial gastrectomy has been shown to be a practicable method of treatment, compatible with an excellent immediate prognosis. As most ulcers which perforate acutely are on the anterior wall of the duodenum, the operation is technically easier to perform as an emergency for perforation than for bleeding, when the ulcers are often posterior and penetrating. It is the method of choice for a surgeon experienced in the technique when: (a) the perforation is gastric, and, although the ulcer may appear simple, there is in fact a considerable risk that it may hide an unrecognized carcinoma; (b) the patient gives a history of more than one year's dyspepsia and an ulcer has been diagnosed previously (because a high proportion of such patients will require a further operation if treatment is limited to simple closure); or (c) perforation and haemorrhage from an ulcer occur concomitantly.

We do not think it likely that immediate partial gastrectomy will be shown to be the method of choice for all perforations. It is possible that the immediate prognosis may be even better than that with simple closure of the perforations, by eliminating the deaths due to further complications arising from the persistence of the ulcer; but we have little firm knowledge of the ultimate results, and several reports have suggested that it may predispose to pulmonary tuberculosis (Pulvertaft, 1952). We do not, therefore, think that the operation can be justified as a routine procedure in duodenal ulcer patients in whom the ulcer has never previously been diagnosed and in whom the late prognosis with simple closure is reasonably satisfactory. Particularly is this so when the patients have no memory of prolonged discomfort from their ulcers to set against the symptoms of the dumping syndrome (should they arise).

Surgical closure of the perforation is now a highly satisfactory method of treatment, so far as the immediate prognosis is concerned. It is reasonable to continue to use it in the absence of positive indications for either of the other methods.

Summary

A series of 715 patients with perforated peptic ulcers, admitted during the period 1938-51, is reported.

Since 1947 there does not seem to have been any appreciable change in the fatality rate; in 340 cases, including those undiagnosed till after death, it has been 7.9%. Twenty patients were not operated on, mostly because the condition was not diagnosed or the patient was too ill; 17 died. In 301 patients simple surgical closure was carried out; 10 died, giving a fatality rate of 3.3%. Nineteen patients were treated by immediate partial gastrectomy without a death; in the first six months of 1952 the number so treated has been increased to 30. The concurrent association of haemorrhage and perforation was successfully treated by both simple closure and by immediate partial gastrectomy.

Seventy-four patients treated by simple closure for perforated gastric ulcers and an equal number of com-

parable patients with perforated duodenal ulcers were followed up after two to twelve years. Ten patients could not be traced. Eight (11%) of the "gastric" patients, but none of the "duodenal" patients, are known to have died of carcinoma of the stomach. Seven (5%) of all the patients died of peptic ulcer.

The late prognosis among the known survivors was unaffected by the sex or age of the patients or the site of the ulcer. It was affected by the length of history prior to the perforation and by whether or not the ulcer had been previously diagnosed; in the latter group 50% suffered a further gastric operation.

The advantages and disadvantages of the three current methods of treatment are discussed, and it is concluded that no one method should be the method of choice in all cases. In any one series all three methods have their proper place. Tentative conclusions about the indications for choice of method in individual cases are suggested.

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GRANULOMA OF THE NOSE AND PERIARTERITIS NODOSA

BY

H. J. M. STRATTON, F.R.C.S.Ed., D.L.O.
Senior Registrar, Woolwich Group of Hospitals

T. M. L. PRICE, M.D., M.R.C.P.
Physician, Lewisham and Woolwich Groups of Hospitals

AND

M. O. SKELTON, M.B., Ch.B.
Pathologist, Group Laboratory, Lewisham Hospital

[WITH SPECIAL PLATE]

From case reports published during the past twenty-one years there gradually emerges the picture of a peculiar syndrome consisting of a chronic ulcerating granulomatous inflammation of the nose, nasal sinuses, and often pharynx, larynx, and trachea, which is followed after a time by generalized periarteritis nodosa, and which leads almost invariably to a fatal issue.

The dominant lesion at the outset of the disease causes a purulent discharge from the nose, which is usually also obstructed. The nasal mucosa presents a characteristic picture of ulcers with yellow crusts which bleed on removal, and necrosis of the bone may appear later. These symptoms are usually accompanied by low-grade fever, and within a few weeks the patient is obviously becoming seriously ill, with albuminuria, signs of renal and cardiac failure, and a rising blood

urea. The terminal illness is usually short, death occurring about six months after the onset of the nasal lesions. Necropsy shows characteristic lesions of periarteritis nodosa in many organs.

This syndrome was first described in 1931 by Klinger (1 case), and since then by Wegener (1939), 3 cases; Lindsay, Aggeler, and Lucia (1944), 1 case; Weinberg (1946), 1 case; and Howells and Friedmann (1950), 1 case. Four of these patients were males and three females; their ages ranged from 23 to 70, and the total duration of illness from six to thirteen months. In all of them the post-mortem findings confirmed the diagnosis.

We record here two cases of this syndrome seen recently. In both of these a diagnosis was made comparatively early in the course of the disease—in the first case on the microscopical appearance of the nasal granuloma, and in the second on account of the striking similarity of the nasal lesions to those seen in the first case.

Case 1

A bus inspector aged 49 was admitted to St. Nicholas Hospital, Plumstead, under the care of Mr. L. E. Gardiner, on June 18, 1951, for investigation of bilateral nasal obstruction, nasal discharge, and an aching pain over the nose of three weeks' duration. There was nothing relevant in his past history, and he had not been given sulphonamides.

Examination showed slight generalized swelling of the nose externally and a thick, blood-stained discharge; the nasal mucosa was widely ulcerated, and had a raw granular surface, covered in parts with a yellow crust. It bled easily when touched; there was no fetor. The patient's general condition was good apart from a slight pyrexia and some malaise. An x-ray film of his nasal sinuses was clear. A course of penicillin injections, 300,000 units daily for 12 days, cleared up the discharge, but did not heal the mucosal ulceration.

A biopsy of the nasal mucosa on June 25 showed appearances interpreted as possibly tuberculous, and an x-ray film of his chest on July 6 revealed tuberculous apical lesions of doubtful activity on the right side. He was given a course of streptomycin, 0.5 g. twice daily, for five weeks, with P.A.S.

Persistent failure to find the tubercle bacillus in the sputum led to revision of the diagnosis, and a further nasal biopsy (Special Plate, Fig. 1) on July 16 was sent to one of us (M.O.S.) and reported on as follows: "The material consists of fragments of granulation tissue containing a fair number of eosinophils, and a small number of multinucleated giant cells of foreign-body type and of Langhans's type. There are no areas of caseation, and no tubercle bacilli have been demonstrated; one cannot at this stage entirely exclude tuberculosis, but the condition this resembles most is not tubercle but the so-called 'giant-cell granuloma of nasal sinuses.' This condition has been reported as a presenting lesion in patients who have subsequently developed periarteritis nodosa."

At the beginning of August the patient developed slight left exophthalmos, and another x-ray film of his sinuses showed left antral infection. Mucopus containing *Staph. pyogenes* and pneumococci was washed out at puncture. Subsequently a muscle biopsy from the thigh showed a small acutely inflamed artery, confirming the diagnosis of periarteritis nodosa (Fig. 2). By the second half of August he had developed gross oedema of the limbs and a peripheral neuritis of the mononeuritis multiplex type. He became severely breathless with left ventricular failure, and a chest x-ray film showed "bat's wing" changes in the mid-zones. Throughout this illness the nasal picture was unchanged.

He was transferred to Lewisham Hospital on August 28 for A.C.T.H. treatment; three intravenous infusions, two of 30 mg. and one of 50 mg., were given without apparent benefit. He died on September 1.

Investigations.—July 19: E.S.R., 52 mm. in first hour (Wintrobe 100-mm. tube). August 5: haemoglobin, 8.89 g.%; red cells, 2,800,000 per c.mm.; white cells, 8,000 per c.mm. (polymorphs 72%, lymphocytes 26%); M.C.H., 31 $\gamma\gamma$; M.C.D., 7.2 μ ; E.S.R., 61 mm. in one hour. August 14: urine contained 40 mg. of protein per 100 ml. and a few red and white cells. August 27: haemoglobin, 7.96 g.%. August 29: blood urea, 84 mg. per 100 ml. Blood-pressure readings: July 18, 160/80; August 17, 180/120; August 28, 155/90.

Necropsy Findings.—Externally, oedema of legs. The heart showed hypertrophy of the left ventricle; all main arteries were healthy. Nasal, laryngeal, and tracheal mucosae were hyperaemic, and one minute granulomatous nodule was present in the tracheal wall. The lungs were airless, oedematous, and congested; there were a few thrombi in the terminal branches of the left pulmonary artery and a small caseous tuberculous focus at the left apex. Pus was present in the antra and ethmoid sinuses. The left kidney had a small infarct; many other organs showed effects of heart failure but were otherwise normal.

Histology.—Kidney: many glomerular tufts contained small fibrin thrombi and showed minute foci of fibrinoid necrosis of the capillary loops, with rupture and small haemorrhages into Bowman's capsule. In some places there were adhesions between the tufts and the capsule, and early crescent formation was present. A small recent infarct was present in the left kidney. No acute arteriolitis was seen, but an acute necrotizing arteritis was occasionally present. Other acute arteritic lesions, typical of periarteritis, were seen in the capsule of the adrenals, the lungs, a small branch of the left coronary artery, and one of the vasa nervorum of the left anterior tibial nerve. The mucosae of the maxillary antra showed inflammatory reaction, with only one giant cell.

Case 2

A maintenance worker aged 51 was first seen on August 13, 1951, with a three-months history of nasal catarrh and obstruction, mild earache and deafness, a husky voice, and some loss of weight. There was no record of his having had sulphonamides before coming to hospital. His general condition was good. The nasal mucosa was congested without ulceration or crusting, there was mucopus in his nasopharynx, and he had chronic laryngitis. An x-ray film showed infection of the left maxillary antrum, which was punctured on three occasions, some smelly pus being washed out each time.

Not much improvement resulted from these measures, and on September 21 a raw granular area, without crusting, was seen on the mucosa of the left side of the septum. A biopsy of this showed thickened transitional epithelium and underlying connective tissue with slight chronic inflammatory reaction. At about this time he began to feel ill, with night sweats, cough, and occasional rigors. Except that he looked ill and thin, a general examination on September 29 did not show any abnormal physical signs, apart from his E.N.T. condition.

He was admitted to St. Nicholas Hospital on October 4, as he had by then developed pains and weakness in his limbs. His septal mucosa was extensively ulcerated, and was covered with dirty yellow crusts which caused bleeding on removal. His tongue was red, smooth, and dry, and his pharynx injected and covered with sticky mucus. The appearance of the nose was so like that in Case 1 that a provisional diagnosis of periarteritis nodosa was made; in keeping with this, he was found to have a widespread mononeuritis multiplex involving all four limbs in a flaccid paralysis with equivalent sensory loss, and associated with considerable oedema. He also had a tachycardia; rales

could be heard throughout both lungs; and an x-ray film showed "bat's wing" shadows in both mid-zones. The diagnosis was confirmed by muscle biopsy.

Later, a second biopsy of his nasal mucosa showed scanty lymphocytic infiltration but no giant cells. As a further antrum puncture still produced a little pus, a polythene tube was inserted for penicillin irrigation. On October 23 cortisone therapy was begun at Lewisham Hospital, and he was given 100 mg. by injection twice a day until he died, uraemic and in heart failure, five days later.

Investigations.—October 23: haemoglobin, 56%; red cells, 3,120,000; white cells, 28,000 (lymphocytes 20%, polymorphs 78%, monocytes 2%); blood urea, 128 mg. per 100 ml. October 27: blood urea, 270 mg. per 100 ml. Blood-pressure readings: October 13, 190/110; October 24, 175/105.

Necropsy Findings.—Externally, some oedema of ankles. The pleural cavities had some free fluid and fibrinous adhesions. The heart showed slight right and left ventricular dilatation, but was otherwise healthy. All lobes of lungs

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FIG. 1.—Serous exudation in liver of child aged 1½ years. (H. and E. $\times 150$.)

FIG. 2.—Serous exudation in the space of Disse. High-power of Fig. 1. Two sinusoids are shown widely separated from the columns of liver cells by serous exudation, which has markedly distended the perisinusoidal spaces. (H. and E. $\times 560$.)

FIG. 3.—Liver of child aged 2 years showing intralobular fibrillary collagen from previous attack and a serous exudate from current attack. (Picro-Mallory connective-tissue stain. $\times 600$.)

FIG. 4.—Wax-like eosinophilic coagulum in a perisinusoidal space, from the liver of a child aged 4 years. The coagulum gives the tinctorial reactions of collagen. (H. and E. $\times 680$.)

FIG. 5.—Serial section of same case as Fig. 4. Stained with picro-Mallory connective-tissue stain. Note the blue-staining coagulum in the perisinusoidal space: the sinusoid is clearly seen. ($\times 630$.)

FIG. 6.—Serial section of same case as Fig. 5, stained with modified Foote-Wilder reticulin stain: the reticulin fibres are swollen and stained black, but the "blobs" of coagulum are golden yellow in colour and are laminated. ($\times 520$.)

FIG. 7.—Liver of child aged 4 years. Stained with a modified Foote-Wilder reticulin stain. There is perivascular cuffing around the centrilobular veins with radiating perisinusoidal reticulosis. ($\times 600$.)

FIG. 8.—Serous exudate distending the space of Mall of a portal triad in the liver of a child aged 2½ years. (H. and E. $\times 370$.)

FIG. 9.—Liver of a child aged 2½ years, showing perivascular deposition of coagulum around an interlobular vessel extending between two portal triads. (Picro-Mallory stain. $\times 360$.)

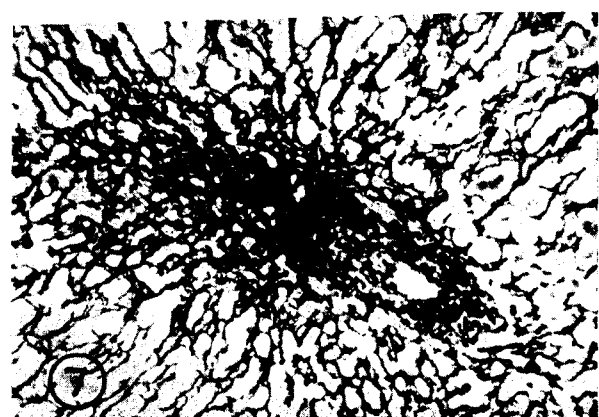
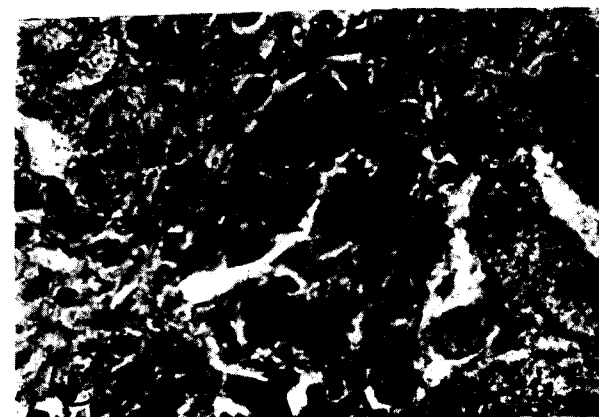
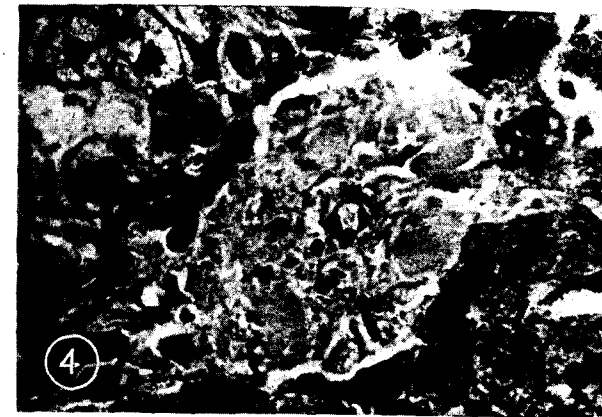
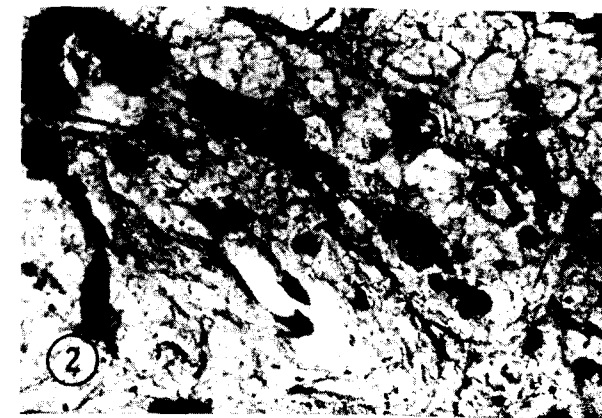
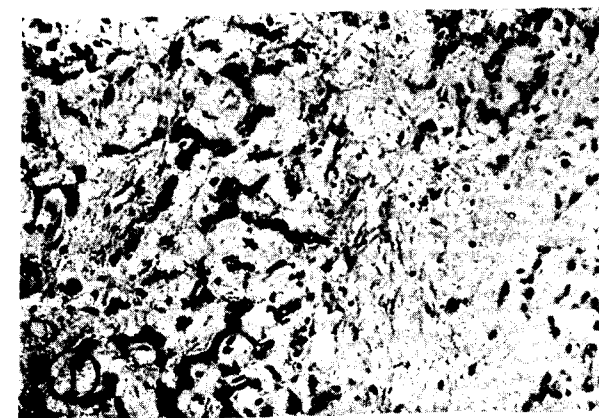
FIG. 10.—Widespread deposition of eosinophilic coagulum in the space of Disse throughout the lobule of a child aged 3 years 3 months. The coagulum has a sparse cellular infiltration indicating early fibrosis. (H. and E. $\times 600$.)

FIG. 11.—Liver from a child aged 2 years showing hepatic fibrosis; stained with a modified Foote-Wilder reticulin stain. Note the centrilobular cuffing and the perisinusoidal and perilobular reticulosis. ($\times 70$.)

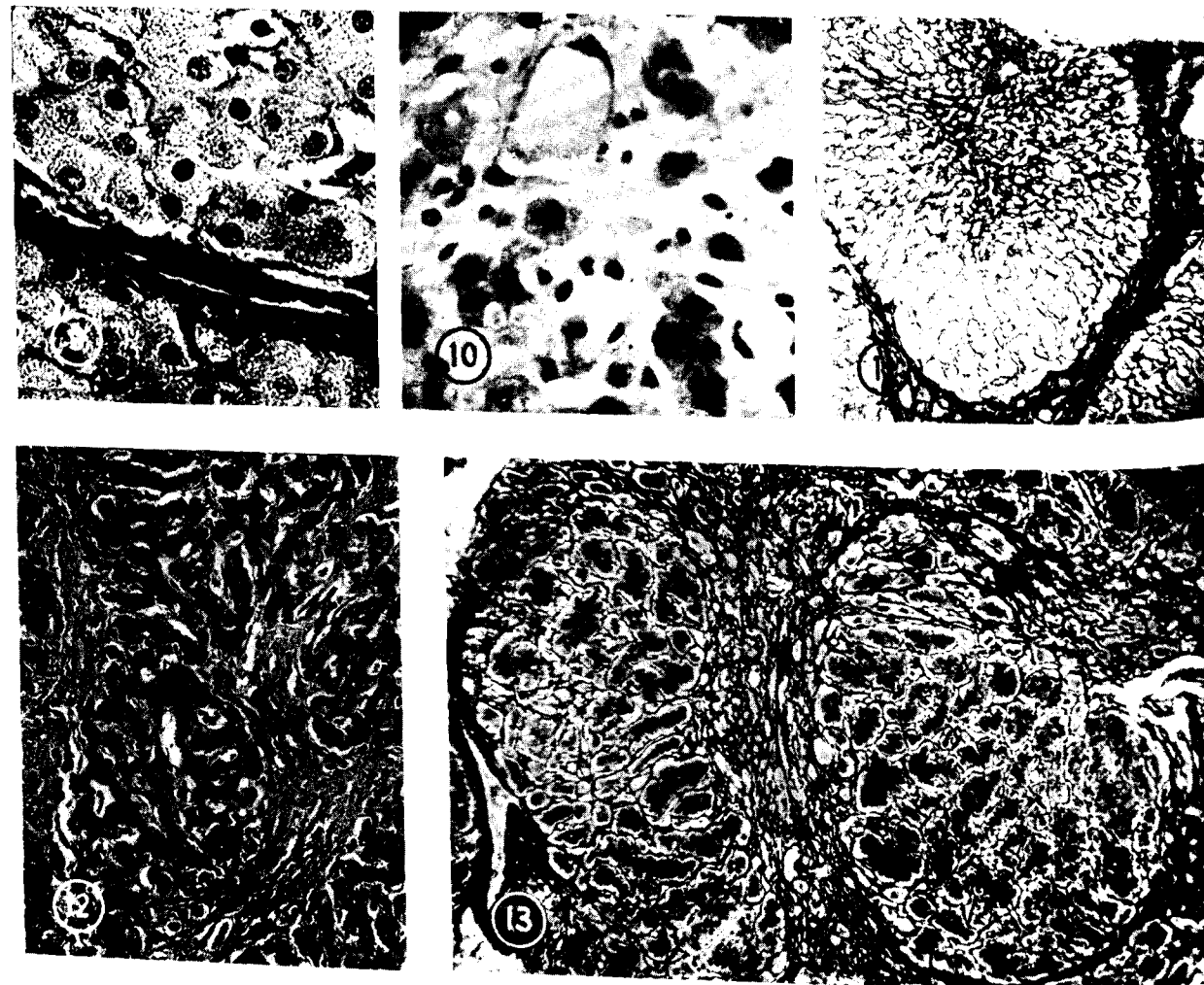
FIG. 12.—Liver from a child aged 2 years showing hepatic fibrosis. There are connecting bands between portal triads and centrilobular veins. (H. and E. $\times 150$.)

FIG. 13.—Shows marked hepatic fibrosis with lobule distortion and nodular reconstruction from liver of child aged 2 years. (Modified Foote-Wilder reticulin stain. $\times 140$.)

K. R. HILL, KATERINA RHODES, J. L. STAFFORD, AND R. AUB: SEROUS HEPATOSIS



K. R. HILL, KATERINA RHODES, J. L. STAFFORD, AND R. AUB: SEROUS HEPATOSIS



H. J. M. STRATTON, T. M. L. PRICE, AND M. O. SKELTON: GRANULOMA OF NOSE AND PERIARTERITIS NODOSA

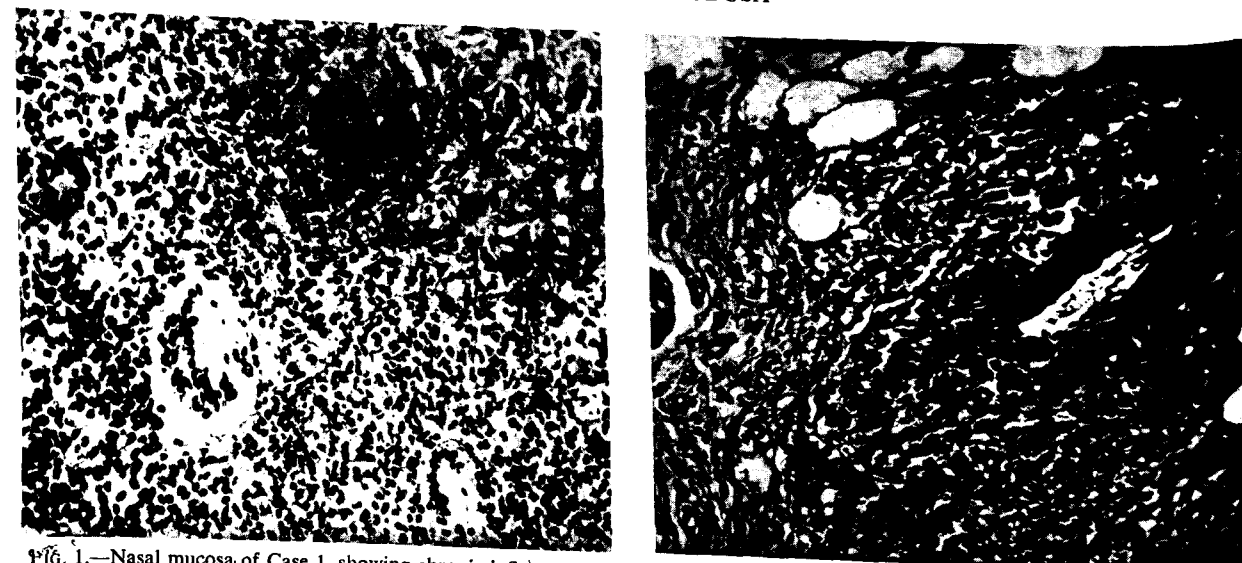


FIG. 1.—Nasal mucosa of Case 1, showing chronic inflammatory reaction and multinucleated giant cells. (H. and E. $\times 110$.)

FIG. 2.—Muscle biopsy of Case 1, showing acute inflammatory reaction in wall of small artery. (H. and E. $\times 90$.)

K. D. FORGAN MORLE AND P. W. ROBERTSON: SEGMENTAL ASPIRATION PNEUMONIA AND BRONCHIECTASIS

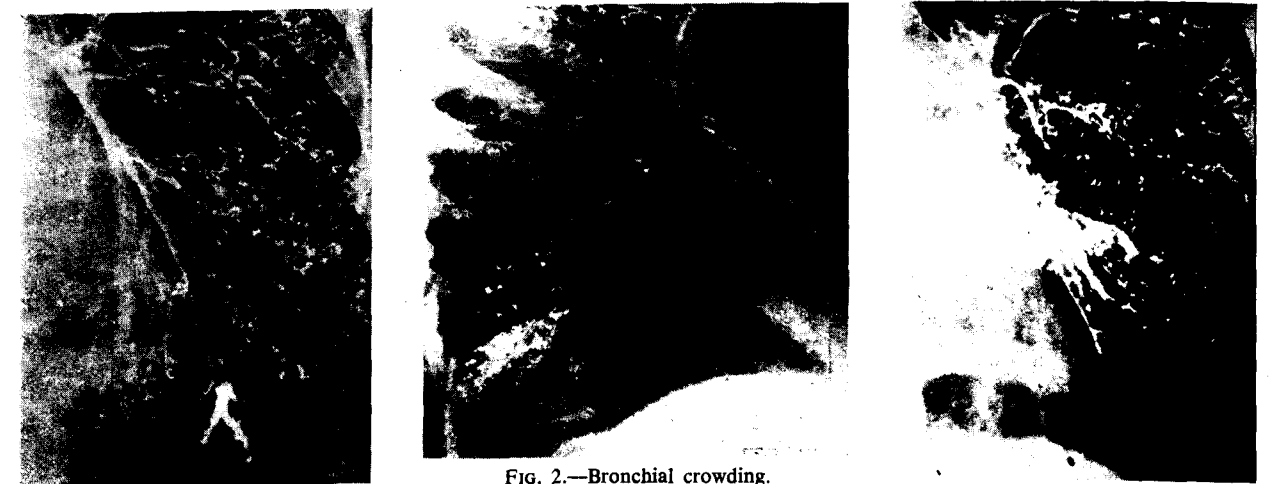


FIG. 1.—Bronchial dilatation.

FIG. 2.—Bronchial crowding.

FIG. 3.—Failure to fill bronchi in affected segment. Note heavy striate markings in unfilled region.

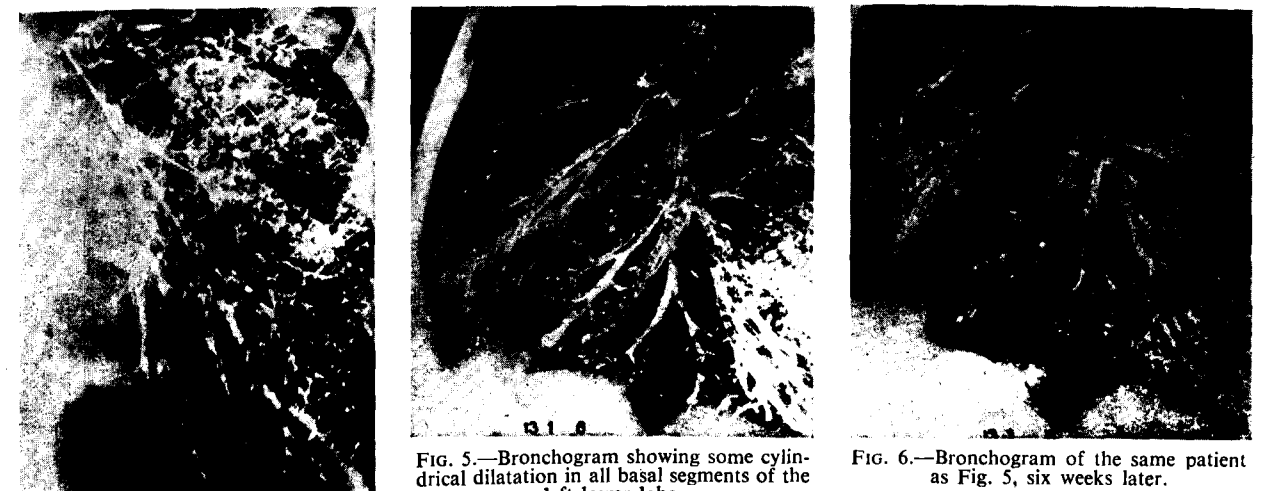


FIG. 4.—Normal bronchogram in same case as Fig. 1 after three months' physiotherapy.

FIG. 5.—Bronchogram showing some cylindrical dilatation in all basal segments of the left lower lobe.

FIG. 6.—Bronchogram of the same patient as Fig. 5, six weeks later.

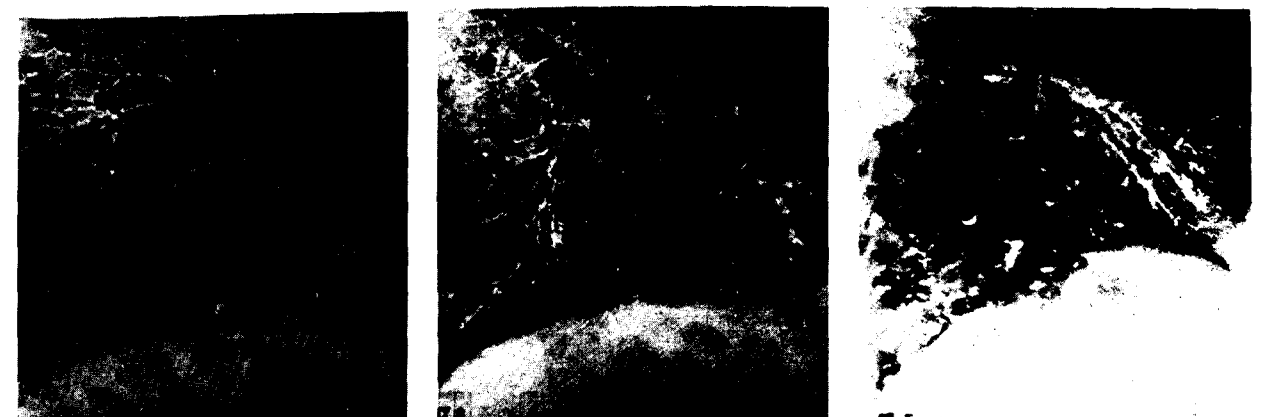


FIG. 7.—Bronchiectatic changes in right middle lobe following an acute inflammatory lesion with collapse.

FIG. 8.—Same case as Fig. 7 one year later, showing some re-expansion of right middle lobe but persistent bronchiectasis.

FIG. 9.—Widespread bronchiectasis in right lower lobe. This patient originally developed segmental pneumonia five years previously.

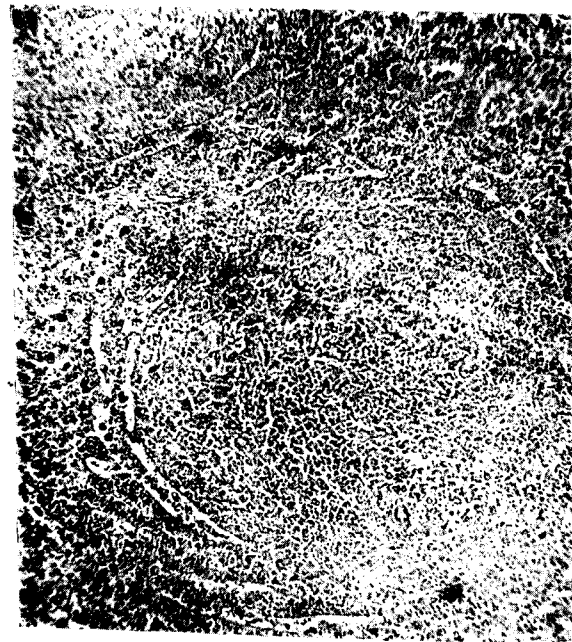
T. NICOL AND A. ABOU-ZIKRY: INFLUENCE OF OESTRADIOL BENZOATE AND ORCHIDECTOMY
ON THE RETICULO-ENDOTHELIAL SYSTEM

FIG. 1

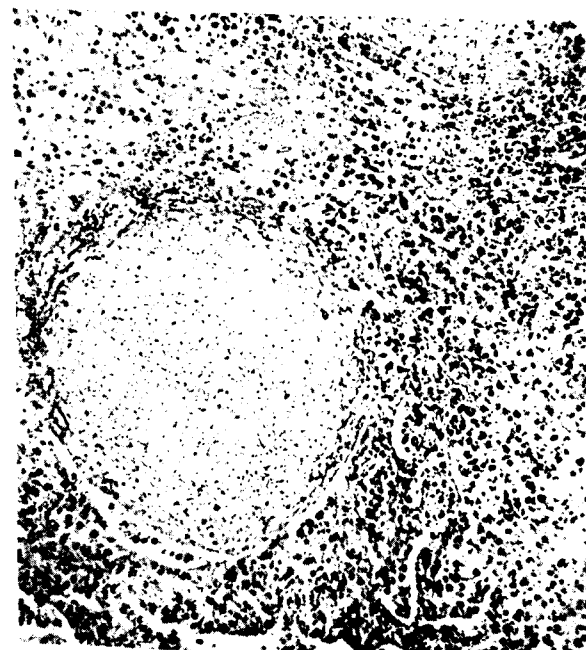


FIG. 2



FIG. 3

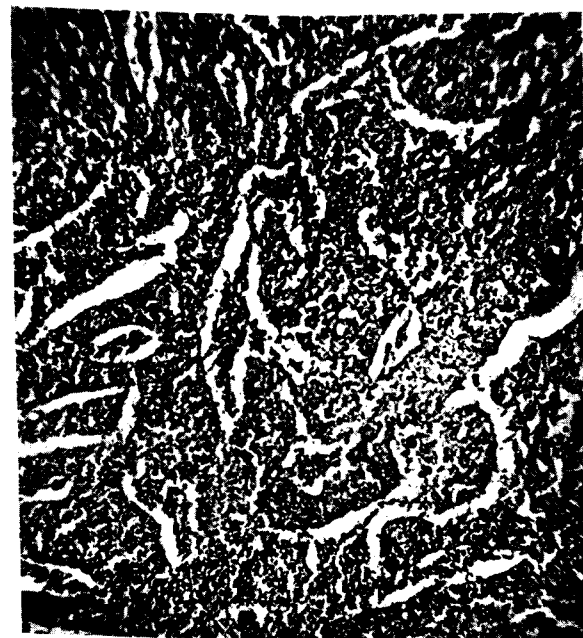


FIG. 4



FIG. 5



FIG. 6

showed red areas of infarction. The pancreas had two small infarcts in its tail; and the spleen showed irregular pale-pink areas throughout the pulp due to necrosis in areas of infarction. The kidneys had no macroscopic vascular nodules; there was one infarct. Periarthritic nodules were seen along small branches of the superior mesenteric and left gastric arteries. There was flat ulceration in nasal cavities—none anywhere else in respiratory tract. Microscopically the kidneys were similar to those of Case 1. Periarthritic was seen in small arteries of the kidneys, liver, lungs, mesentery, ileum, sciatic nerve, soleus muscle, and in arterioles at centres of malpighian bodies of spleen. Right antral mucosa was normal; left antrum and nasal cavities showed chronic non-specific inflammatory changes. Other body organs were essentially normal.

Discussion

As Howells and Friedmann (1950) point out, there are in the literature several cases of periarthritic nodosa in which chronic sinus infection was noted in the previous clinical history without its significance being emphasized. Upper-respiratory-tract infection probably plays a more significant part in periarthritic nodosa than is generally

recognized, and the important feature of the particular syndrome here described is that it is sufficiently clear-cut to enable a diagnosis to be made early. In both our cases the subsequent development of periarthritic nodosa was predicted on the appearances of the nasal mucosa. The microscopical appearances of the fully developed granuloma with its large multinucleated giant cells (Special Plate, Fig. 1) are very striking. Giant cells, however, were not seen in the mucosa in Case 2, either in the biopsy specimen or in the fragments of nasal and sinus mucosa procured at necropsy.

The essence of this syndrome is that the upper-respiratory-tract lesions are the first, and at the outset the dominating, feature of the condition. The periarthritic nodosa picture develops subsequently. This course of events is shown in our two cases. Several cases have been quoted in the literature as examples of this syndrome which do not fulfil these criteria—for instance, the case described by Rössle (1936-7) in which the nasal lesions were incidental in the disease process and were not the initial changes; and the case of Banowitch, Polayes, and Charet (1942) in which a mediastinal mass of giant cell granuloma affected the lung and was associated with periarthritic nodosa. There were no nasal lesions in this case.

Limiting the discussion of the syndrome to those cases exhibiting upper-respiratory-tract ulceration with the subsequent development of periarthritic nodosa, one may speculate on the possible significance of this pattern of the disease process. It is a well-known theory that periarthritic nodosa results from a hyperergic antigen-antibody reaction in the tissues, particularly affecting the vessels but also leading to the development of the granulomatous lesions in the extravascular connective tissue, which sometimes show giant cells of foreign-body type. Such granulomatous lesions have been produced experimentally by Goddard (1947), in his researches on the Arthus phenomenon, by injecting egg albumen into the skin of guinea-pigs; and numerous others—for example, Klinge (1933), Bergstrand (1946), and Pagel (1951)—have described the occurrence of granulomata in the connective tissue in periarthritic nodosa and in acute rheumatism and many others of the so-called "collagen diseases"; thus the nasal lesions in this syndrome may be regarded as special types of paravascular granulomata in the sense of the term used by Pagel, and are in accord with the theory that the disease is a manifestation of hypersensitivity.

There seem to be two possible explanations of the pattern of development of this syndrome. It may be that the patients have already developed generalized periarthritic and that the nasal lesions are merely the first to become apparent. There is no evidence to show whether or not generalized periarthritic nodosa was present at the time these patients first complained of nasal symptoms, and the clinical history at least suggests that the generalized disease followed later; but the patients were not submitted to a general investigation on their first attendance at the E.N.T. department with nasal lesions, and there are no data on this point.

A second possibility is that the upper-respiratory-tract lesions represent the relatively localized site of an attack on the body defences by some injurious agent of bacterial or chemical origin, and that widespread arterial lesions develop subsequently in a body now sensitized. This view is favoured by Wegener (1939) in his survey of the condition.

Another problem concerns the possible relationship between this disease and the condition known variously as "malignant granuloma of the nose" (Woods, 1921) or "progressive lethal granulomatous ulceration of the nose" (Stewart, 1933). The majority of the cases of this disease, which is almost invariably fatal, have not been examined after death, and still fewer have been examined histologically. However, Case 1 of the six cases described by Woodburn and Harris (1951) as examples of this disease and the third of Williams's (1949) three cases showed periarthritic nodosa at necropsy. Woodburn and Harris's Case 1 had

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TO PLATE

FIG. 1.—Photomicrograph of section of spleen of intact male control guinea-pig which received one subcutaneous injection of trypan blue daily at 4 p.m. for six days and was killed the following day. Shows a moderate number of dye-bearing cells in the sinuses of the red pulp. The dye-bearing cells appear black in the photomicrograph. (Weak eosin. $\times 200$.)

FIG. 2.—Photomicrograph of section of spleen of intact male guinea-pig which received 0.5 mg. oestradiol benzoate intramuscularly daily at 10 a.m. for four weeks plus one subcutaneous injection of trypan blue daily at 4 p.m. during the last six days before being killed. Shows numerous dye-bearing cells in the reticulum and in the dilated sinuses of the red pulp. The dye-bearing cells appear black in the photomicrograph. (Weak eosin. $\times 200$.)

FIG. 3.—Photomicrograph of section of spleen of intact male guinea-pig which received 0.5 mg. oestradiol benzoate intramuscularly daily at 10 a.m. for three weeks plus one subcutaneous injection of trypan blue daily at 4 p.m. during the last six days before being killed. Shows a large number of dye-bearing cells in a dilated sinus of the red pulp. The dye granules, which appear black in the photomicrograph, sometimes mask the nucleus of the cell. (Weak eosin. $\times 650$.)

FIG. 4.—Photomicrograph of section of spleen of orchidectomized guinea-pig which received 0.5 mg. oestradiol benzoate intramuscularly daily at 10 a.m. for four weeks, plus one subcutaneous injection of trypan blue daily at 4 p.m. during the last six days before being killed. Shows sinuses of red pulp dilated and empty of cells. Only a few dye-bearing cells can be seen in the reticulum. The dye-bearing cells appear black in the photomicrograph. The splenic vein in this animal contained many dye-bearing cells. (Weak eosin. $\times 200$.)

FIG. 5.—Photomicrograph of section of prostate of intact male guinea-pig which received 0.5 mg. oestradiol benzoate intramuscularly daily at 10 a.m. for four weeks, plus one subcutaneous injection of trypan blue daily at 4 p.m. during the last six days before being killed. Shows dye-bearing cells in the acinar tissue between the acini. The acini are surrounded by a thickened layer of fibrous tissue. The dye-bearing cells appear black in the photomicrograph. (Carbol-fuchsin. $\times 200$.)

FIG. 6.—Photomicrograph of section of prostate of orchidectomized guinea-pig which received 0.5 mg. oestradiol benzoate intramuscularly at 10 a.m. for four weeks, plus one subcutaneous injection of trypan blue daily at 4 p.m. during the last six days before being killed. Shows a densely fibrous prostate. The acini are collapsed and the lining epithelium is thrown into folds. (Weak eosin. $\times 200$.)

two years' history of nasal obstruction, ultimately developing ulcerating lesions of the nose and trachea, and died after one year's illness; at necropsy an acute necrotizing arteritis was found in many organs. We feel that these two cases are perhaps examples of nasal granuloma with periarteritis, as described here.

We have been able to examine slides of nasal lesions and post-mortem specimens of four cases of classical malignant granuloma of the nose. No evidence of periarteritis nodosa was seen, and the local lesion was a chronic non-specific inflammation. Therefore we have no evidence to enable us to decide whether the classical destructive "malignant granuloma of the nose" is another manifestation of the condition previously discussed or something entirely different.

Summary

Two cases are described in which periarteritis nodosa was preceded by an ulcerating granuloma of the nasal mucosa. Seven similar cases, and possibly two others, have been collected from the literature.

The significance of the nasal lesions is discussed and the possible connexion pointed out between this condition and the so-called "malignant granuloma of the nose."

We wish to thank Mr. L. E. Gardiner for permission to publish Case 1; Dr. I. Friedmann, Dr. A. G. Stansfield, Mr. N. R. Jory, and Dr. R. H. D. Short for allowing us to see tissues from cases of "malignant granuloma" of the nose; Mr. S. E. Andrews for the photographs; and Mr. H. Eastwood and Miss K. M. Vale for technical assistance.

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The Lebanon Hospital for Mental and Nervous Disorders at Asfuriyeh, near Beirut, was opened in 1900, and since then has passed through many excitements and upheavals, but the work has gone on unbroken. Apart from a financial crisis during 1946-7, the hospital has grown steadily, the peak number of in-patients being 501 during the summer of 1938. There are now some 23 buildings (contributed by four countries) on an estate of 38 acres beautifully situated on the foothills of Mt. Lebanon, about five miles from Beirut. The present number of beds is 450, but, with the opening this year of a large new building, there will again be room for 500 patients. The latter come from 14 or 15 countries and are of a dozen different religions. They are of all types and classes, from the rich to the destitute. The hospital also runs a neuropsychiatric clinic in Beirut, which is doing important work for early cases. Developments since 1948 include a training school for Lebanese and Near Eastern student nurses, with an Asfuriyeh certificate in psychiatric nursing. Psychiatric instruction to doctors is of longer standing, and the present medical director, Dr. W. M. Ford Robertson, is clinical professor of psychiatry at the American University of Beirut, and two senior psychiatrists also share in the work of teaching. There are also special courses at the hospital for graduate doctors and nurses of various nationalities. A copy of the annual report of the hospital can be obtained on application to the Lebanon Hospital office, Drayton House, Gordon Street, London, W.C.1.

SEGMENTAL ASPIRATION PNEUMONIA AND BRONCHIECTASIS*

BY

K. D. FORGAN MORLE, M.D., D.M.R.D.

Consultant Radiologist, Liverpool Regional Hospital Board;
 Clinical Assistant, Department of Radiology,
 University of Liverpool

AND

PHILIP W. ROBERTSON, M.D., M.R.C.P.

Squadron Leader, Medical Specialist, R.A.F.; Clinical
 Assistant, Royal Infirmary, Liverpool

[WITH SPECIAL PLATE]

In a previous publication we described the clinical features of a large series of cases of segmental aspiration pneumonia (Robertson and Morle, 1951) and suggested that the syndrome of primary atypical pneumonia could be largely explained on an aspiration basis. Reference was then made to bronchographic studies undertaken in these cases of segmental pneumonia. It was stated that a wide range of bronchial abnormality might occur within such lesions and that these changes might be serious and sometimes irreversible.

These changes are now described and their significance is discussed in relation to the natural history of bronchiectasis.

So far we have carried out bronchography about 600 times on over 300 cases of segmental pneumonia. From so large a series we feel that enough evidence is forthcoming to substantiate our view that many, if not most, of the cases of bronchiectasis originate from these segmental pneumonias occurring in association with upper respiratory infections.

Bronchograms

There are many degrees of deviation from the normal, and in a few borderline cases it has been found difficult to decide whether a bronchogram was abnormal or not. This difficulty, which appears to have worried other authors (Evans and Galinsky, 1944), is a matter of some importance, as changes of such minimal nature may represent the initial stages of disease, which may later become fully established.

We classified a bronchogram as abnormal if one or more of the following features were present. (a) Dilatation: this varied in degree from minimal changes in calibre to gross and obvious dilatation. (b) Crowding: approximation and crowding together of the bronchial shadows. (c) Failure to Fill: failure to obtain satisfactory filling of the peripheral bronchi of the region studied.

Further features noted in those bronchograms classified as abnormal on the basis of the above three criteria included distortion and angulation of the peripheral bronchi and apparent irregularity of the bronchial walls. Some elucidation of the three main abnormal features is perhaps necessary.

Calibre changes vary from loss of the normal degree of taper of the bronchus as the periphery is reached to severe and obvious dilatation. In an estimation of the significance of an apparently dilated bronchus there are several features to be taken into consideration. An illusion of dilatation may be caused by solid filling of a group of bronchi. Allowance must be made for the magnification of the

*The substance of this work formed a paper given at a meeting of the Thoracic Society in July, 1951.

image of the bronchus due to the distance of the latter from the film. In serial films care must be taken to allow for physiological change in calibre occurring at different phases of respiration.

Bronchial crowding is easily recognized, and is of course due to some degree of collapse. The coexistence of bronchial dilatation with bronchial crowding is well known and extremely common (Lander, 1946).

It is characteristic of bronchography that the appearances produced are transitory and that different stages of filling are recorded on serial films (Di Reinzo, 1949). For this reason it is unwise to be content with single films, and where necessary these should be followed by additional films after further posturing.

In general, a normal bronchial tree can be completely outlined without difficulty, and persistent failure to fill suggests bronchial abnormality. For this reason it is not possible to interpret bronchograms showing incomplete filling due to inadequate technique.

Bronchography performed in the presence of a resolving segmental aspiration pneumonia will usually show failure of filling of the peripheral bronchi within the affected segment. Further, there may be damming up of the lipiodol in the more proximal portion, indicating blockage of the peripheral bronchi by exudate. Persistent attempts to fill such a segment may lead to well-marked normal alveolar filling in surrounding normal regions—the affected region, in which neither the bronchioles nor the alveoli are filled, then being clearly demarcated. The inconstant changes referred to as rippling or beading of the outline of the bronchial wall could not be relied upon as an indication of abnormality.

The frequency with which the various bronchographic abnormalities are demonstrated in segmental aspiration pneumonia is closely related to the stage in the illness at which the bronchogram is done. Thus the incidence of abnormality is greater in the earlier stages of the illness; reversion of the bronchographic change tends to occur as resolution and re-expansion take place. The three main types of bronchographic abnormality mentioned above usually coexist, though any one may predominate over the others at different stages of the illness.

It is therefore of little value to express statistically the percentage of cases showing bronchographic abnormality. Any such figures would be wholly inaccurate and misleading. Even the incidence of persisting bronchial change is difficult to determine, for this depends upon the length of follow-up, the efficacy of treatment, and the possibility of some pre-existing disease in the affected segments. As a general impression from the investigation of over 300 cases it is felt justifiable to give a figure of about 60-70% as the incidence of bronchial abnormality in all cases of segmental aspiration pneumonia. Possibly about 5% of such pneumonic lesions have led to established bronchial abnormality despite adequate therapy and observation over a period of 18 months to two years. It is not known what the last figure would be if the cases were untreated, but it would probably be very much higher.

Natural History of Bronchiectasis

In this particular series, dealing as it does with chest infections and various stages of bronchiectasis, a history of previous significant chest illness would normally be regarded as of great importance, but in our experience it has proved unreliable. The difficulty centres on the word "significant." There can be few members of the general population who do not admit to winter coughs and colds, but these are not regarded as significant by either patient or general practitioner. Most of the present series gave a history of no more significant previous illness than such conditions, though 15% gave a history of "pneumonia." In some instances this previous history, together with a recent illness, led to the performance of bronchography on the supposedly affected side. It is interesting to note that the

percentage of abnormal bronchograms in such cases was little different from that of cases with no past history of chest disease.

One is continually faced with difficulty in interpreting the accuracy of the history: What does the patient mean by pneumonia? What does he mean by a chest cold? Doubtless in many cases either of these may have been an illness of the type described here. The patient will occasionally state that he has never had a chest illness but that he has had an illness similar to his present condition, in which there are chest pain and cough and radiological changes. There is therefore much unreliable material in the patient's history.

When one takes into account the more nebulous "chesty" colds and coughs a somewhat similar picture is evident. In approximately 13% of all cases such a history was given, and it was found that 79% of these had abnormal bronchograms. This latter group actually includes most of the more severe lesions. However, most of those with gross established and widespread bronchiectasis did not give a history which one might regard as typical of that condition and certainly no more suggestive than many who were shown to have normal bronchograms.

There are three principal points which it is wished to stress in connexion with the previous history of illness. (1) In most instances a history of a specific illness such as pneumonia is of no certain value other than indicating that there has been a chest illness. The diagnosis may well have been made on scanty evidence. The site and type of pneumonia are rarely known to the patient, and there is always the tendency for him to have received an exaggerated version of the childhood illness from his mother. (2) Although it was found that a high percentage of patients with a history of chest colds did show bronchographic evidence of disease, it must not be imagined for a moment that the history was definite enough to enable one to pick it out as "significant" as compared with the histories of a large group of general medical patients. (3) In any individual case only a survey of recent events was of help in deciding upon what investigations were necessary.

It is important to try to ascertain the age of any bronchial abnormality demonstrated in a pulmonary segment which has recently been the site of an inflammatory process. One must determine whether or not the inflammatory process was superimposed upon a pre-existing bronchial lesion. This point has been discussed from a slightly different angle by Grier (1944) and Scarlett (1946), who referred to the possibility of confusing primary atypical pneumonia with bronchiectasis which is the site of a pneumonic exacerbation; and from yet another angle by Blades and Duggan (1943), who stated that bronchograms obtained after atypical pneumonia may occasionally be misleading, and give the impression that the condition was true bronchiectasis. They showed that in several instances such bronchiectases reverted to normal, and they attempted to differentiate this from true bronchiectasis on clinical criteria. They do not seem to have appreciated, as did Ogilvie (1941), that this was an early stage in the natural history of bronchiectasis.

It is our view that in most instances the bronchial condition developed during the current illness. There are several points in support of this opinion: (1) so many of the patients could give no history of chest illnesses of any kind, however trivial; (2) all cases had been passed by mass miniature radiography examination within the previous few weeks; and (3) further evidence is provided by the demonstration of reversion to normal. Failure to conform to any one of these points must cast doubt on the age of the bronchial lesion.

This statement that the bronchial condition usually developed during the current illness is of fundamental significance. It indicates that illnesses such as the so-called "primary atypical pneumonia" syndrome can give rise to serious structural abnormalities within the affected segment. The fact that such structural abnormalities are

concealed calls for great care in the handling of these cases. It provides the reason for the persistence of symptoms or signs after an apparently straightforward "virus pneumonia"; it disposes of the fallacy that such illnesses are necessarily benign; and it offers a demonstration of the actual development of bronchiectasis.

The Forerunner of Bronchiectasis

What place in the natural history of bronchiectasis does this process occupy? It is our belief that this sequence of events is the forerunner of many cases of bronchiectasis. The importance of this statement lies in the appreciation of the commonness of segmental collapse and such illnesses. It has, of course, long been recognized that there is a close relationship between bronchiectasis and such collapse (Findlay, 1935; Andrus, 1937; Lander, 1946). It has not, however, been generally recognized that such atelectatic lesions are so frequent and that most of them may arise from an aspiration mechanism, as has been suggested by us. Such aspirated material is not necessarily derived from the upper respiratory tract, for local bronchial plugging may occur from failure to clear excessive bronchial secretion, as in generalized bronchitis or in asthma. Perhaps rather too much emphasis has been placed on glandular compression, foreign bodies, carcinoma, etc., which are well known to give rise to bronchiectasis but are infinitely less common. Furthermore, we believe that this type of illness forms most of the "bronchopneumonic" illnesses of childhood, the lesions being similar to those described by Lees (1950) in association with pertussis.

In some cases we have been able to observe that where there have been recurrent inflammatory episodes increasingly severe bronchial damage follows. This is suggestive of the possible course of the development of bronchiectasis.

Where obviously established and gross bronchiectasis is found, it is sometimes possible by careful history-taking or by inspection of Service medical documents to reveal an initial illness such as we have described. This may have been four to five years previously and at that time thought to be of little significance, but recurrent chest episodes of increasing severity and frequency followed. We believe that such a history is not that of infection superimposed on previously dilated and damaged bronchi but that of the gradual development of the condition. Finally, and, we feel, most significant of all, the site incidence of segmental pneumonia is identical with that of established bronchiectasis (Robertson, 1951).

Some Problems

Many problems are raised by the detection of segmental bronchial abnormality in a healthy relatively symptomless young man. Little guidance can be obtained from the literature for the long-term management of such cases, and, so far, our own experience has been limited to a three-years study.

In the management of such cases it is often most difficult to correlate the bronchographic changes with the patient's clinical state. How is one to foretell the local anatomical prognosis? Will it remain the same, or improve, or get worse? Having attempted to answer this, one then asks how the patient will be affected clinically. It is only the experience we have gained from serial bronchography on our earlier cases which has given us guidance on the likely course of the local lesion. For example, the segmental lesion may not clear radiologically and the patient may or may not have persistent symptoms; the segment may clear radiologically but troublesome symptoms remain; then, again, there may be apparent recovery radiologically and clinically, but the whole sequence may recur.

The object in all cases in which a segmental lesion has been recently demonstrated should be to arrange for a period of at least six months' observation and treatment. Bronchography should be employed as a guide to progress.

In our own work we have usually performed bronchography a second time at the end of about six to eight weeks, and, if still abnormal, again after four to six months. Most of our patients did in fact show reversion at the time of the first or second repeat bronchogram, and these have not appeared to be particularly prone to further trouble.

One of the most difficult types of case to handle is that in which bronchial damage can be persistently demonstrated but in which symptoms are so often minimal; such a condition might, under normal conditions, and remaining uninfected, be undetected for many years.

When the question of surgical treatment is raised there are again a number of points to consider. What is the risk of recurrent "pneumonia"? Is further damage likely to occur in the same or in adjacent segments? So far as the question of spread is concerned we have been able to show that further damage in the same or neighbouring segments can, and does, occur with the passage of time, although such spread may in turn be reversible if recognized.

Would it be justifiable to interfere surgically in the hope of avoiding more widespread disease with disabling symptoms in, say, 10 years, at which time conditions might be unfavourable for operation? The only patients of ours who were finally selected for local segmental resection with this in mind refused operation on the grounds of their present excellent health.

A slightly different problem is raised by the demonstration of a local segmental lesion in the presence of recurrent attacks of generalized bronchitis or asthma. It is important to recognize that such local lesions are merely incidents in the course of a generalized disturbance and naturally would not benefit to the same extent by resection. Once again the history of "recent bronchitis" may be grossly misleading, since it may indicate, as we have previously noted, repeated infection in a region with bronchial damage or an actual recurrent acute generalized bronchitis. It may be possible to differentiate between these two groups only by a period of observation, during which actual incidents may be studied.

Treatment

The purpose of this work is to indicate a major source of bronchiectasis and to suggest that the attack on this disease be shifted to a much earlier stage in its natural history.

There are two principal factors to be considered in dealing with the pulmonary lesion. These are the infection and the mechanical aspects. The lesion may be large and yet there may be little or no clinical upset. In such cases the mechanical obstructive elements predominate. On the other hand, even small radiological lesions may be responsible for a considerable degree of general illness. Treatment must be directed against either or both of these factors.

Many of the cases when first seen with their initial illness present features so strongly resembling "pneumonia" that there may be a temptation to administer the modern antibiotics at once. However, when the laboratory findings and x-ray appearances are seen it is very often evident that the condition is not consistent with this diagnosis in its more classical sense. This is even more true if the patient be first seen a day or two after the usually short acute stage. We have found that so many have recovered rapidly without specific therapy that the value of antibiotics is often subject to doubt. We do not believe that the use of aureomycin or chloramphenicol is justifiable on the grounds of a possible virus basis for the infection (Robertson and Morle, 1951). Detailed serological investigations, while possibly of academic interest, should not be allowed to cloud the appreciation of the fundamental nature of these segmental lesions. On the whole, it has seemed reasonable to restrict the use of antibiotics to those cases in which the infective element predominates.

The basis for therapy should rest upon an attempt to reverse the sequence of events which have led to the develop-

ment of the segmental pulmonary lesion. It is essential that material which has been aspirated should be removed, thereby establishing adequate aeration of the involved segment and removing the element of collapse. In addition to this process of re-aeration, drainage will prevent stagnation within the segmental bronchi and diminish the likelihood of damage to the bronchial walls.

Properly conducted postural drainage should be instituted, having first established the exact site of the lesion. Drainage may be assisted in some cases by the use of steam inhalations or by short-wave diathermy, especially when the sputum is particularly tenacious. The actual procedure of bronchography has often been observed to increase the production of sputum, with consequent local improvement.

On the other hand, bronchoscopy is not likely to prove helpful, since the bronchial obstruction is usually peripheral and multiple. The bronchial secretions have been found to be so thick and tenacious as to block the suction tube. This suggests the need for an efficient liquefying agent which could be used endobronchially, but so far none appears to be forthcoming.

Expectorant mixtures seem to have little or no effect on these lesions, while the use of opiates is "the most frequently prescribed frustrator of the vital defence of the lungs" (Jackson, 1950).

Summary

A study of the clinical and radiological features of segmental aspiration pneumonia is presented.

There is bronchographic evidence of varying degrees of bronchial abnormality within such segmental lesions. It is shown that in some instances quite well-marked bronchiectasis can be demonstrated, and though this is usually reversible it is not always so. The possible position of this sequence of events in the natural history of bronchiectasis, together with rational preventive treatment, is discussed. It is believed that most recognized established bronchiectases originate from such segmental lesions.

Without the co-operation of the medical authorities of the Royal Air Force, and in particular Air Commodore Rumball, the consultant in medicine, this work would not have been possible. Dr. P. H. Whitaker and Dr. Robert Coope, whose clinical assistants we are, have given us every encouragement and placed the full facilities of their departments at our disposal. Our thanks are due to the radiography staff of the Liverpool Royal Infirmary and to Miss Smith for the x-ray photographs. We are also grateful for much material assistance from the University of Liverpool.

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It may surprise some that the rainfall last year over England and Wales exceeded by only 0.6 in. (1.5 cm.) the average value for the years 1881-1915. Yet such was the case, according to figures published in *The Times* this week by Dr. John Glasspoole. However, the year, in England and Wales, was drier than 1951 by 7.9 in. (20 cm.). Scotland and Northern Ireland experienced a rather drier year than average last year. The most remarkable meteorological event in 1952 was the 9 in. (22.9 cm.) of rain which fell at Longstone Barrow, four miles south of Lynmouth, during the 24 hours which began at 9 a.m. on August 15. This was the third largest daily measurement recorded in the British Isles.

INFLUENCE OF OESTRADIOL BENZOATE AND ORCHIDECTOMY ON THE RETICULO-ENDOTHELIAL SYSTEM

BY

T. NICOL, M.D., D.Sc., F.R.C.S., F.R.C.S.Ed.
F.R.S.Ed.

AND

A. ABOU-ZIKRY, Ph.D., M.B., D.G.O.
M.R.C.O.G.

(From the Department of Anatomy, King's College,
University of London)

[WITH SPECIAL PLATE]

Oestrogens are used in the treatment of prostatic carcinoma and of cancer of the breast, urinary bladder, and other organs with good results, especially in the prostate. In the case of the prostate the beneficial action is accompanied by fibrosis (Fergusson and Pagel, 1945; Fergusson, 1948). Nicol and Helmy (1951) found that oestradiol benzoate, oestrone, stilboestrol, stilboestrol dipropionate, D.B.E. (α -di-(*p*-ethoxyphenyl)- β -phenyl-bromo-ethylene), and dienoestrol stimulated the reticulo-endothelial system in the ovariectomized guinea-pig and suggested that the beneficial effect of oestrogenic treatment in cases of cancer of the prostate may be due to stimulation of the reticulo-endothelial system and the transformation of macrophages in the prostate into fibroblasts and fibrous tissue (Jaffé, 1938; Maximow and Bloom, 1948).

The part played by the reticulo-endothelial system in the defence against cancer has been referred to by several writers. Stern (1941) showed that the function of the system as tested by the Congo-red method was impaired in 86% of patients with malignant disease. Kavetzki and Diadjuscha (1937) showed that stimulation of the reticulo-endothelial system lowered the incidence of development of cancer metastases in rabbits inoculated intravenously with Browne-Pearce carcinoma, whereas blockade of the system raised the incidence of tumour growth. Diadjuscha (1937) has also shown that implantation of Ehrlich carcinoma into mouse liver or spleen or of Flexner-Jobling carcinoma into rat testes was invariably successful when the reticulo-endothelial system was blocked, and rarely so when it was stimulated.

Present Investigations

Our investigations were designed to study the effects of oestradiol benzoate, orchidectomy, and their combination on the activity of the reticulo-endothelial cells in the spleen, liver, lymph nodes, and prostate, and on the amount of fibrous tissue in the prostate. For this purpose 28 intact male guinea-pigs and 24 double-orchidectomized guinea-pigs were used. One month was allowed to elapse after orchidectomy to ensure complete recovery from the operation and disappearance of testicular hormone from the blood. All the animals received one daily subcutaneous injection of trypan blue at 4 p.m. for six days and were killed by chloroform the next day. The dosage of the dye was calculated on the basis of 0.8 ml. of a 1% solution in distilled water per 100 g. of body weight. Six of the intact animals and ten of the orchidectomized animals were given the dye only, and served as controls. The remainder were divided into groups in which each animal received one daily intramuscular injection of 0.5 mg. of oestradiol benzoate at 10 a.m. for one, two, three, or four weeks; these animals received the injections of dye during the last six days of the hormone treatment.

and were killed the following day. Specimens of the prostate, spleen, liver, lymph nodes, bone marrow, skin and subcutaneous tissue, adrenal glands, and, when possible, the testes were fixed in Heidenhain's "susa" fluid. Sections were cut 10 microns thick and stained with dilute carbol-fuchsin or weak eosin. The activity of the reticulo-endothelial system was measured by the number of dye-bearing cells, and the intensity of the vital staining in the organs and tissues was examined.

Results

The results showed that in both the intact and the orchidectomized animals oestradiol benzoate produced hyperplasia and stimulation of the reticulo-endothelial macrophages, mainly in the spleen (Special Plate, Figs. 1, 2, and 3), liver, lymph nodes, and prostate, and that the degree of stimulation was roughly proportionate to the duration of the hormone treatment. In the orchidectomized animals the reticulo-endothelial system was more active, and oestradiol benzoate produced a greater response than in the intact animals.

In the spleen, prolonged oestrogenic stimulation appeared not only to produce a greater formation and activation of the reticulo-endothelial cells but also to assist their mobilization and liberation into the circulation. This was noted especially in the spleen of orchidectomized animals given the hormone for four weeks, in which the splenic sinuses were dilated and contained, in some animals, numerous dye-bearing cells, and in others a moderate number. In others the sinuses were practically empty (Fig. 4), although in the same animals the splenic vein and the intrahepatic branches of the portal vein contained a great number of dye-bearing cells. Furthermore, the peritoneal mesothelial cells covering the spleen became columnar and showed dye granules in the infranuclear zone as a result of the oestrogenic treatment, which confirms the findings recorded by Helmy and Nicol (1951) in female animals.

In the prostate, the dye-bearing cells appeared in the loose areolar tissue between the acini (Fig. 5). The vitally stained cells were very few in the intact animals not given hormone, but became numerous after oestrogenic treatment, and still more numerous when this was combined with orchidectomy. The thin layer of fibrous tissue which normally surrounds the prostatic acini became progressively thicker with hormone treatment, and the prostate showed the greatest degree of fibrosis in the orchidectomized animals which received oestradiol benzoate for four weeks (Fig. 6). Fibrosis was particularly marked in the region of the utriculus musculus. The arrangement of cells around the prostatic acini in the hormone-treated animals suggests that oestradiol benzoate leads to the appearance of macrophages around the acini and that if the treatment is maintained these macrophages change into fibroblasts and fibrous tissue. Orchidectomy also seems to influence both the deposition of the macrophages and their transformation into fibroblasts. The macrophages in the prostate probably come mainly via the blood stream from the spleen and other reticulo-endothelial organs, where their mobilization is stimulated by the oestrogens, and partly from proliferation of pre-existing local cells having mesenchymal potencies.

Conclusions

The stimulating effect of orchidectomy on the reticulo-endothelial system may be explained by: (1) The absence of the neutralizing effect of androgens on oestrogens which are normally found in the male animal and are probably produced by the suprarenal glands. This neutralizing effect was shown by Ihrke and D'Amour (1931), Browman (1937), and Robson (1938). (2) The stimulating effect of orchidectomy on the anterior lobe of the pituitary, leading to the output of more adrenotropic hormone, which in turn leads to the production of more oestrogens by the suprarenals.

The results of the present investigations, therefore, show that oestrogens and orchidectomy both stimulate the reticulo-endothelial system and in this manner probably increase the

general resistance against cancer; that in the prostate they induce the appearance of macrophages and later of fibrous tissue, which acts as a local defence against the spread of cancer; and that oestrogenic treatment combined with orchidectomy produces a more intense result than either alone.

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RESPONSE IN DOGS TO RELAXANTS DERIVED FROM SUCCINIC ACID AND CHOLINE

BY

L. W. HALL, B.Sc., M.R.C.V.S.
Clinical Assistant, Royal Veterinary College

H. LEHMANN, M.D., Ph.D., F.R.I.C.
Senior Lecturer in Chemical Pathology, St. Bartholomew's Hospital

AND

E. SILK, B.Sc.
Research Assistant

It has recently been reported (Hall, 1952) that suxethonium is a useful relaxant in operations on dogs, and as such is a welcome addition to the surgical practice concerned with this species. There was, however, a difference between the effects of the drug in dogs and in man, dogs being more sensitive and responding with longer apnoea to smaller doses. In an investigation on succinylcholine sensitivity in man (Evans, Gray, Lehmann, and Silk, 1952) a correlation had been found between low pseudo-cholinesterase level in the plasma and prolonged response to succinylcholine. This observation, and experiments *in vitro*, suggested that in man the drugs produced depolarization, not only directly but also by inhibiting the true cholinesterase, thus raising the acetylcholine concentration in the neuromuscular end-plates, and that the short duration of this effect was due to the rapid hydrolysis of succinylcholine by the pseudo-cholinesterase of the plasma. We therefore decided to investigate the enhanced effect of suxethonium in dogs along these lines by finding out whether there were differences between the enzyme systems of man and dog.

Methods

All observations in dogs except one were made in the course of necessary treatment. "Brevidil E," which used to be suxethonium di-iodide and is now obtainable commercially as the dibromide, and "scoline" (suxamethonium chloride), which is succinylcholine dichloride, were both used *in vivo* and *in vitro*. There was no major difference in their behaviour. All doses used *in vivo* and *in vitro* are expressed in terms of the active cation. The *in vitro* techniques followed were the same as described previously (Evans *et al.*, 1952). They depend on the evolution of CO₂ from bicarbonate buffer by the products of ester hydrolysis; the activity

of the enzymes is expressed as μ l. of CO₂ formed per minute by 1 ml. of serum or packed red cells at 37° C. (see McArdle, 1940).

Results

In 25 operations on dogs suxethonium was given in dosages mostly from 0.08 to 0.15 mg. per lb. body weight; in some instances the amounts administered were even less. To man four to six times these dosages are administered, yet the apnoea produced in dogs was longer than that seen normally in man. It has to be conceded that in the chest conditions hyperventilation may have played a part in extending the duration of apnoea.

We then established that in dogs, as in man, succinylcholine and suxethonium inhibit the hydrolysis of acetylcholine both by the true cholinesterase prepared from red

TABLE I.—Succinylcholine and Suxethonium in Dogs' Blood. Breakdown by Pseudo-cholinesterase, Inhibition of Acetylcholine Breakdown by Both Pseudo-cholinesterase and True Cholinesterase

Substrate (Active Cation)	μ l. CO ₂ Liberated by 1 ml. Serum or Packed Red Cells per Minute at 37° C.				
	Acetylcholine	Succinylcholine	Suxethonium	Acetylcholine + Succinylcholine	Acetylcholine + Suxethonium
Pseudo-cholinesterase of serum:					
Acetylcholine: 6.5 mg./ml.	68	2	—	14	—
Succinylcholine: 13 mg./ml.	43	4	—	20	—
Suxethonium: 14 mg./ml.	45	7	2	17	8
True cholinesterase of red cells:					
Acetylcholine: 0.65 mg./ml.	18	—	—	1	—
Succinylcholine: 1.3 mg./ml.	16	—	—	2	—
Suxethonium: 1.4 mg./ml.	18	—	—	2	0

cells and by the pseudo-cholinesterase of the plasma, and furthermore, that succinylcholine and suxethonium themselves are hydrolysed by pseudo-cholinesterase and not by the red-cell enzyme (for details see Table I). The inhibition of acetylcholine breakdown by dog's serum in the presence of succinylcholine had already been shown by Bovet and his colleagues (1951).

In man the cause of prolonged apnoea after succinylcholine had been a low activity of the pseudo-cholinesterase of the plasma. We therefore thought at first that dogs might normally have a much lower pseudo-cholinesterase in their plasma than man. Table II shows that, although the values for pseudo-cholinesterase tend to be lower in dog than in man, in whom the normal range is 55 to 120 units, only one dog had an esterase value below 40, which might in man cause a significantly prolonged apnoeic

response to succinylcholine. However, there was a considerable difference between the level of true cholinesterase of the red cells in man and dog. The values for man are about 80 to 120 (although very occasionally they may be as low as 60 to 80); and it will be seen in Table II that we found them to be six to eight times lower in dogs.

As pointed out in the introduction to this paper, the action of succinylcholine in man can be visualized as a combination of it with the two cholinesterases. True cholinesterase + succinylcholine causes the pharmacological effect, and pseudo-cholinesterase + succinylcholine brings it to its rapid end. The duration of apnoea would then depend on the dosage of succinylcholine given and on the concentration of the two esterases combining with it—that is, equilibria will be established between the free succinylcholine and the succinylcholine adsorbed both on the true

TABLE II.—Levels of Pseudo-cholinesterase (Serum) and True Cholinesterases (Red Cells) in Dogs' Blood. None of the Dogs Suffered from Anaemia or Liver Disease

Animal	μ l. CO ₂ Liberated per ml. Serum or Packed Red Cells per Minute at 37° C.	
	Pseudo-cholinesterase (6.5 mg. Acetylcholine/ml.)	True Cholinesterase (0.65 mg. Acetylcholine/ml.)
Greyhound ..	66	15
Mongrel ..	66	10
Mongrel ..	86	9
Cairn ..	55	14
Greyhound ..	68	18
Dachshund ..	49	9
Alsatian ..	65	13
Puppy ..	50	20
Mongrel ..	43	16
Mongrel ..	75	16
Labrador ..	33	21
Labrador ..	49	19

cholinesterase on the one hand and on the pseudo-cholinesterase on the other. Of these the combination pseudo-cholinesterase + succinylcholine is unstable and results in hydrolysis of the adsorbed drug. This will free pseudo-cholinesterase, which will thus become available for the remaining free succinylcholine. As the free drug is also in equilibrium with that combined with the true cholinesterase a fall in its concentration will result in a release of succinylcholine from that combination and the pharmacological effect will progressively abate.

The difference between the action of succinylcholine or suxethonium in man and dog can be explained on the basis of these equilibria. With a low concentration of true cholinesterase less free succinylcholine or suxethonium is required for the inhibitory combination which produces subsequent depolarization, and, although the destruction by pseudo-cholinesterase is almost as efficient as in man, the drain on the remaining free choline derivative cannot have the same effect because in the dog lower concentrations would still suffice to occupy the smaller amount of true

TABLE III

Type of Dog and Sex:	Mongrel, Male	Mongrel, Female	Labrador, Male	Labrador, Male
Age and weight	2 years; 25 lb. (11.3 kg.)	12 years; 22½ lb. (10.2 kg.)	6 months; 41 lb. (18.6 kg.)	3½ years; 63 lb. (28.6 kg.)
Premedication ..	Pethidine, 25 mg.; scopalamine, 1/200 gr.	Pethidine, 15 mg.; scopalamine, 1/200 gr.	Pethidine, 50 mg.; scopalamine, 1/200 gr.	Pethidine, 200 mg.; scopalamine, 1/100 gr.
Thiopentone (g.)	0.3	0.3	0.45	0.6
Maintenance ..	N ₂ O/O ₂ , 50:50	N ₂ O/O ₂ , 50:50	N ₂ O/O ₂ , 50:50; thiopentone, q.s.	N ₂ O/O ₂ , 50:50; minimal tritlene; thiopentone, q.s.
Pseudo-cholinesterase in plasma (units)	43	78	33	49
True cholinesterase in red cells (units)	16	16	21	19
Succinylcholine (mg.) (active cation)	2.5	2.2	5	7
Duration of apnoea (min.)	14	12	15	13
Thiopentone (g.)	0.05	—	—	—
Succinylcholine (mg.)	2.5	2.2	—	—
Duration of apnoea (min.)	18	13	—	—
Pseudo-cholinesterase injected (units)	21,000	21,000	21,000	21,000
in plasma (units)	102	111	54	63
True cholinesterase in red cells (units)	—	15	18	16
Thiopentone (g.)	0.1	0.05	0.05	0.1
Succinylcholine (mg.)	2.5	2.2	5	7
Duration of apnoea (min.)	4	No apnoea*	4.5	No apnoea*
Succinylcholine (mg.)	—	—	5	—
Duration of apnoea (min.)	—	—	5	—

* Though there was no apnoea there was shallow breathing, needing some assisted respiration in dog 2.

cholinesterase available. However, it should be possible to increase the pseudo-cholinesterase of the plasma in the dog and thus to lower the concentration of free succinylcholine and suxethonium so rapidly that even the low concentration of the drug required for inhibition of the true cholinesterase that animal will be effectively attacked. We therefore injected a highly concentrated solution of pseudo-cholinesterase intravenously into four dogs in the course of operations for mastectomy or conditions requiring orthopaedic treatment, and compared the effect of equal amounts of suxethonium given before and after the pseudo-cholinesterase level of the plasma had been increased.

As will be seen in Table III, after the pseudo-cholinesterase had been effectively raised succinylcholine was as short-acting in dog as it is known to be in man. To exclude the effects of premedication and the possibility that apnoea was due to artificial hyperventilation, one experiment was performed in which only thiopentone was used for induction and no artificial respiration was given during apnoea beyond one inflation per minute. Table IV shows that the

TABLE IV.—Adult Mongrel Bitch, Weight 31 lb. (14 kg.)

0 min.	0.5 g. thiopentone	Recording apparatus for blood pressure and respiratory rate connected
18 "	0.1 g. thiopentone	Pseudo-cholinesterase, 46; true cholinesterase, 18
23 "	3.5 mg. suxethonium	16 min. apnoea
43 "	0.1 g. thiopentone	
48 "	3.5 mg. suxethonium	11 min. apnoea
70 "	2 mg. succinylcholine	5 min. apnoea
83 "	0.1 g. thiopentone	
93 "	injection of 21,000 units pseudo-cholinesterase	
97 "	Pseudo-cholinesterase, 76; true cholinesterase, 15.5	
102 "	3.5 mg. suxethonium	no apnoea, 3 min. respiratory depression
112 "	3.5 mg. suxethonium	no apnoea, 4 min. respiratory depression
122 "	2 mg. succinylcholine	no apnoea, 2 min. respiratory depression
130 "	Pseudo-cholinesterase, 78; true cholinesterase, 15	

raising of the pseudo-cholinesterase level was effective under these conditions. Blood-pressure readings were obtained throughout and allowed an exclusion of asphyxia. Both brevidil E and scoline were used and noted as such in terms of active cation.

Discussion

Our findings support the suggestion that the effect of succinylcholine and suxethonium is the outcome of an interplay between these compounds and the two cholinesterases. The fact that the dog is much more sensitive than man would then be explained by the finding of a six to eight times lower true cholinesterase concentration in the red cells. Similarly, the fact that the sensitivity of the dog can be lowered to levels seen in man by raising the pseudo-cholinesterase level of the plasma can be understood on the bases of these considerations. We have assumed that the two esterases in man and dog are the same enzymes, and that the differences in activity of blood and plasma are due to different enzyme concentrations. It is, of course, possible that there are species variations and that the affinities rather than the concentrations are different. However, the interplay between compounds and enzymes would have the same outcome whether the enzymes differ in concentration or in affinity. Apart from theories, our findings have two practical consequences: the absence of side-reactions in the dog when given human cholinesterase preparations justifies its trial in man in cases of succinylcholine sensitivity. The use of the enzyme will be of advantage in veterinary medicine, as it will convert succinylcholine and suxethonium from comparatively long-time relaxants into compounds acting for a few minutes only, thus bringing into the surgery of the dog the advantages found in the use of succinylcholine and suxethonium in man.

Summary

Dogs are more sensitive to suxethonium and succinylcholine than man. When injected with doses about one-fifth of those used in man they react with an apnoea of about five times longer duration.

The pseudo-cholinesterase concentration in dogs' serum is not much lower than that in man, but the true-cholinesterase concentration in the red cells is only about one-seventh. It is suggested that there is a correlation between higher sensitivity and lower true cholinesterase and that raising or lowering any of the two enzymes will raise or lower the time of apnoea after succinylcholine or suxethonium.

In five dogs raising of the pseudo-cholinesterase level in the circulating plasma shortened effectively the time of apnoea after suxethonium or succinylcholine. The theoretical and practical significance of these findings is discussed.

We should like to express our thanks to Dr. E. B. McLean, of the U.S.A., who provided us with a pseudo-cholinesterase preparation containing 21,000 units per ml. This solution will in due course become available commercially under the name of "cholase."

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EFFECT OF PSEUDO-CHOLINESTERASE LEVEL ON ACTION OF SUCCINYLCHOLINE IN MAN

BY

F. T. EVANS, M.B., F.F.A.R.C.S.

Anaesthetist, St. Bartholomew's Hospital

P. W. S. GRAY, M.B., D.A.

Senior Registrar in the Department of Anaesthesia,
St. Bartholomew's Hospital

H. LEHMANN, M.D., Ph.D., F.R.I.C.

Senior Lecturer in Chemical Pathology,
St. Bartholomew's Hospital

AND

E. SILK, B.Sc.

Research Assistant, St. Bartholomew's Hospital

Human blood contains two cholinesterases. One is found in the plasma, and is unspecific so far as acetylcholine is concerned; it is therefore called pseudo-cholinesterase (Ps.ChE.). The other is the true cholinesterase of the red cells (Tr.ChE.). When succinylcholine was rediscovered by Bovet, Bovet-Nitti, Guarino, Longo, and Marotta (1949) and recommended as a muscle relaxant, its short action was already ascribed to its enzymatic destruction by the blood (Bovet-Nitti, 1949); this work was done on rabbits. Evans, Gray, Lehmann, and Silk (1952a) showed that, in man, of the two enzymes the pseudo-cholinesterase was responsible for the hydrolysis of succinylcholine. Bourne, Collier, and Somers (1952) found a significant difference in the pseudo-cholinesterase level when they compared six patients who had recovered normally from the effect of succinylcholine with six others whose response lasted beyond eight minutes. Evans *et al.* (1952a) demonstrated an inverse relationship between the duration of apnoea and the pseudo-cholinesterase level in the serum. It was suggested that unduly prolonged response to the drug should be treated with

transfusion of whole blood, which even on storage contains some 30 units of pseudo-cholinesterase per ml. of plasma. We were then offered for therapeutic trial a concentrated solution of human pseudo-cholinesterase by Dr. McLean, of the U.S.A., and this preparation was first used in dogs, in whom it was found by Hall, Lehmann, and Silk (1953) to be highly efficacious in the reversal of apnoea following injection of succinylcholine. Encouraged by these results, we injected the enzyme preparation, which will become available commercially as "cholase," in one of us (P. W. S. G.) and, following this, into patients. Cholase is prepared by ethanol fractionation and is a subfraction of Cohn's globulin fraction IV-6 (Surgenor, 1949).

Material and Methods

The levels of pseudo-cholinesterase and true cholinesterase were measured in serum and in laked and washed red cells respectively by the manometric method as described by McArdle (1940). This technique measures the CO₂ liberated from a bicarbonate buffer by the products of ester hydrolysis, and the activity of the enzyme solutions as expressed as μ l. of CO₂ formed per minute by 1 ml. of serum or packed red cells at 37° C. The pseudo-cholinesterase was measured, using serum in a final dilution of 1 in 15 with 8 mg. of acetylcholine chloride per ml. as substrate; the true cholinesterase was determined with the final 1 in 75 dilution of packed, washed, and laked red cells with 0.8 mg. of acetylcholine chloride as substrate. Cholase activity was measured in final dilutions of 1 in 1,500.

Experimental Procedure.—Four patients were given thiopentone for induction of anaesthesia. A blood sample was taken for measurement of the cholinesterases. When breathing was regular and no effect on it by thiopentone was noticeable, succinylcholine was injected and the time of apnoea was measured with a stop-watch. When breathing was fully re-established renewed thiopentone had to be given in one case (No. 1), but in the others the induced sleep was still deep enough to make this unnecessary. Cholase was then injected intravenously, and after 90 seconds a second blood sample was taken for measurement of the enzyme levels. Succinylcholine was then again injected as before and the resulting apnoea was measured with a stop-watch. The whole experiment lasted less than 20 minutes in all four cases.

Results

Case 1.—Man aged 61, weight 11 st. 4 lb. (71.7 kg.). Induction, 0.5 g. thiopentone. Blood enzyme levels: Ps.ChE., 90 units; Tr.ChE., 138 units. 50 mg. succinylcholine chloride injected; apnoea of 130 seconds followed. On waking up, 0.5 g. thiopentone given. 12 ml. pseudo-cholinesterase (252,000 units) injected. Blood enzyme levels: Ps.ChE., 183 units; Tr.ChE., 149 units. 50 mg. succinylcholine chloride injected; apnoea of 66 seconds followed. Blood enzyme levels: 2 hours later: Ps.ChE., 185 units; Tr.ChE., 152 units. 18 hours later: Ps.ChE., 125 units; Tr.ChE., 149 units. 24 hours later: Ps.ChE., 129 units; Tr.ChE., 132 units.

Case 2.—Man aged 52, weight 14 st. (88.9 kg.). Induction, 0.5 g. thiopentone. Blood enzyme levels: Ps.ChE., 72 units; Tr.ChE., 124 units. 50 mg. succinylcholine chloride injected; apnoea of 210 seconds followed. When breathing was fully re-established 5 ml. pseudo-cholinesterase (105,000 units) was injected. Blood enzyme levels: Ps.ChE., 95 units; Tr.ChE., 129 units. 50 mg. succinylcholine chloride injected; apnoea of 110 seconds followed. Blood enzyme levels:—3 hours later: Ps.ChE., 86 units; Tr.ChE., 120 units. 24 hours later: Ps.ChE., 74 units; Tr.ChE., 131 units.

Case 3.—Woman aged 67, weight 8 st. 11 lb. (55.8 kg.). Induction, 0.5 g. thiopentone. Blood enzyme levels: Ps.ChE., 34 units; Tr.ChE., 99 units. 75 mg. succinylcholine chloride injected; apnoea of 375 seconds followed. When breathing was fully re-established 6 ml. pseudo-cholinesterase

(126,000 units) was injected. Blood enzyme levels: Ps.ChE., 73 units; Tr.ChE., 97 units. 75 mg. succinylcholine chloride injected; apnoea of 135 seconds followed.

Case 4.—Woman aged 63, weight 12 st. 4 lb. (78 kg.). Induction, 0.45 g. thiopentone. Blood enzyme levels: Ps.ChE., 23 units; Tr.ChE., —. 50 mg. succinylcholine chloride injected; apnoea of 555 seconds followed. When breathing was fully re-established 3 ml. pseudo-cholinesterase (63,000 units) was injected. Blood enzyme levels: Ps.ChE., 36 units; Tr.ChE., —. 50 mg. succinylcholine chloride injected; apnoea of 345 seconds followed.

Table I summarizes the pseudo-cholinesterase levels before and after pseudo-cholinesterase injection and the time of apnoea before and after the raising of the enzyme level.

TABLE I.—Pseudo-cholinesterase Level and Effect of Succinylcholine Before and After Injection of Cholase

Case No.	Pseudo-cholinesterase (Units)		Apnoea following Succinylcholine (Seconds)	
	Before Cholase	After Cholase	Before Cholase	After Cholase
1	90	183	130	66
2	72	95	210	110
3	34	73	375	135
4	23	36	555	345

It will be noted that the levels rise rather less than they would have done if all the pseudo-cholinesterase had remained in the blood stream. Table II shows the "leakage into the tissues." There was, as would be expected, more deficit in the person weighing 14 st. (88.9 kg.) (Case 2) than

TABLE II.—Injection of Pseudo-cholinesterase and Rise in Enzyme Level of Serum

Case No.	Total Units Enzyme Injected	Rise in Units per ml. Serum	Expected Rise (Plasma Volume taken to be 2,500 ml.)	Units not Recovered per ml. Serum
1	252,000	93	100	7
2	105,000	23	42	19
3	126,000	39	50	11
4	63,000	13	25	12

in the others, who weighed much less. This deposition of additional enzyme in the tissues must have led to destruction of succinylcholine in these tissues and lowered the factor of 200, which usually results when the units of pseudo-cholinesterase are multiplied by the minutes of apnoea following administration of 30–50 mg. of succinylcholine to an adult (Evans *et al.*, 1952a). Table III shows that this

TABLE III.—If Succinylcholine Chloride is Injected Into an Adult at a Dosage of 30–50 mg. the Resulting Apnoea Depends on the Pseudo-cholinesterase Level of the Serum: Pseudo-cholinesterase in Units $\times$ Apnoea in Minutes = 200

Case No.	Fall of (Enzyme Units $\times$ Minutes Apnoea) Factor on Injection of Cholase	
	Factor before Injection of Cholase	Factor after Injection of Cholase
1	213	208
2	213	165
3	252	166
4	198	143

relationship applied well in the cases to begin with, but that the factor was lowered after cholase injection, with the exception of Case 1, in which, in view of the large amount of enzyme injected, the leakage into the tissues was relatively insignificant when compared with the rise in the plasma level.

Cases 3 and 4 received blood transfusions during the operation, but Cases 1 and 2 could be followed up for one day, and it was notable that there was still a significantly increased pseudo-cholinesterase level after 24 hours, when

252,000 units had been injected, but not after 105,000 units. Thus it may be possible to protect a person by the prior injection of pseudo-cholinesterase, but to obtain a prolonged protection the dosages will have to be large. In none of the patients did we discover any excretion of pseudo-cholinesterase in the urine.

We have elsewhere dealt with the suggestion that thiopentone was the true causative agent in increased sensitivity to succinylcholine (Evans, Gray, Lehmann, and Silk, 1952b); it will be noted that, at least in Case 1, thiopentone was injected before the succinylcholine was given, with and without choline; the difference in the duration of apnoea can therefore not have been connected with thiopentone. Hall, Lehmann, and Silk (1953) also paid particular attention to this point in their work on dogs, and have excluded apnoea due to thiopentone or to artificial respiration in the animals. We performed a special test on one of us (P. W. S. G.), in whom we injected succinylcholine without prior thiopentone. We have referred to this briefly before (Evans *et al.*, 1952b); here are the details of this experiment:

Man aged 30, weight 15 st. (95.3 kg.). Blood enzyme levels: Ps.ChE., 82 units; Tr.ChE., 136 units. 10 mg. succinylcholine chloride injected; apnoea of 40 seconds followed. One week later: Blood enzyme levels: Ps.ChE., 95 units; Tr.ChE., 129 units. 3 ml. pseudo-cholinesterase (63,000 units) injected. Blood enzyme levels: Ps.ChE. 122 units; Tr.ChE., 123 units. 10 mg. succinylcholine chloride injected; this was followed by no apnoea.

Since our last publication dealing with two patients (Evans *et al.*, 1952a) we have seen more cases in which a prolonged effect of succinylcholine could be explained by the finding of a low pseudo-cholinesterase level in the serum. There were, however, two patients in whom the enzyme level was normal; both were suffering from cancer and inanition, and had altered electrolyte values in the serum—particularly a low serum potassium. It is conceivable that in such patients a paralysis of muscles will not be easily reversed, because of a loss of excitability. Recently nikethamide was recommended as an antidote against succinylcholine (Barron, 1952); it is possible that it was of use in this type of case. Nikethamide has not been seen by us to lower the response to succinylcholine in man *in vivo* or to have an effect on either true cholinesterase or pseudo-cholinesterase *in vitro*.

Summary

The injection of pseudo-cholinesterase shortens the apnoeic response to succinylcholine. Not all the pseudo-cholinesterase injected can be recovered in the plasma; 20,000–50,000 units are “leaking” into the tissues within a few minutes. In one patient who received 252,000 units (equivalent to about 2.5 litres of plasma) the serum enzyme level was still raised after 24 hours, but no enzyme was found in the urine.

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The history of King Edward VII's Hospital for Officers is the subject of an interesting booklet recently published. The hospital was founded by Miss Agnes Keyser (“Sister Agnes”) during the Boer War. King Edward, a personal friend of Miss Keyser, fulfilled the last social engagement of his life at the hospital, of which he was patron. The booklet (price 2s. 6d.) is obtainable from the hospital, now at Beaumont Street, London, W.1, and proceeds from its sale will be devoted to the funds of the hospital.

BREAST-FEEDING IN THE OXFORD CHILD HEALTH SURVEY

PART I—A STUDY OF MATERNAL FACTORS

BY

CELIA WESTROPP, D.M., M.R.C.P., D.C.H.

(From the Institute of Social Medicine, Oxford)

The present investigation relates to 574 mothers* who regularly attended the Oxford Child Health Survey for at least a year. Its purpose is to compare the circumstances of mothers who failed to establish or maintain lactation with those who succeeded in feeding their babies for several months. It will shortly be followed by a descriptive account of the effect on the babies of breast- as opposed to bottle-feeding.

Prevalence of Breast-feeding

None of the mothers failed to put their babies to the breast at least once, but lactation had ceased in 88 within four weeks of delivery, and a further 82 had weaned their babies before the age of 4 months. At the opposite end of the scale there were 70 mothers who gave their babies nothing but breast milk for six months or longer, and 53 who were still giving their babies some breast milk after the age of 10 months. The mean duration of complete breast-feeding was 5.3 months (± 3.62) and of partial breast-feeding (weaning period) 3.7 months (± 1.90).

There was a general tendency for mothers who weaned their babies early to do so quickly, and for mothers who weaned them late to do so slowly. Thus half the babies breast-fed for more than six months had a weaning period which exceeded twelve weeks, whereas nearly two-thirds of the babies who were given bottle feeds within four weeks of birth were completely weaned in less than three weeks.

Compared with recent surveys in this country, the prevalence of breast-feeding is high (see Bibliography). In view of the method of recruiting into the Child Health Survey (Stewart and Russell, 1952) this is unlikely to be a characteristic of all Oxford mothers.

Factors Associated with Breast-feeding Habits

In the following account three groups of mothers will be distinguished: (1) those who did not begin weaning until their babies were over 4 months old (53.8%); (2) those who maintained complete breast-feeding for more than three weeks but less than four months (30%); and (3) those in whom lactation was never firmly established (16.2%).

Age and Parity

In the National Survey of all babies born in England and Wales during the week March 3–9, 1946 (Royal College of Obstetricians and Gynaecologists, 1948) it was found that, after standardizing for social class and parity, there was no consistent relationship between the age of the mother and the duration of breast-feeding, but first babies were breast-fed longer than other babies. Hughes (1942, 1948), and Dummer (1949) also found that the incidence of breast-feeding was higher among primiparae, but Norval (1947) and Dykes (1949, 1950) found no relationship between breast-feeding and parity, and Neale *et al.* (1943) thought that first-born babies had less breast milk than other babies.

In the present investigation there were 264 primiparae, of whom 111 were under 25 years and 20 over 34 years. In these two age groups 11% and 25% respectively failed to

*There are 580 babies in the Survey Group, but five were adopted and two were twins.

establish breast-feeding, and 42% and 35% maintained it for more than four months. The corresponding figures for primiparae of intermediate age were 9% and 65%.

For multiparae there was no distinction by age, but mothers with two or three children more often maintained lactation for over four months (59%) than either primiparae (53%) or mothers with four or more children (45%), though these differences only reach the 5% level of significance. When both parity and social class (Registrar General, 1938) were taken into consideration two distinctly different trends were revealed. For mothers in social classes I and II the incidence of prolonged breast-feeding increased steadily with increasing size of family; but in all other classes mothers with two or three children had a higher incidence than either mothers with first babies or mothers with four or more children. Despite previous observations to the contrary, there seemed to be no association between spacing of children and breast-feeding habits, but this may be due to the fact that only 30 mothers had produced two babies within a year.

To sum up, the observed relationships between breast-feeding habits, age, social class, and parity suggest that previous experience of maternity has a favourable effect on lactation, but that this is not enough to offset the adverse effects of heavy domestic commitments and a low wage packet.

Physique and Health

Breast-feeding habits were found to bear no relationship to the height or weight of the mothers, or to a combined assessment of physique, based on the height/weight ratio ($Ht/\sqrt{Wt}$). There was, however, a close association between health and lactation. Thus, 58% of mothers whose health was uniformly good after delivery breast-fed their babies for more than four months and only 14% failed to establish lactation. The corresponding figures for mothers whose post-natal health was poor are 38% and 24% respectively. These differences reach the 1% level of significance. No definite relationship between health and social class could be established, but there was a definite tendency for health to deteriorate with age and with succeeding pregnancies.

Social and Economic Circumstances

The relationship between social class and breast-feeding has been variously interpreted in different parts of the country. In the National Survey there appeared to be a distinct social gradient, mothers in the professional and administrative classes being more successful in establishing and maintaining breast-feeding than working-class mothers. Gordon (1942) at Ilford and Ross and Herdan (1951) at Bristol found the same tendency, but Robinson in Liverpool, Dummer in Hitchin, and Dykes in Luton found no consistent association between social class and lactation.

In the present survey 66% of the mothers in social classes I and II completely breast-fed their babies for more than four months, compared with 54% in social class III and 44% in social classes IV and V. The same trend was observed in respect of the period of partial breast-feeding, but in social classes IV and V a disproportionately large number of mothers continued to feed their babies for more than nine months. This tendency for a low general prevalence of breast-feeding to be associated with a high late prevalence is apt to cause confusion when comparing the breast-feeding habits of different groups of mothers.

As it was possible that an occupational classification no longer provided a reliable index of material prosperity, an alternative “amenities rating” was applied to the survey mothers (Stewart and Russell, 1952). The object of this was to distinguish mothers who enjoyed the best opportunities for child-bearing from those whose commitments or lack of facilities handicapped them in any way. The rating was based solely on objective criteria and took into consideration such things as the structural repair of the house, the water, sanitary and cooking arrangements, garden facilities, the number of persons per room, the presence of other young children, lodgers, “in-laws,” paid helpers, etc. According

to this index, 20% of the mothers were favourably situated, and 56% moderately and 24% severely handicapped. The corresponding proportions for prolonged breast-feeding were 64%, 54%, and 43%, differences which are significant at the 1% level.

The individual components of the amenities rating appear to have a cumulative effect. Thus, the relationships between household density—that is, persons per room—and lactation, and between outsiders in the home and lactation, were of the same order but of doubtful significance; but no direct association between the duration of breast-feeding and the presence or absence of a paid domestic helper could be demonstrated. There was little to distinguish mothers who shared the house with “in-laws,” mothers who took in lodgers to make ends meet, and mothers who were themselves lodgers in someone else's house; but compared with mothers who had a house to themselves the overall incidence of breast-feeding was low in all three groups.

Wages and housekeeping allowances were not incorporated in the amenities rating, since no figures were available for one-fifth of the mothers; but within the group which was assessed there seemed to be no consistent relationship between the amount of money spent on food and breast-feeding habits.

Only 38 mothers resumed gainful employment before the babies were 4 months old. In this small group the incidence of breast-feeding was exceptionally low, but how many of these mothers deliberately stopped feeding their babies and how many would not have continued in any case is not known. There were eleven unmarried mothers, five of whom continued to breast-feed their babies for over four months.

Maternal Efficiency

Marks were awarded for maternal efficiency on the basis of a number of subjective assessments concerning the appearance of the house and the child on three home visits made during the first year (Thwaites and Sutherland, 1952): 64% of the mothers scored 12 (full marks), 27.6% scored between 11 and 9, and 8.4% scored fewer than 9 marks. The corresponding proportions for prolonged breast-feeding were 61.1, 51.2, and 24.5%.

Since maternal efficiency is correlated not only with social class but also with health, parity, and the amenities rating, it is difficult to assess the significance of its association with breast-feeding. Taken at its face value, the relationship suggests that mothers who are good housekeepers have less difficulty in establishing and maintaining breast-feeding than mothers who are always at “sixes and sevens.” But whether this is a direct effect or merely due to the fact that “efficiency” is one of the ways in which health, education, income, and appropriate facilities manifest themselves it is impossible to say. Within the group with top marks for maternal efficiency were 47 mothers from social classes I and II who also attended a private mothercraft clinic. No fewer than 35 of these (approximately 75%) maintained full lactation for at least four months. In this clinic great stress is laid on the importance of breast-feeding; small complementary feeds are encouraged until lactation is established, and a long weaning period is advised.

Mode, Place, and Time of Delivery

Less than half the survey babies were born at home. The hospital and nursing-home deliveries included 34 forceps deliveries and 7 caesarean sections; but in spite of this the group as a whole had a relatively high incidence of prolonged breast-feeding (56%). Further analysis of the institutional deliveries showed that the mothers in social classes I and II represented a typical cross-section of the whole survey group in respect of “general health” and “obstetrical emergencies,” but the mothers in social classes IV and V included an exceptionally large number of abnormalities under both headings. Both subgroups were mainly composed of primiparae. When the corresponding rates for prolonged breast-feeding were inspected it was found that only 39% of the mothers in social classes IV and V breast-

fed their babies for four months, compared with 68% in social classes I and II. For mothers who were confined at home the overall incidence of prolonged breast-feeding was 50% with no variation in the different social classes.

The babies who were born in the winter and spring (December to May inclusive) were breast-fed longer than babies born in the summer or autumn, but the difference is of doubtful significance ($P < 0.20$). Neither sex nor birth weight appeared to influence breast-feeding habits.

Discussion

So interwoven are the factors which influence breast-feeding habits that it is not only impossible to assess their individual contribution but even difficult to distinguish favourable and unfavourable influences. It is, for instance, unlikely that previous experience of child-bearing has anything but a beneficial effect on lactation, but it is not until parity and economic status are separated from one another that the true physiological effect is seen.

The present investigation has shown that mothers with heavy domestic commitments and lack of suitable facilities tend to wean their babies early, but we are still no nearer knowing what in "the complex of adverse circumstances which accompany poverty" (Ryle, 1946) has the most harmful effect. Other observers have failed to establish a direct relationship between lactation and nutrition (Robinson, 1939). It is improbable, therefore, that the observed association is due to malnutrition. It could, however, be due merely to the fact that the commercial advertising of baby foods is more successful in working-class than in professional circles. Once established, breast-feeding is both simpler and cheaper than artificial feeding. It is therefore unlikely that a working-class mother with several children weans her baby merely to "save trouble." On the other hand, breast-feeding can be very tedious in the early days and, other things being equal, a mother with heavy commitments and inadequate assistance is less likely to be successful in establishing lactation than a mother who can devote more time and attention to the new baby.

The relatively high level of breast-feeding among mothers delivered in hospital could be due to a bias in favour of hospitals by mothers who are otherwise favourably situated to establish and maintain lactation, or to the setting itself, which is, domestically speaking, restful and one in which good habits could be encouraged not only by precept, but also by example. It has certainly been a feature of other investigations (Hughes, 1948; Dummer, 1949; Dykes, 1950; Royal College of Obstetricians and Gynaecologists, 1948), but the relative importance of temporary freedom from worry, "selective recruitment," and example has not yet been measured.

Enough has been said to show how difficult it is to disentangle even the few factors chosen for special study, and how impossible to arrive at firm conclusions. With the small numbers available, the survey data have done little more than confirm the observations of previous writers and provide a background for the survey children. It may, however, be possible for larger clinics to select one or two of the more promising lines of inquiry for closer study. Meanwhile, the relatively high incidence of prolonged breast-feeding in the group as a whole suggests that a target of "breast-feeding by 80% of mothers for six months [which] would materially reduce both morbidity and mortality rates in infancy . . . is perhaps more readily obtainable than is generally believed" (Cruckshank, 1945).

Summary

Among 574 mothers attending the Oxford Child Health Survey, 53.8% breast-fed their babies completely for over four months and 16.2% for less than three weeks.

Social and economic conditions have a pronounced effect on breast-feeding habits. If they are good the incidence of prolonged breast-feeding increases with the increasing size of the family; if not it will diminish.

The high prevalence of breast-feeding among mothers delivered in hospital emphasizes the importance of freedom from domestic commitments in the early days of lactation.

I am indebted to Sister Wood, of the Oxford Mothercraft Clinic; to my colleagues in the Child Health Survey, particularly to Miss Thwaites, until recently our social worker; and to Dr. Alice Stewart for her encouragement and help. The Medical Research Council contributed towards the expenses of this investigation.

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Medical Memoranda

Cholangiography by Means of a Barium Enema

The inflamed gall-bladder containing stones not infrequently becomes attached to a neighbouring hollow viscus, and on occasion a stone or stones may ulcerate into the intestinal tract, either completing the passage safely or producing intestinal obstruction, the complication of obstruction being more likely when the fistula is between the gall-bladder and duodenum.

Examples of the spontaneous passage of gall-stones by the intestinal route were commonplace when biliary surgery was a rarity. The following case is worth recording because the safe passage of the stone or stones did not result in the fistula closing, owing to the normal channel being blocked by a stone in the ampulla of Vater. Moreover, the patient's symptoms were presumably due to the persistence of the fistula, and the presence of this fistula was demonstrated radiologically before operation.

CASE REPORT

The patient, a married woman aged 70, was referred to me by Dr. Russell Fraser. She had been a known diabetic since 1939. In 1947 she suffered from severe diarrhoea for about nine months, and this cleared up after a single injection of liver extract. Up to three months previously she remained well so far as her gastro-intestinal system was concerned, and then the diarrhoea recurred. The bowels were opened 10 to 12 times daily, and she was most affected at night and in the mornings, but the bowels were not opened in the afternoon. The stools were pale yellow and liquid, and there was no blood or mucus. Liver injections were tried again, but with no relief. There was no loss of weight. She also suffered from frequency of micturition, pruritus vulvae, and cataract, all these symptoms being attributed to the diabetes. It was thought that the diarrhoea was due either to the diabetes or to a neoplasm of the

Sigmoidoscopy did not show any abnormality. A barium enema (Dr. A. Jenkins) revealed a fistulous communication between the colon, in the region of the hepatic flexure, and the gall-bladder. The opaque material passed along what was thought to be the common duct, where there was a filling defect which was believed to be a stone at the ampulla of Vater (see illustration).

Operation was carried out November 16, 1951, and the findings were exactly as had been suggested radiologically.



Radiograph showing the filling defect.

The hepatic flexure of the colon was adherent to the liver, and when the two organs were separated the gall-bladder was brought into view and was seen to communicate with the colon by a fistula. The fistula was divided and the opening in the transverse colon closed in layers. The junction of the cystic duct and the common bile duct was identified, and these ducts and the common hepatic duct were seen to be dilated. The pancreas felt normal. The common bile duct was explored and a stone was removed from the lower end. Another stone was found in the right hepatic duct. The ducts were washed out with saline, and, after the patency of the ampulla of Vater had been confirmed by means of a sound, the gall-bladder was removed and a drain placed over the common duct.

The patient made an uninterrupted recovery. The diarrhoea stopped immediately and has not recurred since.

R. H. FRANKLIN, M.B., F.R.C.S.,
Department of Surgery, Postgraduate Medical School
of London, W.12.

Serum Sickness

Antitetanus serum is given widely as a prophylactic measure in out-patient departments of general hospitals and by general practitioners throughout the country, and mild symptoms due to serum sickness are noted from time to time. The following case is interesting because of the splenic enlargement, a factor which may cause confusion in diagnosis from glandular fever and septicaemia. Splenomegaly has been reported in America, but apparently not in this country.

CASE REPORT

The patient, a girl aged 7 years, injured her left thumb so that the nail and pulp were hanging by a medial skin-flap. She was admitted to hospital on October 26, 1951, for suture under general anaesthesia, and was given a prophylactic dose of 1,500 international units of antitetanus serum subcutaneously into the right arm, and "distaquine" penicillin 250,000 international units six-hourly. The wound healed and she remained very well and was discharged on October 31. She returned to the out-patient department the next day, when the thumb was dressed, and appeared quite well. On November 2, when she reported for further dressings, it was noticed that her temperature was 99.6° F. (37.6° C.), was noticed that her temperature was 99.6° F. (37.6° C.), and on examination tender enlarged, firm glands were found in both groins and popliteal fossae. The spleen was palpable two fingerbreadths below the left costal margin, but was not tender. There was no rash.

The patient was admitted to a medical ward, and on further examination four hours later was found to have palpable glands in both anterior cervical triangles and in the left axilla. There was an area of skin in the left hypochondrium 4 in. (10 cm) in diameter, bright pink in hue, but not

irritating. She had no temperature at this time. Her throat was normal, and she had no clinical jaundice. There was no apparent infection, and glandular fever was suspected. Blood examination showed: red cells, 4,530,000; haemoglobin, 78%; leucocytes, 7,000; polymorphonuclears, 83%; eosinophils 1%; lymphocytes, 13.5%; monocytes, 2.5%. A Paul-Bunnell agglutination test was negative, as were the Widal and Brucella agglutination tests. The next day, November 3, the pink erythematous area on the trunk had disappeared, but the skin over the gland in the right groin was discoloured. No local infection was apparent. A vaginal swab was taken, which revealed no cause for the adenitis, and a course of penicillin was begun by injection into the right buttock.

On November 5 the glands were no longer tender, but the whole of the right buttock was red, though on palpation there was no tenderness. A few rubelliform spots were noticed on the abdomen. The penicillin was discontinued, the diagnosis of serum sickness having been made. On November 6 the buttock was normal in colour, but a rash was present on both legs. This consisted of circular lesions with pale centres encircled by red rings varying in size from 5 to 30 mm. in diameter. The rash spread down her legs and faded lastly from her feet on November 8.

The following tests were made on November 8 and 9: Antitetanus serum was diluted to 1/100 and 0.02 ml. was injected intradermally into the right forearm. Twenty minutes later a wheal measuring 12 mm. in diameter and a flare measuring 24 by 30 mm. were noted. Antitetanus serum was diluted 1/10 and one drop was inserted into the left conjunctival sac: there was no reaction or irritation. (Ciba in 1932 tested 465 patients with conjunctival and intradermal tests: 5.6% were positive to both tests; 21.3% were positive to the intradermal test only. All patients positive to the conjunctival tests were also positive to the intradermal test.) Crystalline penicillin was diluted 1/100 and 0.02 ml. was injected intradermally into the left arm. Twenty minutes later there was no reaction.

Strazza (1946) reported delayed sensitization to penicillin similar to serum sickness. On a scratch test the reaction to penicillin 15,000 units per ml. was negative. Gordon (1946) reported three cases and reviewed the literature on reactions to penicillin simulating serum sickness. There was no reference to enlargement of the spleen, but one case had glandular enlargement. Scratch tests were sometimes positive.

Diphenhydramine hydrochloride was begun on November 9, 20 mg. being given four-hourly. The glands in her neck, axilla, and popliteal fossae were no longer palpable on November 10. The glands in the groin had decreased in size and were not tender, and the spleen could just be felt on inspiration. On November 12 the spleen was no longer palpable.

Peterson and Bishop (1947) treated serum sickness with diphenhydramine hydrochloride, giving 50 mg. or more, up to 100 mg., six- to eight-hourly, depending on results. As relapse may follow withdrawal, they suggested carrying on for three days to a week, depending on the condition of the patient.

COMMENT

There was no history of asthma, urticaria, or hay-fever in the family, and this was apparently the first injection of horse serum the child had had. The first sign was a slight fever discovered seven days after the injection, though it is possible that the glands and spleen had enlarged before this time. The rash appeared on the tenth day, and varied in type over the next five days. The only complaint during these manifestations of serum sickness was tenderness in the groins.

I wish to thank Dr. H. R. E. Wallis for permission to publish this case and Dr. M. Marshall, house-surgeon, who transferred the child under my care.

MARY WHITFIELD, M.B., Ch.B.

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Reviews

SURGERY OF THE OESOPHAGUS

Surgery of the Oesophagus. By R. H. Franklin, M.B., B.S., F.R.C.S. (Pp. 219; 90 illustrations. £2 2s.) London: Edward Arnold, 1952.

Mr. Franklin's pioneer work on the surgery of the oesophagus, doubtless inspired by his association with Grey Turner, is well known, and his book is bound to attract attention. His own most important contribution is in the account of the treatment of atresia of the oesophagus, in which he tells us that his were the first recorded successes outside the United States; at the time of writing he had eleven successes following primary anastomosis. This is a noteworthy achievement and emphasizes that, owing to carelessness or ignorance in diagnosis, many infants are still being deprived of the chance of survival by not being referred to a surgeon. It is interesting to note that he now recommends the transpleural approach; the original procedure of resecting several ribs and working extrapleurally recalls the early years of this century.

The book provides a concise and clear account of the problems of oesophageal surgery and can be read without effort. It is liberally illustrated, although two of the four coloured plates are useless and their omission might have lessened the cost of the book. An index of the illustrations should have been included.

A chapter is devoted to oesophagoscopy, and the author emphasizes the dangers of the examination. Although he mentions the importance of the correct position of the head for safe instrumentation, he gives no instructions, and indeed Fig. 46 shows both the head and the neck in full extension, a position in which introduction of the oesophagoscope is almost impossible and certainly dangerous. This figure should be replaced by a set of illustrations showing the varying position of the head and neck at the different stages of the examination.

The book is chiefly suitable for postgraduate students and general surgeons needing to acquaint themselves with the advances of oesophageal surgery. One remarkable omission is any reference to or analysis of the figures (either the author's or others') of operability, mortality, and prognosis after operation for carcinoma of the oesophagus.

R. C. BROCK.

E.N.T. INTRODUCTION

Diseases of the Ear, Nose, and Throat. By J. Douglas McLaggan, C.V.O., M.B., Ch.B. (Aberdeen), F.R.C.S., and Josephine Collier, B.M., Ch.B. (Oxon), F.R.C.S. Second edition. General Practice Series. (Pp. 438; 149 illustrations. £1 17s. 6d.) London: H. K. Lewis, 1952.

The authors are to be congratulated on this the second edition of this work. It is intended for students about to be introduced to the subject and for the recently qualified, and both classes will greatly benefit from reading it. The text is refreshingly clear, largely owing to the correct choice of words. In its 422 pages the authors cover the whole ground of diseases of the ear, nose, throat, oesophagus, and bronchi; nothing is omitted, but there must be no skipping by the reader else he will miss sentences which, though short, contain considered opinions based on wide experience. As teachers the authors know it is better to make dogmatic statements than to enter into verbose discussions which tend to confuse—for example, "The practice of enucleating tonsils to relieve quinsy is dangerous and unsurgical."

The anatomy throughout is brief but clearly emphasizes what is important to the parts under consideration. Indeed the whole book is full of common sense, as may be seen in the informative paragraphs where, writing of Ludwig's angina, the authors say, "the rarity of the disease contrasts forcibly with the prominence given to it in textbooks." They

stress the importance of bacteriology in the differential diagnosis of tonsil ulcerations; they might have added routine blood examinations. Writing of operations, they emphasize general principles, giving details of technique only for the simpler operations, and these are clearly illustrated.

The chapter on laryngeal paralysis reduces the whole complicated story to easily understood simplicity; these words also apply to the account of simple and malignant intrinsic growths. Lastly, the chapters on the bronchi and oesophagus maintain the high standard set by the rest of the work and are admirably illustrated by diagrams and radiographs. This is a most readable book and should be in the hands of those tackling the specialty and desirous of becoming experts.

W. M. MOLLISON.

HEART AND CIRCULATION

Disorders of the Heart and Circulation. Edited by Robert L. Levy, M.D. (Pp. 944; 368 figures. £4 11s. 6d.) London: Baillière, Tindall and Cox, 1952.

Although the publishers describe this work as a new book, many of the chapters are revised versions of those published previously in *Nelson's Loose-Leaf Medicine*; with several new ones they have been assembled in the form of a separate monograph for the convenience of those specially interested in cardiovascular disorders.

In arranging the sequence of the 34 contributions by 41 authors, the editor confesses that he found it impossible to adhere closely to an aetiological classification, but was influenced by anatomical, physiological, diagnostic, and therapeutic considerations as well. Despite this explanation, it is difficult to discern any significant design in the order of presentation, and the expressed hope that undue overlapping has been avoided is certainly not fulfilled. Thus more than half the introductory chapter on cardiocirculatory physiology is devoted to heart failure, and yet we have another whole chapter on the same subject by a different author. Then, in a 48-page chapter on diseases of the pericardium, Pick's disease is discussed fully (and very well); yet the next chapter is on "Chronic Constrictive Pericarditis." Continuing, we have Abbott's original article on congenital heart disease (116 pages) followed by a modern version in 60 pages by Bing. Rheumatic heart disease (Bland) is on both active rheumatic carditis and established valve lesions, and then the chronic valve lesions are given a chapter to themselves. Perhaps the best example of duplication occurs later in the book, when a chapter on cardiac neurosis is followed by one on neurocirculatory asthenia (subject matter the same).

Owing to the increasing complexity of medicine and the vast territory that has been opened up in recent years, it is often said that the day of the textbook by a single author is over. Before it is discarded for good, however, its advantages should be carefully noted, so that they may be retained in the polygenetic literature of the future. These advantages include uniformity of style and treatment, continuity, balance, and proper building up of the work, section by section, without gaps and without redundancies, into a recognizable, pleasing, and comprehensive whole—in short, graceful, economical, and sound architecture. In the polygenetic book the editor is alone responsible for this architecture; in this respect he assumes a highly important role and should be fully aware of it. When Robert Levy says—referring to the contributors—"obviously, it is their book," one must agree, and that is partly the trouble.

But that is not all there is at fault. A single author seems more alive to the fact that he will be judged by what he has written; a multitude of authors give the impression that they do not care quite so much. It is the old story of the fewer men the greater share of honour, and its corollary. And so, even if the book is accepted as an unrelated series of 34 essays on various cardiovascular subjects, it does not compare favourably, chapter by chapter, with several well-known treatises on heart disease written by single authors. Now this is serious, because the chief theoretical reason for encouraging multiple authorship

(apart from the time factor) is the belief that one individual cannot be expected to cover a variety of subjects as well as a group of experts, each allotted his own special field. This is where the contributors must recognize their own responsibilities and the editor exercise his right of frank criticism.

Finally, there is the index. This one occupies 2% of the 944 pages and must have been compiled by an able and industrious lay professional. But was it checked by a cardiovascular expert? Under angina pectoris, for instance, we have

in aortic insufficiency ..	383
in aortic stenosis ..	381
in coronary disease ..	450
in coronary heart disease ..	442

and no page reference to angina in anaemia, diabetes, hypertension, paroxysmal tachycardia, mitral stenosis, myxoedema, pulmonary hypertension, syphilitic aortitis, or thyrotoxicosis. Six surgical treatments for angina are given a page reference, but is there no medical treatment? QRS appears in three guises, as a complex, interval, and wave—and so on. I believe that a single author, responsible for everything in the book, would either compile the index personally or would check it carefully for gaps and redundancies as well as for accuracy: not that this index is bad, but neither is it good. Thomas Nelson and Sons have printed the book very nicely, and the figures are excellently reproduced.

PAUL WOOD.

THROMBOSIS

The Pathogenesis and Treatment of Thrombosis: With a Clinical and Laboratory Guide to Anticoagulant Therapy. By Irving S. Wright, M.D. Modern Medical Monographs (Pp. 78; 27 figures. \$3.) New York: Grune and Stratton, 1952.

This monograph is based on the George E. Brown Memorial lecture, presented before the American Heart Association in 1951. The demand for copies of the lecture far outran the number of reprints available, so that Dr. Irving Wright wisely decided to incorporate the material in a small book. He discusses clearly and concisely the modern views on blood coagulation, reducing into an easily comprehensible form the knowledge of the complex factors known to take part. He also briefly reviews the influence of physico-chemical phenomena and morphological changes in the blood and vessels which may play an important part in the initiation of thrombosis. The relationship of malignant disease, familial traits, cold haemagglutinins, and cryptoglobulinaemia to the onset of clotting are ably discussed.

About half the monograph is devoted to the methods now available to combat the onset and sequelae of thrombosis; all the main anticoagulants, as well as some which are little used over here, are mentioned and their characteristics compared. Finally, the most widely used laboratory methods for the study of blood clotting and the control of anticoagulant therapy are set out in the appendix.

This monograph should be of interest to all concerned with the care and treatment of patients with thrombosis. Though it does not present any new concepts, both its theoretical discussions and practical applications are of value to the clinician and laboratory doctor. Since it was originally designed to be presented as the spoken word, it is both clearly expressed and easy to read.

H. PAYLING WRIGHT.

INJURIES OF THE SPINAL CORD

Les Traumatismes de la Moelle Epinière. By Daniel Mahoudeau. (Pp. 196; 33 figures. 1,250 francs.) Paris: Masson et Cie., 1952.

This short monograph was written with the intention of summarizing the results of recent work on injuries to the spinal cord, chiefly by English-speaking workers, and largely determined by their experiences of spinal cord injuries in the second world war. It is built round a sound bibliography and forms an excellent introduction to the subject,

being a well-ordered and clearly set-out exposition of physiological principles. No statistics interrupt the even development of the subject.

From the practical point of view the volume fails on two accounts. First, the strict limitation of the subject to cord injuries and bare mention of cauda equina injuries robs it of much usefulness, as the two lesions are so commonly encountered together and the differential diagnosis, if not of immediate practical importance, is of great prognostic value. Secondly, there are no case histories. The apology tendered for this, that they would overburden the volume, is scarcely sufficient to justify such an important omission, for on them one is chiefly dependent for correlating and reinforcing the theoretical considerations as well as for practical guidance.

The author only outlines orthopaedic aspects of treatment. He does not mention stabilization of the spine after reduction of a dislocation. His account of nursing is rather general. Tidal drainage, though becoming less popular in Britain, receives pride of place in treatment of the paralysed bladder.

In short, this is an excellent study in applied physiology and an ideal book for a senior student particularly interested in neurology or a postgraduate beginning some special training in spinal injury. But it will only refresh the mind of the experienced neurologist.

J. G. BONNIN.

CHIROPODY

Chiro-podial Orthopaedics. By Franklin Charlesworth, F.Ch.S. Foreword by Sir Harry Platt, M.S., F.R.C.S., F.A.C.S. (Pp. 255; 131 figures. £1 5s.) Edinburgh: E. and S. Livingstone, 1951.

The author of this well-written book has qualifications which must be almost unique, for in addition to a practical knowledge of surgical boot-making and years of experience as the head of an active school of chiropody (one of a number which have failed to survive the advent of the Welfare State), he has handled many hospital patients with really troublesome feet. Mr. Charlesworth describes his techniques in the concise manner of a good teacher, and the text is freely illustrated. Most of the chapters are on matters of interest not only to chiropodists and orthopaedic surgeons but also to surgical technicians and boot-makers. But many of the problems and the methods of dealing with them are well outside the field of chiropody: lobster feet requiring special insoles and surgical shoes is a typical example.

Considering he is a qualified chiropodist, the author expresses a fine scorn for felt pads and strapping in prolonged contact with the foot. Some of the removable appliances he describes are similar to those obtainable under N.H.S. schedules, but others require so much personal skill and care that they are not likely ever to be freely obtainable. This applies particularly to Mr. Charlesworth's moccasin technique for the protection of tender areas and for filling up the space of missing toes; a soft leather moccasin is made to cover the foot and is then built up in certain places, often by applications of milk rubber latex, to a form which can be accommodated in a shoe of acceptable shape. Strangely enough, the author does not mention that useful addition to a sturdy walking shoe, a steel plate inserted lengthwise between the layers of the sole in order to prevent any buckling at the tread in cases of hallux rigidus, march fracture, osteochondritis of a metatarsal head, or amputation of the great toe.

As consultant chiropodist to the Hope Hospital, Salford, the author naturally favours a department of chiropody in every large general hospital, and in the final chapter he describes his own clinic, which appears to thrive in happy symbiosis with the orthopaedic department. But Mr. Charlesworth has come up the long and hard way, and the chances are slender that other men will follow his lead and acquire such a combination of special skills.

K. I. NISSEN

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SILICA OR COAL?

All miners, no matter what mineral they are occupied in extracting, are exposed to some dust derived from rock, and almost all such dusts contain silica, partly free and partly combined in the form of silicates. Since free silica causes fibrosis in experimental animals, while other mineral dusts are either much less fibrogenic or entirely non-fibrogenic, it is natural that pulmonary fibrosis in miners should be attributed to the free silica in the dust. The classical type of silicosis with whorled collagenous nodules, giving rise to the characteristic nodular picture in radiographs of the chest, is found only in men exposed to dusts containing a high proportion of free silica, as in the gold mines on the Witwatersrand. It was chiefly the increasing use of radiography that led to the recognition that pulmonary fibrosis also occurred in workmen exposed to various dusts with a relatively low free silica content. But the appearance of these "mixed-dust pneumoconioses" both pathologically and radiologically was different from that of silicosis, and the question arose whether the fibrosis was due to silica modified in its effect by admixture with other components of the dust or whether these other components were themselves contributing to, or even responsible for, the fibrosis.

This question has been most keenly debated and thoroughly investigated in relation to the pulmonary fibrosis found in coal-workers. In this country the non-committal term "coal-workers' pneumoconiosis" has been applied to this disease in order to leave its pathogenesis open, but in America and on the continent of Europe the terms "anthraco-silicosis," "silico-anthraco-silicosis," or plain "silicosis" are used with the implication that the disease is fundamentally a form of silicosis. These opposing points of view were debated at a conference on silicosis held at the Silicosis Research Institute at Bochum,¹ and some of the evidence put forward by both sides is discussed below.

Pathological studies of the lungs of coal-workers²⁻⁴ have shown that there is a progressive series of histological lesions ranging from the typical whorled silicotic nodule of the rock-worker to deposits of coal dust in foci throughout the lung, and in the peri-

bronchial and subpleural lymphatics, with little or no collagenous fibrosis and only a slight reticulin reaction. While silica may be responsible for the collagenous fibrosis in the intermediate type of nodule, Heppleston⁵ has recently argued that the coal "macule," without collagenous fibrosis, develops in response not to the minute quartz content of the coal but to the coal substance itself, and that the later development of collagen in these deposits is simply due to the advancing age of the lesion. Supporters of the siliceous origin of mixed dust pneumoconioses⁶⁻⁷ maintain that free silica, even in very small amounts, is always responsible for any significant fibrosis and that these non-fibrous, impalpable deposits of coal dust should not be regarded as falling within the realm of pathology. It was Arnold⁸ who, in 1885, first distinguished "anthracosis simplex" from "anthracosis indurativa." Rüttner⁷ dismisses the soft nodules of anthracosis simplex as "a mere soiling (*blosse Verschmutzung*) of the lung" and, like Gardner,⁹ maintains that they have no effect upon the function of the lung. However, simple nodular silicosis has also been found to have no significant effect upon lung function,¹⁰⁻¹¹ yet no one would deny that it was a pathological condition. Gough³ and Heppleston¹² have emphasized that in the course of time focal emphysema may develop in and around the coal macules, and that this must result in some disturbance of function. Severe disability in coal pneumoconiosis is largely confined to men with massive fibrosis,¹⁰⁻¹³ which develops only in those who already have simple pneumoconiosis. A "mere soiling" of the lung which may have such serious aftermaths is surely a pathological condition.

The advocates of the siliceous origin of coal pneumoconiosis take their strongest stand on the fact that animal experiments—whether carried out by intratracheal, subcutaneous, or intraperitoneal injection or by inhalation—have with few exceptions¹⁴⁻¹⁵ shown that pure coal dust produces no fibrogenic reaction, but here the argument appears self-contradictory. Collis and Gilchrist¹⁶ and Gough¹⁷ first showed that coal-trimmers who are exposed to such pure coal dusts do in fact develop pulmonary fibrosis, and Wright¹⁸ has shown that after the inhalation of large quantities of coal dust, collected at a coal face where the prevalence of pneumoconiosis is high, rats do not develop even a reticulin reaction in the lung approaching that found in the coal focus in man.

Negative animal experiments cannot disprove the fibrogenic action of a dust in man. It is possible that the experiments have not extended over a long enough period or, more likely, that the reactions of

human and animal lungs differ. It may be argued that since silica does produce fibrosis in the lungs of animals it should do so even in the presence of coal if it is the silica that is responsible for the fibrosis in man. Alternatively, the human lung must be more susceptible to minute amounts of silica in association with coal than is the animal lung. If this were so the administration to animals of coal enriched in silica (by the admixture of a small amount of quartz) should produce lesions resembling the coal focus in man. Such experiments have recently been reported by King and his colleagues.¹⁹ Using intratracheal injection, they found that 2 mg. of quartz caused no fibrosis in the lungs of rats, since it was removed to the hilar lymph nodes, where some fibrotic nodules appeared. One hundred milligrams of pure anthracite or graphite dust remained in the lung, producing no significant fibrosis. But when 2 mg. of quartz was mixed with 98 mg. of coal nodular foci of reticulosis developed. The authors suggested that the large amount of coal upset the lymphatic drainage so that the silica was retained in the lung to produce its toxic effect. While this conclusion is justified their experiments throw no light on the relative roles of coal and silica in human pneumoconiosis. They only suggest, not unreasonably, that a man exposed to a negligible hazard from pure silica might be worse off if he also had to inhale much coal dust, or that a coal-miner who also does some rock work may get more pulmonary fibrosis than a worker on a pure coal face. Moreover, dusts administered by intratracheal injection may behave differently from inhaled dusts. Mavrogordato,²⁰ using the inhalation method, found that a mixture of coal dust and silica caused less fibrosis in the guinea-pig's lung than the same amount of silica alone.

What is needed now is information on the pathological changes occurring in men exposed to high concentrations of pure carbon dust. Such exposure occurs in the manufacture of carbon black and of carbon-arc electrodes. Fifteen years ago Löcktemper²¹ and Hollman²² showed that workers in the carbon-black industry develop radiological abnormalities similar to silicosis. Recently Brauss and Gärtner²³ have confirmed these observations, finding radiological changes in soot-workers identical with

those in coal-workers' pneumoconiosis, including both simple nodulation and massive shadows. Koelsch¹ reported similar findings in workers making carbon electrodes. Unfortunately, and mysteriously, none of these cases has yet been investigated pathologically. Until this has been done there is no certainty that pure carbon can produce pulmonary fibrosis in man. But the close association shown by Gough²⁴ between radiological and pathological findings in coal-miners suggests that when at last a pathological account of soot-workers' lung is published it will tell a story of changes closely resembling those found in coal-workers. The present assumption that carbon is a wholly innocuous dust on inhalation may then finally be shown to be wrong.

This debate is not only of theoretical interest, for it has important practical consequences. In this country, recognition that coal dust itself may cause disabling pneumoconiosis has led to a vigorous campaign of dust suppression at the coal faces of all mines where dust concentrations, regardless of their silica content, rise above an approved level of 650 particles per c.cm. in anthracite and 850 in other coal mines. In the U.S.A., too, measures are taken to suppress all dust in mines, but the suggested levels of safety are still related to the silica content. Rüttner⁷ advocates judging the hazard of any dust upon a mineralogical and chemical measurement of the silica content. This insistence on the orthodox silica theory was also shown by nearly all the German experts in the discussion¹ at Bochum to which we have referred, and it affects their mining practice. In German coal mines dust suppression is concentrated on rock dust, and coal dust is regarded as being harmless. This attitude is carried to remarkable lengths. Worth and Dickmans,²⁵ in a survey of 350 miners, found as much radiological abnormality in relation to years worked underground in men who had only worked on the coal face as in men who had also worked in rock. They conclude that rock dust must be carried on to the coal face from other parts of the mine to produce disease in the men working there. Koelsch alone among the German experts sounded a note of warning based on his experience among workers exposed to pure carbon dust, and agreed with the view that coal dust itself might be

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¹¹ 3rd Saranac Symposium, 1937.
¹² Wright, G. W., Occup. Med., 1946, 2, 546.
¹³ Rossier, P. H., Bucher, H., and Wiesinger, K., Vjschr. naturf. Ges. Zürich, 1947, 92, Beiheft 3/4, 83.

¹⁴ J. Path. Bact., 1947, 59, 453.
¹⁵ Cochrane, A. L., Fletcher, C. M., Gilson, J. C., and Hugh-Jones, P., Brit. J. Industr. Med., 1951, 8, 53.
¹⁶ Argyll Campbell, J., Brit. J. exp. Path., 1944, 25, 46.
¹⁷ Ravvin, V. A., and Enyakova, P. A., Arkh. Patol., 1951, 13, 79.
¹⁸ J. Industr. Hyg., 1928, 10, 101.
¹⁹ J. Path. Bact., 1940, 51, 277.
²⁰ Bericht über die Medizinisch-wissenschaftliche Arbeitstagung über Silikose, Bochum, 1951, p. 119 (quoted by C. M. Fletcher).
²¹ Brit. J. Industr. Med., 1951, 8, 62.
²² S. Afr. Inst. Med. Res., Publ. No. 15, 1922.
²³ Verh. dtsch. Ges. inn. Med., 1936, 48, 154.
²⁴ Röntgenpraxis, 1937, 8, 32.
²⁵ Med. Welt, 1951, 20, 253.
²⁶ J. Fac. Radiol. (Lond.), 1949, 1, 28.
²⁷ Tuberkulosearzt, 1950, 4, 495.

fibrogenic. "We have not got so far in scientific investigation in Germany," he said, "that the problem can yet be considered to be finally settled." Until it is settled the British term "coal-workers' pneumoconiosis," which leaves the question of pathogenesis open and concentrates attention on the coal dust which has been shown to cause the disease, is greatly to be preferred to anthraco-silicosis or, worse still, plain silicosis.

SEROUS HEPATOSIS

Two varieties of hepatic cirrhosis have hitherto been recognized as associated with, or resulting from, malnutrition: the diffuse fibrosis that follows prolonged severe fatty infiltration, and the less regular form with nodular hyperplasia that follows non-fatal massive hepatic necrosis. Both are readily produced in experimental animals, the former by diets deficient in lipotropic factors, and the latter by diets deficient in the thio-amino acids and vitamin E. In our opening pages this week Professor K. R. Hill and his colleagues draw attention to a third variety, in which neither fatty infiltration nor liver-cell necrosis appears to play any significant part in pathogenesis. Their discussion springs from the study of 150 cases of liver disease in Jamaican children. The disease apparently passes through three phases, acute, subacute, and chronic, and about one-third of their cases fell in each category. The phase at which the children were first seen correlated roughly with the patient's age, the acute cases occurring in the youngest and the chronic cases in the oldest; most were aged between 1 and 3 years. In the acute stage the child is obviously ill, with a large tender liver and ascites as the outstanding features. In the subacute phase the children do not appear ill, but the liver is enlarged, although ascites is often absent. In the chronic stage the clinical picture is that of hepatic cirrhosis with the usual complications due to portal hypertension.

The anatomical evolution of the hepatic lesion has been followed in many cases by serial biopsies, and the sequence of events is clearly depicted. In the early stages there is a conspicuous distension of the perisinusoidal spaces of Disse, which appear histologically to be filled with a protein-rich fluid. At a later stage a strongly eosinophil coagulum occurs within Disse's space in many places, and in association with this coagulum reticulin fibres appear in excess of those normally present in this situation. An extension of this sequence of changes to the spaces of Mall in the portal tracts and around the inter- and intralobular vessels gradually results in an exten-

sive diffuse fibrosis. This is further enhanced by fibroblastic invasion of the coagula, the resultant fibrosis producing the distortion and destruction of the normal lobular architecture characteristic of cirrhosis. It is apparently only in these more advanced stages that the parenchymal cells show evidence of severe degeneration or necrosis. Fatty change, with few exceptions, is insignificant throughout the course of the disease.

This sequence of events is strongly reminiscent of the condition termed serous hepatitis by Roessle¹ and Eppinger,² in which the perisinusoidal spaces become conspicuous owing to their distension by a protein-rich fluid. Although these authors did not actually observe the evolution of this condition into cirrhosis, they both emphasized the impairment of nutrition of the liver cells that must result from interposition of a further barrier between the cells and their blood supply as well as the interference with the adequate removal of metabolites. Keschner and Klemperer,³ however, strongly criticized the concept that serous hepatitis is an important precursor of fibrosis, since they found a similar condition in 15% of a large series of necropsies. As they found, moreover, that 36% of their cases of heart failure showed the same picture, they were inclined to dismiss both the term serous hepatitis, with its implication of an underlying inflammatory aetiology, and the condition itself as an important precursor of fibrosis. The frequency with which a similar state seems to occur agonally, to which Popper⁴ has drawn attention, would seem to support this attitude. The development of hepatic cirrhosis in cases of long-standing congestive cardiac failure—so-called cardiac cirrhosis—in which the histological picture of serous hepatitis is so frequently seen, draws attention to the importance of the time factor in liver pathology. If a hepatic lesion is of short duration, recovery from it is often complete and without scarring. The same lesion, or even one of lesser extent, if present beyond a certain minimum length of time, leads to irreversible change accompanied by fibrosis. This is well seen in cases of carbon tetrachloride injury, fatty infiltration, and congestive heart failure, and undoubtedly is of great importance in the Jamaican children.

Two points of especial interest in this work from Jamaica—and there may be a connexion between them—are the remarkable rarity of fatty infiltration (only 5 of Hill's 150 cases) and the cause of the

¹ Roessle, R., "Entzündungen der Leber" in F. Henke and O. Lubarsch's *Handbuch der Speziellen Pathologischen Anatomie und Histologie*, 5, 243. Berlin: Springer, 1930.

² Eppinger, H., et al., *Die Seroöse Entzündung; eine Permeabilitäts Pathologie*. Vienna: Springer, 1935.

³ Arch. Path. (Chicago), 1936, 22, 583.

⁴ Ibid., 1948, 46, 132.

⁵ Evans, W. C., and Evans, E. T. R., *Nature*, 1949, 164, 30.

⁶ Popper, H., *Z. klin. Med.*, 1937, 131, 161.

⁷ Eppinger, H., and Leuchtenberger, R., *Z. ges. exp. Med.*, 1932, 85, 581.

accumulation of protein-rich fluid in the spaces of Disse. The diet of the affected children was both tragically monotonous and deficient in protein—animal and vegetable. In all other parts of the world where similar diets are taken, the outstanding hepatic lesion, at least in the early stages, is fatty infiltration. Despite many detailed studies, serous hepatitis has not been observed in these other areas. Yet in Jamaica an essentially similar diet produces not fatty infiltration but serous hepatitis. An important dietary difference may lie in the various vegetable infusions or "teas" which appear to be consumed in large quantity by these Jamaican children, and the toxicity of these infusions is now being investigated. The hepatic necrosis caused by ingestion of the alkaloids of *Senecio* (ragworts)⁵ points to the possible importance of such a line of inquiry. The enhanced susceptibility to many liver poisons that results from dietary protein deficiency may well be a factor in restricting the condition to people whose nutrition is inadequate. Even if this is the true explanation of the facts, the anatomical effect of the toxic agent is distinctly unusual. The great majority of hepatotoxic substances cause necrosis of liver cells as the most conspicuous lesion. In the "serous hepatitis" in Jamaica the absence of parenchymal necrosis is conspicuous, and the outstanding lesion appears to be an increase in permeability of the sinusoidal endothelium. But, since a similar histological appearance can be produced experimentally with allyl formate⁶ or histamine,⁷ the postulated properties of the hypothetical poison are by no means unique.

ASPIRATION PNEUMONIA AND BRONCHIECTASIS

The many current theories about the aetiology of bronchiectasis reflect the uncertainty about the exact mode of production of this disease. Bronchial dilatation can be caused, it has been postulated, by developmental abnormalities, by destruction and weakening of the bronchial walls by infection, by traction from peribronchial fibrosis, or by mechanical factors following pulmonary collapse. As we have previously commented, the view that bronchiectasis is commonly congenital in origin is now less widely held.¹ Although it cannot be denied that bronchiectasis sometimes arises from an abnormal development of the bronchial tree, such cases are exceptional, and even many of the cases of so-called "congenital cystic disease of the lung" are probably acquired after birth.² The relative importance of the other factors in causing bronchiectasis remains uncertain.

being approached in different ways. The clinician, with an eye to the progress of the patient and the radiographic changes in the bronchial tree, has focused his attention on the calibre of the bronchi and been drawn to the mechanical theory of bronchial dilatation, sometimes without due regard to the pathological changes in the lung. The pathologist, on the other hand, from histological studies, has emphasized the inflammatory and fibrotic appearance of the bronchial walls and surrounding lung, and has tended to regard such changes as being primarily responsible for initiating bronchial dilatation. Again, as Whitwell³ has recently suggested, the diversity of these views might indicate that bronchiectasis is not a single disease but only a common feature of a number of distinct pathological processes. From a study of 200 lung specimens removed at operation Whitwell found it possible to separate three pathological varieties of bronchiectasis, and correlation with the clinical findings in these patients suggested that the varieties were aetiologically distinct. He gave the name "follicular" to a type of bronchiectasis which, occurring in young patients, often followed measles or whooping-cough; in these cases subepithelial lymph-follicle formation and peribronchial interstitial pneumonia dominated the histological picture. It was thought that the disease began as a diffuse bronchiolitis following acute viral infections in childhood. In the second variety, bronchiectatic saccules were formed by the bulbous ends of the branches of the segmental bronchi, the intervening lung parenchyma remaining normal and fully aerated. This type of "saccular" bronchiectasis was found in older patients, and it was thought to start as a mural inflammation of the medium-sized bronchi, with consequent destruction of the bronchial walls. The initial infection was not severe enough to affect the alveoli, so collateral ventilation remained normal, and there was no alveolar collapse. The third variety, "atelectatic" bronchiectasis, included those cases where lobar or segmental bronchial dilatation was associated with pulmonary collapse. Stimulating as these findings are to the study of bronchiectasis, it must be noted that Whitwell was able to fit only about half of the specimens examined into one of these three categories, and it is not altogether surprising that some specimens showed features common to both follicular and atelectatic bronchiectasis.

Most clinicians agree that there is a close association between pulmonary collapse and bronchiectasis.

¹ *British Medical Journal*, 1949, 2, 970.

² Oswald, N., and Parkinson, T., *Quart. J. Med.*, 1949, 18, 1.

³ *Thorax*, 1952, 7, 213.

⁴ Scadding, J. G., *Lancet*, 1948, 1, 89.

⁵ *British Medical Journal*, 1951, 2, 1018.

⁶ Crofton, J. W., et al., *ibid.*, 1951, 2, 1368.

and there is ample evidence that the atelectasis occurring in such diseases as whooping-cough and primary tuberculosis often gives rise to bronchiectasis. Elsewhere in this issue of the *Journal* Drs. K. D. F. Morle and Squadron Leader P. W. Robertson describe investigations which show that bronchiectasis may also follow simple aspiration pneumonia. By doing serial bronchograms on 300 patients with this disorder they were able to demonstrate the development of bronchial abnormalities in over 60% of the patients. In most instances the bronchi returned to normal, but in 5% an established bronchial abnormality persisted for more than 18 months after the original pneumonia. It is fair to assume that most of these patients had developed permanent bronchiectasis as a result of their pneumonia, although it is possible that there had been a previous bronchial abnormality in some patients. This finding emphasizes once again the importance of understanding simple aspiration pneumonia.

Aspiration pneumonia may be defined as collapse and inflammation of a broncho-pulmonary segment following mechanical obstruction to a bronchus by the retention or aspiration of infected secretions.^{4,5} It is a common complication of catarrhal disorders of the respiratory tract; it is usually a benign illness which responds rapidly to postural drainage and chemotherapy. This type of pneumonia has been slow to achieve general recognition because it is often confused with virus pneumonia and because it can be diagnosed with certainty only by accurate radiographic location of the pulmonary lesion. Yet benign aspiration pneumonia is probably the commonest type of pneumonia encountered in present-day hospital practice.⁶ Last week Dr. John Fry reviewed in this *Journal*⁷ a series of patients with acute lung disease which he had seen in general practice. During a period of two years he found only seven cases of lobar pneumonia as compared with 70 who had a mild pneumonic illness. Of these, no fewer than 21 patients had an illness which conformed to the accepted pattern of aspiration pneumonia. It is evident that aspiration pneumonia is not only a common condition but also one which can give rise to bronchiectasis as a late complication.

SUCCINYLCHOLINE

The chemist and pharmacologist are continually presenting the anaesthetist with new tools to help him to solve the problem of how to obtain safe and selective muscular relaxation without the need to depress cerebral function by deep narcosis or endanger life by prolonged depression of the respiratory muscles. A compound recently used for these purposes is succinylcholine;

chemically it resembles two molecules of acetylcholine lying alongside one another. It is valuable because it produces a muscular relaxation that is profound but normally of a very short duration, and allows manoeuvres such as intubation to be safely carried out. Unfortunately in a few patients the action of succinylcholine is not so short-lived, and prolonged cessation of respiration (apnoea) may result. A possible explanation of this abnormal reaction is discussed in two papers in this issue by Dr. H. Lehmann and his colleagues. The findings confirm earlier observations^{1,2} that the prolonged action of succinylcholine is seen in patients who have an unusually low level of serum pseudo-cholinesterase. The evidence now presented suggests that injection of a preparation of concentrated human serum which is sufficient to increase significantly the pseudo-cholinesterase activity of the blood will at the same time reduce this period of apnoea in these sensitive patients. It is unfortunate that it was not demonstrated that successive injections of succinylcholine would produce similar periods of apnoea in the absence of injected enzyme, so that there would then remain no doubt that the shorter period of apnoea after the second dose and following the plasma infusion was directly related to the rise in pseudo-cholinesterase activity so produced. Similar attempts^{3,4} have been made in animals to raise the level of the true cholinesterase by adding concentrated enzyme preparations, but these have shown little or no effect on the rate of destruction of acetylcholine. It is therefore unlikely that such infusions would be of any value in the treatment of poisoning by anticholinesterase substances such as some of the modern insecticides or war gases. It seems probable that succinylcholine exerts its effects by occupying the sites on voluntary muscle normally occupied by the acetylcholine produced in response to a nerve impulse which contracts the muscle. But the mechanism for destroying succinylcholine is less efficient, so that a longer-lasting block occurs, and further impulses cannot affect the muscle until the succinylcholine has disappeared to leave room for acetylcholine. Acetylcholine is destroyed by both true cholinesterase and pseudo-cholinesterase, but succinylcholine only by the latter.

The means whereby the succinylcholine is removed from the muscle remain uncertain, except that there is diffusion back into the blood, because we do not know whether pseudo-cholinesterase exists in the muscle or at the myoneural junctions in man. In view of the interest in cholinesterase and substances that interfere with its action it is surprising how little information there is on the amounts of these enzymes present in the different tissues. Only Thompson and his colleagues^{5,6} seem to have attempted a survey, and this includes rat tissues and only the central nervous system of man. As true cholinesterase cannot reach the myoneural junction from outside it is unlikely that pseudo-cholinesterase

¹ Bourne, J. G., et al., *Lancet*, 1952, 1, 1225.

² Evans, F. T., et al., *ibid.*, 1952, 1, 1229.

³ Beck, I. T., *Brit. J. Pharmacol.*, 1951, 6, 144.

⁴ — *ibid.*, 1952, 7, 482.

⁵ Ord, M. G., and Thompson, R. H. S., *Biochem. J.*, 1950, 46, 346.

⁶ — *ibid.*, 1952, 51, 245.

⁷ *Nature, Lond.*, 1952, 170, 617.

added to the blood will be any more successful. The effect of raising the amount of enzyme in the blood is probably to increase the speed at which the blood level of the drug falls so that no more can reach the muscles. It would therefore be interesting to know if human muscles do in fact contain pseudo-cholinesterase and, if so, whether the level here varies as it does in the serum. The attempt made to compare the action of succinylcholine in man and dogs on the basis of the cholinesterase activities of their bloods will not bear critical examination. Before jumping to any conclusions about these observed differences in man and dog in their response to succinylcholine it would be as well to bear in mind the comment recently made by Zaimis⁷: "Hitherto it has generally been assumed that results obtained from experiments on one mammal could safely be regarded as typical for mammals in general. It is now clear that results obtained from the muscles of any one mammalian species are valid only for this species and perhaps for the particular muscle upon which the experiments were made." Dr. Zaimis was discussing the results of her observations on the action of decamethonium and succinylcholine on muscles.

THE TREATMENT OF VENTRICULAR FIBRILLATION

Increasing interest has recently been shown in the treatment of cardiac arrest during operation, a subject always of importance to surgeons and anaesthetists since the dangers of chloroform were first recognized, and now of particular significance while operations are being performed on the heart itself. Such operations and those on the adjacent thoracic viscera have given opportunities for direct observation of the heart and have allowed the differentiation of two catastrophes—cardiac arrest and ventricular fibrillation. In cardiac arrest, or ventricular asystole, there is complete cessation of all heart action. In ventricular fibrillation the ventricular muscle contracts in an irregular and uncoordinated fashion, producing rippling movements which can be easily seen or felt but which are ineffective, causing no beat and no pulse. The two conditions thus cannot be distinguished except by direct observation of the heart or by electrocardiography, and so when the heart stops during an abdominal or limb operation it is impossible to tell in which fashion it has done so. The effect of ventricular fibrillation is as serious as that of asystole, since it is never spontaneously reversible.

The established treatment for cardiac arrest is cardiac massage. An essential adjuvant is the maintenance of adequate oxygenation by artificial respiration with pure oxygen. Cardiac massage has two possible effects: first, it stimulates the heart mechanically; secondly, it provides a limited circulation. The heart itself and the brain cannot survive undamaged if their blood supply is cut off for more than a very few minutes—probably four minutes is the maximum¹—whereas other organs are much more tolerant, the liver and kidney surviving up to about thirty minutes' ischaemia. Compression of

the aorta below the origin of the carotids concentrates the blood flow to the coronary vessels and the brain and so should be done if feasible. The heart cannot be massaged efficiently through the intact pericardium. If the chest is open, it is a simple matter to incise the pericardium; if not, the approach is through the upper abdomen, dividing the diaphragm and pericardium through the adherent area, or perhaps preferably by a left-sided intercostal incision through the fourth space, with division of costal cartilages. Massage should always be started as soon as possible after arrest has been diagnosed.² The injection of various drugs into the cavity of the heart is usually recommended, sometimes before massage is started, but the importance of maintaining a circulation is so great that massage must not be delayed. Pride of place is usually given to adrenaline. This is probably a mistake, for it has recently been shown^{3,4} that the action of adrenaline on the anoxic heart muscle is to cause ventricular fibrillation; it should therefore be avoided. Calcium chloride, 10%, increases the irritability of the heart, and is perhaps of value,⁵ but there is no known drug proved to remedy this condition. Once the heart's action is restored, it is important to maintain an adequate systemic blood pressure. For this purpose continuous administration of vasoconstrictor drugs such as methedrine or noradrenaline may be necessary for several hours.

The same measures have been recommended in the past for the treatment of ventricular fibrillation. It has long been known that ventricular fibrillation can be stopped in the experimental animal by an electric shock. A powerful electric current of short duration passed through the ventricles causes a complete tetanic contraction, which is usually followed by resumption of normal beat. There have been several reports from America of this procedure applied to human patients,⁶ and recently McMillan, Cockett, and Styles⁷ at St. Thomas's Hospital have published the first account from Britain. They describe a simple apparatus, working off the mains, capable of giving a series of interrupted shocks of various voltages, which was found to succeed in dogs without causing serious damage to the heart. Its use in three human patients is reported; in each case the fibrillation was abolished. In the first two after about half an hour asystole occurred and the patients died. In the third normal rhythm was restored and persisted, and this patient recovered; his recovery was not complete, for he showed evidence of cerebral damage, and an electrocardiogram suggested an anterior myocardial infarct. The electric apparatus is an ancillary method of treatment; cardiac massage should be used before it is tried and if necessary after, and full oxygenation maintained throughout. Beck, whose experience is very wide, has stated, "The beat can be restored in every normal heart."⁷ By speedy diagnosis and rapid action many of these surgical tragedies can be avoided.

¹ Dale, W. A., *Ann. Surg.*, 1952, 135, 376.

² Bost, T. C., *Amer. J. Surg.*, 1952, 83, 135.

³ McMillan, I. K. R., et al., *Thorax*, 1952, 7, 205.

⁴ Barber, R. F., and Madden, J. L., *Amer. J. Surg.*, 1944, 68, 151.

⁵ Kay, J. H., and Bialock, A., *Surg. Gynec. Obstet.*, 1951, 93, 97.

⁶ Beck, C. S., and Rand, H. J., *J. Amer. med. Ass.*, 1945, 141, 1220.

⁷ *Veterans Adm. techn. Bull.*, 1950, TB 10-65.

meningitis. Local lesions of the mouth or throat, such as an impacted wisdom tooth or peritonsillar abscess, although they may cause difficulty in opening the mouth, are painful and can usually be distinguished from true trismus on careful examination. The abdominal rigidity of tetanus has simulated that due to acute abdominal conditions, but the absence of tenderness and presence of trismus should prevent this mistake. At a later stage reflex spasms, accompanied as they are by severe trismus and opisthotonos, are characteristic, but occasionally they have to be distinguished from other causes of fits such as meningitis, encephalitis, epilepsy, and hysteria, and the convulsions of strychnine poisoning are similar except that they do not cause trismus.

The diagnosis of tetanus is essentially clinical, and special investigations are of little value. Lumbar puncture should be avoided except in cases of real doubt. The isolation of the organism from the wound is difficult, often impossible, and too slow to be relied on.

Treatment

This is best considered under four headings: (1) antitoxin and wound toilet; (2) prevention of intercurrent infection; (3) sedation and control of reflex convulsions; and (4) nursing, feeding, and general management.

The aim of giving antitoxin in tetanus is to prevent further absorption of toxin from the wound and to neutralize any toxin in the tissues or circulation before it can reach the nerve cells. If this can be given before a lethal dose has reached the nervous system the patient's life may be saved. To this end a large dose of 200,000 I.U. should be given, preferably intravenously, at the earliest possible moment. If the whole of this dose is not available when the patient is first seen a smaller dose should be given and the rest as soon as possible. A smaller dose given early is probably more effective than a larger dose some hours later. In patients with slight wounds it is unnecessary to give further antitoxin after the single large initial dose, but with severe infected wounds 50,000 units should be given intramuscularly once a week until healing has occurred. This is hardly ever necessary after civilian wounds. Nothing is gained by giving intrathecal antitoxin, and lumbar puncture is liable to excite spasms.

When antitoxin has been given the wound should receive appropriate treatment. Broadly the aim should be to convert an anaerobic into an aerobic infection, with the minimum disturbance of tissues, by thorough drainage and removal of necrotic tissue and foreign bodies.

One of the great risks of tetanus is secondary lung infection. As a prophylactic measure against this 500,000 units of penicillin should be given daily from the outset, and if infection develops in spite of this other appropriate antibiotics may be necessary.

It cannot be too strongly emphasized that the control of reflex convulsions by sedatives and relaxants is only symptomatic treatment. Complete control has little effect in prolonging life in a patient who has already absorbed a lethal dose of toxin. The aim should be to control the severe spasms which exhaust and are dangerous, without depressing respiration so much that the risk of chest complications is increased. Tonic rigidity alone is relatively harmless and can be left alone. In the early stages or in mild cases slight reflex excitability is best treated by large doses of ordinary sedatives such as potassium bromide, chloral, or phenobarbitone. For reflex convulsions bromethol is the drug of choice, but at present is difficult to obtain. This is given rectally as for basal anaesthesia in doses of from 0.07 to 0.1 ml. per kg. of body weight (estimated) twice or even three times daily in severe cases. As an alternative paraldehyde may be given rectally in normal saline in doses of 30 minims per stone of body weight (0.25 ml. per kilo.) two or three times daily or in one-quarter of this dose intramuscularly. Mephenesin antagonizes the convulsions produced by strychnine, probably by depressing reflex activity in the spinal cord, and has been favourably reported on in tetanus. It may be given either intra-

muscularly or orally in doses of 0.5 to 1 g. for an adult, repeated every few hours according to the effect produced. Opinions vary as to which route is better, but it seems to be relatively more effective in mild than in severe cases. Tubocurarine appears to be liable to excite respiratory spasm and is dangerous. In using sedatives and relaxants in tetanus the first dose should be on the small side and the increment judged by the response.

Because reflex convulsions are excited by stimuli of all kinds tetanus patients should be nursed as quietly as possible in a darkened room. All manipulation such as feeding and giving injections should be done while the patient is most deeply under the influence of sedatives. Nourishing fluid feeds should be given as regularly as possible, and a special nurse is essential in severe cases. When trismus is severe nasal feeding is necessary and intravenous fluids may be required. The mouth should be kept as clean as possible to lessen the risk of aspiration pneumonia, and cyanosis controlled by warmed nasal oxygen. Good nursing may have great influence in turning the scales in borderline cases.

Prognosis

In assessing prognosis the factors which have to be considered are whether passive immunization has been given, the length of the "incubation period," the length of the "period of onset," the severity and site of the wound, the violence of the spasms, the age and physique of the patient, and the presence of intercurrent disease. The "incubation period" is the length of time between the receipt of the wound and the first symptom, which is usually trismus. If infection with *Cl. tetani* has occurred some time after the wound was received this may be shorter than it appears, and therefore misleading. An incubation period of less than seven days means a bad prognosis, but when more than 10 days it is relatively good. When the "period of onset" is less than 48 hours the chances of recovery are slight, but when more than three days relatively good, and they improve with every day convulsions are delayed. If prophylactic antitoxin has been given the attack is usually mild. A severe or heavily infected wound makes the prognosis worse, and it is bad in infants or the aged or those enfeebled by intercurrent disease. The best prognostic yardstick is the period of onset, and this should always be used in assessing the result of any new form of treatment.

It will be seen that tetanus still presents many practical problems in prevention, diagnosis, and treatment. The ideal relaxant has yet to be found, and there is no specific remedy against toxin in the nervous system. The paradox remains that, although preventable, tetanus still occurs in civilian practice. Notification with details of age, sex, occupation, type of wound, and whether active immunization had been given might yield useful data which would make it easier to apply active immunization to certain limited sections of the population.

Next Refresher Course Article.—"Antenatal Care," by Professor W. C. W. Nixon.

A special programme of health education by World Health Organization teams was recently carried out under the auspices of the Egyptian Government in an isolated village in Upper Egypt (*Chron. Wld Hlth Org.*, 1952, 6, 355). Here a venereal disease control campaign included a complete serological survey of the population of about 9,000 persons and treatment with penicillin of all infected persons and their contacts. Social workers had the task of visiting homes and obtaining the co-operation of village people. Though there had never before been a public meeting for women in the village the team was successful in arranging shows of films and other meetings for them. While blood samples were being taken a rumour went round the village that the blood was being used in the manufacture of certain beverages, but it was successfully dispelled. In the end about 85% of the population submitted to blood tests.

THE ELDERLY AMPUTEE

BY

D. S. MCKENZIE, M.B., Ch.B.

(From the Ministry of Pensions Limb Fitting Centre, Roehampton)

Since the advent of the National Health Service the Ministry of Pensions Limb Service has been called upon to treat large numbers of elderly patients, and it was therefore felt that a more detailed study of the results obtained by current methods would be of value and perhaps form a guide to the minutiae of technique and selection in future.

At the inception of the N.H.S. the experience of the Limb Service in the rehabilitation of elderly patients was not extensive, the technique of rehabilitation having been evolved primarily in relation to active ex-Service men. This technique had, however, met with success, and we were encouraged to adopt the same methods, modified only in so far as the programme was adapted to the physical capacity of the higher age groups and the more enfeebled.

Enough time has now elapsed to assess results in respect of the first 6,000 N.H.S. patients accepted for prosthetic treatment at Roehampton. Of these, 344 were "primary" cases—that is, patients who had not yet worn a prosthesis—aged 65 or more, representing some 30% of all the primary lower-limb cases received during the same period. It has been estimated that 4,000 to 5,000 major amputations are performed each year in the British Isles in times of peace, so that the Limb Service can expect some 1,350 new elderly patients annually. The wastage from death and intercurrent disease is, of course, considerable, and only a proportion are successfully equipped with prostheses; but elderly patients requiring continued supervision by the Limb Service throughout the years cannot be expected to be less than 5,000 to 6,000 at any given time.

Technique

The technique adopted in the treatment of this age group has followed the same general plan as that used in the past. Patients are seen as out-patients in the limb centre as soon as possible after reference from hospital. There seems to be no general decision concerning the stage at which cases to be seen by the limb surgeon at an early stage, while others wait until the patient has been discharged to his home.

At first the limb surgeon makes a local and general examination and assesses the capabilities. If further stump or general treatment is indicated he will normally refer the patient back to his hospital with suitable recommendations, unless he feels that the special experience of the Roehampton staff is required. At the earliest possible stage a pylon is ordered for thigh cases, while below-knee cases normally are fitted direct with the permanent prosthesis. The pylons are fitted direct with the "durestos" sockets (Scales, now used are provided with "durestos" sockets (Scales, 1950), and are very light. They can be made in a very short time, and rehabilitation can begin at an early date and so promote morale. It is found that many patients and so promote morale. It is found that many patients referred to this centre have not persisted with stump exercises and bandaging, the details of which technique have been published by the Ministry of Pensions (1951). Omission of this treatment, or failure to persist in it, results in a flabby stump with terminal oedema and general debility with lack of muscular tone, and in delays and difficulties in limb-training which are in some cases insuperable.

Training in walking is started as soon as possible after delivery of the pylon. We find it better for morale if this is carried out by daily attendances on an out-patient basis, and only those who have too far to travel or have complicating factors are admitted to the hospital. The training consists of individual balancing and walking exercises between handrails, progressing to walking with sticks, stair-climbing, walking on slopes and cambers, etc., and instruction in meeting all the ordinary needs of existence. In conjunction with this, group therapy is employed in the form of suitably modified remedial exercises designed to promote general improvement in muscle tone, to improve reactions, and to stimulate morale. The training is continued until the patient is fully independent or until no further progress can be made. Thus the single below-knee amputee may have two weeks' and the double-thigh subject four or more weeks' training.

After training, the patient is kept under observation by a follow-up, and the permanent prosthesis is prescribed when function merits it. Further training is given after delivery of the permanent prosthesis.

Results

An attempt has been made to assess results obtained in the 344 cases under review in relation to the age and sex of the patient, the site of amputation, the cause of amputation, and the presence or absence of complications. Rehabilitation was regarded as successful in 171 (49.7%). No very exacting criteria have been taken, but cases were considered to be successful if appreciable and regular daily use has been made of the prosthesis for a period of not less than six months from completion of fitting and instruction. Failure occurred in 101 cases (29.4%). Death supervened during rehabilitation procedures or within six months of completion in 31 cases (9%). Fitting was not attempted in 16 cases (4.6%), the result remains uncertain in 5 cases (1.5%), and follow-up has failed to trace 20 patients (5.8%).

TABLE I.—Results in Relation to Age

Age:	85+	80-4	75-9	70-4	65-9	Total
S ..	3 (50%)	7 (29.3%)	31 (41.3%)	54 (52.4%)	76 (55.9%)	171 (49.7%)
F ..	2 (33.3%)	9 (37.5%)	26 (34.7%)	28 (27.2%)	36 (26.5%)	101 (29.4%)
D ..	0	2 (8.3%)	9 (12%)	9 (8.7%)	11 (8.1%)	31 (9.0%)
NT ..	0	2 (8.3%)	5 (6.7%)	7 (6.8%)	6 (4.4%)	20 (5.8%)
NA ..	1 (16.7%)	2 (8.3%)	4 (5.3%)	3 (2.9%)	6 (4.4%)	16 (4.6%)
U ..	0	2 (8.3%)	0	2 (2.0%)	1 (0.7%)	5 (1.5%)
Total	6 (1.7%)	24 (7.0%)	75 (21.8%)	103 (29.9%)	136 (39.6%)	344

S=Satisfactory. F=Failure. D=Death. NT=Not traced. NA=Not attempted. U=Uncertain.

Table I shows, as would be expected, an increasing failure rate with age. The high proportion of successes in the oldest group is probably not significant, owing to the small numbers involved, except to show that age itself is no bar to successful rehabilitation. The oldest patient to be treated was a woman born in 1860 who had had the right leg amputated above the knee when she was 5 years old but had never worn a prosthesis. To this extent she was perhaps not strictly a primary case, as she had not recently had a debilitating illness or undergone major surgery. She has been included, however, on the ground that it was her first attempt with a prosthesis. She was fitted with a pylon in November, 1948, and with an articulated prosthesis seven months later. She made uninterrupted progress despite domestic difficulties, and when last seen in September, 1951, she was "making better use of her leg than many half her age." At the other end of the scale six of the youngest patients were so debilitated that limb-fitting was not attempted, and over 25% have failed to learn to manage a prosthesis. The oldest double-thigh amputee to make successful use of prostheses was 81.

The incidence of failure has been higher in females. Table II shows the relative figures. There were approximately twice as many males as females in the series.

TABLE II.—Results in Relation to Sex Distribution

	S	F	D	NT	NA	U	Total
Male ..	119 (52.1%)	55 (24.2%)	24 (10.5%)	13 (5.7%)	12 (5.3%)	5 (2.2%)	228
Female	52 (44.8%)	46 (39.7%)	7 (6.0%)	7 (6.0%)	4 (3.5%)	0	116

The death rate was appreciably higher amongst the males. It may be that they approached their rehabilitation with greater determination to overcome their disablement, in many cases possibly through a feeling of economic compulsion, which could explain the higher success rate at the cost of shortening life in some of them. The numbers are not large enough for us to draw more than tentative deductions on this score, particularly as the death rate in general in this age group is higher in males.

TABLE III.—Site of Amputation

	Single A.K.	Single Thro. K.	Single B.K.	Double A.K.	One A.K. One B.K.	Double B.K.	Upper Limb	Total
S ..	118 (49.4%)	5 (2.1%)	26 (10.8%)	14 (5.8%)	3 (1.2%)	3 (1.2%)	2 (0.8%)	17
F ..	73 (30.5%)	2 (0.8%)	9 (3.8%)	16 (6.8%)	1 (0.4%)	0	0	101
D ..	21 (8.8%)	0	5 (2.1%)	3 (1.2%)	0	0	0	31
NT..	11 (4.6%)	0	5 (2.1%)	3 (1.2%)	0	0	0	20
NA	12 (5.0%)	0	0	2 (0.8%)	0	0	0	16
U ..	4 (1.7%)	1 (0.4%)	0	0	0	0	0	5
Total	239	8	45	38	9	3	2	

The preservation of the knee-joint is, of course, normally an advantage. However, the low success rate among those who have suffered double amputation—one above and one below the knee—the high death rate, and the high proportion for whom limb-fitting could be attempted (Table III), support the apparently paradoxical view held by me that in patients of this age rehabilitation, at least to a measure of independence, has been more readily effected among those who have had a double amputation at or above the knee. This is in direct relationship with the technique employed in the latter case, because initial rehabilitation is undertaken on short pylons, on which the patient is kept as near the ground as is permitted by the longer of the two stumps, and effort is minimized. A recent development of this technique, not included in this series, is the addition of rocker bases to the short pylon, which further reduce the expenditure of effort. The results of this method are most promising but it would be premature to give figures at this stage. (Note: The supply and use of short pylons has been regarded as a successful outcome in the double above-knee cases, although only five of them progressed to full-length articulated limbs within the period of review.)

Disarticulation at the Knee

Although the numbers are small, it is interesting to note the high success rate of disarticulation at the knee. (This includes two Stokes-Gritti amputations, of which one failed.) The success of these cases tends to confirm the impression gained that such patients learn to walk more readily and gain balance and confidence more quickly than those with the conventional above-knee amputation. This is probably because, with a disarticulation at the knee, end-bearing can often be tolerated, thus permitting the axis of the body weight to be borne through the femur instead of through the ischium, and requiring less readjustment. It is necessary to provide a somewhat more cumbersome prosthesis for the disarticulation case owing to the bulbous extremity

of the stump, and it is probable that the gait can never be so good as that obtained with the prosthesis designed for the ideal stump, but it is felt that for the elderly these disadvantages are outweighed by the relative ease of the early rehabilitation and, above all, by the fact that such an operation is the simplest one and is attended by the minimum of shock.

In only one of the cases (the one classified as uncertain) was there any breakdown of the stump, and it would seem that disarticulation could be adopted with advantage for many more patients in the age group under consideration. The Stokes-Gritti stump has never proved very satisfactory among ex-Service men from the limb-fitting point of view; end-bearing is seldom tolerated, and the terminal soft tissues are prone to circulatory deficiency, possibly owing to the fact that the flaps may have been taken too high to obtain advantage of the anastomosis round the knee. There seems no reason to expect better results in the higher age group than in the younger patients we have seen in the past, and the bone section involved would cause the very surgical shock which one wishes to avoid. We therefore do not see any place for the Stokes-Gritti amputation or any other modification of the classical disarticulation at the knee for the elderly patient.

Cause of Amputation

The most significant fact, as shown in Table IV, is that diabetics have relatively poor prognosis with regard to both rehabilitation and survival. As might be expected, in the

TABLE IV.—Cause of Amputation

	S	F	D	NT	NA	U	Total
Diabetes ..	20 (34.5%)	22 (38.0%)	9 (15.5%)	4 (6.9%)	3 (5.1%)	0	58
Embolism ..	0	1 (50%)	1 (50%)	0	0	0	2
Thrombosis ..	4 (33.3%)	3 (33.3%)	1 (8.3%)	1 (8.3%)	1 (8.3%)	1 (8.3%)	12
Raynaud's disease	2 (100%)	0	0	0	0	0	2
Other forms of gangrene	90 (50.6%)	55 (30.9%)	12 (6.7%)	11 (6.2%)	8 (4.5%)	2 (1.1%)	178
Ulceration ..	24 (61.6%)	8 (20.5%)	2 (5.1%)	2 (5.1%)	1 (2.5%)	1 (2.5%)	39
Neoplasm ..	10 (55.6%)	4 (22.2%)	2 (22.2%)	0	0	0	18
Trauma ..	11 (61.1%)	3 (16.7%)	1 (5.6%)	1 (11.1%)	1 (5.6%)	0	18
Pyogenic infection	6 (75%)	1 (12.5%)	0	0	0	0	8
Tuberculosis ..	1 (33.3%)	2 (66.7%)	0	0	0	0	3
Aneurysm ..	2 (50%)	0	1 (25%)	0	1 (25%)	0	4
Elephantiasis ..	1 (50%)	1 (50%)	0	0	0	0	2
Total ..	171	101	31	20	16	5	344

acute pyogenic and traumatic groups the success rate is high. This is probably because they have not suffered from prolonged debilitating illness. The presence or absence of concomitant disease or disablement is of more direct prognostic significance.

Complications

The complications (Table V) were in the main cardiovascular and respiratory, and disorders of locomotion. The latter include disabilities of the upper limbs, owing to the fact that these patients have at least to learn to walk as quadrupeds. Specific complications, together with numbers of cases exhibiting each complication, are shown in

TABLE V.—Complications

	S	F	D	NT	NA	U	Total
Complications present	81 (40.1%)	66 (32.7%)	20 (9.9%)	14 (6.9%)	16 (7.9%)	5 (2.5%)	202
Complications absent	90 (63.4%)	35 (24.7%)	11 (7.7%)	6	0	0	142

Table VI. It will be appreciated that two or more complications may have been coexistent in individual cases. The figures emphasize the importance of defects of the contralateral leg, the arms, vision, heart disease, and deafness.

TABLE VI.—Specific Complications

	Total	Successful	
		No.	%
Defects of contralateral leg ..	72	26	36
Defects of stump ..	56	26	46
Gross obesity ..	31	16	52
Hernia and hydrocele ..	18	9	50
Myocardial disease ..	17	5	29
Defects of upper limbs ..	15	4	27
Chronic bronchitis, with dyspnoea on exertion ..	13	6	46
Defective vision ..	11	2	18
Intercurrent hemiplegia ..	9	3	33
Deafness ..	8	2	25
Cerebral arteriosclerosis ..	7	3	43
Psychological overlay ..	4	1	25
Dermatitis (general) ..	4	1	25
Previously treated neoplasm in breast ..	2	2	100
Tabs dorsalis ..	2	1	50
Intercurrent prostatectomy ..	2	1	50
Bedsore ..	2	—	—
Scoliosis, peripheral neuritis ..	1	—	—
Prolapsus uteri ..	1	—	—

The last of these is interesting, and its inclusion among the complications is probably explained by the fact that the deaf person retires into himself and is difficult to bring into group therapy and into the atmosphere of optimism one can cultivate in his more fortunate fellows. Obesity has been less of a handicap than might have been expected.

Discussion

The results in these cases show that no single complication encountered can be regarded as an absolute contraindication to limb-fitting. On the other hand, one cannot simply regard the elderly amputee as having a stump for which all that is required is to fit a prosthesis to enable him to walk. On the contrary, the stump is by no means the most important part of the problem. A comprehensive examination must be made of the patient's entire physical and mental make-up, and suitable treatment of any concomitant disability instituted in conjunction with prosthetic rehabilitation.

The complicating factors are, in fact, wider even than this. The environment to which the patient returns on discharge is of vital importance. We not infrequently see patients who have made good progress and who are discharged from the walking school able to control their prosthesis and to look after themselves fairly well. Yet when we see them on follow-up we find they have hardly worn the prosthesis, and the musculature has lost tone to the extent that they can no longer control it. Inquiry reveals that they live alone, perhaps in an upstairs flat, or it may be that they have simply lacked the incentive to make the effort to persevere. It would seem that here is a problem of welfare which is outside the scope of the Limb Service, and falls more within the province of the social medicine specialist.

Again, we have had to contend with patients who have acquired an unwarranted optimism concerning what can be done for them. They expect to be provided with a prosthesis with which they can walk immediately and without effort. They may be in poor physical condition, and often their stumps may be flabby, neglected, and quite unprepared for wearing a prosthesis. It is impossible to convince some of them that they will not be able to manage a prosthesis other than by letting them try for themselves on a pylon. The effect on morale of the inevitable failure can be imagined. We have known of patients admitting that they had been prevailed upon to accept amputation by the promise of easy function with a prosthesis. The psychological approach from the limb surgeon's point of view is much simplified if a more conservative briefing has been given in the general hospital and the patient has been

warned beforehand that he will have a prolonged and strenuous programme before him, but that if he will make the effort he should be able to walk. This programme should be initiated from an early date and maintained throughout by a regime of active physiotherapy, directed not only to the stump but to the whole bodily musculature, together with occupational and diversional therapy suited to the intellectual standard of the individual. The programme can with advantage be phased, each phase having a target which must be attained before the next phase is started (Marjory Warren, 1950, personal communication). This may seem a counsel of perfection unrelated to the pressure on hospital beds in these days, but it is my belief that there would actually be a saving of time, and therefore of beds, if such a programme were in uniform use.

The following brief case histories illustrate some of the points raised.

Case 66.—A married woman aged 68. Double above-knee amputation, the later amputation being performed on December 22, 1948, for gangrene of unspecified nature. She was grossly overweight. W.R. positive; prior to the amputation she had been diagnosed as tabetic. She made uninterrupted progress on short pylons, and, although she did not progress to full-length articulated limbs, she obtained enough function from the short pylons for the result to be regarded as an unqualified success.

Case 69.—A man aged 81. Amputation of right thigh through lesser trochanter following road accident. There was an unreduced congenital dislocation of the left hip. He lives by himself. He learned to manage a "through hip" (tilting table) prosthesis without difficulty, and in spite of his unfavourable home circumstances continued to make good use of it.

Case 223.—A married woman aged 66. Left above-knee amputation as a result of old-standing osteomyelitis. She had generalized seborrhoeic dermatitis, was deaf, and had defective vision (6/60 R. and L.). Despite this, she did well on a pylon prosthesis, and also learned to manage an articulated prosthesis competently. Four months later she was found to have given up the effort and had reverted to a wheelchair existence.

Case 257.—A man aged 69. Right above-knee and left below-knee amputation. Despite his excessive weight he made an uninterrupted and rapid rehabilitation, which was maintained.

The cause of death in the 31 patients who died during or immediately following limb-fitting procedures was as follows: coronary occlusion, six; hypertensive myocardial failure, four; diabetic coma, three; pneumonia, hemiplegia, and secondary carcinomatosis, two each; renal failure in association with diabetes, diabetic gangrene of contralateral leg, senile gangrene of contralateral leg, dissecting aneurysm with renal suppression, and perforated gastric ulcer, one each. In seven cases the cause of death could not be ascertained. Only one death occurred while the patient was actually undergoing fitting of the prosthesis or training in walking; this patient collapsed and died of acute cardiac dilatation in the walking school. He was a hypertensive subject.

In consideration of the fact that all cases in the series were under observation for upwards of a year, the death rate gives no cause for alarm or for modification of policy. It is very doubtful if the effort of limb-fitting had any material effect in shortening life, and, even if it did, the majority of patients would prefer to make the attempt rather than pass the rest of their life in a chair. The manifestly bad risks were not attempted.

Summary

A series of 341 consecutive primary amputees of 65 years or more who have been referred to Roehampton Limb Fitting Centre for a prosthesis has been reviewed.

The results suggest that no single factor will determine the selection of patients suitable for limb fitting, and that an assessment must be made of the entire physical and mental make-up. Age itself is not an adverse factor, and there is no evidence that wearing a prosthetic limb has shortened life significantly.

Self-demand Feeding

SIR,—I should like to make a few remarks on Professor R. S. Illingworth's interesting letter (December 20, 1952, p. 1355). Self-demand feeding will not fulfil its purpose if it is to become a rigidly imposed doctrine as has been scheduled feeding in the past. Of the many maladjusted children to-day who have failed to fit into their environment a high proportion have broken down under the strain of too great pressure to conform at an age when their capacities for such adjustment were inadequate; but it should not be overlooked that many children have grown up and adjusted themselves in such a regime. I have met mothers who felt so insecure without this kind of order in their lives that the anxiety and tensions which were aroused adversely affected their relation to the baby, and feeding suffered accordingly.

When deciding which method is best the question to be asked is which will suit this particular mother and baby. This can only be decided by the couple themselves. If a free hand is given at the start they will establish a regime that suits them. Feeding is the first social activity the child experiences, and the first social relationship begins then; this lays the foundation for future relationships in the wider social sphere.

An important aspect of wise mothering is the use of a kindly discipline that protects the infant while he is too young to know what is necessary for his survival; but because his needs often cut across his wishes such "discipline" is only possible with a minimum degree of disturbance from someone who has made it her business to understand him and can use it with insight. It would be disastrous, in my opinion, if self-demand feeding should be thought to imply that the mother is to be completely at the mercy of her baby's omnipotent demands, just as it has been disastrous in the past when the baby has been completely at the mercy of such demands from the mother. For this reason I share Professor Illingworth's misgivings about the term "self-demand schedule." It would seem to me only common sense to allow two people who are so important to each other to determine for themselves how best they can establish a good feeding relation.—I am, etc.,

London, W.1.

MARION MACKENZIE.

Overfeeding in Early Infancy

SIR,—I was most interested to read "Overfeeding in Early Infancy," by Dr. Ian G. Wickes (November 29, 1952, p. 1178). I found this article very instructive, and there is so much in it with which I agree. I have had over 20 years' concentrated experience in the feeding of infants, and have a vast correspondence with mothers and nurses on this subject.

It is true in most breast-feeding cases that if the infant is allowed to determine his own requirements overfeeding takes care of itself. I have, however, met many cases of definite overfeeding with the symptoms of this disorder as described by Dr. Wickes. Often opportunity for diagnosis is not possible until symptoms and conditions have generally altered and the breast milk is likely to have lessened considerably. Underfeeding may very easily follow overfeeding, and, for this reason, underfeeding is sometimes mistakenly pronounced to be the cause of the original trouble. Diagnosis of overfeeding by reason of a large weight gain alone is not justifiable; other points should also be noted before such a diagnosis can be considered. Babies are individuals, no hard and fast rule can be made, and each infant's particular needs should be respected.

Surely it is misleading to group the breast- and bottle-fed babies together in this discussion? The breast-fed infant can be over- or underfed, but normally the balance of his food remains stable and perfect. In contrast, the artificial mixtures can be variable and the balance should be considered even before quantity per feed. It is pointless to pronounce that the artificially fed infant is either over- or underfed without first knowing the content of his feeds and the proportion of one ingredient to another, as well,

of course, as his symptoms. It is, in fact, difficult to overfeed a bottle baby but easy to underfeed him. Refusal to finish feeds often means that his mixture is too concentrated, and I find that appetite sharpens when the balance of the mixture is corrected.—I am, etc.,

The Nursery World,
London, E.C.4.

E. MORRISON.

Parenteral B₁₂ in Acute Leukaemia

SIR,—Dr. Ian Welsh (November 22, p. 1133) details his experience with larger-than-ordinary parenteral doses of B₁₂ ("ordinary" in this case referring to the dose employed in Addisonian megaloblastic arrest anaemia, to date the only unequivocal indication for B₁₂ administration) in acute leukaemia. Results relating to duration of life are tabulated along with a qualitative designation (plus or minus) whether some degree of remission may have been induced. Dr. Welsh seems inclined to the opinion that his results were essentially negative, a conclusion that may also have been implemented by the fact that transfusion and antibiotic administrations were interspersed at the direction of attending physicians, and by Dr. Welsh's apparent cognizance of the additional fact that either of these modalities can be responsible for remission of acute leukaemia.

Whether the B₁₂ administered took the form of liver- or streptomycin-derived material and, if the latter, whether it was of "crystalline" or "crude parenteral" grade might be germane to a negative report were it not for the fact that my own experience with any of these sources of B₁₂ affirms the modest conclusion reached by Dr. Welsh. My reason for the present affirmation is twofold. First, in 1950, along with Dr. Harry L. Fox, I published a paper entitled "Innocuity of Protracted Administration of Special Fermentation Concentrates of B₁₂ as Demonstrated in a Patient with Acute Leukaemia" (*Ohio St. med. J.*, 1950, 46, 784). The patient remained in prolonged remission, and, though the body of the mistitled paper contains the belated explanation that it was the mycin antibiotic content of the streptomycin-derived fermentation material—not its B₁₂—that induced and maintained remission, we have been erroneously confronted with the advocacy of B₁₂ administration for this condition.

That onus might stoically be borne were it not for the second point, that I believe parenteral B₁₂ to be not only ineffective but to have been materially harmful to patients whose anaemia is of the erythroblastic arrest (rather than megaloblastic arrest) type, a situation not infrequently extant in the so-called "haemolytic" anaemias as well as the usually refractive anaemia of acute leukaemic subjects. Like Dr. Welsh's conclusion about ineffectiveness, my own on its invidiousness must necessarily rest on impression, but my conclusion in this regard is so strong that I will risk neither its dispelling nor its fortification at the cost of direct human experimentation. The risk would involve the latter, for, on my own acute leukaemic service, needling, whether for supernumerary haematological "follow-up" or for other than urgent medications (and this includes transfusion), is kept at a bare minimum. Opportunity for direct observation has, however, not been altogether lacking, because on other haematological services strong appeal has resided in giving what general physicians have been told is the most active "haematinic" yet uncovered—one that is effective in far smaller amounts than any other common pharmaceutical and, without too much specification around the last point, is completely devoid of toxicity. I have thus seen doses of from 0.1 to 1.0 mg. given to acute leukaemic patients as well as those with aplastic anaemia, not always as a desperation measure, and, though I cannot at present prove my point, I believe the majority of these patients have reacted poorly and have even initiated haemorrhagic phases more than coincidentally to the B₁₂ injection. Being without ability to firmly document this belief, refuge must be taken in the rationalization that most acute leukaemic patients are hypersensitive individuals; they react poorly to a host of agents which those who do not have a disease of adaptation will readily tolerate.

The overall life duration in the series presented by Dr. Welsh does not compare unfavourably with numerically equal series in which B₁₂ was not given, and this may serve to mitigate a possible contention that such administration is noxious. In fact, these durations are easily as good as, if not better than, in some contemporary series accrued while the aminopterin fiasco was emerging. The justifiability of utilizing life duration figures in comparison has been questioned; their only possible merit lies in overtreatment, whereas "remission rate" as a therapeutic criterion is open to the more dubious question of definition. Be that as it may, my own life durations of acute leukaemias in a series incorporating all ages

statistically significantly so, time alone will tell. In the latter series the mainstay of treatment has been the relentless, continuous daily administration of just enough oral terramycin with milk to maintain a Gram-positive, odourless stool. The severe potassium loss and sodium retention exhibited by many leukaemics on this antibiotic ingestion regime is anticipated and met with a high potassium intake and sodium restriction. Where preponderant mineralocorticoid effects (joint or bone pains, rapidly enlarging glands and intractable oedema) persist, the antibiotic dose is supplemented by a small one of the glucocorticoid, oral cortisone.

The patient's haematomorphology is studiously ignored, because the clinical condition seems a much better index of progress. The numbers of circulating formed elements are permitted to find their own equilibrium level compatible with life, which they frequently do. As a corollary of this go fact, transfusions are seldom resorted to; in cases which go to erythroplasia there is no other alternative than transfusion, but these always take the form of packed, unwashed cells. By studious deletion of those agents which contribute to overtreatment, including B₁₂ injections, average life duration in the present series is now about four times that calculated from Dr. Welsh's table. I am hopeful of doing even better in the future.—I am, etc.,

ROBERT D. BARNARD.

New York City.

Measurement of Tissue Components Radiologically

SIR,—Dr. Frank Falkner and Miss Sylvia Wisdom in their article "Measurement of Tissue Components Radiologically" (December 6, 1952, p. 1240) appear to have exaggerated the simplicity and accuracy of their "new" technique and also exaggerated the difficulty of the tele-radiographic method. With teleradiography the object is not to reduce the overall magnification (which in any case is easily corrected mathematically) but to produce a nearly parallel beam which prevents differential magnification of the tissues being measured due to these lying in more than one plane.

Their technique seems to be based on the false assumption that the outlines of skin, muscle, and bone in a cross-section of a limb may be represented by three concentric circles and that of a maximum diameter of all three structures will fall in one plane which will be parallel to the film. In fact, the outlines are neither circular nor concentric, nor are they symmetrical; thus the two points on an outline where the rays of the anode are tangential will often be different distances from the film, thus to measure the diameter of these outlines in one limb by the "new" method six object/film distances have to be measured. Even assuming this can be done, what distances is it proposed to measure—the actual distance between the two points where the rays are tangential or the distance apart in the plane parallel to the film? In either case three exercises in trigonometry will be necessary for each limb.

But can the object/film distances be measured? The shift of technique is a well-known method of estimating the depth of opaque foreign bodies. But foreign bodies have fixed identifiable points the shift of which can be measured. With solid objects without recognizable points any tube shift which will produce a measurable shift of the shadow will produce a different profile of the outline so that the tangential rays will cut the outline at different points on this circumference, and it is not difficult to conceive possible limb shapes where these points would be widely separated. The excessively short anode film distance used in the "new" technique will mean that the points on the outline (even a circular outline) where the rays are tangential will not be on the maximum diameter. The error will be greater the larger the diameter and, therefore, disproportionate between the diameter and, therefore, disproportionate evidence of the same structures as the limb grows. The experiment with a rigid metal object (we are not told its shape but it, presumably, had fixed points) seems merely a repetition of foreign body localization. The second experiment used only one cross-section of a cadaver. What we need to know is the error involved over the whole range of size and shape of limb cross-sections from infants to adults.

The disadvantages of teleradiography are not as great as Dr. Falkner and Miss Wisdom suggest. The output of the apparatus they employ at 60 cm. is 15 mA for $\frac{1}{4}$ second. Using a distance of 180 cm. (6 ft.) only nine times this exposure is required—namely,

15 mA for one second, or 135 mA for $\frac{1}{4}$ second are appropriate. This compares with their statement that 200 to 400 mA for $\frac{1}{4}$ second is required. Their third criticism of teleradiography is that the centre of the limb can only be guessed and cannot be accurately positioned relative to the film. Substituting a doubtful radiographic technique introduces much more error—for example the image shift measurement, a few millimetres at the most, cannot be judged with any great accuracy bearing in mind that ± 1 cm. may represent a 10–20% error. Contrary to the statement of Dr. Falkner and Miss Wisdom, scatter is not influenced by the choice of methods. In the teleradiographic method the beam is limited to the part being examined by devices known as cones. Further, if the examinations are to be repeated often enough for irradiation dangers to be considered then the very short anode film distance of the "new" method will materially increase the dose to the skin nearest to the tube.

Dr. Falkner and Miss Wisdom complain of the expense of apparatus for teleradiography. We doubt if the price of two 15 mA units will be much less than one 100 mA unit, since 15 mA units are in demand for portable work, whereas 100 mA units are obsolete and large numbers have been scrapped recently and are, presumably, available second-hand. The only advantage of the new method over teleradiography, using a 60–100 mA unit, is an insignificant reduction in exposure time which cannot justify the introduction of a "new" technique which appears to have so many sources of error.—We are, etc.,

B. C. H. WARD.
G. N. WEBER.

London, S.E.3.

External Popliteal Palsy

SIR,—External popliteal palsy is not quite so simple as Drs. Hugh Garland and Doreen Moorhouse (December 27, 1952, p. 1373) would make it appear. To mention only one difficulty, the bifurcation of the sciatic nerve often occurs inside the pelvis, and then an "uncomplicated" palsy may result from a lesion well above the level of the head of the fibula—for example, in the piriformis muscle, which is frequently pierced by the external popliteal division.

In an article on electromyography (*Lancet*, 1950, 1, 937), I described a case which resembled several of theirs in that the palsy came on after squatting in an awkward position. But in my case the electromyograph revealed signs of denervation in the short head of the biceps femoris, proving that the lesion was situated at least above mid-thigh level. Weakness of the short head is not easy to demonstrate clinically, because the long head (innervated by the medial popliteal nerve) remains intact; but either head alone can readily be explored with a needle electrode. It is possible that, if the patients of Drs. Garland and Moorhouse had been tested in this way, evidence of lesions above knee level might have been found in some of them.—I am, etc.,

London, W.1.

FRANK SARGENT.

Smoking and Cancer of the Lung

SIR,—The conclusions of Dr. R. Doll and Professor A. Bradford Hill (December 13, p. 1271) leave no doubt that cigarettes are the main carcinogenic factor in this disease. This is of vital importance to the whole nation. 13,233 people died of this cancer in 1951. A correlation between the rising curve of tobacco consumption with that of deaths from lung cancer, over the last 25 years, suggests that the annual increase of approximately 1,000 deaths will continue until 1965 unless action is taken quickly. It is probable that nearly 25,000 people will die each year by that time. This is a most serious challenge in the social history of our generation. The facts must be made known to the whole community, and the Government, the manufacturers, the medical profession, and the consuming public must face their responsibilities.

The Government problem is primarily one of public health, for many men are dying an avoidable death before the age of 65. Publicity and consequent prevention can only come from central action, and all the power of the Press must be harnessed in this great campaign. A drop in revenue from the tobacco tax is inevitable, but £610m.

annual tax cannot justify silence on the cause of the mounting death rate. The legal responsibility of cigarette manufacturers should be clarified, for it can be an offence to produce goods which are harmful to the health of the consumers. The profession itself must now meet a very personal responsibility in preventive medicine. For years clinicians have tended to pay lip service to the wider aspects of prevention of disease. If we continue to smoke, our patients will follow our example. Are we justified in encouraging them to take this risk? Whatever decision we make about our own health we must tell them of their risk. Doctors who see men slowly dying of this unpleasant and painful death must feel impelled to prevent such deaths in the future. The general public will respond if they are given a sufficiently bold lead. The nation cannot afford to lose many of its most able and industrious men at the peak of their careers.

The following facts should make us press for a saner import policy. Expenditure on the import of cortisone and A.C.T.H. was officially limited to £216,428 in the 12 months ending October 31, 1952. In the 12 months ending March 31, 1951, 221,200,000 lb. of imported tobacco were smoked. Thus beds are filled with dying patients while beneficial and life-saving treatment is denied to sufferers from other diseases.—I am, etc.,

London, N.W.10.

HORACE JOULES.

Treatment of a Case of Shock

SIR,—We feel that it may be of value to record the following case of volvulus of the small bowel with vascular collapse treated by intravenous infusion of "levophed" (noradrenaline). We are informed by Messrs. Bayer Products Ltd. that the use of intramuscular ephedrine to facilitate withdrawal of noradrenaline has not previously been described.

The patient, a woman aged 65 years, was admitted on May 10, 1952, with a history of acute abdominal pain which had commenced eight hours previously. Her blood pressure on admission was 135/70 mm. A diagnosis of small-bowel obstruction was made, and gastric aspiration and intravenous saline were commenced in preparation for operation. In spite of this her condition deteriorated rapidly and her blood pressure began to fall. A transfusion of whole blood gave no improvement, and intramuscular and intravenous methedrine was also tried without effect. The blood pressure continued to fall until, five hours after admission, she was in severe shock and the pressure was unrecordable. An infusion of normal saline was set up containing 8 mg. of noradrenaline to the 35-oz. (994-ml.) bottle and the drip commenced fairly rapidly. Within 30 seconds the patient sat up in bed and vomited, and her blood pressure was found to be 160/100 mm. The drip was slowed to approximately 30 drops/min. and the pressure stabilized at 120/80 mm. During transport to the operating theatre the drip was inadvertently speeded up and her pressure rose to 260 mm. systolic. During the operation the systolic pressure was maintained without difficulty at 120 mm. At operation the peritoneal cavity was full of blood and a volvulus of the small bowel was found. The involved bowel was gangrenous and more than 7 ft. (2.13 m.) of small intestine was resected.

Post-operatively it was found to be impossible to discontinue or even slow the noradrenaline drip. Every attempt to do so resulted in an immediate fall in the blood pressure. In addition, it was found that increasing amounts of noradrenaline were required to maintain a steady pressure. It was decided to try the effects of intramuscular ephedrine, and gr. $\frac{1}{4}$ (32 mg.) at three-hour intervals was given. As a result it became possible gradually to slow the noradrenaline drip, and after a further 12 hours it was discontinued completely, with the patient's blood pressure remaining steady at 140/85 mm.

In this case we have no doubt that the intramuscular ephedrine was the operative factor in the stabilization of the blood pressure, and without this the patient would not have survived, as the noradrenaline appeared to have been gradually losing its efficacy over the preceding 24 hours. The patient's subsequent recovery was uneventful, and when last seen she was well and without symptoms.—We are, etc.,

J. WILSON MUGGOCH.

J. R. DYER.

London, E.3.

Operative Treatment of Hallux Valgus and Rigidus

SIR,—Mr. N. Ross Smith in his article "Hallux Valgus and Rigidus Treated by Arthrodesis of the Metatarso-phalangeal Joint," published in your issue of December 27, 1952, p. 1385, claims that the operation he describes will preserve the function of the great toe. He pours scorn on the operations designed to produce a pseudarthrosis of the first metatarso-phalangeal joint because they all fail to preserve this function. The new arthrodesis requires a relatively extensive operation, including fixation of the cartilage-denuded metatarso-phalangeal joint with a screw, stainless steel wire, or staples (either of the two latter admittedly to cause trouble in removal later). After two weeks the foot has to be immobilized in plaster-of-Paris, which has to be retained for six weeks. The metal internal sutures will then need to be removed, and finally adjusted footwear will be required. The advantages claimed over the other operations are that walking in the plaster cast can be started after two weeks and physiotherapy is hardly needed. As a result of all these complicated manoeuvres it is stated that there is freedom from pain and disablement in 58% of patients and a further 31% are to be thought satisfactory if sufficient account is taken of the other causes of disablement in the foot.

In the conventional pseudarthrosis operations it is to be expected that, after a fortnight's freedom from weight-bearing and with due attention to the rehabilitation of the intrinsic muscles of the feet, a fully mobile foot will result and that the patient will be capable of walking in normal footwear. Cleveland and Winant¹ published a series of results of 193 Keller's operations for hallux valgus and rigidus, and 93% of excellent results are claimed. Bonney and Macnab² published a similar series of 188 arthroplasties and modestly claim reasonably good results, but admit the need for further research.

It is difficult to see why fusion of the first metatarso-phalangeal joint of the foot should be more rational than arthroplasty, or that it can preserve the function of the hallux any better. The author suggests that the failures in his series are caused by fixation of the fused joint at less than 30 degrees of dorsiflexion, but a big toe at such an angle must prove in itself something of a disability when putting on a shoe. Whatever may be gained cosmetically by the new operation is probably lost in the inevitable rigidity of the foot which will result partly from the fused joint and partly from prolonged immobilization of the foot.

Statistically the new operation has no advantages to claim over the conventional arthroplasties, while they have the distinct recommendation that there is a fair chance of restoring the proper muscular control of the foot. The Mayo, Keller, and Girdlestone operations may very well be far from ideal, but at least no farther than the new procedure advocated. If it be conceded that the arthrodesis may finally produce a relatively painless semi-rigid foot which is cosmetically satisfactory, then it might be fairly suggested that a rigid foot equally immaculate cosmetically and quite painless could be more expeditiously produced by amputation below the knee.—I am, etc.,

Leeds.

JOHN M. P. CLARK.

REFERENCES

- ¹ *J. Bone Jt Surg.*, 1950, 32A, 163.
- ² *Ibid.*, 1952, 34B, 366.

Routine Dental Treatment

SIR,—The letter on the above subject from Brigadier R. A. Broderick (January 3, p. 43) is so one-sided as to be misleading. The dental hygienists whom he praises could in their second year be trained to do other operations equally efficiently, and as there are long waiting-lists in every large hospital for children requiring the operation of "Ts. and As." is this his answer?

What of the profession of dental surgery? It became a "closed" profession after much effort in 1921 (long after the medical profession). Are we now to admit "half-

qualified" dentists, and, if so, how is the general public to differentiate? Brigadier Broderick owes it to his juniors that they enjoy the same professional standing as he has done during his professional life. It should be known that it is necessary to acquire the same technical skill to fill both temporary and permanent teeth, and the extraction of temporary teeth is by no means always easy.

The dental schools are full of students training (four years or more) to be fully qualified dental surgeons: are they to be displaced to make room for these "dental nurses"? The idea of utilizing dental nurses emanated from New Zealand, where the conditions for their employment are peculiarly suitable, but these conditions do not exist in this country.—I am, etc.,

Newtown, N. Wales

E. DAVIES-THOMAS.

SIR,—Brigadier R. A. Broderick (January 3, p. 43) has mentioned that the British Dental Association is strongly opposed to ancillary dental workers, but has failed to refute its case in any way. He has assumed, perhaps quite unwarrantably, that the large numbers of children with badly decayed teeth are owing to lack of skilled attention being available. He seems to envisage the use of ancillaries in general hospitals to provide "simple fillings" for those who attend, probably both out-patients and in-patients being in-attendant. Brigadier Broderick knows as well as any other dental surgeon that spasmodic provision of fillings is worse than useless, and that follow-up inspections and further fillings are essential if further caries is not to destroy teeth already filled. Without adequate follow-up patients lose faith in fillings, and when a dental surgeon tries to persuade them to save teeth at a later stage they refuse point-blank because they know fillings are "no good."

Brigadier Broderick has not said how he could define a "simple filling," nor has he stated what distinguishes a difficult extraction. Surely he is not suggesting that all deciduous teeth are easy to extract. Does he think dental surgeons could use hypodermic syringes in the mouth, and ancillaries could use hypodermic syringes from being inhaled under avoid fragments of carious teeth from being inhaled under general anaesthesia? It would be interesting to know how Brigadier Broderick would answer the British Dental Association's point that to train ancillaries would not increase total dental man-power because the supply of dental teachers is limited and the effective life of women trained in this kind of post is only 10 years; also what objections he has to the British Dental Association's belief that the most effective way to deal with the problem is to enlarge existing dental schools and to turn out more fully qualified dental surgeons.—I am, etc.,

Birmingham.

C. N. JEFFRIES.

POINTS FROM LETTERS

Puerperal Psychiatric Illness

Dr. ELLIS STUNGO (London, W.1) writes: I cannot agree with Dr. R. E. Hemphill's emphatic assertion (December 6, 1952, p. 1232) that pregnancy seems to insulate and protect women from psychological and social stresses and strains of the greatest severity. His comprehensive survey of puerperal psychiatric illness was carried out on women delivered at maternity hospitals the majority of whom were, no doubt, either enthusiastic potential mothers, or, alternatively, multiparae who had accepted their pregnancies as a matter of course. My experience of pregnant women has included many who for some reason were unwilling to have the child, and the psychiatric conditions they exhibited have varied from mild reactive depressions to severe schizoid states. I have seen so many cases of attempted suicide in this category of case women that I am convinced of their special vulnerability, and I believe that the incidence of suicide in this category of case is high. I certainly agree that women who are desirous of physical and psychological health, and I would suggest that the degree of "insulation" varies directly with enthusiasm for their pregnancies. An additional survey to that of Dr. Hemphill's valuable investigation which I am sure would prove most rewarding, might be conducted into the incidence of psychiatric illness in unwillingly pregnant women before, during, and subsequent to the puer-

perium. It would be interesting to ascertain the psychiatric history and destiny of women denied a therapeutic abortion. My experience is that a proportion of them either kill themselves, become chronically ill, enter into unsatisfactory marriages with detrimental repercussions on their mental health, or become prostitutes, alcoholics, or delinquents. While the risk of psychiatric illness must not be too readily invoked or exaggerated by doctors sympathetic to the termination of a pregnancy in a particular case, it must not be too lightly disregarded by those antagonistic to interference with an otherwise normal pregnancy. The welfare of the nation is involved either way, and research is urgently indicated into the incidence of psychiatric illness in (a) those women whose pregnancies are interrupted on psychiatric grounds and (b) those compelled to carry on.

Second Attack of Chicken-pox

Dr. N. H. H. GOLLEDGE (Horn, Sussex) writes: I have had the impression that genuine second cases of chicken-pox were comparatively rare. I have just encountered an example in which the interval between the two attacks was only six months. Both attacks occurred in time of minor epidemic. On the first occasion there was a moderate typical rash, but in the second attack there was a severe eruption preceded by general constitutional upset and headache for three days. The rash was again absolutely typical in appearance and distribution. I should be interested to know whether any of your correspondents have had a similar experience.

"Et al., etc."

Dr. R. E. M. COKE-HARVEY (Berkhamsted) writes: Dr. A. J. Jex-Blake (December 6, p. 1259) is baying down the scent of an illusory "space-saving abbreviation for the printer." Whereas "et al." for the singular "and another" is a real abbreviation confirmed by time and use, the plural "and others" ("et alii") is more elegant and correct, and takes up no more space than "et al." Moreover, if Dr. Jex-Blake wishes to write the neuter form "and other things" ("et alia") does he flee the Scylla of the full form for the same old Charybdis of "et al.," thereby causing a possible confusion?

Remedy for Drunkenness

Dr. A. H. BARTLEY (Tumatumari, British Guiana) writes: I wonder if any of your readers have ever used any of the intravenous barbiturates when confronted with a wildly excited, abusive, and sometimes dangerous drunkard. As an orderly medical officer in a British colonial hospital in 1948, I was frequently called to deal with such types. They were somehow more quarrelsome, noisy, and dangerous than those met with in the United Kingdom. This of course may be due to the cheap and poor quality liquor consumed. Since all forms of remonstrance and sedation failed to quieten these cases, it occurred to me that an intravenous barbiturate would be effective. I used pentothal sodium 1 g. in 10 ml. distilled water given slowly, as apnoea may occur if given quickly. Immobilization was easily obtained with the assistance of the usually numerous onlookers. The sudden change from bedlam to peace and quietness is so marked that it makes one feel one has really done mankind a service. . . . No dangers or side-effects have been met with in the dozen or so cases I have dealt with.

Any Answers?

Dr. JOHN C. GILLIES (Selby, Yorks) writes: Whoever has had the good fortune to peruse the leading article entitled "The Patient Tells His Story" (December 6, p. 1246) must have observed with regard to the C.M.I. that it trespasses a trifle on the orthodox magnitude of such systems of interrogation. Scorning what we may designate as the customary O.P. investigation, it positively swells into somal and psychical territories far and away beyond the accepted frontiers. Picture to yourself the harassed G.P., ill-tempered, short of time, his attention perforce attracted by the dazzling phantoms of universal benevolence. All other considerations drop from his mind what time he struggles to grasp the collective interests of the species. No 195 questions, for such wretches as he who toil behind the testimonial curtain. Only one question, essential, overriding, and universal, waits for an answer, "Do you want a certificate?"

Correction

It is regretted that the word "Foley" was wrongly inserted in the last sentence of a letter from Mr. B. H. Page on "The Catheter and the Prostate" (see *Journal*, December 27, 1952, p. 1415), and this resulted in restricting the meaning of the sentence. Mr. Page wished to draw attention to a complication caused by various types of rubber catheter and probably least of all by the Foley type.

Obituary

CHARLES H. MELLAND, M.D., F.R.C.P.

Dr. Charles Melland died in Manchester on January 8 at the age of 80. With his passing Manchester has lost not only a distinguished physician but the last member of a family which has given its service in the best medical tradition for well over a century.

Charles Herbert Melland, whose father, Frederick Melland, was a Manchester surgeon, was born on October 20, 1872. From Manchester Grammar School he went on to Owens College. After a distinguished career as a student—he won the Platt Physiology Exhibition—he qualified in 1894, graduated M.B. (London) with first-class honours in 1897, and proceeded M.D. in 1900.

He held a number of senior house appointments, serving as resident medical officer at the Manchester Royal Infirmary and at the City of London Hospital for Diseases of the Chest, Victoria Park. In 1902 he became a Member of the Royal College of Physicians, and two years later he took the B.Sc. of Victoria University. From 1901–5 he was director of the clinical laboratory at the Royal Infirmary. During his years of study he widened his knowledge by Continental travel and increased his medical experience in the clinics of Vienna and Graz. On his return to Manchester he started consulting practice, and became a physician to Ancoats Hospital, to which he gave devoted service until his resignation from it in 1914 on his election to the staff of the Royal Infirmary. From then on until his retirement from the active staff in 1932 he was a teacher and was able to be in contact with a rising generation: the association was a happy one for both teacher and students.

In 1906, when the Royal Commission on the Care and Control of the Feeble-minded was collecting evidence, Melland was appointed medical investigator, and his report on the incidence of feeble-mindedness and epilepsy in Manchester was embodied in the commission's blue book. As a result of this work he was appointed honorary physician to the National Association for the Care of the Feeble-minded. In the 1914–18 war he served in the R.A.M.C., being attached to the Second Western General Hospital. Dr. Melland was elected F.R.C.P. in 1921.

T. H. O. writes: As a physician, trained in the old order before the advent of x rays and the clinical laboratory, Charles Melland proved himself a man of vision who kept abreast with the times, and though his particular interests were diseases of the blood his knowledge was wide and his clinical acumen was always regarded with respect. He himself, even in his later years, remained a man of broad outlook, interested in many branches of knowledge. Despite an increasing lameness he was often to be found at medical gatherings, delighting on more convivial occasions to meet his colleagues at some reunion or dinner, and it was obvious how much he enjoyed the gathering of his friends to celebrate his eightieth birthday. Apart from medicine, two things interested him to the very end—mountains and lacrosse. As a young man he had been a noted lacrosse player, and even in old age he would travel long distances in order to watch the fortunes of the university team. Although not a mountaineer in the strict sense of the word, he had an abiding passion for mountains, and whether fell-walking in the Lake District or in Wales, or on holiday in the

Dolomites or Alps, he found in them something which stirred his imagination and brought content. His memory was stored with them and he would delight to talk of them, even about those which he had never seen.

Kindly and considerate, Charles Melland upheld a great tradition and we feel the poorer for his loss, and if in later years an increasing infirmity and the loss of a loved wife marred his old age it was borne cheerfully and with courage, and death came mercifully and without pain. He leaves a son and daughter, to whom we offer our sincerest sympathy.

HAROLD ORR, O.B.E., M.D., F.R.C.P.(C.), F.A.C.P.

For the first time in its history the Canadian Medical Association lost its serving President by death when Dr. Harold Orr, of Edmonton, Alberta, died in Toronto on December 26, 1952. Dr. Orr assumed the presidency of the association at its annual meeting in Banff in June last year. During the three succeeding months he and Mrs. Orr travelled more than 8,000 miles in Canada attending the annual meetings of the provincial divisions of the association. Early in October he departed for Athens to represent Canada at the Sixth General Assembly of the World Medical Association. Shortly after his arrival in Greece the first signs of coronary insufficiency presented themselves, but Dr. Orr managed to carry on until his return to London, England, where he was in hospital for three weeks. He then departed for home by boat, but on arrival in New York was again obliged to enter hospital, where he remained for four weeks. Once again he resumed his homeward journey, getting as far as Toronto, where he suffered a very severe coronary occlusion from which he failed to recover.

Born in Toronto in 1889, Harold Orr graduated in 1911 at the University of Toronto. He engaged in general practice in Medicine Hat, Alberta, until the outbreak of the first world war, when he joined the Canadian Army Medical Corps and served as a medical officer for five years, being twice mentioned in dispatches. He returned home with the rank of lieutenant-colonel, and was awarded the O.B.E. After training in dermatology and syphilology in London, Dr. Orr established himself in specialist practice in Edmonton, and was appointed clinical professor of dermatology and syphilology in the faculty of medicine, University of Alberta. For more than 20 years he most efficiently supervised the division of venereal disease control in the department of public health of the Province of Alberta.

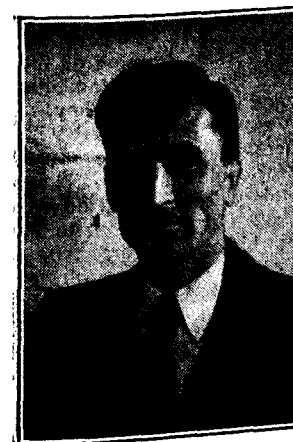
While a comparatively young man, Harold Orr had crowded into his life a full measure of accomplishments of which any member of the medical profession could be justly proud. Always interested in the welfare of his chosen profession and the community in which he served, he could be counted upon to assume with cheerfulness whatever responsibilities were laid upon him and to carry them out with efficiency. He had served as president of the Alberta Division prior to his election to the office of President-Elect of the Canadian Medical Association. In debate he was clear, incisive, and always fair. He possessed those rare qualities of head which permitted him to get to the heart and core of a question quickly and intelligently.

Canadian medicine mourns the passing of a great leader, a warm-hearted companion, and a brilliant mind. He made his contribution to humanity in full measure. He leaves to mourn him his wife and one daughter.—T. C. R.

ROYDEN S. WALE, M.D., F.L.S.

Dr. R. S. Wale, who was pathologist to the Leicester General Hospital, died in London on November 21, 1952, at the early age of 45.

Royden Samuel Wale was born on December 22, 1906, and was educated at King's College School, Wimbledon, and at King's College Hospital, where he graduated M.B., B.S. in 1931, and he was a keen and competent athlete, playing rugby football, squash, rackets, and tennis for his hospital. His love for pathological work was kindled while he was a dresser to the late Sir G. Lenthal Cheatle, and in 1930 they



published jointly a short paper on "A Lesion Common to Breast and Prostate Glands" in the *British Journal of Surgery*. After graduating in 1931, Wale worked under Dr. R. D. Lawrence in the diabetic department and under the late Dr. E. ff. Creed in the pathological department at King's College Hospital, which he left after holding a series of appointments to become assistant pathologist at the Royal Cancer Hospital. He

proceeded M.D. in pathology in 1935. At the outbreak of war in 1939 his services were retained in the Emergency Medical Service, and in 1942 he was placed in charge of the pathological department of the Leicester General Hospital, where he quickly endeared himself to his colleagues and associates. His main medical interests were morbid anatomy and histology, but his library of books on physics, astrophysics, mathematics, botany, entomology, music, and the theatre was a hall of mirrors reflecting many facets of his versatile mind. Like so many medical men, he developed an interest in alpine flora. As a result of his own excursions to the Balkans and with the help of friends who travelled abroad he amassed a unique collection of *semperviva*, which he cultivated and studied, ultimately attempting to clarify and reclassify the genus in articles published in the *Bulletin* of the Alpine Garden Society. His work brought him national and international recognition, and his election as a Fellow of the Linnean Society in 1936 attested to the value of his investigations.

Wale also willingly undertook administrative responsibility and became secretary, and later chairman, of the Leicester General Hospital medical consultants committee. He sought tirelessly to encourage hospital improvements and to wed the best of the old medical service to the good of the new National Health Service.

It was some eight years ago that he first diagnosed his own lymphatic leukaemia. It remained an everlasting source of wonder, admiration, and inspiration to many of us who worked with him to see how calmly and unflinchingly he bore his cross. His kindness, forbearance, and consideration for both the medical and domestic staffs will long be remembered. When life became a frightful burden his courage and sweet stoicism glowed ever brighter.—J. O.

M. H. WOSTENHOLM, F.R.C.S.

We record with regret the death on December 12, 1952, as the result of a motor accident, of Mr. M. H. Wostenholm, who was an ear, nose, and throat surgeon at the Bedford General Hospital. His wife was killed at the same time.

Born on May 31, 1915, in South Africa, Maurice Humphrey Wostenholm came to England in 1935 to study medicine at Cambridge and at the London Hospital, where he qualified M.R.C.S., L.R.C.P. in 1941. After holding resident appointments at the London he joined the R.A.M.C. in 1942, and served until 1946 as a graded surgeon with the rank of captain. On his return to civil life he was appointed first assistant in the aural department at the London Hospital, and in 1947 he became F.R.C.S. He was appointed a consultant ear, nose, and throat surgeon on the staff of the Bedford General Hospital about 18 months ago, and he also held an appointment at St. Albans City Hospital. Mr. and Mrs. Wostenholm leave three young sons.

Dr. DAVID LEWES writes: The tragic news of the sudden death of Maurice Wostenholm and his wife will fill with sorrow all who were privileged to know that able young surgeon. Those whose good fortune it was to come into contact with him will bear testimony to his spontaneous kindness, and his patients will always remember him with gratitude both for his skill as a surgeon and for his whole-hearted sharing of their personal problems. From his earliest days at the London he was fired with enthusiasm in all he did, and his gay spirit, which was infectious, livened and cheered his many friends. He worked hard and played hard. In his daily life he gave vital meaning to the motto above the entrance to the medical college where he worked: *Amara lento tempera risu*—temper the difficult things in life with a smile. He faced difficulties with a slow smile and he possessed in rich measure those rare qualities—equanimity and imperturbability. Our hearts go out in sorrow to his parents and to other relations and to his three little boys.

Mr. KENNETH B. BELLWOOD writes: In the tragic death of Mr. Maurice Wostenholm, Bedford General Hospital has lost a most vital and capable member of the staff; indeed, in the 18 months, or even less, since he joined us he had already become much liked and respected. In the ear, nose, and throat department, in which we were jointly responsible, I soon became aware of his amiable and helpful character. Both as a clinician and as a surgeon he had good experience and judgment. It was always pleasant to meet and to discuss matters with him, and I regret that our friendship was so soon cut short, when it seemed that he was keen to develop the department both now and in the future. We have lost a young and a most promising friend and colleague.

Dr. M. D. C. HOSFORD writes: Mr. Wostenholm's work as a surgeon was brilliant, and his enthusiasm, energy, and tireless attention to all the details of his work will make his tragic death at the outset of a brilliant career a serious misfortune to his patients and all with whom he worked. He and his wife were delightful companions and missed by a wide circle of friends.

Dr. LESLIE EDWARD HUGHES, who died at the age of 75 after a short illness, was the youngest son of the late Dr. D. S.

ham, Norfolk. He was a medical student at St. Bartholomew's Hospital, and after qualifying in 1902 he put in the long period of six years in various house appointments at the Norfolk and Norwich Hospital, finally becoming senior resident surgical officer there. Throughout his life he was very keen on surgery and midwifery, and when he joined the late Dr. C. P. Hooker in partnership at Cirencester in 1907 he quickly made a name for himself as a sound surgeon and an exceptionally good accoucheur. Indeed, his figure of 3,000 confinements with only two maternal deaths—confinements often carried out in home conditions leaving much to be desired and without all the modern advantages and with no institution for difficult cases—is one which cannot often have been surpassed. As a surgeon to Cirencester Memorial Hospital he proved his skill and judgment over many years. At the outbreak of war in 1914 Dr. Hughes offered his services to the R.A.M.C., but his offer was refused, as he was just over the age limit prevailing then. Not to be deterred from serving his country, Dr. Hughes enlisted in the Grenadier Guards and went through the recruits' training for three months. Representations from influential quarters secured a relaxation of the age limit in his case, and he was posted as medical officer to the Gloucester Regiment. He went on active service in 1915 as regimental medical officer to the Oxford and Bucks Light Infantry, and remained with the unit until the autumn of 1918, when he was promoted temporary major and posted as surgical specialist to a casualty clearing station on the Murmansk front. He was mentioned in dispatches four times, was awarded the Military Cross, and was recommended for the D.S.O. Returning to Cirencester in 1919, he resumed his partnership until Dr. Hooker's retirement, and he then continued in single-handed practice until his own retirement in July, 1948. He had great misgivings about the new National Health Service Act. Dr. Hughes was a keen shot and took a great interest in the work of the British Legion, having been chairman of the benevolent committee of the Cirencester branch for many years. He was unmarried.—J. H. G.-W.

Medico-Legal

DAMAGES AGAINST CASUALTY OFFICER

In the recent case of *Payne v. St. Helier Group Hospital Management Committee and Another*, the court held that a casualty officer at the hospital had been negligent. Since the casualty officer was employed by the management committee of the hospital, the hospital also became liable, but, in awarding damages to the plaintiff, the judge made an order indemnifying the committee against the doctor in respect of the whole sum awarded as damages, and in respect of two-thirds of the committee's costs. Because of some notable features the case is reported at length below.

The plaintiff, Mrs. Payne, was the widow of a horse-keeper employed by United Dairies. At about 5 o'clock in the morning of July 10, 1950, Mr. Payne was kicked in the abdomen by a horse that slipped when he roused it. He consulted his doctor, who referred him to the hospital. A casualty officer examined him at 2.30 p.m., some 9½ hours after the injury had been sustained. This practitioner had been professionally qualified for two years. He observed and recorded in the notes a bruise as large as the palm of a hand in the right iliac fossa. He recorded also that there was no sign of bony or visceral injury. He sent the patient home to go to bed and to call in his own doctor.

On July 28, eighteen days later, the patient had become lacerated, and was readmitted to hospital. The diagnosis was peritonitis. An operation was performed on August 2. Although a peritoneal haematoma was found, but the peritonitis was not attributed with the finger of the operator and gas walking in the lake. The wound was drained. A further operation was performed on August 21 for general perito-

nititis and faecal fistula. The patient's condition was by this time very poor, and an anastomosis was made of small bowel to transverse colon. Death followed on August 30, 51 days after the original accident.

Mrs. Payne, the widow of the deceased, said in evidence that her husband had vomited after his arrival home from work on the morning of the injury. He had also vomited repeatedly while at home after return from hospital. He was able to keep nothing down, not even a switched egg. During the period when he was at home he got up for necessary purposes, came down for short periods to sit by the fire, and went out a little. On one occasion he had attended for a short time a cricket match in a neighbouring sports field.

Casualty Officer's Evidence

The casualty officer in evidence stated that, when he first examined the deceased on his arrival at hospital on the day of the injury, he had found slight surface bruising of the right iliac fossa. He had palpated the abdomen, and the bone, but had been unable to find any sign of bony or visceral injury. The abdomen was soft and moved with respiration, it was not tender, there was no muscle guarding, and sounds of bowel movement could be heard. There was nothing abnormal in the man's pulse rate and he was not in any way collapsed. He had told the patient to go home and go to bed and to call in his own doctor.

General Practitioners' Evidence

The patient's general practitioner said in evidence that when he had sent the patient to hospital he had had in his mind that the surgical consultant would be in attendance at the hospital on that afternoon and would have an opportunity of seeing him. He wished in the case of such an injury to have a second opinion. He did not specifically ask in his letter of recommendation for a consultant's opinion. On the following morning Mrs. Payne had called at his surgery and told him that there was no internal injury, and that the injury was not considered to be serious, but that she had been asked to call her own doctor in again. He saw the patient next morning and examined him. There was still some tenderness but rather less than on the previous day. Shock was less marked and he seemed to be a little better. There was definitely no deterioration in his condition on this occasion. He told him to rest and to let him know if anything went amiss. He got no further call to see Mr. Payne, but visited him on July 17, when he was still in bed. He was getting up to go to the toilet and had had some diarrhoea. There was no other abdominal symptom and the bruising was less. He did not remember Mrs. Payne or her husband mentioning vomiting to him; had either done so he would certainly have referred the patient to hospital again. He told Mr. Payne that he was going on holiday on July 18, but that he should see on July 24 the colleague who was doing his holiday work, and who would come and visit him before if he felt worried in any way.

Mr. Payne did in fact visit this colleague on that date and informed the colleague, it was said in evidence, that he was feeling much better and anxious to return to work, but was still troubled by a fair amount of wind. This doctor said in evidence also that the patient appeared strained, but that his abdomen presented no tenderness whatever and no muscle guarding. There was a suggestion, however, of some abdominal distension. He did not remember Mrs. Payne or her husband mentioning vomiting to him; had either done so he would certainly have referred the patient to hospital.

On July 28 this doctor had a call from Mrs. Payne and visited the patient again in his home. He was in bed in a cold sweat, his breathing was somewhat laboured, he looked drawn, and was a very sick man. His abdomen was grossly distended. With a diagnosis of early paralytic ileus he referred the patient to hospital for admission. He did not at that time present the signs of peritonitis.

On admission to hospital, as recorded above, the two successive operations were performed and the patient died on August 30.

Evidence of the post-mortem findings was given by Dr. David Haler, the coroner's pathologist. He had found at necropsy a state of general peritonitis, a subphrenic abscess, a bruise of the abdominal wall and necrosis of the muscles in the hollow of the ilium, necrosis and perforation of the caecum, an external fistula from the caecum through the wound of the first operation, and the anastomosis which had been performed at the final operation. He gave it as his opinion that the caecum had been bruised at the time of the original injury and that, if operation had been performed then, the subsequent course of the patient's illness and his death would in all probability have been averted.

Expert Witnesses

Sir Hugh Griffiths, surgeon to the Albert Dock and other hospitals, gave it as his opinion that the caecum had been bruised by the original injury, and that an abscess had formed in relation to the bruised caecum, bursting later to give a general peritonitis and to occasion death. He was of opinion that if the patient had been submitted to operation at the time when he was first sent to hospital the later effects of the injury would have been avoided by prompt attention to the bruised caecum. Bruising could not occur from the impact of force unless tissue was bruised between that force and a hard structure such as bone. The bruising of the right iliac fossa indicated that the tissues of the right iliac fossa had been pressed between the horse's hoof and the hollow of the ilium. The caecum would anatomically lie between the force of the hoof and that bone. He took a serious view of all abdominal injuries and had made it a rule in his hospital that all abdominal injuries, like all head injuries, were admitted for 24 hours for observation at least. He did not regard one act of vomiting after such an injury as necessarily serious; but, with that amount of bruising, if a patient had vomited on more than one occasion he would operate, even in the absence of signs of perforation. By so operating, bruised bowel could be removed before actual perforation occurred. He did not blame the casualty officer—it was inexperience.

Professor Ian Aird said in evidence that he was puzzled by the whole circumstances of the case and could not explain why peritonitis had occurred so late. Perforation of the caecum and necrosis of the caecum which was productive of peritonitis could not be present for more than a few days. He suspected that the subphrenic abscess, a condition notoriously difficult to detect, and which was certainly present at death, had played a more important part than had been suggested by other evidence. He would not have operated on the day of the injury in the presence of the symptoms and signs which had been described. He would not operate even in a case of suspected bowel rupture unless there were actual signs of perforation, tenderness, and rigidity of the abdominal muscles at least. He did not regard bruising of the character described, even if associated with vomiting on two occasions, as an indication for abdominal exploration. He did not think necessarily that the patient should have been admitted when he presented at hospital. It was desirable to admit for observation patients after abdominal injury of this kind who were seen within a short time of the injury, but, if there were no signs of perforation present after nine and a half hours, it was safe to conclude that no urgent emergency would be likely to arise and to permit the patient to return home to the care of his own doctor. He did not believe that the severity of an injury could be deduced from the presence or extent of bruising, and he could not agree that for bruising to occur it was necessary for tissues to be compressed between an external force and bone. An external force alone could cause bruising to soft tissues, as it did for instance in the loin quite commonly, where there could be no question of crushing of tissues against the distant spine; such organs as the brain and the lung too could be bruised within the intact walls of the cavities which enclosed them. He thought it wrong to conclude that an earlier operation, even if it had been performed in this case, would have averted the later consequences. He found

it impossible to say at what time he would have advised that operation be done in this particular case. The patient was not thought to be in urgent need of operation even when finally admitted to hospital 18 days after the original injury.

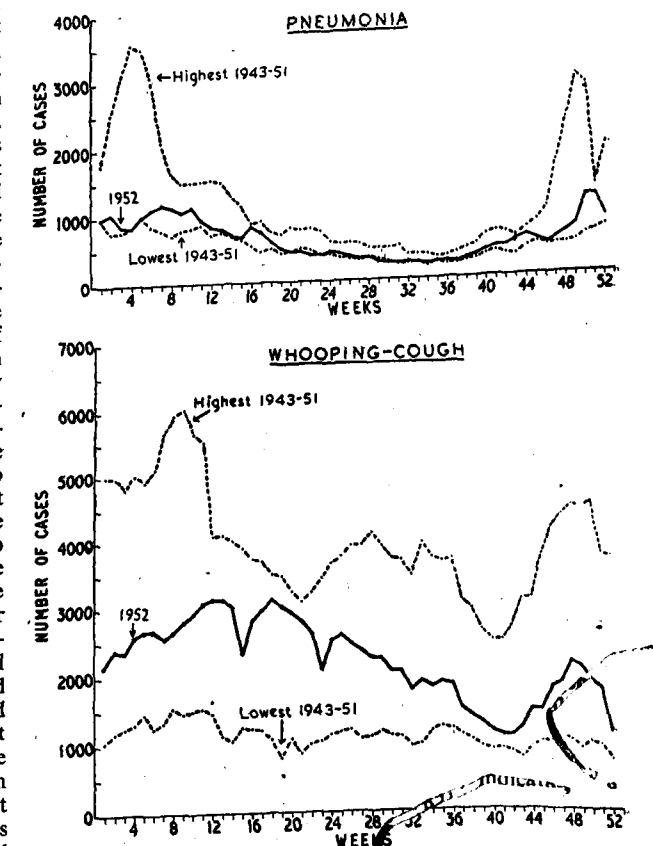
Judge's Comments

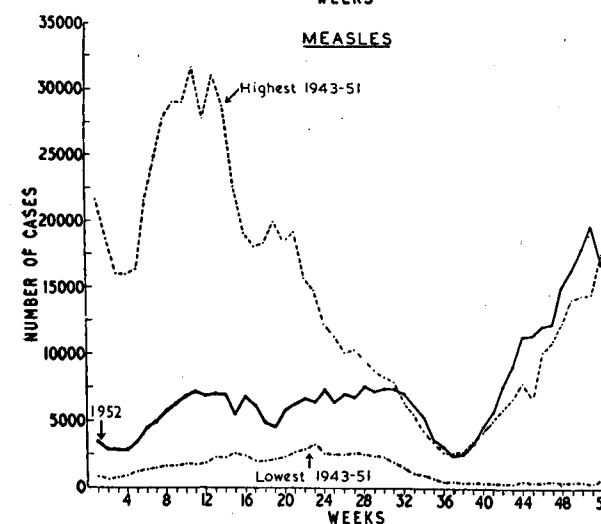
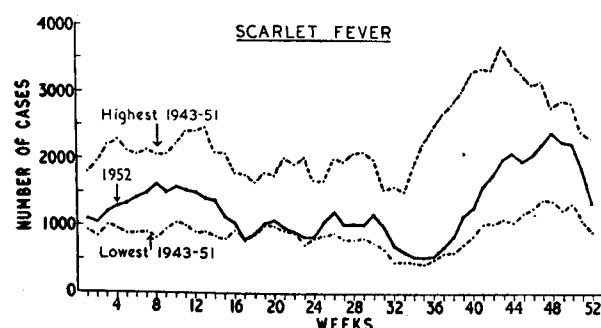
Mr. Justice Donovan awarded the widow £2,640 in damages, holding that the casualty officer was wholly liable and indemnifying the hospital in respect of its responsibility for him. He admitted that the clinical tests made by the casualty officer were correct, but he was of opinion that the casualty officer had failed to observe a rigidity of the abdomen which must have been there, and to notice that the patient was suffering from pain and shock. If these conditions were present in addition to the bruising, then the diagnosis and treatment represented less than the exercise of reasonable care. It was wholly unjustifiable to send the man home and not to detain him for examination by a consultant. It was reasonable to conclude that, if the man had been seen by a consultant, timely operation would have been performed, and the deceased in all probability would have survived.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1943-51 are shown thus -----, the figures for 1952 thus ————. Except for the curves showing notifications in 1952, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

A large fall occurred in the number of notifications of infectious diseases in England and Wales during the week ending December 27, 1952. The largest decreases in the number of notifications were 5,262 for measles, from 19,551 to 14,189, 631 for whooping-cough, from 1,748 to 1,117, 523 for scarlet fever, from 1,881 to 1,358, and 143 for dysentery, from 327 to 184.

The largest declines in the incidence of measles were 912 in Essex, from 2,327 to 1,415, 801 in London, from 1,797 to 996, 545 in Middlesex, from 1,329 to 784, 410 in Kent, from 1,181 to 771, and 301 in Yorkshire West Riding, from 1,297 to 996. The largest falls in the number of notifications of whooping-cough were Lancashire 69, from 290 to 221, and Cheshire 63, from 134 to 71. The largest decreases in the incidence of scarlet fever were Essex 77, from 162 to 85, and Lancashire 59, from 229 to 170. During the week 26 cases of diphtheria were notified, 3 more than in the preceding week. No case of diphtheria was notified in the southern section of the country comprising London, the south-east, the south-west, and the south midland counties.

33 cases of acute poliomyelitis were notified; these were 5 fewer for paralytic and 9 fewer for non-paralytic cases than in the preceding week. The largest returns were Middlesex 4, Sussex 3, and Berkshire 3 (Maidenhead M.B. 3).

The largest centres of dysentery were Lancashire 44 (Liverpool C.B. 21), Lincolnshire 38 (Grimsby C.B. 37), London 23, Kent 23 (Penge U.D. 19), and Westmorland 13 (Kendal M.B. 13).

Week Ending January 3

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,716, whooping-cough 2,165, diphtheria 25, measles 30,497, acute poliomyelitis 37, dysentery 262, paratyphoid fever 0, and typhoid fever 1. The number of measles notifications is about double that of the previous week.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **December 27**
(No. 52) and corresponding week 1951.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1952					1951				
	Eng. & Wales	London.	Scot.	N. Ire.	Eire	Eng. & Wales	London.	Scot.	N. Ire.	Eire
Diphtheria	26	0	10	1		43	3	13	0	2
Dysentery	184	23	75	2	1	293	17	84	0	
Encephalitis, acute	6	0	0	0		0	0	0	0	
Enteric fever:										
Typhoid	2	0	0	0		3	2	1	0	0
Paratyphoid ..	3	0	0	0		7	0	1(B)	0	
Food-poisoning ..	42	0		1		449	7		0	
Infective enteritis or diarrhoea under 2 years				8	1				14	9
Measles*	14,189	996	103	17	40	2,331	19	84	106	42
Meningococcal infection	31	3	14	2		26	4	15	1	1
Ophthalmia neonatorum	9	1	10	0		20	0	9	0	
Pneumonia†	826	44	284	1	2	678	30	245	4	
Poliomyelitis, acute:										
Paralytic	30	2	}	2	0	{	17	2	0	3
Non-paralytic ..	3	0								
Puerperal fever‡ ..	145	17	13	1		131	21	13	1	
Scarlet fever	1,358	72	264	14	52	1,095	72	281	12	41
Tuberculosis:										
Respiratory			123	21				142	18	
Non-respiratory ..			23	4				29	8	
Whooping-cough ..	1,117	73	61	11	12	1,402	73	230	60	22

DEATHS In Great Towns	1952					1951				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	0	0	1		0	1	0	1	0	0
Dysentery	0	0					0		0	
Encephalitis, acute		0			0	0	0	0	0	
Enteric fever ..	0	0	0							
Infective enteritis or diarrhoea under 2 years	11	2	3		1	12		3	0	2
Influenza	44	6	2		1	22	5	0	0	0
Measles		0	1		0		0	0	0	0
Meningococcal infection		2	1				0	1		
Pneumonia ..	449	91			9	250	44		7	6
Poliomyelitis, acute	2	0			0	0	0			0
Scarlet fever ..		1	0		0		0	0	0	0
Tuberculosis : Respiratory .. Non-respiratory ..	120	{ 21 2	27 5		{ 3 0	131	{ 11 0	28 2	10 0	5 0
Whooping-cough ..	6	0	0		0	0	0	2	1	0
Deaths 0-1 year ..	249	23	29		13	217	30	35	4	9
Deaths (excluding stillbirths) ..	6,472	1029	763		173	5,033	816	612	115	104
LIVE BIRTHS ..	4,450	623	778		254	5,082	707	804	138	91
STILLBIRTHS ..	133	11	30			159	25	34		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

§ Includes puerperal pyrexia.

Medical News

Careers in Medical Research.—The Medical Research Council has issued a useful pamphlet entitled "Opportunities for Appointment to the Scientific Staff" for those considering a career in medical research. The pamphlet deals briefly with the Council's constitutional position and states the conditions of work and terms of service for its staff. Then follow a classified survey of the current research programme and a list of the Council's establishments. The Council's method of recruitment is by recommendation from the director of the unit at which an applicant wishes to work. Copies of the pamphlet may be obtained, free on request, from the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1.

Travelling Medical Fellowships.—The Medical Research Council invites applications for the following Travelling Fellowships for the academic year 1953-4:

Rockefeller Fellowships.—These Fellowships are intended for graduates who have had some training in research work in clinical medicine or surgery, or in some other branch of medical science, and who are likely to profit by a period of work at a centre in the United States or elsewhere abroad, before taking up positions for higher teaching or research in the United Kingdom. Fellowships tenable in the United States will normally carry a maintenance allowance at the rate of \$2,600 per annum for a single Fellow and \$3,600 per annum for a married Fellow. Provision will also be made for travelling and other approved expenses. The last date for application is March 15.

Eli Lilly Fellowships.—Four Fellowships, tenable in the United States, will be available for the academic year 1953-4, and the awards will in general be made on terms and conditions similar to those attaching to the Rockefeller Travelling Fellowships in Medicine. The last date for application is March 15.

Dorothy Temple Cross Research Fellowships.—The object of these Fellowships is to give special opportunities for study or research to suitably qualified British subjects "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms." The Fellowships will, as a rule, be awarded to candidates who wish to make their studies or inquiries elsewhere than in the United Kingdom. The Fellowships provide for the payment of a maintenance allowance at the rate of £650 per annum for a single Fellow and £900 per annum for a married Fellow, subject to appropriate adjustment in the case of Fellowships tenable at centres outside the sterling area; in addition, an allowance will be made for travelling and other approved expenses. The last date for application is March 15.

Alexander Pigott Wernher Memorial Fellowships.—These Fellowships are intended for suitably qualified medical graduates who are likely to profit by a period of work in ophthalmology or otology at a centre abroad before taking up positions for higher teaching and research. The awards, which will normally be tenable for one year, are at the rate of £650 per annum for a single Fellow or £900 per annum for a married Fellow, subject to appropriate adjustment in the case of Fellowships tenable at centres outside the sterling area. In addition, an allowance is made for travelling and other approved expenses. The last date for application is March 31.

French Government Exchange Scholarships.—Under the terms of a reciprocal arrangement with the Centre National de la Recherche Scientifique two scholarships, tenable at research institutions in France during the academic year 1953-4, are open to British workers in medical science (excluding clinical medicine). The scheme is intended for young graduates in medicine or science who have already had some experience in a branch of medical science. Candidates must be of British nationality and have at least a working knowledge of French. The scholarships will normally carry a maintenance allowance within the range of 45,000-90,000 francs a month, according to qualifications and experience, and married men will receive a supplementary allowance (payable in sterling by the Council). Provision will also be made for travelling expenses to and from the place of work. The last date for application is March 31.

Further details of these Fellowships and forms of application may be obtained from the Secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1.

Anglo-French Exchange Bursaries.—Applications are now invited for bursaries which will be awarded this year to young British doctors under an exchange scheme arranged by the French Embassy in London between the Institut National d'Hygiène, in Paris, and the Ciba Foundation, in London. The value of the French grants is 60,000 francs a month, tax free. Grants will be awarded for periods of two to four months to doctors who wish to obtain clinical experience or carry out medical research in France. Applications for the bursaries should be sent before March 31 to Dr. Wolstenholme, Director; Ciba Foundation, 41, Portland Place, London, W.1.

Scholarship for Medical Women.—The Royal Society of Medicine announces that a William Gibson research scholarship will be awarded in July to date from October, 1953. The scholarship, which is tenable for two years and is at the rate of about £200 a year, is open to "qualified medical women who are subjects of the British Empire." Further details may be obtained from the secretary, Royal Society of Medicine, 1, Wimpole Street, London, W.1. The last date for applications is June 1.

Laboratory for Dr. Funk.—On January 13 Dr. Louis H. Bauer, president of the American Medical Association, presented a new research laboratory to Dr. Casimir Funk, the noted biochemist who coined the word "vitamin" (originally "vitamine"). The laboratory, which is in Manhattan, New York, was paid for by the Funk Foundation for Medical Research, a fairly recently founded non-profit organization interested especially in cancer research. Here Dr. Funk is proposing to carry out a much-expanded research programme. Dr. Funk was born in Warsaw 69 years ago, and it was while he was at the Lister Institute, London, that he did much of his well-known work on the metabolism of the B vitamins.

*** Care of the Premature Baby.**—The Southmead General Hospital Group Management Committee has published a booklet called "The Care of the Premature Baby in the Bristol Area." Prepared jointly by the departments of child health and public health, the booklet describes the services which have been developed at Bristol to deal with premature infants. It was originally intended for private circulation among paediatricians and laymen faced with establishing similar services, but in view of the large demand it is now made more widely available. Copies may be obtained from the Management Committee, Southmead Hospital, Bristol.

Sir Heneage Ogilvie, consulting surgeon, Guy's Hospital, has been appointed praelector in the faculty of medicine at St. Andrews University for the session 1952-3. During his tenure of office he will take part in the teaching and clinical work of the department of surgery and deliver a series of open lectures.

Professor F. H. Bentley has resigned the Chair of Surgery in the University of Durham to take up a research and teaching appointment under the Sommer Memorial Trust, combined with the practice of surgery, in Portland, Oregon.

Star and Garter Home Commandant.—Colonel Geoffrey Anderton has been appointed Commandant of the Star and Garter Home for Disabled Sailors, Soldiers, and Airmen at Richmond in Surrey in succession to Major Cecil Burnham. Colonel Anderton entered the R.A.M.C. in 1928, and in the last war he was mentioned in despatches in 1943 and in the following year was appointed O.B.E.

Emergency Bed Service: Applications and Admissions.—During the seven days ending January 12 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 1,758, of whom 80.78% were admitted. A white warning indicating that the percentage of admissions fell to 82½, was issued on January 6.

COMING EVENTS

Health in Industry.—The Industrial Welfare Society has arranged a course of lectures on "Positive Health Measures in Industry." The lectures, all of which begin at 6 p.m., are to be held at the offices of the Society, 48, Bryanston Square, London, W.1. The titles and speakers are as follows: January 22—Organization of First Aid in Work Places, by Dr. Neil G. Marr; January 29—Sickness Absenteeism, by Dr. P. Fitzsimons; February 5—Posture and Movement in Relation to Industrial Health, by Dr. W. F. Floyd; February 12—Health Education in Industry, by Dr. F. M. Oldershaw. The fee for the course is £1 10s. for members and £2 for non-members. Further information may be obtained from Mrs. O. K. Skelley, Industrial Welfare Society (Inc.), 48, Bryanston Square, London, W.1.

Postgraduate Course for General Practitioners.—Cambridge University Medical School has arranged a further postgraduate course at Addenbrooke's Hospital, Cambridge, on January 24 at 10.30 a.m. It will take the form of a symposium on radiotherapy, and will include lecture-discussions and demonstrations. The course is open, free of charge, to general medical practitioners whose names are on the National Health Service list. Those wishing to attend are asked to notify the secretary, Cambridge University Medical School, The Naval Hut, Downing College, Cambridge, immediately.

British Association of Allergists.—The annual general meeting of the British Association of Allergists will be held at the Royal Society of Medicine, 1, Wimpole Street, London, W.1, at 11 a.m. on January 24. Speakers will include Dr. N. C. Oswald, Professor J. Gough, Dr. H. O. Schild, Dr. MacKenna, and Dr. I. B. Sneddon.

Congress of Universities.—The Seventh Quinquennial Congress of Universities of the British Commonwealth will be held at Cambridge in July.

NEW ISSUES

British Journal of Venereal Diseases.—The next issue (Vol. 28, No. 4) will be available in a week's time. The contents include: CHANGING CONCEPTS IN THE SERO-DIAGNOSIS OF SYPHILIS: SPECIFIC TREPONEMAL ANTIBODY VERSUS WASSERMANN REAGIN. R. A. Nelson, Jr. CARDIOLIPIN-ANTIGEN. II: A QUANTITATIVE EXAMINATION OF SENSITIVITY. Henning Schmidt. STATISTICAL APPENDIX by Michael Weiss Bentzon. PLURALITY OF ANTIBODIES IN SYPHILITIC SERUM AND CLINICAL PRACTICE. Vittorio Puccinelli. RESULTS OF TREATMENT OF GONORRHOEA WITH PENICILLIN ALONE AND WITH PENICILLIN AND SULPHONAMIDE. G. O. Horne, J. B. Blittner, and J. R. G. Buchanan. THE INCIDENCE AND DEMONSTRATION OF BIOLOGIC REACTIONS IN ROUTINE WASSERMANN TESTS. H. M. Rice. MANAGEMENT OF VESICAL DYSFUNCTION OF NEUROSYPHILIS BY TRANS-URETHRAL RESECTION OF THE VESICAL NECK. W. Fowler. HERPETIC URETHRITIS. Juvenal Esteves and Manuel R. Pinto. ACUTE GONORRHOEA DUE TO A STREPTOMYCIN-RESISTANT GONOCOCCUS. W. J. Ryan. ACETARSOL PESSARY DERMATITIS. J. O. Doyle.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Industrial Medicine.—The next issue (Vol. 10, No. 1) will be available in a week's time. The contents include:

THE INFLUENCE OF HORMONES ON THE DEVELOPMENT OF SILICOTIC NODULES PRODUCED BY INTRAPERITONEAL INJECTION OF QUARTZ. Erich Schiller. THE ACTION OF DIFFERENT FORMS OF PURE SILICA ON THE LUNGS OF RATS. E. J. King, G. P. Mohanty, C. V. Harrison, and G. Nagelschmidt. SOME PSYCHOLOGICAL CONFLICTS CAUSED BY GROUP BONUS METHODS OF PAYMENT. Norah M. Davis. EMOTIONAL STABILITY IN COLLIERY WORKERS. Alastair Heron and Dorothy Braithwaite. AN INVESTIGATION INTO THE REMOVAL OF RADIOACTIVE CONTAMINATION FROM THE HANDS. James Gregory. A FIELD STUDY OF OCCUPATIONAL DEAFNESS. Colin M. Johnston. AGE AND INDUSTRIAL ACCIDENT RATES. H. F. King and D. Speakman.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

Details in this column are necessarily brief. Further information and tickets where required (marked ●) should be obtained from the institution concerned.

Monday, January 19

HUNTERIAN SOCIETY.—At Mansion House, 8.30 p.m., Hunterian Society Lecture by Dr. J. Van Laer (Holland): Auto Mutilation of Prisoners. ROYAL EYE HOSPITAL.—5 p.m., Dr. T. H. Whittington: Refraction Work in the Young and the Old. Aphakia.

Tuesday, January 20

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. A. S. Parkes, F.R.S.: Preservation of Living Cells at Low Temperatures. CAERNARVONSHIRE AND ANGLESEY PAEDIATRIC CLUB.—At Clinic, Sackville Road, Bangor, 4.30 p.m., Dr. E. G. G. Roberts: Paediatric Radiology. ●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Professor P. B. Medawar: Pigmentation. LONDON UNIVERSITY.—6 p.m., Sir Godfrey Thomson, D.Sc., Ph.D.: Geometry of Mental Measurement. SOCIETY FOR THE STUDY OF ADDICTION.—At 11, Chandos Street, W., 8 p.m., Detective-Sergeant G. Lyle: Dangerous-Drugs Traffic in London. Discussion will follow. SOUTH WEST LONDON MEDICAL SOCIETY.—8.30 p.m., Dr. Kenneth Cameron: Common Psychiatric Problems in Childhood. WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Mr. J. Minton: Ocular Manifestations in Nervous Disease: Part I.

Wednesday, January 21

EUGENICS SOCIETY.—At Burlington House, W., 5.30 p.m., Dr. J. D. Nisbet, Ph.D.: Family Environment and Intelligence. ●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Inflammation. INSTITUTE OF UROLOGY.—At St. Paul's Hospital, 4.30 p.m., Mr. J. E. Semple: Differential Diagnosis of Renal Pain. LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8.30 p.m., Sir William MacArthur: History of Smallpox in the British Isles. LONDON UNIVERSITY.—6 p.m., Sir Godfrey Thomson, D.Sc., Ph.D.: Geometry of Mental Measurement. MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., Dr. A. L. P. Peeney, Dr. A. M. Nussey, Dr. W. C. Smallwood, and Mr. C. Rudd: A Symposium on Cortisone and A.C.T.H.

Thursday, January 22

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Mr. H. J. Seddon: Certain Aspects of Nerve Repair. ●INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. J. G. Scadding: The Chronic Cough. ●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Mycology.—Pathogenesis of Tinea Capitis. LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Dr. M. K. Alexander: Case of the Stevens-Johnson Syndrome; Dr. A. H. Cruickshank: Case of Chiari's Disease; Dr. K. McCarthy: Generalized Vaccinia. LONDON UNIVERSITY.—6 p.m., Sir Godfrey Thomson, D.Sc., Ph.D.: Geometry of Mental Measurement. OXFORD UNIVERSITY.—5 p.m., Dr. G. W. Corner (Washington): Medicine in the Poems of Chaucer. ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor C. G. Rob: Intermittent Claudication and Gangrene of Toes by Arterial Grafting. UNIVERSITY COLLEGE.—At Physiology Theatre, 5.30 p.m., Professor F. Bergel: Some Chemical Aspects of Normal Growth.

Friday, January 23

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. I. Muende: Anomalies of Pigmentation. ROYAL EYE HOSPITAL.—5.30 p.m., Mr. Howard Reed: Visual Fields. ROYAL INSTITUTE OF PHILOSOPHY.—At University Hall, 14, Gordon Square, W.C., 5.15 p.m., Mr. A. H. Smith, M.A.: Moral Philosophy in Ancient Greece. ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Symposium: Diabetes Mellitus. ROYAL SANITARY INSTITUTE.—At Town Hall, Bournemouth, 10 a.m., Lord Douglas of Barloch: Soil, Food, and Health; Dr. K. O. A. Vickery: Keystones of Positive Health.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Barwise.—On December 29, 1952, at Frome St. Quinton, Dorchester, to Dr. Maureen (formerly Bassett), wife of Dr. David Barwise, a son—Michael David. Fairley.—On December 20, 1952, at the R.A.F. Hospital, Rinteln, Germany, to Dorothy Jean (formerly Orr), wife of Dr. J. H. Barrie Fairley, M.B., B.S., D.A., a daughter. Gray.—On January 1, 1953, at St. David's Hospital, Cardiff, to Marion (formerly Muir) and Dr. Peter Gray, a daughter.

DEATHS

Abbott.—On January 3, 1953, at 21, Vallance Gardens, Hove, Sussex, Horatio White Abbott, M.D., late of Holloway, London, N. Carr.—On January 2, 1953, Jack Carr, M.R.C.S., L.R.C.P., of Manchester, Lancs. Hughes.—On January 2, 1953, at 1, Seaford Lodge, Barnes, London, S.W., John Hughes, M.B., B.Ch., D.P.H., aged 67. Richards.—On January 1, 1953, at Brynhyfryd, Aberavon, Port Talbot, Glam., William Jones Richards, F.R.C.S., aged 79. Ware.—On January 5, 1953, Arthur Maitland Ware, M.D., of Tying Down, Guildford, Surrey, aged 78.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Regular Douching

Q.—What are your views on the desirability of routine vaginal douching for reasons of personal cleanliness?

A.—There is no need for the normal woman ever to use a douche for the purpose of keeping the vagina "clean." The vagina can very well look after itself in this respect, even to the extent of clearing itself of degenerating blood and endometrial debris within 24 hours of the end of menstruation.

Douching without a clear indication is not only unnatural and unnecessary but may well be harmful. The vagina and cervix depend for health on the particular environment provided by their secretions and by their bacterial inhabitants. Douching tends to wash these away and may modify the pH of the vagina, thereby encouraging vaginal infections and possibly erosion of the cervix.

Disinfection of Telephones

Q.—In many industrial concerns it is the practice to "disinfect" the telephones once a week by wiping the mouthpiece of the instrument with a piece of paper impregnated with a disinfectant. It has been stated that the disinfectant action is retained over the week elapsing between treatments and that the procedure is of benefit in minimizing the spread of possible infection (e.g., influenza, etc.). Is there any reliable evidence for this?

A.—So far as is known no convincing evidence has ever been produced that respiratory tract infections are spread by way of telephones, and a consideration of the mechanics of possible transmission does not suggest that such spread is very likely. One does not ordinarily touch the mouthpiece of the telephone when talking, so that transference by physical contact is improbable, and, since any microbes that are coughed into the mouthpiece are coated with saliva or sputum, they may be expected to adhere to the instrument or to the mouth. It seems very unlikely that any of air from the mouth. It seems very unlikely that any tolerable antiseptic would long remain sufficiently active on the surface of the instrument to kill bacteria embedded in a protective coating. However, pathogenic bacteria can only very rarely be recovered from the mouthpieces of telephones even when they are not disinfected. At the same time the cleansing associated with "disinfection" may be useful from an aesthetic point of view.

Heat Spots

Q.—What are "heat spots"? How are they best treated?

A.—"Heat spots," or papular urticaria, is the usual pattern of urticaria seen in children between the ages of about 1 to 5 years. It differs from the adult pattern in that the lesion is not well demarcated and resembles a flea-bite. When the wheal and flare have subsided there remains a central papule, due to lymphocytic infiltration, which persists for seven to ten days. This papule is readily excoriated in an attempt to relieve itching. The condition is more frequently seen in the summer.

The causes of urticaria in childhood are similar to those of adult urticaria. Most cases relate to gastro-intestinal disturbance and are relieved by attention to diet, care of

bowels, and the administration of alkalis. A proportion of the more persistent and intractable cases have an emotional basis and require treatment from this aspect. Specific food allergy, parasitic infestation, focal infection, constipation, carbohydrate excess, nervous instability, and emotional upsets are important causes.

It may be difficult to differentiate insect bites from papular urticaria, and the former may provoke the latter. The season and circumstances may help; an irregular rather than a symmetrical distribution and the presence of a puncture would suggest bites. Bites more readily become infected. In both affections lesions may be vesicular or bullous, especially on hands, feet, or lower legs, and more commonly in the very young and in hot weather. Infection may also be associated with blister formation.

Calciferol in Bazin's Disease

Q.—Have large doses of calciferol been found to be of any use in Bazin's disease? The case I have in mind is that of a woman aged 40 who has had chronic ulceration of her lower leg for about six years. The ulcer, having formed, will not heal unless skin-grafted. The case has been classified as Bazin's disease at hospital, but tuberculosis has not been found on biopsy. The ulcers have failed to respond to any antibiotic given systemically.

A.—Reports of the treatment of Bazin's disease with calciferol have not been very encouraging. The condition is, of course, rare in this country, particularly in a woman of this age. As tuberculosis was not found on biopsy the diagnosis should be called seriously into question, and if doubt still remains guinea-pig inoculation should be carried out. If the diagnosis of tuberculosis can be substantiated isoniazid is suggested as a treatment more likely to succeed.

Salty Taste in Mouth

Q.—My patient complained first of a bad taste in the mouth; this was traced to tonsils, which have been removed. Ever since then she complains bitterly of a permanent salt taste, and I write to ask the cause of this. Her gums and teeth are beyond reproach.

A.—A patient commonly complains of a salty taste in the mouth when there is bleeding from the gum margin or discharge into the mouth from parodontal disease or a chronic abscess or cyst. The first two of these causes are excluded if the statement that the teeth and gums are beyond reproach means that there has been a thorough clinical examination, including vitality tests of the teeth, and full mouth radiographs. A chronic abscess or cyst may discharge its contents into the mouth through a small sinus which is sometimes very difficult to find; but the lesion would show in a radiograph as a radiolucent area. In the case of a cyst the area would be limited by a white line.

In the absence of these causes, any interference with the mechanism of taste must be investigated, special attention being given to the lingual and glosso-pharyngeal nerves.

Bitter Taste in Mouth

Q.—A woman of 47 has complained of a bitter acid taste in the mouth for 18 months. The condition is worse when dentures are worn. Dental examination reveals no abnormality, and acrylic dentures have been changed to vulcanite. The patient has not yet reached the menopause. Can you advise on the cause and treatment?

A.—So little is known about this troublesome complaint that the implications in the question very nearly supply such answers as can be given.

A bitter, acid taste occurs most usually in women of middle life, and it seems that it is nearly always associated with the wearing of dentures. Dental experts suggest that the complaint is less common now that plastic dentures are

used more frequently than vulcanite ones. Biopsies have been taken of the gums without providing any solution to the problem, and extensive gingivectomies undertaken in the hope of eradicating hypothetical sepsis have proved unsuccessful. The age of the patients naturally suggests that the endocrine changes of the menopause may be causative, and oestrogens are invariably given a trial, but usually are without benefit. In the belief that the condition may be due to a vitamin deficiency, nicotinic acid and vitamin-B complex have been tried in almost every case, and allergy has been invoked as an explanation, but antihistamine drugs are without effect. The possibility that some heavy metal such as mercury is being excreted by the salivary glands should not be overlooked. Diabetics and those suffering from pernicious anaemia occasionally complain of this symptom, and when this is so specific treatment usually leads to their complete relief. Naturally a psycho-neurosis has been invoked to explain most of the cases, and this may be so in some of them, but the truth is we know little about the condition and the treatment is empirical.

Post-mortem Removal of Eyes

Q.—*I should welcome advice on the post-mortem removal of eyes for later corneal grafting. (a) Am I right in believing that the consent of the executors is necessary, apart from the expressed wish of the deceased? (b) Is any eye with a healthy cornea suitable? (c) Must the eyes be removed within two hours of death to be of any use? (d) Into what solution should they be put? (e) To whom and where are the eyes to be sent? (f) Are there any special details of technique for this operation?*

A.—The answers to these questions are as follows:

(a) The consent of the executors is not necessary, but the eyes may not be removed if the surviving spouse or any surviving relative objects.

(b) The answer to this is yes, except where there is melanoma of the iris, glioma of the retina, or syphilis.

(c) Successful grafts have been obtained from eyes removed within 10 hours of death, but the sooner the eyes are removed the better the grafts are for optical purposes.

(d) The eyes should be placed in liquid paraffin in a sterile wide-mouthed stoppered jar, and kept in a refrigerator at 4° C.

(e) Eyes should be sent to the ophthalmic surgeon of the nearest centre at which corneal graft surgery is practised.

(f) There are no special details of technique in this operation except that the eyeball must not be opened. The standard technique of enucleation is used.

Treatment of Bed-wetting

Q.—*Is hypnosis useful in the treatment of bed-wetting?*

A.—Hypnosis, according to those who have practised it, is often useful in the treatment of bed-wetting. It is, of course, a symptomatic treatment, and should be applied only when the case has been investigated, an opinion reached about the causes of the bed-wetting, and a decision made that hypnosis is suitable.

Dyspeptic Constables and Others

Q.—*Can you give me any information on the incidence of peptic ulcers in policemen? A constable has advanced a claim that his ordinary duties have been a major factor in the development of a gastric ulcer, and I shall be glad of advice.*

A.—According to Ihre and Müller (*Acta med. scand.*, 1943, 116, 33) the proportion of policemen among male ulcer patients in Stockholm is the same as the proportion among all other male patients with medical illnesses—in each case 1%. No special study of policemen was made in the recent investigation into occupational factors in the aetiology of gastric and duodenal ulcers undertaken in this country (*Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 276, 1951). The conclusion that "less variation of incidence

has been found than might have been expected, if conditions of work played an important role in the genesis of the disease" may, however, be relevant. This is perhaps particularly so since the ulcer in the case referred to in the question is a gastric ulcer. Anxiety about work appeared to be unduly common in subjects with duodenal ulcer, but not in subjects with gastric ulcer. No evidence could be obtained that shift work or irregular meals played an important part in the causation of either type of ulcer. The most striking finding with regard to gastric ulcer was its greater prevalence among the poorer social classes and decreasing incidence as economic status improved. This would not, presumably, be considered evidence that the conditions of a policeman's life conduced to the development of gastric ulcers. A review of the literature on occupational factors in peptic ulcers is included in the M.R.C. publication.

NOTES AND COMMENTS

Corneal Herpes.—Dr. C. HEATH and Dr. F. A. WHITLOCK (Truro) write: Your expert states that none of the new antibiotics has proved effective against the herpes group of infections ("Any Questions?" December 6, 1952, p. 1270). Surely it is recognized that the virus of herpes simplex is sensitive to aureomycin?^{1,2,3} It is true that, once established beneath the corneal epithelium, the infection may prove inaccessible to surface applications, but in suitable cases it may be controlled. Recently a child of eight months gravely ill with Kaposi's varicelliform eruption—a condition usually regarded as the result of herpes simplex infection superimposed on an infantile eczema⁴—was found to have widespread dendritic ulceration of both corneas. After treatment with aureomycin by mouth and ocular, aureomycin and atropin, to the eyes, the child made a complete recovery, the corneas healing without developing other forms of herpetic keratitis and without scarring. It seems most unlikely that this would have occurred without benefit of aureomycin.

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2. Berenson, E. S. (1949). *Ibid.*, 13, 13.
3. McConachie, J. A., and Anderson, T. E. (1951). *Brit. J. Derm.*, 63, 307.
4. Ruchman, I., Dodd, K., and Welsh, A. L. (1947). *Arch. Derm. Syph.*, 56, 846.

OUR EXPERT writes: There is no critical evidence that aureomycin has any effect on the herpes virus. This is borne out by an immense literature, and is generally accepted by virus experts, though it is true that there are a number of clinical reports to the contrary. Experimentally all that has been claimed for the newer antibiotics has been that they may have some prophylactic or inhibiting action on the virus. Experimental studies on the eye have led to essentially the same negative conclusion (Geller and Thygeson, *Amer. J. Ophthalm.*, 1951, 34, 165; Hallett *et al.*, *Arch. Ophthalm.* (Chicago), 1951, 46, 33). The case reported by your correspondents is interesting, but, like all isolated case reports, is open to more than one interpretation. My own clinical experience with herpes infections of the eye treated with the newer antibiotics has been distinctly disappointing.

Correction.—In a paragraph headed "Methorphan Scheduled" (January 3, p. 52) attention was drawn to an Order in Council relating to 3-methoxy-N-methylmorphinan. It was wrongly implied, however, that this substance was the same as methorphan. Methorphan is 3-hydroxy-N-methylmorphinan and it has been scheduled since July, 1951.

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THE PHENOMENA OF EPILEPSY*

BY

DENIS WILLIAMS, M.D., D.Sc., F.R.C.P.

Physician in charge of Neurology, St. George's Hospital, Physician to Out-Patients, the National Hospital, Queen Square

The question, "Is this epilepsy?" seems to be asked more often and in more various circumstances than it used to be. It may simply relate to attacks of unconsciousness, or to focal disturbance of movement or sensation, but, even so, the answer is unusually important because of its social and economic implications to the patient and his family, quite apart from the problem of treatment and management. Other groups of people are interested too. Employers want to know, sometimes more to safeguard themselves than to protect the patient; public servants have to administer insurance and superannuation regulations; armed Forces have to protect their efficiency from the sudden disruption of a fit or the administrative consequence of its recognition. Teachers want to prevent their pupils from seeing an epileptic attack in another to the ruin of his own schooling; or lovers about to mate calculate the risks of procreation in this respect.

With the assumption of social responsibility by others, and with a more enlightened approach to the study of and with a more enlightened behaviour, many more people antisocial and aggressive behaviour, many more people became interested in the answer. Those philanthropists who were concerned about crime and the criminal recognized that some aberrant behaviour or abnormalized that some thoughts might be epileptic, that a cause might be found, and chemical treatment prove successful where psychiatric and social had failed. The child psychologist studying a child with temper tantrums asked whether this might be epileptic. The prison medical officer faced with an intractable Borstal problem, or the inter-psychiatric physician dealing with a long story of intermittent unusual behaviour, has been faced with the same problem. Then lawyers, encouraged by the physicians for the defence in cases of comparatively gainless crime, advance the argument, "This may be epilepsy," so that finally the judge or his jury have to answer the question.

The Diagnosis of Epilepsy

With all this, the ordinary doctor had been seeing many ordinary patients with attacks of loss of memory or consciousness, of muscle-twitching, of feelings of faintness or of unreality, or of transient disturbances of vision, for every unusual one who presented a social problem. Usually there are no physical signs to help him in this diagnosis, for the patient is well when he tells his story, so that he must base his opinion on

minute retrospective facts found by careful questioning of subject and observers. The true interpretation lies in deduction, with the same scrupulous regard for facts as is found in police detection. It is rarely that this method fails, and, allowing the place of experience of the usual and unusual in arriving at a correct diagnosis, the neurologist may succeed simply by taking a more careful history and by sticking to the evidence he has found. In the unusual case, diagnosis may at the time be impossible for want of evidence, or in doubt because of its nature. When this is so, opinions may be given too freely, the term "epilepsy" applied too carelessly; and, when such assumed accuracy seems dishonest, diagnostic uncertainty is expressed as "epileptoid states" or "epileptic equivalents"—phrases which reflect as great confusion of thought in the physician as there is confusion of feeling and behaviour in the patient.

How, then, is the diagnosis of epilepsy to be made? When the distinction is between a faint and a fit there may be no great difficulty, but when the diagnosis rests upon a story of complex disturbances of behaviour, or prolonged disorder of thought or feeling, it may be most bewildering. Clinical observation, aided by electrophysiology and experimental neurosurgery, has very widely expanded the recognized field of disorders caused by epileptic disturbances and has made many definitions worthless. We know that epilepsy can occur without loss of consciousness, without amnesia, without involuntary movement, and without any of the simple features which would enable us to make a certain diagnosis of epilepsy. None of the definitions will do, for they are all too narrow.

The Nature of Epilepsy

Whenever an epileptic disturbance is recognized by the patient or by others there is an abnormal discharge of electrical energy in the brain. It is more accurate to consider the disturbances which are seen in the electroencephalogram as the accompaniment of the disturbance experienced by or seen in the patient rather than as its cause. They are both related to the same cause. Lennox found so much difficulty in defining epilepsy that he called it a cerebral dysrhythmia, having in mind the disordered electrical rhythms invariably present in the attack. In fact, epileptic states are accompanied by a cerebral electrical dysrhythmia, and the electrical disturbances may be closely related to the nature of the clinical attack, but they are not the cause of the attack.

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*Address to the Guildford Division of the British Medical Association given on December 11, 1952.

single, in transient bursts, or more prolonged as in a major convulsion. The major convulsion is in fact the ultimate intensity of this form of epileptic discharge. Focal clonus probably indicates a local organic lesion, and when it begins in adult life the possibility should be considered of the lesion being recently acquired. If the attacks change their character progressively the lesion is probably an advancing one. But the pathological nature of the lesion does not alter the fundamental character of the clonic attack. After the causal lesion has been investigated, and if possible recognized, chemical treatment of all attacks with clonus follows the same plan—usually the use of barbiturates and hydantoins.

Attacks with Co-ordinated Movements

There are many attacks in which the movements are smooth and natural, not clonic. Here the epileptic disturbance has arisen in a part of the cortex responsible for co-ordinating and integrating movements. Because of this the cortical discharge causes response in the body which is physiologically integrated, so that, for instance, when muscles contract there is inhibition of antagonists. This is in contrast to the unphysiological simultaneous contraction of agonists and antagonists in the tonic-clonic fit. Because the movement of limbs in these attacks is necessarily co-ordinated, it appears to the observer to be reasonable and to have purpose, although as it is invoked by a primitive epileptic disturbance it is devoid of purpose. Attacks of this sort have been called "psychomotor" or "epileptic equivalents." They are in fact focal epileptic attacks involving cortical association areas, which used to be called silent areas, but which are responsible for the integration of feeling and movement. The movements or feelings which are invoked are consequently more elaborate than in other sorts of attacks. They are commonly seen when a focal fit begins in a temporal or a frontal lobe.

The movements which are seen in these attacks may range from a single act, such as deviation of the eyes, licking, swallowing, or movement of a hand, but they include complicated rituals, salaams, and simple aggressive acts. Most of the prolonged purposive movements seen in association with epilepsy occur in the post-epileptic confusional state, are post-ictal, and are not strictly epileptic.

Post-ictal Activity

It may be difficult to tell when the abnormal behaviour is occurring during the actual epileptic fit (ictal) or after it (post-ictal), particularly when an insignificant and brief fit is followed by a long post-ictal confusional state causing the restless behaviour of a fugue. As a rule the behaviour seen in the fit is apparently spontaneous, and, being the result of the epileptic disturbance of the brain, is stereotyped, short-lived, and without relation to circumstance. The post-ictal activity, whether it is restlessness, aggression, or a fugue, is due to the state of confusion, and so it is simple in its form, evoked by stimulation; when purposeful, primitive, or stupid in its purpose its form is often determined by past experience. It seems automatic. The confused person just walks, or fumbles with clothes, undresses routinely or blindly, resists help or interference. While there can be no real purpose in the ictal activity, any purpose in the post-ictal is immediate and very crude. No prolonged, elaborate, and intelligently purposeful fugue state is epileptic. Very rarely the actual epileptic attack may consist of a lowering of consciousness (confusion) and so simulate the post-epileptic state described in this paragraph.

Sensory Attacks

As sensation must be experienced by the patient there cannot be a sensory equivalent of the major tonic-clonic fit, since consciousness cannot be retained when the epileptic discharge has spread over both hemispheres. The form of sensory disturbance in epilepsy may be negative (loss of sensation) or positive (a hallucination). These may affect common sensation, special senses, or emotions, and mixed forms are common.

The commonest kind of sensory disturbance encountered in epilepsy is very crude—simply tingling at an extremity: but disturbance of proprioception with changes in the shape or position of a limb are met. Epileptic pain is uncommon, but is experienced as a mixture of intense pains, often with a sensation that the limb is in an unnatural position. While tingling is the sensory counterpart of a focal clonic fit, the more complex disorders of feeling, relating to the shape of a limb and causing sensations of bodily or spatial distortion, are the counterpart of the attacks in which co-ordinated movements occur.

Similarly, although when special senses are involved in the epileptic experience they are felt in a most primitive manner—as an unrecognized smell or taste, or flashes of white light—they may be co-ordinated with elaborate formed hallucinations when the epileptic discharge happens to involve one of the special sensory association areas. The most common examples of these are the elaborate, animated, and coloured scenes witnessed by the subjects of lesions in the parieto-occipital area. When even more highly organized areas of cortical integration in the temporal lobes are affected, hallucinations made up of the blending of several sensations may be indivisibly experienced. These may be accompanied by spontaneous and transient emotional disturbances.

The episodic disorders of emotion experienced during temporal lobe attacks have not yet been studied in sufficient detail, perhaps because they are easily overlooked by the questioner, but also because they may suggest to him a psychological disorder rather than a physical disturbance. They may contain any possible emotional experience, any combination of emotions, or any linking of emotion with simpler sensations, and they may evoke appropriate visceral or somatic behaviour. They must be recognized as being epileptic if the patient's problem is to be fully understood.

Prolonged Disorders of Behaviour or Feeling

In status epilepticus, focal or general, abnormal states of movement, sensation, or consciousness may last for many hours. It is usually possible to recognize the individual attacks of the status and so to establish the responsibility of epilepsy for such a prolonged disorder. Otherwise some other cause for the disorder should be sought, since a single epileptic attack is so short-lived. Prolonged amnesic states, fugues, stupor, coma, or aggressive or unsocial behaviour are unlikely to be epileptic in the absence of status, for even post-ictal confusion lasts for minutes rather than hours. In particular, as I have said, activity which is motivated, or which uses past learning, cannot be epileptic. The soldier, absent without leave, who finds his way home by road and rail with no memory of the process, could not have done so in an epileptic attack; neither can the criminal who has amnesia for an act of violence directed against a selected subject with an appropriate weapon, however obscure the motive or violent the act. In cases of this sort organic causes having been studied, natural or neurotic motives must be sought, and any evidences of a psychopathic or psychotic personality should be assessed.

It might be said in criticism of this didactic and rigid distinction between epilepsy and other states that the borderland between epilepsy and psychopathy is a narrow one, hardly explored, and that the basis of neither state is understood. That is no justification for a mongrel diagnosis such as that of "epileptoid state" or for the subterfuge of calling inexplicable behaviour epileptic upon tenuous or inappropriate evidence.

A sixth revision of the *Index of Modern Remedies* has been published by the *Scottish Chemist*, 240, Albert Drive, Glasgow, S.1. It includes much information on proprietary preparations and takes note of the 1951 addendum to the *B.P.*, the *National Formulary*, 1952, and the *Pharmacopoeia Internationalis*. It is a most useful handbook for all who need an up-to-date guide to modern drugs. The price is 5s., and in London it may be obtained from H. K. Lewis, 136, Gower Street, W.C.1.

ACUTE DISSEMINATED ENCEPHALOMYELITIS TREATED WITH A.C.T.H.

BY

HENRY G. MILLER, M.D., M.R.C.P.

Assistant Physician, Royal Victoria Infirmary, and Lecturer
in Neurology in the Medical School, King's College,
Newcastle-upon-Tyne

In 1951 I drew some analogies between the neurological syndromes of serum sickness, polyarteritis nodosa, and acute disseminated and post-exanthematous encephalomyelitis (Miller, 1951). All these conditions show a tendency to gross and often evanescent focal symptoms arising at every level of the nervous system, occasional apoplectic syndromes suggestive of lesions involving major cerebral blood vessels, and pathological changes concentrated in close relation to the cerebral vasculature. It was suggested that some such cases of acute disseminated encephalomyelitis may have their foundation in an allergic vasculitis—an "urticaria of the nervous system"—and trial of cortisone or A.C.T.H. in the treatment of these conditions was suggested.

Although these drugs are known to be without beneficial effect in experimental acute infections of the nervous system of virus origin, such as equine encephalomyelitis and Lansing poliomyelitis (Milzer, 1951), Moyer and his co-workers showed in 1950 that adequate dosage with A.C.T.H. protects effectively against the clinical manifestations of experimental "allergic" encephalomyelitis produced in guinea-pigs by repeated injection of heterologous (rabbit) brain emulsion. Pathological changes in the brains of the protected animals were minimal. Whether such protection is due to inhibition of antibody formation or to a more purely vascular reaction at the site of the lesion (as in inhibition of the Shwartzman phenomenon) is undecided.

Kabat *et al.* (1952) have produced pathological evidence suggesting that the inhibitory effect of cortisone (Kabat *et al.*, 1951) on the development of the similar experimental encephalomyelitis produced in the rhesus monkey by injections of heterologous and homologous brain tissue emulsified with Freund adjuvants (Kabat *et al.*, 1947; Morgan, 1947) is due to suppression of the granulomatous response to the antigenic brain emulsion at the site of injection. It is possible that this local granulomatous reaction is responsible for antibody production; at any rate it appears to be an invariable accompaniment of the development of encephalomyelitis under these experimental conditions (Kabat *et al.*, 1948). Kabat's assumption that the local response plays a causal part in the pathogenesis of the encephalomyelitis is, however, not beyond question: suppression of the neurological illness could be interpreted as a parallel effect of cortisone on hypersensitivity reactions rather than as a secondary result of suppression of the granuloma.

Evidence of the mode of action of cortisone and A.C.T.H. in anaphylactic hypersensitivity in general is somewhat conflicting, and Kabat *et al.* (1952) believe that the balance of such evidence is in favour of inhibition of antibody production as the effective mechanism. In support of this is the observation that whereas these drugs completely or almost completely inhibit the active Shwartzman phenomenon, which depends on the active production of antibody, they are much less effective

(if indeed they have any action at all) in inhibiting the passive Shwartzman phenomenon caused by reaction of antigen with antibody already present. In their view the undoubted inhibition of experimental acute disseminated encephalomyelitis by cortisone and A.C.T.H. is probably due "to an alteration in the experimental conditions shown to be necessary for the production of the disease, rather than to any fundamental effect on the disease itself." The pathogenesis of human acute disseminated encephalomyelitis is unknown, and Kabat's view, if correct, provides a further reason for hesitancy in anticipating an effect of cortisone on the human disease analogous to that seen under experimental conditions. Furthermore, should the action of the drug be in fact due to inhibition of antibody production, it is understandable that, even granting the existence of some pathogenetic relationship between experimental allergic and human—for example, post-infective—encephalomyelitis, prophylaxis of the disease in man might be possible but therapy ineffective if the established condition represents a response to antibody already formed at the onset of the illness.

It had previously been shown that some protection against the development of experimental allergic encephalomyelitis was offered by the administration of nitrogen mustard (Koprowski *et al.*, quoted by Moyer *et al.*, 1950) or of salicylates (Good *et al.*, 1949), both of which block antigen-antibody reactions. Antihistamine drugs (Lumsden, 1949) have also been shown to offer some protection against allergic encephalomyelitis in the guinea-pig, though they were without therapeutic effect in the established condition. In this last instance, however, pharmacological evidence would suggest a suppressive action on the "peripheral" pathological expression of an antigen-antibody reaction rather than an inhibition of the reaction itself.

In 1949 Pickar and Kramer reported prompt improvement of a single case of encephalomyelitis following antirabic vaccination (showing a strongly positive skin reaction to the vaccine) after the administration of diphenhydramine hydrochloride.

Glaser and Smith (1951), in reviewing encephalomyelitic syndromes following antirabic therapy, described a fatal case in which 100 mg. of cortisone was given to the patient before he expired. Garrison (1952) reported "dramatic improvement" in a single case of encephalomyelitis complicating antirabies vaccine (phenolized rabbit-brain virus) treated with large doses of cortisone (375 mg. daily for two days, and 100 mg. daily during the subsequent four days). This patient showed great improvement within 24 hours, by which time his high fever subsided. He remained drowsy, however, for four days and retention of urine persisted for six days: five weeks later a single extensor plantar response was the only residual evidence of his illness.

The present paper reports results obtained in a preliminary series of seven cases of acute disseminated encephalomyelitis treated with A.C.T.H. The difficulty of assessing the value of therapy in this disease is evident, as the condition often recovers spontaneously with dramatic suddenness. The results obtained cannot be claimed to be conclusive, but they suggest that the drug may have some value in the therapy of human encephalomyelitis in keeping with its known effectiveness in protecting animals against experimental "allergic" encephalomyelitis.

Two years previously this boy had sustained a fractured skull, with transient loss of consciousness, but he made an excellent recovery and had no subsequent symptoms except for occasional headaches and rather unruly difficult behaviour of doubtful significance.

On the morning of May 19, at which time he was recovering from a severe head cold contracted one week previously, he awoke complaining of dizziness, headache, and double vision on looking to either side. He fainted on endeavouring to leave his bed, and within six hours of the onset became drowsy, though he could be roused.

On examination 15 hours after the onset he was stuporous but talked sensibly on being wakened. He complained of occipital headache, double vision, and giddiness on raising his head from the pillow. The positive signs on examination were meningism, gross nystagmus which was present in all positions of the eyes and maximal on lateral deviation, gross generalized hypotonia, sluggish deep reflexes in the arms, and almost extinct knee- and ankle-jerks. The plantar responses were flexor and the abdominal reflexes tired easily. The spinal fluid was entirely normal and the electroencephalogram showed diffuse theta activity with paroxysmal bursts of higher amplitude but no evidence of a focal lesion.

The boy was given 50 mg. of A.C.T.H. intramuscularly on admission and 25 mg. six-hourly during the subsequent 72 hours. Twelve hours after treatment started he was more alert, nystagmus was less sustained, and the right ankle-jerk was easily obtained. Re-examination 36 hours after the onset of treatment showed complete disappearance of meningism and nystagmus. Diplopia had disappeared, headache was the sole subjective complaint, and reflex changes were as before.

On completion of treatment there were no symptoms, and the only abnormal signs were sluggish knee- and ankle-jerks. Hypotonia had completely disappeared. Ancillary investigations were entirely negative.

Discussion

The hypothesis on which this therapeutic experiment is based is that the clinical syndrome of acute disseminated encephalomyelitis in man may arise on the basis of vascular and perivascular changes in the nervous system which are interpreted as pathological expressions of a non-specific hypersensitivity reaction of anaphylactic type, probably primarily vascular but involving, either simultaneously or secondarily, the extravascular mesenchymal tissues of the neuraxis. Some hope that the disease in man might be influenced by cortisone or A.C.T.H. is offered by the observations that these drugs exercise a powerful prophylactic effect on experimental "allergic" encephalomyelitis, which is in some ways strikingly similar to the human disease; and that they suppress the established general manifestations of serum sickness—a frank expression of hypersensitivity which may rarely be complicated by an encephalomyelitic syndrome.

Even if theoretical and practical objections to this hypothesis prove invalid, and it is ultimately shown to be an approximation to the truth, the limitations of its therapeutic application are at once apparent. The most that could be hoped for on theoretical grounds is that physiologically effective dosage of cortisone or A.C.T.H. might diminish the inflammatory response by decreasing or abolishing exudation from damaged blood vessels, and might possibly accelerate the absorption of exudate and the resolution of inflammatory change which presumably occur during spontaneous recovery. This implies two practical limitations: first, that the drug would be likely to influence the condition only during the phase of exudation and acute inflammation; and, secondly, according to this hypothesis the focal and general neurological symptoms of encephalomyelitis arise from damage to neurones and their processes by oedema, haemorrhage, or toxic substances essentially secondary to vascular-mesenchymal inflammation: any detectable clinical response to therapy could at best be anti-

cipated only in relation to symptoms arising from neural lesions not already irreversible by reason of their duration or their initial severity. Even on theoretical grounds no response would be expected, for example, in the rapidly fatal encephalomyelitic illness of which the pathological basis is a diffuse cerebral purpura, or in those cases of severe myelitis which are characterized by actual necrosis of the spinal cord.

Critical consideration of the present small series of cases does nothing to invalidate these theoretical views, and offers a small amount of admittedly fragmentary clinical evidence in their support.

The mortality of encephalomyelitic cases admitted to the Royal Victoria Infirmary is in the region of 27% (8 of 30 cases occurring between 1930 and 1940), and somewhat similar figures are reported by most other observers. Certainly in "spontaneous" cases and in those following Jennerian vaccination, and probably in post-exanthematous instances, fatalities occur almost entirely among patients in whom coma is a clinical feature. Only one of the present patients, however (Case 4, following chicken-pox), was ever more than stuporous, and although this was an unusually severe illness, encephalomyelitis following varicella is widely regarded as having a rather better prognosis than similar illnesses following some other exanthemata such as measles. The absence of fatalities in the present series is therefore valueless in the assessment of treatment.

In one case (Case 6, subacute ascending and probably necrotic myelitis) treatment with A.C.T.H. clearly exerted no beneficial effect: unequivocal clinical deterioration occurred during both an initial uncontrolled and later a controlled course of treatment.

In neither of the instances of encephalomyelitis following chicken-pox (Cases 2 and 4) was the course or duration of the illness materially different from that which is often seen in untreated cases, though the improvement which coincided with increased dosage in Case 2, and that which followed an initial phase of deterioration in the much more severe Case 4, are compatible with the view that the drug exercised a favourable effect on the condition.

In Cases 5 and 7, clinical improvement was evident within six and twelve hours of the initial injection of A.C.T.H. respectively, and a similar response has since been observed in a sixth encephalitic episode in the former case that is not detailed here. Unfortunately the previous history of cerebral trauma in both these cases, as well as the remarkable familial incidence, renders diagnosis ultimately problematical. Cases of relapse and recurrence of encephalomyelitis are not rare, and several have been personally observed, though never with so many attacks as have been seen in Case 5. However, the encephalitic nature of the syndrome with a maximal though not exclusive incidence on the cerebellum or its connexions, its relation to preceding banal infection, its rapid and complete resolution clinically and electroencephalographically, and the absence of spinal-fluid changes, would appear to render any diagnosis other than acute disseminated encephalomyelitis difficult to sustain.

In Case 3 the improvement in mental acuity and in the clinical manifestations of the transverse cord lesion which was observed within 12 hours of the first injection is surprising, even on theoretical grounds, in view of the 12-day history of the condition. It should be noted, however, that this patient was still deteriorating clinically when treatment began, which presumably argues a continuing inflammatory reaction in the nervous system, and that he was left with appreciable disability, in keeping with the duration of his cord lesion. The slight relapse which occurred four days after completion of treatment is perhaps also a point in favour of the view that A.C.T.H. may have exercised a suppressive effect on the symptoms in this case.

These cases are numbered in the order in which they were treated, and it is ironical that the evidence in favour of a therapeutic response is more suggestive in Case 1 than in any subsequent patient. In this instance a combination of

circumstances—in particular an intelligent patient and a very alert practitioner—led to reference of the case at a much earlier stage in the development of the disease than is usual. Although clinical deterioration until treatment was instituted was rapidly progressive, it is clearly impossible to claim with any certainty that the apparent response was more than coincidental. Nevertheless the relapse associated with objective evidence of physiologically inadequate dosage, and the resumption of improvement when dosage was increased, as well as the remarkably complete recovery which was evident within a matter of days, render coincidence a not entirely satisfying explanation: that resolution of the condition was related to the administration of A.C.T.H. would appear to be a distinct possibility.

Acute disseminated encephalomyelitis is a rare disease, and, although it is fully appreciated that no firm conclusions can be drawn from the present small series of treated cases, they are reported in the belief that the results are suggestive enough to merit similar trial on a larger scale. In the absence of any other effective or rational therapy such a trial would appear justifiable, though a word of caution is advisable. Diagnosis of acute encephalomyelitis following exanthemata is usually simple, but the "spontaneous" examples, and those following non-specific infections, may present difficult diagnostic problems. Administration of A.C.T.H. to cases of virus disease such as poliomyelitis is at best useless, and recent evidence suggests that it may be actively harmful. In bacterial infections such as cerebral abscess or tuberculous meningitis its use might well be disastrous. For these reasons, and also in order not to confuse assessment of the value of the drug in the disease under consideration, the employment of this experimental therapy should be limited to cases of acute neurological illness in which an unequivocal diagnosis of encephalomyelitis can be competently sustained. The present paper shows that in such cases the drug is harmless if nothing more.

Summary

Seven cases clinically diagnosed as acute disseminated encephalomyelitis have been treated with A.C.T.H. They comprise two cases of encephalomyelitis following varicella, two cases of transverse and one case of subacute ascending myelitis, and two (familial) cases of encephalitic illness following non-specific infection, in one of which there have been recurrent encephalitic illnesses. Acute disseminated encephalomyelitis has a pronounced tendency to rapid, spontaneous, and often complete recovery, and no final conclusions regarding the efficacy or otherwise of A.C.T.H. can be reached without extended observations on a scale which would permit of statistical evaluation. It is believed that the results reported here are suggestive enough to justify further trial.

I wish to thank practitioners and consultants in Region No. 1 who have been kind enough to refer cases for treatment, Dr. G. A. Smart for help and advice on technical aspects of the use of A.C.T.H., and Dr. M. J. Evans for his clinical assistance.

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ANURIA TREATED BY CORTISONE*

BY

HENRY MOORE, M.D., D.Sc., F.R.C.P., F.R.C.P.I.

Professor of Medicine, University College, Dublin; Senior Physician, Mater Misericordiae Hospital, Dublin; Consulting Physician, National Maternity Hospital, Dublin; Chairman and Clinical Director of the Cortisone Committee of the Medical Research Council of Ireland; Member of the Medical Research Council of Ireland

AND

D. K. O'DONOVAN, M.D., Ph.D.

Associate Professor of Medicine, University College, Dublin; Visiting Physician, St. Vincent's Hospital, Dublin; Member of the Cortisone Committee of the Medical Research Council of Ireland

The present trend in the treatment of anuria is in favour of a conservative policy using a balanced fluid and electrolyte intake with a low-protein diet in the hope of a spontaneous remission (Bull *et al.*, 1949). In cases in which gross oedema or some electrolyte imbalance has already occurred active measures to substitute for the kidney must be used.

Methods of treatment based on the primary aetiology, such as decortication, nerve block (surgical or pharmacological), alkalization of the urine, etc., are not often successful. This relative failure may be due to the presence of other unsuspected aetiological mechanisms. The possibility that an acute allergic reaction in the kidneys is a causal factor in some cases is considered in this communication. To test this hypothesis we have tried the effect of cortisone in a miscellaneous group of four cases of anuria. The cortisone used was cortisone acetate ("cortone"), and was given by intramuscular injection, except where oral administration was specified.

Case 1

A man aged 33 was admitted to the Mater Misericordiae Hospital on October 27, 1950, suffering from rheumatoid arthritis, grade II, of ten years' standing. The previous history was irrelevant. There were four areas of alopecia areata on the scalp. His general physical examination was otherwise normal, but the urine contained a very faint trace of albumin, a few squamous cells, and a very rare leucocyte. The electrocardiogram was normal; the blood pressure was 140/80; and the E.S.R. 45 mm. (1 hour). Seven days after admission he was started on cortisone treatment. By November 30 the arthritis had improved by 80%, and cortisone was discontinued on November 26.

By December 1 a relapse of the arthritis was evident and cortisone treatment was resumed: 100 mg. a day orally, in three doses, was given, and because of a favourable response it was reduced to 50 mg. on December 5. As, however, a considerable amount of fluid had developed in the left knee, the dose was increased to 100 mg. a day by mouth on December 13. On December 15 the patient returned home on this dosage, and on the 24th he developed acute pharyngitis with pyrexia of 101° F. (38.3° C.), and was treated with penicillin. Some hours later there was a transient erythematous rash on the trunk. On December 25, contrary to instructions, he ceased taking cortisone; next

*Fourth report of the Cortisone Clinical Subcommittee (Professor Henry Moore, Professor W. J. E. Jessop, and Professor D. K. O'Donovan) to the Medical Research Council of Ireland. The material embodied in this report was part of a series of lectures delivered by one of us (H.M.) at the Mayo Clinic, the University of Minnesota, and the University of Chicago (June, 1952).

On November 29, 1951, he complained of symptoms of pyrexia. Next day his temperature was 99.5° F. (37.5° C.), his pulse rate regular 80, and there were a few scattered rhonchi at the base of the left lung. At that time there were no urinary symptoms. A dessertspoon of "cremomerazine" was prescribed every four hours with rest in bed and abundant fluids. On December 3 his temperature was normal, but it was discovered that he had taken 4 oz. (114 ml.) of cremomerazine—that is, 16 g. of sulphamerazine—within 48 hours. This drug was then stopped and glucose and an alkaline mixture were prescribed, as on that day he complained of abdominal pain and vomited several times. He was admitted to hospital that afternoon. He passed no urine from admission to hospital on December 3 (except about 30 ml. on December 5) until January 7,

oedema of the lumbar region and legs. Some rhonchi were heard at the bases of both lungs.

Treatment with cortisone was started on December 7, and on that day he was given 500 mg. in two doses (see Table III). Next day he was given 400 mg. of cortisone in two doses, and on the same day (29½ hours after the first dose of cortisone) he passed 240 ml. of urine containing +2 albumin, no sugar, no crystals, an occasional leucocyte, and very numerous erythrocytes, but no casts; the nausea had improved so that he was able to drink a moderate amount of fluid. On December 9 he was given 400 mg.

rhage had by then practically disappeared. He returned to hospital on January 28 and a detailed investigation of kidney function revealed no abnormality.

Case 4

A man aged 64 was studied in co-operation with Dr. B. Mayne in the Meath Hospital, Dublin. He was suffering from symptoms of prostatic enlargement for about one year previous to admission. Prostatectomy was recommended by Mr. Lane, and was carried out by the retropubic method on January 29, 1952.

TABLE III.—Case 3

Date 1951-2	Cortisone Dosage mg./24 Hours	Urine; ml./24 Hours	Fluid Intake; ml./24 Hours	Average Respiratory Rate per Min.	Blood Urea mg./100 ml.	E.S.R. mm.	Plasma CO ₂ -combining Power; Vol. %	Serum Sodium mg./100 ml.	Serum Potassium mg./100 ml.	Plasma Chlorides mg./100 ml.	Plasma Inorganic Phosphorus mg./100 ml.	Eosinophil Count c.mm.
3/12	—	0	?									
4/12	—	0	?									
5/12	—	30±	?		120							
6/12	—	0	?									
7/12	500	18±	?	28	217	46	34.2			442	8.7	25
8/12	400	240	?	24								
9/12	400	4,680	3,000	24								
10/12	200	5,700	3,031	16	246		49.7	296	30	494	10.8	50
11/12	400	390*	2,010	16			49.7					
12/12	400	4,080	2,280	18	318					576	10	25
13/12	400	6,180	4,980	17	184						6.8	
14/12	400	5,880	4,500	18								
15/12	400	4,200	4,020	16				310				
16/12	375	3,330	3,090	16								
17/12	350	3,360	3,990	18	56							
18/12	273	3,450	3,720	17	27							
19/12	250	3,180	2,850	18								
24/12	50	1,350	1,350	22	21							
31/12	0	1,290	1,560	20								
28/1					22	3						25

* No urine passed from 9 p.m., December 10 to 5.30 p.m., December 11 (20½ hours). Patient was given 325 mg. cortisone at 5.30 p.m., December 11, and passed 390 ml. urine two hours afterwards (see text).

TABLE IV.—Case 4

Date 1952	Cortisone mg.	Fluid Vol. (oz.) through Catheter	Oral Fluid Intake oz.	I.V. Fluid Intake oz.	Blood Urea mg./100 ml.	Urea, mg./100 ml. in Fluid from Catheter	Plasma-CO ₂ combining Power; Vol. %	Serum Sodium mg./100 ml.	Serum Potassium mg./100 ml.	Plasma Chlorides mg./100 ml.	R.b.c. (millions)	Chloride in Gastric Juice
30/1		26	66	40								
31/1		10	110		148							
1/2		5	32		250		45			517		
2/2		1½	40		267		50			529		
3/2		2	32									
4/2		1½	40		365		38			520		
5/2		3	40		435		51	279	22.7	494	2.6	
6/2	400	3½	42		445		51			541		
7/2	500	2½	43		475		62			495	3.2	
8/2	500	2½	38	60	465	455	45			517		
9/2	500	3	28	55	515	545	50	296	24.2	447	3.1	
10/2	500	3½	39									
11/2	500	3½	42		515	502	51	279	28.8	447		
12/2	500	5½	43		635	1,050*	54			446	3.0	329
13/2	500	7	48		690	870	58	298	31.5	423		
14/2	500	5½	50		725	740	62			435		
15/2	500	15	48			890						
16/2	500	19		20	665	910	59	288	30	400	2.6	482
17/2	500	28		103								635
18/2	250	40½		99	650		61	293	31.2	388		795
				120								846

* Assuming the ammonia present was derived from urea.

of cortisone in two doses, and he passed 4,680 ml. of urine and drank 3,000 ml. of fluid; he had no nausea, vomiting, or oedema, and drowsiness had disappeared. His general condition was improved.

It was decided to reduce drastically the dose of cortisone to see if the diuresis of the previous day was a coincidental phenomenon. On December 10 100 mg. was given twice daily, and on the morning of the 11th 75 mg. No urine was passed from 9 p.m. on December 10 (the day the cortisone dosage was halved) up to 5.30 p.m. on the 11th; 325 mg. of cortisone was therefore given at 5.55 p.m. on December 11 and he passed 390 ml. of urine two hours after this dose (see Table III for details).

On December 19 the urine showed only the faintest trace of albumin and no erythrocytes. The latter never reappeared again up to discharge. On December 24 the urea-clearance figure was 158.

He was discharged from hospital on January 4, 1952, apparently fully recovered. The subconjunctival haemor-

Pre-operative examination had not revealed any other abnormality in the urinary system. The blood urea was 37 mg. per 100 ml. The urine was clear and contained no albumin, cells, or casts. An intravenous pyelogram showed normal outline and concentration in both kidneys. Clinical examination revealed a few scattered rhonchi in the lungs and bilateral inguinal herniae. The heart and blood pressure were considered normal. Blood count, chest x-ray film, and glucose tolerance were also normal.

Some hours after operation his blood pressure was low, and he was given a transfusion of 2 pints (1,140 ml.) of blood, and 40 oz. (1,140 ml.) of normal glucose intravenously. On the following day he seemed well, but his urinary output was only 26 oz. (738 ml.), and his fluid intake (oral and intravenous) was put up to 106 oz. (3,010 ml.). During the next two days his urinary output continued to decrease (see Table IV). On February 1 an exploratory operation was done on the right kidney and ureter. Oedema of the perirenal tissue was noted, and the capsule over the

lower pole was incised. On February 4 his general condition was good and his mind was clear. Except for sighing respiration there was no other clinical sign to indicate the degree to which uraemia had developed. His blood pressure was 160/75 mm. Hg, and there was no oedema. On that date he was put on a high glucose intake (300 g. daily). Treatment with cortisone was started on February 6. This decision was made reluctantly, as there was no clue to the aetiology of the renal failure. He was given 400 mg., which was increased to 500 mg. the next day.

On February 5 his clinical condition was still good, and his electrocardiogram was normal. At that time his serum potassium was 22.7 mg. per 100 ml. The serum potassium subsequently increased further, and on February 17 the electrocardiogram showed the effect on his myocardium of this rise.

His general condition remained very good until February 15, when it became necessary to aspirate his stomach contents because of vomiting; much bile-stained fluid was withdrawn. At this time fluid was given intravenously and during the next three days this increased gradually, and for the first time the blood urea ceased to rise; indeed, the blood urea began to decrease, having reached its peak of 725 mg. on February 14. Meanwhile, however, his general condition deteriorated, and he died on February 18 after a short convulsion.

The post-mortem examination report by Professor R. A. Q. O'Meara on the kidneys, suprarenals, heart, and liver, was as follows:

Macroscopically the liver was enlarged, but no gross lesion was seen in it or in the spleen. The kidneys were swollen and pale, and contained a fair number of cortical cysts about ½ in. (0.6 cm.) in diameter; the pelvis appeared normal. Heart: some hypertrophy of the left ventricle and normal. Suprarenals much auto-atheroma of the ascending aorta. Suprarenals much auto-lysed. Microscopically, the liver showed passive congestion. The kidneys showed: (1) old lesions of chronic glomerulonephritis with hyalinization of glomeruli; (2) recent focal glomerulonephritis; (3) much interstitial oedema; (4) marked congestion of the vasa recta; and (5) some tubules contained pus, others contained blood or altered blood.

Discussion

The onset of anuria in Case 1 appeared to be due to the sudden withdrawal of cortisone, which may have exaggerated an allergic type of reaction in the kidneys following on the throat infection and rash. It was this hypothesis which led us to try the effect of cortisone. The striking improvement in the patient's condition which followed was in agreement with this interpretation. It is debatable whether this patient had an atypical form of acute nephritis, and therefore the possibility that cortisone may be of value in such cases should be considered.

The anuria in Case 2 is difficult to explain and was probably due to mild acute nephritis complicated by pregnancy. Dr. Arthur Barry held the view that it was not entirely a symptom of pregnancy toxæmia for a variety of reasons, including the absence of toxæmia in previous pregnancies and the history of recent sore throats. The response to cortisone was not entirely satisfactory, and it would perhaps be more reasonable to explain, at least partly, the late onset of diuresis by the termination of pregnancy and by the spontaneous recovery which is likely to occur in such cases.

In Case 3 the anuria was interpreted as the result of an acute allergic reaction to sulphamerazine in the urine. The diuresis there was no sulphamerazine crystals in the urine. The diuresis which followed cortisone administration seemed to be attributable to the hormone. This view was substantiated by the recurrence of anuria when the dose of cortisone was suddenly reduced and by the prompt reappearance of diuresis when the dose was increased.

In Case 4 the anuria followed prostatectomy and a moderate degree of glomerulonephritis was found at

necropsy. One apparently contributory cause of death was the high blood potassium.

There are theoretical reasons for caution in using cortisone in cases of acute anuria. One may ignore the well-established fact that cortisone acts in animals as an electrolyte-controlling corticoid causing water and salt retention. In humans this effect is less consistent and even contradictory, depending on the condition of the patient. Thus it has an antidiuretic effect in most normal people if the salt intake is above a certain level; it has a diuretic effect in some cases of nephrosis; whilst in toxæmia of pregnancy it may produce internal fluid transfer, causing ascites with diminution of subcutaneous oedema (Moore *et al.*, 1951).

A more serious objection is that cortisone promotes increased tissue catabolism and is therefore apt to increase the concentration of toxic metabolites in the blood. It is thus possible that some of the increase in blood urea noted in the above cases after cortisone administration could be attributed to this effect. A similar explanation may partially account for the increase in serum potassium noted in Case 4.

Another theoretical objection to using cortisone is suggested by its effect on rats' kidneys, resulting in marked hyperaemia of the glomerular capillaries and a shunting of blood towards the medulla, which becomes greatly congested. This may eventually lead to hypertension and nephrosclerosis. Cortisone is also described as aggravating the renal damage caused by mineral-controlling corticoids. Furthermore, cortisone has not a renotropic effect on the kidney which is characteristic of the anabolic steroids such as testosterone; indeed, it is only the steroids possessing this characteristic which have a protective effect on the kidneys of animals exposed to a wide variety of noxious drugs or violent physical treatment (Selye, 1951). Thomas and Good (1951) reported that cortisone-treated rabbits developed cortical necrosis after intravenous injection of bacterial toxin. Such adverse observations should not be considered decisive for clinical problems, since the reaction of different species is not constant and the doses used are not strictly comparable.

The possibility that an acute allergic reaction in the kidneys to a drug such as the "sulpha" compounds may be controlled by cortisone is of particular interest, as such reactions have often been reported in the literature, especially with sulphathiazole.

Five separate pathological manifestations in the kidney have been attributed to sulphonamide derivatives, and each has been associated with anuria. The best known is mechanical blockage due to crystalluria. The second, that of perifocal tubular nephritis, was recorded by Bergstrand (1946), who also emphasized that the renal findings were essentially the same as those found in the crush syndrome. An acute nephritis resembling the "mercury kidney," with parenchymatous degeneration of the convoluted tubules without inflammatory cell infiltration (More *et al.*, 1946), and a glomerulonephritis have also been described. Finally, a type mainly distinguished by arterial changes and cellular exudate suggestive of an anaphylactic reaction has been defined by Black-Shaffer (1945). That such reactions may arise after even a small dose of a sulphonamide is exemplified by the case of Bakken (1947).

It is evident from the pathological findings in cases of anuria due to sulphonamides that, while the allergic factor may be inhibited by cortisone, the hope of recovery will depend on whether treatment is given before irreversible changes have occurred in the kidneys. Since the type of allergic reaction is variable it remains to be seen if cortisone will be successful in only a limited number of such cases.

According to our limited experience in the treatment of acute rheumatic fever we believe it is probable that cortisone can not only prevent rheumatic carditis but perhaps even abolish it if given in proper dosage and before irreversible cardiac changes have occurred. If also it be true that cortisone is useful in acute diffuse glomerulonephritis due to allergy, one condition for success would seem to obtain in both these conditions: administration should begin early

in the attack and before organic damage is done to the heart or kidneys. This view was expressed over two years ago by one of us (H. M.) as regards the heart when introducing Professor Philip S. Hench for the Honorary Degree conferred on him by the National University of Ireland.

Summary

Four cases of acute anuria treated with cortisone are reported. In two patients an allergic reaction in the kidneys was suspected, and both responded satisfactorily, making a rapid and complete recovery; in one the allergy was attributed to an overdose of sulphamerazine; in the other it was attributed to the sudden cessation of cortisone, which was being taken (100 mg. daily) for rheumatoid arthritis, and to the development of a sore throat, pyrexia, and rash; both factors preceded the anuria.

No definite conclusions can be drawn from the three apparently successful cases, as acute anuria is prone to develop a spontaneous remission.

We are indebted to Professor W. J. E. Jessop, of the Meath Hospital, Dr. Maurice Hickey, of the Mater Misericordiae Hospital, and Dr. Frank Geoghegan, of the National Maternity Hospital, Dublin, for carrying out the biochemical and pathological investigations. The tables were constructed by Mr. Ronan Kieran, of the Department of Anatomy, University College, Dublin.

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N,N'-DIBENZYLETHYLENEDIAMINE PENICILLIN: A NEW REPOSITORY FORM OF PENICILLIN

BY

A. P. FLETCHER, M.D., M.R.C.P.

AND

C. R. KNAPPE, M.D., Dip.Bact.

(From the Department of Bacteriology and the Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London, W.2)

Szabo, Edwards, and Bruce (1951), during a study of the properties of certain penicillin salts, discovered that the coupling of N,N'-dibenzylethylenediamine with penicillin resulted in the formation of a complex only very sparingly soluble in water. These authors described the properties of this complex, its preparation, and the fact that one molecule of base was coupled to two molecules of penicillin. A shortened name for this complex—benzethacil—will be used in this communication. Seifter *et al.* (1951), reporting on the toxicity of benzethacil to animals, found that this compound was approximately 25% more toxic than procaine penicillin to mice by intra-abdominal injection, but was not more toxic when given by intragastric drip, whilst its local analgesic action compared favourably with that of procaine hydro-

chloride. Elias, Price, and Merrion (1951) followed serum penicillin levels in man after the intramuscular injection of this compound, and concluded that it showed no significant toxicity and gave serum penicillin levels of greater duration than any reported with other forms of repository penicillin.

Benzethacil can be administered orally, and shows therapeutic activity by this route (Lepper *et al.*, 1952), but the present communication deals solely with the serum penicillin levels obtained after intramuscular injection.

Materials and Methods

Penicillin assay was performed by the *Sarcina lutea* plate technique (Food and Drugs Administration, Washington), using *Sarcina lutea* C.P.I.-1001. This technique, which uses penicillin dilutions made up in serum, allows adjustment for the influence of protein-bound penicillin, and is thus of considerable assistance in evaluating the significance of low penicillin levels.

With this technique reproducible zones of inhibition were obtained throughout the period of the experiment, as shown by the figures given in Table I. In practice a complete set

TABLE I.—Diameters of Inhibitory Zones of *Sarcina* Plates

Standard Penicillin in Serum (units/ml.)	Mean Diameter of Zone of Inhibition in mm.	Standard Deviation
0.10	23.9	±1.2
0.075	20.0	±0.96
0.05	18.8	±1.25
0.03	12.8	±1.45
0.02	9.1	±1.1

of control plates was run with each set of serum assays. Serum penicillin levels were estimated from a line calculated from the individual control plates (see Ungar, 1951).

Benzethacil was supplied as an aqueous suspension in "tubex" ampoules containing 1 ml. (1 ml. contained 600,000 units of penicillin). The needle provided with the tubex syringe had a diameter of approximately 19 s.w.g.; the suspension could be injected without undue difficulty through this needle.

Nineteen volunteer male subjects took part in this investigation; their ages ranged from 19 to 33 years, and their weights from 10 to 15 st. (63.5 to 95.3 kg.). A single injection of 600,000 units of penicillin contained in one tubex ampoule was given into the gluteal muscles. Blood was withdrawn by venepuncture, and the serum, after being separated by centrifugation, was stored in stoppered bottles over solid CO₂ until used for assay.

Toxicity

Most of the subjects complained of aching at the site of injection for 24 to 48 hours. In no case was this severe. One subject developed a "serum sickness" reaction ten days after the injection. This reaction could not be positively attributed to the benzethacil since another possible antigen had been given shortly before. Despite the lack of positive evidence as to causation, this case is recorded, since benzethacil is excreted extremely slowly, and may give rise to unusual types of sensitivity response.

Results

The serum levels recorded are presented in Table II. It is seen that benzethacil administered by intramuscular injection gives sustained levels of serum penicillin considerably superior to any repository penicillin preparation yet developed. The findings in Table II support the view that even if benzethacil injections were spaced as far apart as 14 days a summation of dose effect might occur.

TABLE II.—Distribution of Serum Levels following 600,000 Units of Benzethacil Intramuscularly

Serum Penicillin Levels (Units/ml.)	Time After Injection												
	3 Hrs.	6 Hrs.	24 Hrs.	48 Hrs.	72 Hrs.	5 Days	7 Days	10 Days	14 Days	17 Days	21 Days	24 Days	28 Days
0.10-0.15	4	3	2	1	5								
0.075-0.099	1	3	2	3	10	1	1		1				
0.05-0.074			2		3	2	8	1	9	7	6	8	3
0.03-0.049					1		7	5	6	5	5	2	5
0.02-0.029							2						
<0.02. No detectable level.													
Total observations ..	5	6	6	6	19	3	18	13	16	12	11	10	8
Range	0.130/ 0.075	0.115/ 0.075	0.115/ 0.070	0.110/ 0.050	0.090/ 0.020	0.050/ 0.035	0.050/ <0.02	0.030/ <0.02	0.040/ <0.02	0.025/ <0.02	0.020/ <0.02	0.025/ <0.02	0.025/ <0.02
Mean	0.104	0.097	0.085	0.076	0.067	0.042							

Though small zones of inhibition were sometimes found at levels of less than 0.02 unit of penicillin, any serum showing less than this level was regarded as showing no detectable amount.

In Table III it is shown that assayable penicillin levels may appear only intermittently in some subjects. This phenomenon is not surprising when the insoluble nature of the preparation and the long duration of action are considered.

TABLE III.—Cases Showing Intermittent Penicillin Levels

Subject No.	Days After Injection							
	3	7	10	14	17	21	24	28
1	0.045	0	0	0	0.020	0.020	0.025	0.025
2	0.075	0.030	0	0.040	0.025	0	0.020	0
3	0.080	0.025	0.020	0	0	0.020	0.020	0.020
4	0.050	0.035	0	0.025	0.020	0	0.020	0.020
5	0.020	0.025	0	0.025	0.020	0.020	0.025	0

Discussion

This substance is a most interesting addition to the variety of penicillin preparations now available for therapeutic use. It is as yet too early to do more than suggest what place it may come to occupy in the treatment of disease. Venereal disease, since default from treatment is relatively common, would seem to be a promising field for trial. O'Brien and Smith (1952) have reported on the efficacy of this substance in the treatment of gonorrhoea, while preliminary results in the treatment of syphilis (Roberts, personal communication, 1952) have been said to be highly encouraging.

The prophylaxis of haemolytic streptococcal infection in patients who have suffered from rheumatic fever may be improved by the use of benzethacil. Stollerman and Rusoff (1952), who treated 135 convalescent rheumatic children, concluded that in most cases a single injection of benzethacil will clear the throat of haemolytic streptococci, and that with continued administration at fortnightly intervals there will be no recurrence of the carrier state. Unfortunately, low intermittent penicillin levels provide the optimum conditions for the emergence of drug-resistant organisms, and it is possible that the wide use of benzethacil would increase the magnitude of this problem.

The incidence of sensitization to this preparation is not yet known; but theoretically it may be high, owing to the long-continued exposure of the patient to low and at times intermittent penicillin levels. Preliminary data provided by O'Brien and Smith (1952) and Stollerman and Rusoff (1953) with combined series of 1,500 patients suggest that the incidence of significant penicillin reactions is not greater than 0.3%. In addition, O'Brien and Smith, in a study of four patients who developed urticarial manifestations within ten days of the injection, found that the reaction lasted only two to three days and cleared up whilst assayable penicillin was still present in the blood. However, in view of the unusual nature of the penicillin levels produced by

benzethacil further clinical study will be required before the danger of sensitization can be fully assessed.

We are grateful to Wyeth Incorporated, Philadelphia, Pennsylvania, for the supply of "penidural" benzethacil.

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CLINICAL TRIAL OF T.B.3 IN SURGICAL TUBERCULOSIS

BY

J. H. MAYER, T.D., M.B., F.R.C.S.

Orthopaedic Surgeon, Pembury Hospital, Kent

AND

P. GOWANS LAING, M.B., F.R.C.S.

Senior Surgical Registrar to the Bradford Group

The thiosemicarbazones have been on trial in the treatment of tuberculosis for several years, principally in Germany, and a fair measure of success has been reported.

This report deals with a short clinical trial of one of the drugs, *para*-ethylsulphonylbenzaldehyde thiosemicarbazone (also known as T.B.3, "ethizone," and 8388), in eight patients suffering from tuberculosis of the spine or sacro-iliac joint whose organism was proved, or strongly suspected, to be resistant to streptomycin and P.A.S. We are concerned here mainly with the toxic effects of T.B.3, which in all our eight cases prevented the administration of the drug for long enough to reach any conclusions about its possible bacteriostatic effect on *Mycobacterium tuberculosis*.

Historical Survey

The use of thiosemicarbazones in tuberculosis was first described by Domagk *et al.* (1946). After trying many of these drugs they concluded that the most useful was *para*-acetamidobenzaldehyde thiosemicarbazone (thiacetazone; also known as T.B.1, "conteben," T.B.1/698); their report stimulated extensive clinical trials in Germany.

Donovick and Bernstein (1949) reported that T.B.1 was more active than P.A.S. but less active than streptomycin in early pulmonary infections, but its activity seemed to decline later in the disease. Karlson *et al.* (1949) found that in guinea-pigs T.B.1 and streptomycin, given together, were more effective than either given alone in ordinary therapeutic doses. Hurni (1949), however, working with mice, reported no additive effect of T.B.1 with either streptomycin or P.A.S. separately, though he found that T.B.1 did have some useful effect if given with both streptomycin and P.A.S. together. Heilmeyer (1949) reported good results in exudative lesions and in bone and joint infections. He noted a frequent fall in the erythrocyte sedimentation rate, which, however, did not correspond to any clinical improvement in the disease. He also recorded many toxic reactions, including liver and kidney damage and anaemia.

Hinshaw and McDermott (1950) and Mertens and Bunge (1950) reviewed German results in 10,000 cases. These workers confirmed the activity of T.B.1 against *M. tuberculosis*, but were unable to reach a definite conclusion about the clinical efficacy of the drug, since the trials had been conducted in Germany at a time when the general nutrition of the patients and the facilities for the general treatment of the disease were constantly improving. Toxic symptoms, consisting mainly of digestive disturbances and albuminuria, were fairly common, while profound anaemia developed occasionally after long courses of this treatment. A further possible toxic effect is mentioned by Stadler and Weissbecker (1951), who report a case of transient Cushing's syndrome in a patient receiving T.B.1.

As early as 1949 Hoggarth *et al.*, reporting trials of about 100 thiosemicarbazones and allied substances in infected mice, stated that T.B.3 seemed to be the most effective of these. In 1950 Hoggarth and Martin showed that T.B.3 was superior to P.A.S., though less effective than streptomycin. Martin and Stewart (1950), however, found T.B.3 superior to streptomycin in the early stages of the disease, but this relationship became reversed in more advanced cases. Bavin *et al.* (1950) and Hamre *et al.* (1950) agreed with other workers that T.B.3 was a more effective agent than T.B.1 in experimental mouse tuberculosis.

Rees and Robson (1951) showed that in experimental corneal tuberculosis T.B.3 with streptomycin was more effective than T.B.3 with P.A.S. or streptomycin with P.A.S. Ross *et al.* (1951) recorded encouraging effects from T.B.1 in conjunction with streptomycin and P.A.S. in human renal tuberculosis, but suggested that T.B.3 might be more efficacious and less toxic.

Little seems to be known about the possible toxic effects of T.B.3 in man. Francis *et al.* (1950) showed in monkeys that a dose of 500 mg. per kg. body weight twice daily produced fatty degeneration of the liver, and that 500 mg. per kg. once daily produced no toxic effects. The therapeutic value of this lower dosage in experimental tuberculosis was about half that of 40 mg. of streptomycin per kg. daily. This is equivalent to comparing a dosage in an average man of 3 g. of streptomycin daily with over 30 g. of T.B.3. From the known toxicity of the thiosemicarbazones such high doses in man would clearly be dangerous. Siebenmann and Zubrys (1952) have shown that the haemolytic anaemia produced by T.B.1 in mice does not occur with T.B.3. Spinks (1951) has shown that T.B.3 in mice and dogs produces blood levels four times as high as the same dosage of T.B.1. Since T.B.3 appears to be a more effective substance in the treatment of tuberculosis than T.B.1, it seems reasonable to hope that an effective blood level can be maintained on T.B.3 with less danger of toxic signs than on T.B.1.

Clinical Material

It was decided to conduct a limited clinical trial of T.B.3 in selected cases of bone and joint tuberculosis whose lesions were failing to respond satisfactorily to other

forms of treatment. All these patients were appropriately splinted and on a general sanatorium routine in hospital, and all had received appropriate surgical treatment where indicated. All were receiving daily 1 g. of dihydrostreptomycin and 15 g. of P.A.S. Three had developed proved resistance to one or both of these drugs, and in the other five the clinical progress led us to believe that such a resistance must be developing, though we were not able to prove this. In six of the eight patients the lesion was proved to be tuberculous; in one there was histological evidence but no bacteriological proof of tuberculosis; in the eighth the clinical and radiological condition was typical though there was no histological or bacteriological proof of its tuberculous nature.

Dosage.—The first four cases started on 50 mg. of T.B.3 a day and the dose was increased gradually over a period of a few weeks to the maximum of 200 mg. a day in divided doses. The later cases started on 100 mg. a day, and the dose was raised more rapidly to 200 mg. a day. This is the dosage advised by the makers, who warn against exceeding 250 mg. a day.

Routine Investigations.—The following investigations were carried out in all cases: daily urinalysis, weekly haemoglobin estimation, red-cell and white-cell counts, and a fortnightly or monthly erythrocyte sedimentation rate. Blood-sugar estimations and glucose-tolerance curves were done in five cases.

Case Records

Case 1.—A woman aged 30. Tuberculosis of left sacro-iliac joint, onset summer, 1948; not proved. Recurrent sinuses despite streptomycin and P.A.S. Arthrodesis October, 1950. Recurrent wound breakdown. T.B.3 was given with streptomycin and P.A.S. from May 28 to August 7, 1951, when intermittent albuminuria and vomiting led to its discontinuation. E.S.R. rose during the course and haemoglobin fell from 102% to 74%.

Case 2.—A boy aged 9. Tuberculosis of dorsal spine; proved. Treated since 1944. Progressive collapse of thoracic spine and recurrent psoas abscess. Aspirations of psoas abscess; local streptomycin and P.A.S. Organism became resistant. T.B.3 was given from May 31 to August 7, 1951. Intermittent albuminuria and reducing substance in urine. Some anorexia. No anaemia.

Case 3.—A woman aged 64. Tuberculosis of right sacro-iliac joint; proved. Treated by plaster bed, streptomycin and P.A.S., and operative fusion. Organism became resistant, and a course of T.B.3 was added from June 5 to September 21, 1951. Discontinued because of severe albuminuria, profound nausea, vomiting, and anaemia. Haemoglobin fell from 96% to 64%, necessitating blood transfusion. E.S.R. rose. Urine occasionally contained a reducing substance.

Case 4.—A woman aged 31. Tuberculosis of thoraco-lumbar spine; proved. Wound broke down after operative excision of the disease in spite of streptomycin and P.A.S. T.B.3 was given from June 5 to September 27, 1951; discontinued because of albuminuria and severe vomiting. No fall of E.S.R. or haemoglobin. A reducing substance was found in the urine.

Case 5.—A man aged 20. Tuberculosis of D.12 and L.1 and os calcis; proved. Wound broke down following excision of spinal lesion while on streptomycin and P.A.S. T.B.3 was given from June 26 to July 13, 1951, when heavy albuminuria led to its withdrawal.

Case 6.—A girl aged 16. Pott's paraplegia; proved. Failed to improve after plaster-bed and lateral rachotomy. T.B.3 added to streptomycin and P.A.S. from August 24 to September 17, 1951, when severe albuminuria and vomiting led to its discontinuation. E.S.R. and haemoglobin percentage unchanged. A reducing substance appeared in the urine.

Case 7.—A woman aged 69. Dorso-lumbar tuberculosis; proved. Lumbar abscess. Organism became resistant to

streptomycin and P.A.S. T.B.3 was given from September 6 to 25, 1951, when severe nausea and vomiting led to its discontinuation. Mild albuminuria. E.S.R. and haemoglobin unchanged. Reducing substance present in urine.

Case 8.—A woman aged 21. Tuberculosis of lumbar spine; proved. Wound broke down following excision of the disease. Course of T.B.3 was given from September 10 to 27, 1951, when albuminuria led to its discontinuation. Moderate nausea and anorexia throughout the course. E.S.R. and haemoglobin unchanged. Reducing substance was found in urine.

Discussion

No attempt has been made to assess the effect of T.B.3 on the tuberculous lesions in these cases. Since only eight patients were given the drug, and some for only a few weeks, any such deductions would be statistically invalid. We confine our remarks to the toxic effects of T.B.3.

None of this series remained free from toxic signs or symptoms while receiving the drug, and in all of them the drug was withdrawn because of this toxicity.

Albuminuria was found in every case at some time during the course, though its severity varied from case to case. Case 4 developed albuminuria while receiving only 50 mg. of T.B.3 a day, and this did not increase when the dose was raised to 200 mg. a day. In Case 5, on the other hand, very severe albuminuria occurred only when this full dose was reached, the course being immediately abandoned. We found no evidence of permanent renal damage following the courses of T.B.3, and albuminuria disappeared a few days after the drug was withdrawn in all cases. We feel, however, that the persistent albumin leak through the kidneys is evidence that the drug has a very definite toxic effect on this organ, and that long courses of the drug might well lead to irreversible changes.

In all but two of our cases a reducing substance appeared in the urine during the course. In Cases 4, 6, 7, and 8 this was a constant finding, while in Cases 2 and 3 it was intermittent. This substance was shown not to be a sugar, and was probably glycuronic acid, which appears in the urine during the detoxication of P.A.S. in the liver. All these cases were receiving P.A.S.

Only one case tolerated T.B.3 without developing anorexia, nausea, or vomiting to some degree. In Cases 1, 3, 4, 6, and 7 these disturbances were severe on a dose greater than 100 mg. a day, and led to a deterioration in the patient's general health. We were unable to reduce the severity of these symptoms by increasing the intake of glucose or by these symptoms by increasing the intake of glucose or by the administration of "avomine" or chlorbutol. We feel that such a disturbance of the general condition of a tuberculous patient can only do harm.

Case 3 showed a gradual fall of the haemoglobin level throughout the course of T.B.3 in spite of the administration of oral iron. The haemoglobin finally reached a level of 63% after nearly three months on the drug. This patient also experienced severe anorexia and vomiting from time to time during the course. No evidence of any haemolytic element could be found, and the anaemia was of the normocytic hypochromic type. After the course of T.B.3 a blood transfusion and the continued administration of iron soon led to cure of the anaemia.

Case 1 developed a similar type of anaemia but of slighter degree. In neither of these two patients was there any local sepsis at the disease site, and the sinus in Case 1 was at all times sterile. It seems probable that the digestive upsets led to deficient absorption of iron from the intestines. No fall of the white-cell count was seen in any of our patients.

The E.S.R. remained substantially unchanged in six cases and rose in two during the administration of T.B.3. We did not encounter the fall reported by other workers. No case developed any allergic manifestations while receiving the drug.

It is possible that our dosage was too high, but it is of interest that Case 2, an undersized boy of 9, tolerated the

full dosage of 200 mg. a day for several weeks a great deal better than most of the adult patients. In view of the work of Francis and Spinks, we felt that no useful therapeutic effects could be expected from a lower dosage.

Conclusions

The serious toxic effects of T.B.3 forced us to abandon this clinical trial in its early stages. Obviously we cannot draw any far-reaching conclusions from this limited experience. We feel, however, that the ill effects of the drug on the general condition of the patients are a very serious contraindication to its use in bone and joint tuberculosis.

The modern combination of a sanatorium regime with the administration of streptomycin and P.A.S. and a planned surgical attack on the disease is in our experience yielding good results. It is important also not to overemphasize the role of chemotherapy in a disease whose basic pathology is the avascular tubercle and caseation, for even the most active antituberculous drug may not reach the living organisms in the centre of the lesion.

The routine use of any fresh chemotherapeutic aids can be justified only if their therapeutic benefits outweigh any toxic effects. The general condition of the patient must not suffer during treatment, and there must be no permanent sequelae.

We believe that T.B.3 fails on the first of these conditions, and that its prolonged administration may lead to failure on the second also. In our opinion its use in bone and joint tuberculosis should be restricted to cases in which other methods are failing to arrest the disease, and in which the situation is becoming so critical that the risks must be accepted.

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At a meeting in Edinburgh on January 7 Dr. Charles Hill, Parliamentary Secretary to the Ministry of Food, discussed the possibilities of derationing some foods (*Scotsman*, January 8). Speaking of the shortage of butter, he said that it was not sufficiently realized that it took 20 pints of milk to make 1 lb. of butter, or that 60% more liquid milk was being consumed to-day than before the war. The drive for more meat had also affected production of butter, but it was hoped that Australia would be able considerably to increase supplies of butter to this country, though it would be unduly optimistic to expect a return to the large quantities of cheap butter which were available before the war. Dr. Hill said that there was enough oil and fat in the world to dispense with the rationing of margarine and cooking fat, but our difficulty was to be able to afford to buy the necessary supplies.

TUBERCULOUS MENINGITIS TREATED
WITH STREPTOMYCIN

A FOUR-YEAR FOLLOW-UP

BY

SHEENAH J. M. RUSSELL, M.D., M.R.C.P.Ed.
D.C.H.

Former Clinical Assistant

AND

PATRICK MacARTHUR, M.D., F.R.F.P.S. D.C.H.

Assistant Visiting Physician

Royal Hospital for Sick Children, Glasgow

In 1950 we reported on the various methods of treatment with streptomycin and the results obtained after at least one year in 33 proved cases of tuberculous meningitis in the Royal Hospital for Sick Children, Glasgow (Russell and MacArthur, 1950). Because it has been recognized that certain children with tuberculous meningitis who have been treated with streptomycin and have apparently made a satisfactory recovery may subsequently suffer a relapse of the disease and die, it was thought necessary to watch the progress of these children for some years after the completion of treatment before claiming that they were cured. The present report is a further record of the 15 children who were alive at the time of the first report. The period of follow-up now ranges from 49 to 68 months. Each survivor was examined during the past year and the cerebrospinal fluid of all but one was examined. Details of these children are recorded in Table I and the case numbers correspond with those in our first report.

The main clinical features of the disease in each of the 33 original cases have already been recorded (Russell and MacArthur, 1950). These were the first patients to be treated with streptomycin in this hospital, but they were not consecutive admissions, because the accommodation available and the time required for the detailed investigations necessary ruled out the possibility of treating all cases admitted for diagnosis and found to have tuberculous meningitis. It was the practice to reserve four cots in each of the two medical units for this therapeutic trial, and when one of these cots was vacated the place was taken by the next case diagnosed. No attempt was made to select cases in which a favourable outcome might be anticipated. The results of treatment are not the best that could be obtained, because

the trial was in force at a time when little was known regarding the best method of using streptomycin, and indeed at one stage a number of patients were given only intramuscular injections.

Of the 33 patients, 12 are alive—nine are leading normal lives in their own homes and three are grossly disabled. The cerebrospinal fluid (C.S.F.) is cytologically and chemically normal in 11 of the children. One of the disabled cases (No. 25) has a low sugar content. Table II shows the results obtained in this series and in other published series.

Nine Survivors who are Well

Five of these children were under 4 years old when they developed meningitis. In only one survivor (Case 24) was there a snowstorm appearance on x-ray examination, and in one other (Case 32) there was a single choroidal tubercle, now healed. In three children the disease was in its early stages when treatment was begun, and in the other six it was in an intermediate stage. No child has survived in whom the disease was already advanced at the onset of treatment. Two children have had a relapse of meningitis and have recovered after a second course of treatment. A block in the circulation of C.S.F. from the ventricles throughout the subarachnoid space was present in Cases 14 and 22. In Case 14 the block resolved during the period of observation, while in Case 22 a partial spinal block was still present at the time of writing, although he was very well 55 months after the onset of the disease and 52 months after the block was first detected. The parents of the child with the single healed choroidal tubercle (Case 32) refused to bring him to hospital for review, but he was seen in his own home. It was impossible, however, to examine the spinal fluid or to have a skiagram taken. He appeared to be a healthy, happy boy with no abnormal signs in the central nervous system. During August and September, 1951, the C.S.F. of the other eight children was examined and cultured, and was found to be cytologically and chemically normal and sterile.

While the children were under review special attention was paid to their scholastic attainment, but unfortunately it was not possible to have intelligence tests carried out. One child (Case 14), who is of an affectionate and happy disposition, is definitely backward mentally and attends a special school, while Case 11 is probably of low average intelligence. The remaining seven, however, appear to be making good progress at school and do not exhibit any behaviour problems. Recent skiagrams of the skull show areas of calcification in six of these children.

Three Survivors Disabled

One of these children (Case 2) developed meningitis 68 months ago. Though in an early stage of the disease when treatment was begun, she did not respond satisfactorily, and

TABLE I

Case No.	Age (Years)	Stage of Disease at Start of Treatment	Duration of Observation (Months)	Snowstorm Skiagram	Choroidal Tubercles	Spinal Block (B)	Relapse (R)	C.S.F. at End of Treatment				C.S.F. Most Recent				Result	Intra-cranial Calcification
								Cells per c.mm.	Protein mg. per 100 ml.	Chloride (as NaCl) mg. per 100 ml.	Sugar mg. per 100 ml.	Cells per c.mm.	Protein mg. per 100 ml.	Chloride (as NaCl) mg. per 100 ml.	Sugar mg. per 100 ml.		
2	4	E	68					30	66	761	—	0	36	723	59	Disabled	+
9	6	I	47				R	90	43	710	—	4	36	725	59	Well	+
10	2	E	60				R	350	281	699	30	—	—	—	—	Dead	+
11	2	E	63					5	38	765	53	—	—	—	—	Well	+
12	2	I	63					12	65	770	—	—	—	—	—	Well	+
14	11	I	58			B	R	55	73	729	—	1	24	743	61	Well	+
15	3	I	58					70	277	658	—	1	19	762	48	Well	+
22	4	E	55			B	R	40	31	756	—	0	42	748	73	Well	+
24	1	E	55					1	41	713	—	2	27	734	48	Disabled	+
25	6	E	53	+				26	41	629	77	0	38	764	61	Well	+
28	1	I	52				R	35	82	681	—	3	40	735	37	Well	+
29	3	E	51					17	37	717	—	4	27	735	61	Disabled	+
32	2	I	51					49	50	716	56	2	34	758	63	Well	+
33	7	E	49		+	B	R	10	72	676	—	1	30	682	53	Well	+
			42	+	+			4	4	625	32	—	—	Refused permission	—	Dead	?

E=Early stage. I=Intermediate stage.

TABLE II.—Recorded Results in Tuberculous Meningitis Treated with Streptomycin

Author	Minimum Observation Period (Months)	No. of Cases			
		Total	Alive	Well	Disabled
Illingworth and Lorber (1951)	12	82	36 (44%)	24 (29%)	12 (15%)
Lincoln and Kirmse (1949) (promizole also given)	12	10	8 (80%)	5 (50%)	3 (30%)
Cairns <i>et al.</i> (1950)	12	60	30 (50%)	21 (35%)	9 (15%)
Cathie and MacFarlane (1950)	12	60	28 (47%)	23 (39%)	5 (8%)
McCarthy and Mann (1950)*	16	37	14 (38%)	12 (32%)	2 (6%)
Russell and MacArthur (1950)	12	33	15 (45%)	10 (30%)	5 (15%)
Present series	49	33	12 (36%)	9 (27%)	3 (9%)

* In this series six children treated with intramuscular streptomycin alone have been excluded from the figures quoted.

tubercle bacilli were still cultured from her C.S.F. two and a half months after the start of streptomycin therapy. After six months of intramuscular and intrathecal treatment her clinical condition was deteriorating and she developed convulsions and a right-sided hemiplegia. Treatment was finally stopped after 12 months, when she was hemiplegic and having convulsions. The disease is now quiescent and her C.S.F. is normal and sterile on culture, but the child is a low-grade mental defective with a right-sided hemiplegia and has frequent epileptic fits. Calcification is apparent in a recent skiagram of her skull, and is situated above and anterior to the sella and on both sides of the midline.

Case 15 has been observed for 58 months. He had intramuscular treatment alone for 60 days, after which tubercle bacilli were still cultured from his C.S.F. and he was emaciated and comatose. Ten weeks of combined intramuscular and intrathecal treatment brought improvement in the cerebrospinal-fluid findings, but his clinical disability remained severe. He suffered a relapse of meningitis 15 months after his initial attack and had a further three months of intramuscular and intrathecal treatment. The disease is at present quiescent and the C.S.F. is normal, but he is mentally defective with a right hemiplegia, has epileptic fits, and shows marked sexual precocity. Intracranial calcification began to appear 23 months from the onset of the illness, and there is now a dense mass above the sella turcica and on the left side of the brain.

Case 25 has now been under observation for 52 months. He was 12 months old and was in an intermediate stage of the disease when the diagnosis was made. He had a three-months course of intramuscular and intrathecal treatment, on the completion of which he was blind, he was having convulsions, and his C.S.F. was still abnormal. Six months later, however, his spinal fluid was normal, although he was mentally defective and was still having convulsions. Two years after his initial illness he had a relapse of meningitis, and again tubercle bacilli were cultured from his C.S.F. He was given another three-months course of intramuscular and intrathecal streptomycin with some improvement. At the present time he is mentally defective, has epileptic fits, and his C.S.F. sugar is at an ominously low level.

Changes Since last Report

Comparison of the present state of this series with the state in September, 1949, shows four changes, one for the better and three for the worse. Case 32 was reported as disabled because he was believed to be developing hydrocephalus, but he has completely recovered and attends school regularly, where his achievements are well up to the average standard. One inactive choroidal tubercle is still visible in his right eye.

Case 33, who was disabled at the time of the last report, has since died, 30 months after the onset of the disease. This boy was admitted to the centre with miliary tuberculosis and developed meningitis while on intramuscular treat-

ment. Until his death 30 months later he was under continuous observation and had four relapses, at the onset of three of which tubercle bacilli were cultured from his C.S.F. In the final episode the tubercle bacilli were still sensitive to streptomycin, but he died suddenly on the day after the start of treatment. At necropsy the brain showed hydrocephalus, with a thick gelatinous exudate at the base of the brain, and four small tuberculomata were found in the cortex.

Case 9 was classified as "well" in the original report, although nine months after the completion of treatment his C.S.F. still had a raised cell count. He remained at home, leading a normal life and attaining average success at school, but 45 months after his initial meningitis he had a relapse and in spite of treatment died within two months. This boy showed the most scattered intracranial calcification of the series, the nodules being widely spread on both sides of the brain. The course of the illness during the first six months was stormy, with episodes of convulsions, aphasia, hallucinations, facial palsy, and severe psychological upsets. Three months after stopping streptomycin it was realized that he was deaf, but gradually his deafness diminished, and a year later his hearing, by rough tests, was normal. It seems probable that his deafness was due to the disease rather than to the streptomycin sulphate with which he was treated.

Case 10 was classed as "well" in our 1949 report, but in October, 1949, he was found to have a tuberculous abscess in the anterior end of the left seventh rib. This discharged pus containing tubercle bacilli, and the child was given a four-weeks course of intramuscular streptomycin. The lesion healed completely and permanently within three months. An x-ray film of the skull in February, 1951, showed extensive intracranial calcification at the base of the brain. During 1951 the boy remained apparently well, though there was a mild right-sided hemiplegia, and he attended school regularly. On August 22 a lumbar puncture was done during routine follow-up studies. The C.S.F. was cytologically and chemically normal and he seemed very well, but it was disquieting to culture two colonies of tubercle bacilli from the C.S.F. In May, 1952, he had a relapse of tuberculous meningitis and in spite of intramuscular, intrathecal, and intraventricular treatment he died with gross hydrocephalus eight weeks later. In this relapse, three years after his primary attack, the tubercle bacilli were fully sensitive to streptomycin.

Intracranial Calcification

One of the most interesting features of the follow-up has been the detection of intracranial calcification. This has been present in the skiagrams of 8 of the 12 survivors and also of two children (Cases 9 and 10) who died of a relapse of meningitis in March, 1951, and June, 1952. In every case there have been calcified areas in the vicinity of the sella turcica. In five children central nodules were seen around the sella or just above it. In six cases there were nodules a little above the level of the sella and about one-third of the distance towards the left side of the skull, and in two cases the nodules were on both sides of the film. The majority of calcified foci appeared to be in the vicinity of the cisterna interpeduncularis and cisterna chiasmatica, and in one case the calcification extended up towards the cisterna ambiens. This localization was supported by the findings at necropsy on Cases 9 and 10, whose skiagrams showed widespread intracranial calcification. There were numerous calcified foci in the tuberculous exudate at the base of the brain, often deep in the sulci, but no calcified areas in the brain substance.

Cairns (1951) stated that "in tuberculous meningitis it is probably many months before the subarachnoid spaces are clear of exudate; in some successful cases traces of it persist indefinitely and become calcified." From the present findings it would seem that in the successful cases calcification is the rule rather than the exception, and it is probable that its appearance depends mainly upon the length of time

since active meningitis occurred. The earliest appearance of calcification in the basal cisterns was noted at 23 months from the onset of meningitis. In two of the children the areas concerned may well be within the brain parenchyma. Case 15, who shows signs of precocious puberty, has a dense mass, probably situated in the hypothalamus. Case 14, before the onset of meningitis, was admitted to a neuro-surgical unit for investigation of a cerebral tumour. At that time, in November, 1947, a skiagram of the skull showed an area of calcification in the left temporal lobe. Ventriculography revealed that there was also a large mass in the right frontal area blocking the anterior horn of the right lateral ventricle. A second area of calcification has been present on films dating from 15 months after the onset of meningitis, and the site appears to correspond with the tuberculoma found in the right lateral ventricle. It is not surprising to find that seven of the ten children showing intracranial calcification also show intrathoracic calcification.

Other published accounts of tuberculous meningitis treated with streptomycin have been searched for any reference to the presence of intracranial calcification in surviving patients. Lorber (1951) described intracranial calcification in a girl of 7 years who developed tuberculous meningitis 18 months previously. This girl showed signs of sexual precocity, and in her case there were two small foci of calcification believed to be in the wall of the third ventricle. The demonstration of intracranial calcification which is now possible in so many of these cases is a vindication of the view (Rich and McCordock, 1929) that meningitis is commonly secondary to cortical or meningeal tuberculomata.

Relapse of Meningitis

In this series there have been nine children who suffered recurrence of meningitis at intervals of 3 to 179 weeks after the completion of treatment (Table III). Six children have

TABLE III.—Relapses of Tuberculous Meningitis

Case No.	Interval Since Last Treatment (Weeks)	Last C.S.F. Taken Before Relapse					Present Condition
		Interval Before Relapse (Weeks)	Cells per c.mm.	Protein mg. per 100 ml.	Chloride (as NaCl) mg. per 100 ml.	Sugar mg. per 100 ml.	
3	36	9	40	76	719	38	Dead
5	3	3	20	57	764	—	"
9	179	128	31	26	727	—	"
10	(1) 4	2	130	59	695	25	Well
	(2) 179	27	1*	31	693	83	
12	80	57	12	24	702	—	Well
15	36	6	9	58	650	51	Disabled
25	88	16	4	30	693	71	Dead
26	5	3	13	90	674	20	
33	(1) 5	5	42	83	686	18	"
	(2) 4	2	15	7	667	45	
	(3) 49	12	1	—	660	58	
	(4) 32	4	2	32	604	69	

* Tubercle bacilli cultured. V.P. Ventricular puncture.

died. Only in Case 25 had the C.S.F. been normal before the relapse occurred, but physically he was severely disabled. In Case 10 the C.S.F. was cytologically and chemically normal but tubercle bacilli grew on culture. One relapse which occurred after three and a half years of good health was particularly disappointing. This child (Case 9), in an intermediate stage of the disease when treatment was begun, had intramuscular and intrathecal treatment during a period of three months. Reference has already been made to the severity of the clinical picture. Ten months after the completion of treatment his C.S.F. was still abnormal, although his only physical disability was some impairment of hearing. He remained at home, and was doing well at school until January, 1951, when he had a relapse of meningitis with tubercle bacilli in the C.S.F. In spite of treatment he died six weeks later. A skiagram taken on January 30 showed extensive intracranial calcification, and at necropsy numerous calcified tubercles were found in a dense basal exudate but none were present in the brain substance. The appearance of intracranial calcification is therefore not an

infallible sign of healing of the meningitis; it does not preclude the existence of tuberculous foci which may still contain living tubercle bacilli. Cases 9 and 10 had extensive intracranial calcification when they developed a recurrence of meningitis and died.

Cortical or subcortical tuberculomata have been detected after death in only two of the six children who died after a relapse, and in only 7 of the 20 necropsies performed in the whole series. Hydrocephalus of marked degree was found in five of the six fatal cases of relapse, and the thickness of the basal exudate aroused comment in three. Tubercle bacilli were cultured from the C.S.F. withdrawn at the onset of the relapse in six of the nine children. Unfortunately, it was possible to test the streptomycin sensitivity of only two of these cultures (Cases 10 and 33). The bacilli were as sensitive to streptomycin as at the beginning of treatment more than three years previously, although there had been adequate opportunity for resistance to develop.

Type of Streptomycin and Neurotoxicity

All the children in this series were treated with salts of streptomycin—hydrochloride, sulphate, or calcium chloride complex. During their relapse three children were given dihydrostreptomycin for short periods, but no untoward effects were noted. On the basis of this limited experience of the comparative action of the two drugs we are unable to assess the relative toxicity of streptomycin and dihydrostreptomycin in the present series of cases.

Summary

Thirty-three patients with tuberculous meningitis have been treated with streptomycin and the survivors have been re-examined from four to five and a half years after the institution of treatment.

Nine (27%) are alive and well and leading normal lives, three are gravely disabled, and 21 have died after periods ranging from 2 days to 60 months.

Spinal block occurred in nine of the patients—seven are dead, and a partial block persists in one of the two survivors.

Intracranial calcification as seen in skiagrams has occurred in 10 of the 13 patients who survived long enough for it to develop. Six of these are well, two are disabled, and two have since died.

Relapse of meningitis has occurred in nine cases. Only one of these children is alive and well, two others are disabled, and six have died of the relapse.

We wish to thank the late Professor G. B. Fleming, Professor Stanley Graham, and Dr. James H. Hutchison for access to the case records and for advice in the preparation of this paper; and the staff of the biochemistry, pathology, and radiology departments for their arduous investigations.

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The first report of the W.H.O. Expert Committee on Public Health Administration is now available as No. 55 in the *World Health Organization: Technical Report Series*. In the committee's opinion, the main functions of the central authority should be the formulation of policy, the giving of advice and specialized technical assistance to local authorities, and the enforcement of medical legislation and other standards of efficiency; while the main function of the local health administration should be operational

USE OF SUCCINYLCHOLINE IN E.C.T. WITH PARTICULAR REFERENCE TO ITS EFFECT ON BLOOD PRESSURE

BY

D. J. ADDERLEY, M.R.C.S., L.R.C.P.

Formerly Registrar, Springfield Hospital, London

AND

MAX HAMILTON, M.D., D.P.M.

Assistant Psychiatrist, Springfield Hospital, London

In recent years it has been possible to apply electric convulsion therapy to a wider range of cases than previously, with the aid of curare-like substances to weaken the muscular spasms of the convulsion. For the specific requirements of E.C.T. the newly introduced short-acting group of muscle relaxants is particularly appropriate. This paper deals with the practical problems that arise during this type of treatment and the methods of dealing with them. Certain theoretical problems are also discussed.

The contraindications to convulsion therapy, in otherwise suitable patients, are usually classified into two groups: those due to the effects of the convulsion itself—for example, damage to bones, damage to tuberculous lesions in the lung—and those due to the strain on the cardiovascular system, particularly incipient heart failure and hypertension. Since depression, for which E.C.T. is usually given, becomes more common with increasing indication to treatment. There has been much discussion on this problem. Kraemer (1950) measured the blood pressure immediately before the shock, and 2, 5, 10, 30, and 50 minutes afterwards. The average rise of pressure was 40/10 mm. Within 10 minutes it had returned to normal. He concluded that moderate hypertension was not a contraindication to E.C.T. In some preliminary measurements we found that the B.P. is extremely variable, undergoing a number of phasic changes during different stages of the convulsion and immediately afterwards.

Eyman and Morris (1950) discussed fatalities associated with E.C.T., and emphasized the risks of cardiac abnormality. They recommend that an E.C.G. should be taken before treatment is given wherever cardiac involvement is known or suspected. On the other hand, Piette (1950), who agrees that most of the fatalities are due to cardiac failure, thought that in such cases there may often be no clinical or E.C.G. abnormality in the cardiovascular apparatus. This is in agreement with Bankhead, Torrens, and Harris (1950), who state that cardiac reactions are due to overactivity of the vagus, and are of the opinion that they can be eliminated by premedication with atropine. There is no doubt that E.C.T. produces a rise in blood pressure, although this is of fairly short duration. In practice very few fatalities have occurred, but the possibility cannot be excluded that this is partly because of the caution exercised by physicians in the selection of cases for treatment.

The use of relaxants in E.C.T. has been recommended on the grounds that it reduces the strain on the heart produced by the convulsion, so that the presence of hypertension can be regarded as an indication for their use. It was therefore decided to investigate the changes

in blood pressure which occur in E.C.T. when relaxants are used. So far as we are aware, this has not previously been studied; the paper by Davies and Spencer Paterson (1952) dealt with the hypertensive effect of electro-narcosis. Piette (1950) stated that curare does not suppress the rise in blood pressure due to E.C.T., but if it is used with sodium thiopentone, atropine, and oxygen the variations in arterial pressure which normally appear are entirely avoided. Since the shorter-acting relaxants can be used not only to "soften" the convulsion but to eliminate it completely, without at the same time producing respiratory difficulties afterwards, it would seem that they are eminently suitable for this purpose. This investigation is therefore confined to the use of succinylcholine ("scoline").

No attempt was made to select patients, who came from our own wards. They were all women, chiefly elderly, feeble, and hypertensive, with a few younger healthy ones.

Methods

The procedure was as follows. Blood pressures were taken with an aneroid-type sphygmomanometer, because it is speedy and convenient in use. They were taken immediately before the injection of sodium thiopentone, one minute after that injection, again after the injection of succinylcholine had become effective, and, lastly, immediately after the convulsion was over. The moment selected for taking the B.P. after the injection of succinylcholine was when the fibrillation produced by the drug had ceased, and therefore when paralysis was complete. Preliminary trials showed that 0.2 g. of sodium thiopentone was enough to produce unconsciousness in most of our patients, and this amount was always used. It is not often that more would be required, except for very big patients. The recommended dose for succinylcholine is 1.2 ml. of a 5% solution, but we found that 1.5 ml. produced complete relaxation, but we have done so, but, again, More could be given, and we have done so, but, again, The larger dose would in general be required for only very muscular patients. The lungs were inflated two or three times with oxygen containing 5% carbon dioxide, just before a shock of 30 joules was given.

Results

The results of these preliminary trials showed the expected drop of blood pressure after sodium thiopentone medication, but an unexpected rise was almost invariably found after the injection of succinylcholine. This rise was not after the injection of succinylcholine. The accompanying further increased by the convulsion. The rise Table gives the results in 12 consecutive cases. The rise in B.P. demonstrated in the Table is statistically very highly significant. A similar rise after the injection of succinyl-

Blood Pressure in Patients Given E.C.T. After Sodium Thiopentone and Succinylcholine (Recorded to Nearest 5 mm.)

At Beginning	After Thiopentone	After Succinylcholine	After Fit
160/95	130/95	160/110	170/90
150/90	120/80	120/80	140/80*
150/90	145/85	185/120	180/100
160/80	150/75	190/130	160/100
160/80	130/75	150/100	180/100
140/80	110/75	170/105	160/90
140/80	110/70	140/90	150/90
125/90	120/80	220/160	200/110
175/105	140/90	195/100	180/100
150/100	150/80	200/150	190/110
140/90	130/80	180/160	200/100
160/90	135/80		

Mean B.P. after sodium thiopentone 130.8/80.4 mm.
 Mean B.P. after succinylcholine 170.8/116.2 mm.
 Difference 40.0/35.8 mm. $\pm$ S.D. 22.6/26.5 mm.
 Number of cases = 12.
 $t = 6.2/4.7$. P is $< 0.001/0.001$.

* Part of the succinylcholine leaked out of the vein in these cases.

choline was found in each of the subsequent experiments. The overall effect of this substance—that is, the change from the initial B.P.—is, of course, not so great, but it is still highly significant statistically.

It is possible that this increase of B.P. might be due to the delayed effects of the sodium thiopentone. A control series was therefore investigated in which succinylcholine was replaced by the same volume of sterile water, and the B.P. taken after the same interval. Subsequently, the normal procedure was completed. It was found that the injection of sterile water had no significant effect on the blood pressure. The results were as follows:

No. of cases	10
Mean B.P. after sodium thiopentone	122.3/75.4 mm.
" " sterile water	121.8/74.5 mm.
Difference: $-0.5/-0.9$ mm. $\pm$ S.D. 7.8/9.1 mm.	

This proves that the rise must be due to the succinylcholine.

This rise in B.P. produced by succinylcholine is not very great, but if the relaxant is to be used for borderline cases in which any strain on the heart might be dangerous it is a matter of practical importance. It was decided to investigate the possibilities of ganglion-blocking agents in preventing this rise. The two substances tested were tetraethylammonium bromide (T.E.A.B.) and hexamethonium iodide ("hexathide").

Preliminary trials showed that both ganglion-blocking drugs achieved their maximum effects in two minutes, and that the optimum dose of hexamethonium iodide was 2 ml. of a 2% solution. The new procedure was as follows. After the first B.P. reading 2 ml. of hexamethonium iodide was injected, followed immediately, through the same needle, by the normal dose of sodium thiopentone. The B.P. was taken one minute after this, the rest of the procedure being identical with that in the first experiment. The results of this new procedure were satisfactory, and demonstrated that this dose of hexamethonium iodide did not produce a profound fall of B.P. and was enough to prevent the B.P. rising above the normal for the patient even after the convulsion. The results were:

No. of cases	10
Mean B.P. at the beginning	171.0/96.0 mm.
" " after fit (preceded by hexamethonium iodide 2 ml., thiopentone, and succinylcholine)	139.0/88.5 mm.
Difference: $-32.0/-7.5$ $\pm$ S.D. 27.3/21.2 mm.	

This procedure was repeated, using T.E.A.B. instead of hexamethonium iodide. It was found that 1 ml. of a 10% solution was just enough for most cases. The results were:

No. of cases	9
Mean B.P. at the beginning	159.4/91.1 mm.
" " after fit, etc.	152.8/92.8 mm.
Difference: $-6.6/+1.7$ $\pm$ S.D. 29.4/22.0 mm.	

The results with 2 ml. are but little more effective for the average case:

No. of cases	10
Mean B.P. at the beginning	184.5/93.5 mm.
" " after fit, etc.	168.0/92.5 mm.
Difference: $-16.5/-1.0$ $\pm$ S.D. 31.4/11.73 mm.	

Discussion

The most important of our observations is the undoubted rise in B.P. following an adequate relaxant dose of succinylcholine. This has previously not been described in the literature; in fact, succinylcholine in clinical doses has been stated to have no effect on the arterial pressure. Experiments on animals have shown that a dose of 25 times the normal, or even higher, is required to produce any increase in the B.P. The difference between this and the results found in our patients is probably a species difference. Since the hypertensive effect of succinylcholine is not eliminated by blocking the autonomic ganglia, either it must be due to an interference with the action of the blocking agent or it acts peripheral to the ganglion. If it be the former, then succinylcholine must have a reaction similar to the "nicotinic" action of acetylcholine. It is evident that the ques-

tion can be settled only by experiment, preferably on human tissue. This is outside the field of this paper, which is restricted to purely clinical matters.

Smaller doses of succinylcholine would have much less effect on the B.P., but then the specific value of this drug would be lost. It can be used to produce a paralysis so complete that no muscular activity can be seen at all during the "convulsion." This eliminates all strain on the cardiovascular system from that particular aspect—which is confirmed by the fact that the patient remains quite pink throughout. Furthermore, recovery from a full dose is just as rapid as from a smaller dose, unlike the longer-acting relaxants. Previous reports have indicated that the latter do not increase the B.P. This would be a contraindication to the use of succinylcholine were it not for the fact that the convulsion itself produces such a rise. If a ganglion block be used to deal with this, it can be used also to cover the hypertensive effect of the succinylcholine.

It was noticed on two or three occasions that after the injection of succinylcholine the pulse became irregular, apparently owing to extrasystoles. It is unlikely that such irregularities are common, and, in any case, they were never observed when the autonomic ganglia were blocked.

We have the impression that the effect of blocking the autonomic ganglia is greater in those patients with the higher blood pressures. This is probably true, but would require a special investigation, with careful standardization of many factors, to test it adequately.

Practical Points

The statistics given are based on a limited number of cases dealt with by the technique described. This, however, is unnecessarily elaborate for routine work, and normally all that would be required would be the following:

1. We consider that an injection of atropine should always be given, to reduce salivation and excessive bronchial secretion. When a relaxant is to be used it is important that the patient should be placed in a comfortable position, to prevent strain on the ligaments when not protected by the tone of the muscles.
2. Sodium thiopentone and succinylcholine may be mixed in the one syringe, provided this be done immediately before injection. This enables a one-syringe technique to be used when no ganglion-blocking agent is given.
3. The ganglion-blocking agent should be given before the mixture of thiopentone and succinylcholine, as the former takes slightly longer to produce its full effect.
4. If a few breaths of oxygen be given before the shock the patient stays pink throughout. In our experience with succinylcholine, running into several hundred administrations, we have never observed prolonged apnoea, which, we think, may be due to an unsuitable technique.
5. It has been our practice to press upon the epigastrium just before the current is passed, to prevent the patient waking with a stomach distended by the oxygen used for inflation.

6. *The Convulsion.*—With complete relaxation it is difficult to determine whether an adequate convulsive dose has been given. We have employed two methods for this purpose: (a) By noting the autonomic component of the cerebral discharge which constitutes the fit; the simplest observation is to look for dilatation of the pupils, and, particularly, injection of the conjunctivae. (b) As this method is not always accurate with ganglion-blocking agents we have devised a specific manoeuvre to demonstrate the presence of the fit. Immediately before succinylcholine is injected a tourniquet or a sphygmomanometer cuff is fixed round the opposite arm. If this be kept tight enough to compress the artery until the current is passed the effects of the shock will be observed in that arm only. Thus the patient may be seen lying absolutely motionless apart from a slightly modified clonic fit in the blocked arm. By this means one is never in doubt about the effectiveness of the current.

Summary

Succinylcholine is a safe relaxant for E.C.T.

It can be used to abolish the convulsion completely; even with the doses necessary to do this the patient's recovery from the fit is always rapid.

Succinylcholine produces a slight rise of blood pressure which is generally unimportant. If necessary, this can be controlled by blocking the autonomic ganglia.

When complete muscular relaxation is advisable succinylcholine can be administered with safety without any elaborate system of dosage. In such cases the presence of a fit can be detected by the simple manoeuvre described.

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CANICOLA FEVER

A HUMAN CASE IN NORTHERN IRELAND

BY

C. COTTON KENNEDY, B.M., B.Ch.

Assistant Pathologist, Northern Ireland Public Health Laboratory, Belfast

T. H. CROZIER, M.D., B.Sc., F.R.C.P.

Physician to the Royal Victoria and Belfast City Hospitals

AND

A. C. HOUSTON, M.D., M.R.C.P.Ed.

Late Senior Medical Registrar, Belfast City Hospital

In 1931 Klarenbeek and Schüffner (1933) isolated *Leptospira canicola* from the urine of a dog. This discovery was soon followed by the recognition of *L. canicola* infections in man (Dhont *et al.*, 1934). Baber and Stuart (1946) reported the first human infection in England; Joe and Sangster (1951) published the first cases in Scotland, although Stuart (1938), in a survey of Glasgow tripe-workers, had found agglutinins in low titre to *L. canicola* in the serum of a woman who gave no history of illness. In the four-year period 1947–50 70 cases were diagnosed in England and Wales (Broom, 1951). Figures given by Alston (1951) show that 25 cases occurred in 1949 and 33 in 1950.

Broom (1951), in a review of leptospirosis in England and Wales, drew attention to the fact that no human case of canicola fever had yet been reported from any part of Ireland, although his survey of the incidence of the disease in Dublin dogs had shown the infection rate in that city to be as high as in England.

The case recorded here is, we believe, the first serologically proved human infection with *L. canicola* reported from Ireland.

Case Report

A muscular and well-nourished man aged 36 was admitted to a surgical unit of the Belfast City Hospital on February 1, 1952. Eight days before admission he complained of feverishness and shivering attacks of abrupt onset. He was forced to give up work six days before admission, and he took to bed one day later. He then developed pains in the legs, lumbar regions, and right renal angle; these were severe and disturbed sleep. Other symptoms were colicky pains in the right hypochondrium and epigastrium, loss of appetite, vomiting, tiredness, photophobia, and very severe frontal headache. Frequency of micturition, dysuria, and oliguria caused him to summon his medical attendant, who visited him on January 29 and found his temperature to be 102° F. (38.9° C.) and the urine to contain a heavy cloud of albumin. A tentative diagnosis of acute pyelitis was made and treatment by oral sulphatriad instituted. The pyrexia promptly subsided, but nausea and vomiting became troublesome, and admission to hospital was arranged.

On admission his temperature was 98° F. (36.7° C.), pulse 104, and respirations 22. Clouding of consciousness was considerable; there was no neck rigidity, and Kernig's sign was negative. The face was flushed and the conjunctivae were markedly congested and suffused. Jaundice was absent. A patchy erythema was noted on the chest, also labial herpes. The tongue was coated. Slight tenderness was elicited over the right upper abdomen, the liver and spleen were not palpable, and the renal angles were free. The urine was acid and contained a trace of albumin with scanty red blood cells but no pus or organisms. On the day after admission the temperature rose to 99.2° F. (37.3° C.), but afterwards remained subnormal.

The patient was seen at this stage by one of us (A. C. H.), and the possibility of leptospiral infection was discussed. He was transferred to a medical unit for further investigation, although clinical recovery was rapid and uneventful. Discovery of a positive leptospiral agglutination prompted an exhaustive inquiry into the history of the case, and it was found that the patient's dog had sickened and died after a few days' illness, during which the patient had tended the animal and handled it a great deal. The patient first felt unwell about three days subsequent to the dog's death. He worked as a labourer in a bakery which was infested by rats and required periodical deratting. One such campaign had occurred about a week before the present illness.

The patient insisted on being discharged on February 11, before an effective penicillin course could be completed. Shortly after leaving hospital the muscular pains reappeared and a pustular rash developed on his face. He returned to hospital on his doctor's advice two weeks after his initial discharge. On this occasion his general condition seemed satisfactory, and the limb pains rapidly subsided. He was given a penicillin course (2,000,000 units daily, intramuscularly, for 12 days) and the laboratory tests were repeated. The leptospiral agglutinins of the other members of the household and of three fellow workers were examined.

Agglutination Tests

The technique of the agglutination tests was Broom's (1948) modification of that of Schüffner and Mochtar (1927). The first specimen of blood, taken on the 12th day of illness, agglutinated *L. icterohaemorrhagiae* and *L. canicola*, both to titres of 1 in 300. (In the early stages of leptospirosis equal or nearly equal titres are common.) Subsequent specimens, taken over a period of weeks, gave agglutinations which showed a falling away of the heterologous titre, while the homologous titre remained high (see Table I).

It will be seen that the second specimen of blood serum (taken on the 19th day of illness) gave agglutination in higher titre for *L. canicola*; this serum was sent to Dr. J. C.

TABLE I.—*Leptospiral Agglutination Tests*

Duration of Illness	Reciprocal of Titres	
	<i>L. icterohaemorrhagiae</i> (Strain Jackson)	<i>L. canicola</i> (Strain Utrecht)
12th day ..	300	300
19th ..	1,000	300. $\pm$ at 1,000. Trace at 3,000
48th ..	300. Trace at 1,000	3,000
66th ..	100	1,000. Trace at 3,000

Broom for confirmation. In view of the nearly equal titres for both *L. icterohaemorrhagiae* and *L. canicola*, a cross-absorption test was carried out. Dr. Broom's result is shown in Table II, clearly demonstrating *L. canicola* as the infecting organism.

In addition, agglutination reactions against *L. icterohaemorrhagiae* and *L. canicola* were performed on blood samples from the patient's wife and eight children, and from three of his workmates. All results were negative.

TABLE II.—*Results of Cross-absorption Test*

	Reciprocal of Titres	
	<i>L. icterohaemorrhagiae</i>	<i>L. canicola</i>
Unabsorbed ..	1,000	1,000. Trace at 3,000
Absorbed:		
<i>L. icterohaemorrhagiae</i>	0	300. Trace at 1,000
<i>L. canicola</i> ..	0	0

0 = Negative in all dilutions from 1/30 upwards.

Other Laboratory Investigations

The blood urea was 100 mg. per 100 ml. on May 4, 44 mg. on May 7, and 38 mg. on May 26. On May 5 the white blood cells numbered 16,300 per c.mm. On May 27 the cerebrospinal fluid (examined after readmission) was normal, and the erythrocyte sedimentation rate 4 mm. in one hour (no E.S.R. done on first admission). On May 28 a blood count showed: haemoglobin, 13.3 g.% (90% Haldane); red cells, 4,400,000 per c.mm.; white cells, 6,600 per c.mm.; haematocrit, 42%; mean corpuscular volume, 96 μ^3 ; mean corpuscular haemoglobin concentration, 32%; normal film. Liver-function tests: serum bilirubin, normal; thymol turbidity, 4 units; alkaline phosphatase, 7 units per 100 ml.; plasma proteins—albumin 5.6 g.%, globulin 2.4 g.%, total 8 g.%; bromsulphthalein, normal (no retention of dye). The Wassermann reaction was negative.

Animal Inoculation.—After the urine had been made alkaline to litmus a guinea-pig was inoculated intraperitoneally with 2 ml. of the centrifugized deposit (33rd day of illness). The animal remained well and was sacrificed 22 days later: no leptospirae were seen by direct microscopy and none were isolated by culture. Failure to isolate the organism was probably due to the fact that the guinea-pig is not highly susceptible to infection with *L. canicola* (Mackay-Dick and Watts, 1949; Whitehouse, 1952, and others). Also, the patient's premature departure prevented the collection of a urine specimen at the optimum time. The patient had earlier received several injections of penicillin, which may have been lethal to the leptospirae.

Summary

The occurrence of a case of canicola fever in Ireland is reported. Infection was probably by dog's urine. The case presented characteristic clinical features—namely, abrupt onset with rigors, muscular pain, headache, photophobia, and gastro-intestinal and renal upset. Jaundice was absent. Recovery was rapid.

We wish to thank Dr. J. C. Broom, of the Wellcome Research Institution, London, for his advice and for carrying out the cross-absorption test. We are indebted to Dr. A. H. Diamond for his help with the early clinical details, and to Dr. Mary Uprichard, resident medical officer, Belfast City Hospital, for her painstaking

work on the case. Acknowledgment is also due to Dr. V. D. Allison, Director of Laboratory Services, Northern Ireland Hospitals Authority, for his interest in the laboratory work.

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TWO EXAMPLES OF THE -D/-D- GENOTYPE IN AN AMERICAN FAMILY

BY

R. K. WALLER,* M.D.

Department of Clinical Pathology, Medical College of Virginia, Richmond, Virginia

RUTH SANGER, Ph.D.

Medical Research Council, Blood Group Research Unit, the Lister Institute, London

AND

O. B. BOBBITT, M.D.

Department of Clinical Pathology, University of Virginia Medical School, Charlottesville, Virginia

This report deals with unusual findings in both the red blood cells and serum of a 48-year-old white woman (Mrs. V.W.) suffering from tuberculosis. In 1940 she received one bottle of blood following the first stage of a thoracoplasty. No transfusions were required for the two operations performed several months later. In May, 1952, she submitted to partial lobectomy, during which procedure four bottles of blood were administered. Eight days after the operation her serum was found by one of us (O. B. B.) to be incompatible with 72 random Group O bloods. The only blood found to be compatible was that of the patient's brother, J.C.

The Red Cells of Mrs. V. W.

The blood groups of the patient (Mrs. V.W.) are: O, NsNs, P+, Lu(a-), kk, Le(a- b+), Fy(a+), Jk(a-), Tj(a+), and Mi(a-); the blood groups of her brother (J.C.) are the same save that he is MNSs and Jk(a+). Only the Rh grouping presented any difficulty.

The red cells of Mrs. V.W. and of her brother were strongly agglutinated by anti-D sera; though not agglutinated by anti-c sera they were only weakly agglutinated by a powerful anti-C serum. The clue to the situation was revealed when it was found that saline suspensions of both samples of red cells were agglutinated by incomplete anti-D. This called to mind the remarkable case of Mrs. B., whose genotype was -D/-D- (Race, Sanger, and Selwyn, 1950, 1951).

Subsequent investigation showed that the Rh genotypes of Mrs. V.W. and of her brother were indeed -D/-D-. Saline suspensions of the two samples of red cells were agglutinated by three complete anti-D sera, by 14 incomplete anti-D sera, by five anti-C sera which also contained incomplete anti-D, and by one anti-E serum which also contained incomplete anti-D.

*Dr. R. K. Waller has died since the completion of this report.

Saline suspensions of both samples were not agglutinated by one anti-C serum free from incomplete anti-D, five anti-E sera free from incomplete anti-D, five anti-c sera, three anti-e sera, one anti-Cw serum, and three samples of incomplete anti-D. Neither sample of red cells reacted with two incomplete anti-C sera free from incomplete anti-D (from Rh-positive donors). Neither sample reacted with the serum of the original -D/-D- patient, Mrs. B.: this serum had agglutinated all of more than 1,400 samples of Group O red cells, and was shown to contain anti-C, anti-c, and anti-e (Race, Sanger, and Selwyn, 1950, 1951).

Saline suspensions of red cells of the original -D/-D- patient, Mrs. B., had been agglutinated by 14 out of 16 incomplete anti-D sera. Dr. Philip Levine, of Ortho Research Foundation, has tested saline suspensions of the red cells of Mrs. V.W. against titrations of 13 incomplete anti-D sera; the results are shown in the Table; the cells were agglutinated by 11 of the 13 sera. The agglutination of these cells, however, is not directly related to the titre of incomplete anti-D, as is indicated by the striking differences observed in the behaviour of the five sera of highest titre. Dr. Levine showed that the absence of C from the red cells of Mrs. V.W. could also be demonstrated with the aid of a complete anti-D+anti-C serum; he found that the anti-D component could be successfully blocked by the addition of selected incomplete anti-D (see Table).

Differences in Behaviour of Various Anti-D Sera. Tests by Dr. Philip Levine with 13 Sera Containing Incomplete Anti-D

Titre	No. of sera	Titration with cells of Mrs. V. W. in saline
1/4	1	1/2
1/8	1	1/1
1/16	1	1/8
1/32	1	1/2
1/64	3	1/4, 1/4, 1/64
1/128	1	1/4
1/512	5	0, 0, 1/2, 1/128, 1/256

The Serum of Mrs. V. W.

The serum of Mrs. V.W. has reacted with all of approximately 250 unselected samples of Group O red cells so far tested; it does not react with those of her brother J.C. or with those of Mrs. B. The serum reacts only weakly with cells suspended in saline but strongly by the indirect antiglobulin, the albumin, and the trypsin methods.

Titration of the serum of Mrs. V.W. showed values of 1/128 to 1/256 with the indirect antiglobulin test. Titration with bloods of various genotypes failed to reveal direct evidence of a mixture of antibodies. Absorption experiments now being done present considerable difficulties because of the small quantities of serum available and a gradual diminution of titre in more recent bleedings. So far only anti-e has been isolated, after absorption with cDE/cDE red cells. In view of the parallelism with the blood of Mrs. B. it is very likely that the high incidence of positive reactions is due to the presence of antibodies for both C and c and perhaps E as well as e. Under such conditions all bloods would be incompatible except those with the identical genotype -D/-D-. No atypical antibodies could be demonstrated in the serum of the compatible sibling, J.C.

As in the case of Mrs. B., there is a history of cousin marriage: the parents of Mrs. V.W., each of whom must have contributed the chromosome -D-, were first cousins. Efforts are being made to trace any consanguineous relationship between the British and American families. Further studies are planned on three additional surviving siblings, five others having died—three from tuberculosis, one from influenza, and one from accidental causes.

It may be that the chromosome -D- is not as rare as it was first thought to be; it may, for example, be no rarer than the chromosome CdE. In the heterozygous state the chromosome -D- would usually escape detection, though it can be recognized if it is specially sought for (Race, Sanger, and Selwyn, 1951).

Summary

Two further examples of blood representing the Rh genotype -D/-D- are described. The samples come from a white American woman and her brother, offspring of a first-cousin marriage.

The sister has had five blood transfusions. Her serum is incompatible with all of about 250 unselected samples of Group O blood, but it is compatible with her own red cells, her brother's, and with those of the original -D/-D- British patient. Of the several antibodies which are doubtless present only anti-e has so far been identified. No unusual antibodies could be found in the serum of the brother.

The red cells of the two Americans are the only samples so far found to be compatible with the serum of the British patient, besides her own, though more than 1,400 samples have been tested.

We wish to thank Mrs. V. W.'s physician, Dr. I. N. Hunnicutt, of Virginia, for his active help in this investigation.

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Medical Memoranda

Uterine Chorionepithelioma

The possible development of chorionepithelioma following hydatidiform mole is well recognized, although there is a wide variation in estimates of the incidence of the malignant change. In the follow-up of cases of hydatidiform mole the biological tests for the excretion of gonadotrophin in the urine occupy a prominent position, but the interpretation of their results presents problems which are not widely enough understood, despite the excellent summary by Brews (1950). The following case illustrates the difficulty of diagnosis when the Aschheim-Zondek reaction is only weakly positive.

CASE REPORT

The patient, a 1-para aged 32, had had an uneventful pregnancy three years previously. Her last menstrual period began on February 1, 1950, and very early in the pregnancy she attempted to procure a miscarriage by taking a large dose of quinine. At the ninth week of amenorrhoea vaginal bleeding occurred and the case was treated as one of threatened abortion. It was noted at this time that the uterine enlargement corresponded to that of a 12-weeks pregnancy. The diagnosis of hydatidiform mole was made at the eleventh week, when the fundus of the uterus had arisen to midway between the pubic symphysis and the umbilicus. At this stage the early morning urine gave a positive Aschheim-Zondek reaction in a dilution of 1 in 10, but was negative at 1 in 100.

Vaginal evacuation of the uterus was effected on April 22 after dilatation of the cervix by laminaria tents. The tumour removed was a typical hydatidiform mole with characteristic microscopical appearance. There was no evidence of malignancy in the sections. Twenty days later the uterus had involuted satisfactorily and the Aschheim-Zondek reaction had become negative. But further biological tests were made at intervals, and 57 days after evacuation it was found that the Aschheim-Zondek reaction was again positive, though negative in dilution.

The patient was readmitted to hospital and examined under an anaesthetic on July 7. The uterus was bulky, the cavity measuring 3½ in. (9.5 cm.), and the left ovary was

slightly enlarged. With a ring forceps, fragments of apparently typical hydatidiform mole were removed, and then a curettage was performed. Microscopy revealed considerably more trophoblastic activity than in the original specimen, with variations in nuclear size and density, and occasional mitoses. No villi were seen in the curettings. Some bleeding persisted, and one week later the Aschheim-Zondek reaction was still positive, though remaining negative in dilution. X-ray examination of the chest showed no abnormal shadows.

In view of the recurrence of the mole with atypical trophoblastic activity, total hysterectomy with bilateral salpingo-oophorectomy was performed on July 21—that is, 91 days after evacuation of the mole. Both ovaries contained small luteinized and atretic follicles; in the right ovary there was also a recently ruptured small lutein cyst. The uterus was bulky and contained a haemorrhagic tumour approximately $\frac{1}{2}$ in. (1.3 cm.) in diameter near the right cornu. The growth extended from the endometrium through approximately half the thickness of the uterine wall. Microscopically the growth was a typical chorionepithelioma with malignant trophoblastic elements invading the myometrium. Sections of the ovaries and uterine tubes revealed no secondary deposits.

The patient's progress was uneventful; at examinations 7 and 16 weeks after operation there was no clinical evidence of recurrence, and on each occasion the Hogen test was negative. Subsequent direct follow-up has not been possible, as the patient went abroad, but a letter reports that she was well in January, 1952.

COMMENT

In 1939 Brews observed that as a method of absolute diagnosis of active chorionepithelioma quantitative hormone assays had failed to realize initial expectations. By that time cases had been reported in which the biological tests for urinary gonadotrophin had remained negative in the confirmed presence of a tumour. Cuscaden and Bettinger (1940), in describing a case in which certain features closely resembled that now reported, refer to the possible fallacies of the biological tests and maintain an attitude of great caution in accepting reports of cases of chorionepithelioma without a positive Aschheim-Zondek reaction. The possibility of a negative pregnancy test in the presence of chorionepithelioma is mentioned by Baird (1950) and Browne (1950), while Sutherland (1951) has collected 19 reports of such cases from the literature, and Richli (1950) describes another in detail.

In trying to explain the negative and only weakly positive reactions the factors to be considered include haemorrhage, necrosis, thrombosis, and fibrous reaction; all of these may separate the tumour from healthy maternal tissue and so limit the absorption of gonadotrophic hormone. Browne (1950) suggests that the degree of anaplasia present in the cytotrophoblast may determine the strength of the Aschheim-Zondek reaction. Sutherland (1951) attempts to relate the very weakly positive reaction to an almost complete absence of syncytium, although he admits that this is not in accordance with the experimental evidence of Jones, Gey, and Gey (1943), who found that the Langhans cells were apparently responsible for the production of chorionic gonadotrophin.

The cases described by Browne (1950), Ehrhardt and Bureck (1939), Scott (1939), and Brews (1950) illustrate the dangers of waiting to establish a firm histological diagnosis in the presence of a persistently positive pregnancy reaction after evacuation of a hydatidiform mole. When the reaction has become negative soon after expulsion of the mole, and later in the absence of a new pregnancy it again becomes positive, radical treatment is indicated. This view, however, is not shared by Siegler, Ravid, and Tobin (1950), who, in presenting a review of 12 cases of chorionepithelioma and acknowledging the fallibility of the biological tests, advise that, "so long as the titre is decreasing or at least remaining constant, watchful conservatism may still be

applied." Such a recommendation appears highly dangerous, bearing in mind the fatal cases of Brews and of Ehrhardt and Bureck, referred to above.

Shively (1950) assesses the reliance to be placed upon quantitative urinary gonadotrophin determinations by saying that, because of the variations encountered, they should be used only as confirmatory evidence in the diagnosis of these neoplasms and should not be regarded as necessary diagnostic criteria.

Publication of this case report has been approved by the Director-General, Army Medical Services.

P. A. TRAFFORD, M.B., B.S., Major R.A.M.C.,
Military Families Hospital, London, S.E.18.

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Traumatic Encephalopathy from Boxing

The risk of serious intracranial damage occurring in boxing is well known, and the following account may be of interest to those concerned with the welfare and medical examination of boxers.

CASE REPORT

A miner aged 26 had boxed on numerous occasions since the age of 15 and as a professional from the age of 20. An ample history, obtained from various sources, failed to reveal evidence of previous mental disorder or any other abnormality, except a minor degree of mental dullness indicated by his school work and Army records. His I.Q. was reported to have been 90 on the Stanford-Binet scale (Form L) when he was tested at some unspecified time before leaving school at the age of 14.

Two years ago, after becoming cruiser-weight champion of his area, slight changes in character became apparent, shown in the form of egocentricity and of monopolizing the conversation with accounts of the various opponents whom he had knocked out. Soon he was knocked out himself after only 18 seconds in the first round, and three months later, in an encounter with a boxer thought by all to be inferior, he took so much punishment that the fight was stopped in the fourth round. His friends were now finding him more quarrelsome and garrulous; he often complained of headaches, and he expressed mild paranoid ideas about his wife which eventually resulted in his admission to a mental hospital a year ago, after he had made threats to kill her with the carving-knife.

He was then found to be slightly confused, was alternately excited or unduly reticent, and had also a slight spatial and temporal disorientation, misidentification of persons around him, confabulation with an associated patchy memory defect for events of the preceding four months, and fleeting olfactory hallucinations. Abnormal physical signs were slurred speech, absent abdominal reflexes on the left side, and a slightly ataxic gait of cerebellar type. The cerebrospinal fluid and an x-ray film of the skull were normal.

Gradual improvement took place over a period of six months with sedation and rehabilitation, and he was then

discharged from hospital and obtained work as an unskilled labourer. Residual signs then were amnesia for events over a period of one to two weeks at the time of his last two fights, and what appeared to be a reduction in intellectual capacity. His I.Q. on the Stanford-Binet scale (Form L) was 65. On Raven's progressive matrices and on Kohs's blocks test he was at the 5 percentile and on the Mill Hill vocabulary scale at the 10 percentile level. There were now no abnormal signs neurologically. The E.E.G. showed reduced activity in all leads.

COMMENT

The difficulties in the diagnosis of this type of case have been summarized by Bremner (1950) and one has to admit that the difference in the I.Q. may be wholly or partly due to other factors, and also that further improvement might have been found had examination at a later date been possible.

One hesitates to go as far as Carroll (1936), who believes that every knockout is likely to cause irreparable damage, although the boxer intellectually below average is more likely to show persistent clinical abnormality. A further difficulty is the fact, as observed by Jokl (1941) and others, that severe cerebral injury may occur without anything unusual being observed by spectators at the time, and medical elimination of a contestant in such circumstances may be strongly opposed. Romino (1949) puts forward various suggestions to make boxing safer, such as equality of matching, medical records of each fight, and no fights for three months after being knocked out, to which might be added the use of psychometric tests at intervals and the search for minimal neurological abnormality.

R. B. TAYLOR, M.R.C.S., L.R.C.P., D.P.M.

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Comparison of Treatment of Haematemesis by Drip Transfusion of Stored Blood and by Direct Transfusion

The aim of treatment of haematemesis is to produce haemostasis; where a large artery is eroded this can be achieved only by surgery, but haemorrhage from small arteries and veins is stopped by the natural process of vasoconstriction and thrombosis. That repeated transfusions of stored citrated blood may inhibit this natural process, whereas small direct transfusions aid vasoconstriction and thrombosis, is suggested by the histories of the following three cases.

CASE 1

A married woman aged 52 was admitted to hospital on June 24, 1952. She was well until 12 hours previously, when there was a sudden onset of diarrhoea followed by melaena.

On admission her general condition was good, the haemoglobin being 73%. Nine hours later she passed a tarry stool and became pale. Systolic blood pressure was 70 mm. Hg and haemoglobin 44%. A drip transfusion of stored blood was begun, and 3 bottles (each 500 ml.) were given over a period of four hours, followed by 1 litre of normal saline, then 2 bottles of blood at a slower rate. Three hours after the transfusion had finished, haematemesis recurred and the patient became shocked. A surgeon advised medical treatment. A drip transfusion was begun, being continued for two days, during which period further repeated attacks of haematemesis and melaena occurred and 7 bottles of blood and 2 litres of saline were given.

Three days after admission the patient's condition was so low that surgical operation was hazardous, and it was decided to try direct transfusions. Three were given at intervals of approximately four hours, and her condition

improved. Twenty-four hours later haematemesis recurred and a drip transfusion of 6 bottles of blood and 1 litre of saline were administered. This transfusion continued over 35 hours, during which period melaena and haematemesis occurred repeatedly.

Her condition was again desperate, and two further direct transfusions were given at intervals of four hours. Although several melaena stools were passed there was no further evidence of severe haemorrhage.

On July 1 the haemoglobin was 48%; two direct transfusions were given to raise the haemoglobin, which on July 15 reached 70%. At this stage a generalized erythematous rash developed, labelled the Stevens-Johnson syndrome, which delayed her discharge from hospital until August 9. X-ray examination of the stomach and duodenum was reported as N.A.D. All told, the patient was given 19 bottles of stored blood and 6 direct transfusions.

CASE 2

A man aged 36 was admitted to hospital on December 27, 1951, suffering from haematemesis and melaena.

On admission he was in a shocked state, and a drip transfusion was begun; 4 bottles of bank blood were given, and his condition improved. Within nine hours further haematemesis occurred, and the drip transfusion was recommenced. During the next five days the transfusion was continued and 29 bottles of blood and 9 litres of glucose-saline were administered. During this period the patient repeatedly vomited blood and passed melaena stools.

On January 3, 1952, he was seen by me. His general condition was very low; systolic blood pressure was 90 mm. Hg and haemoglobin 38%. During a period of two days he was given five direct blood transfusions. His condition improved, and no further bleeding occurred. X-ray examination showed no abnormality of the stomach or duodenum. He had been given 34 bottles of blood, 9 litres of glucose-saline, and five direct transfusions.

CASE 3

A man aged 28 was admitted to hospital on March 10, 1951. He was suffering from haematemesis and melaena, which occurred on the day of admission.

On examination his skin was pale and he was in a shocked condition. He was immediately given a transfusion of 4 bottles of stored blood by the drip method. The next day he vomited blood and the haemoglobin was 52%. Another drip transfusion was started, and during a period of 17 hours 6 bottles of stored blood were given; but during the transfusion further haemorrhages occurred and on March 13 the haemoglobin was 42%. Another 3 bottles of stored blood were transfused. On March 14 there was severe melaena, and the haemoglobin was 40%. Two bottles of bank blood were given, but again there was haematemesis.

The patient was seen by me at this stage. Three direct transfusions, each of 500 ml., were given on the 14th, 15th, and 16th. Subsequently there was no further bleeding. On March 24 the haemoglobin was 83%. X-ray examination on March 27 showed evidence of duodenal ulceration. He had been given 15 bottles of bank blood and three direct transfusions.

COMMENT

In these three cases severe haemorrhage occurred during the prolonged transfusion of large quantities of stored blood and ceased when fresh blood was transfused at short intervals by the direct method. Further investigation, such as a planned research project, would be necessary to establish the validity of this observation as indicating an untoward effect of stored blood transfusions when given to excess, and the purpose of recording these cases is to suggest that such an investigation would be worth while.

Recent work on blood coagulation and thrombosis emphasizes the importance of blood platelets in the natural

This large volume is the second edition of a treatise that enjoys a considerable reputation. It is the work of 87 authors, distinguished for their contributions to paediatrics and allied subjects, and they deserve congratulation for their industry in producing, under the leadership of Grulee and Eley, a reference book of much merit. It is only natural that the chapters should vary in quality and that there

pathognomonic. When the child is awake there is a low-pitched inspiratory stertor in the early stages, with a louder and lower-pitched coarse expiratory rattle, resembling a snore. Later, when oedema is marked, the inspiratory stertor is replaced by a somewhat muffled high-pitched stridor, or the inspiratory stridor disappears, the expiratory component remaining unchanged. He emphasized that these were dry sounds and had to be distinguished from the "ruttling" produced by mucus. If the epiglottitis could not be seen by tongue depression or laryngoscopy, or if laryngoscopy was thought inadvisable, a lateral radiograph of the throat was sometimes useful in showing the narrowing and obstruction of the airway above the vocal cords. Camps described similar cases in Britain, but *H. influenzae* Type B was recovered in only two, though in the earlier cases seen by him this organism was not specifically looked for. The mortality in these cases is quite high. In Rabe's series it was 18%.

The treatment is basically the same for both types—the relief of anoxia, the provision of an airway, and the combating of infection. Humidification of the atmosphere by a steam kettle or aerosol vaporizer seems to be beneficial. Briggs and Heseltine, in common with other workers, strongly advocate that tracheotomy should be performed as an elective procedure, not as a last desperate measure in a moribund child. If the child with restlessness and severe stridor does not rapidly respond to rest in bed, or if there are cyanosis, extreme fatigue, increasing restlessness, pallor, and stridor, with decreasing air entry, tracheotomy should be performed without delay. In the "virus" type this is essential to secure an airway, and to enable the thick tenacious secretions, which are the principal cause of death, to be sucked out of the bronchi. For this purpose they found that an electrical sucker with polythene tubing was needed: the water suction apparatus was not adequate. Rotation of the head combined with twisting of the curved tubing allowed easy passage of the tube into either main bronchus, and down distally to a distance of 4 to 6 in. (10 to 15 cm.) in a child aged 3 to 6 months. Suction was repeated in most cases every three to four hours on the first post-operative day. A soft rubber catheter was used to keep the tracheal tube clear of mucus. They emphasized that a special nurse is essential for each child, that the patient should not be hidden in a canvas tent, and that lighting at night should be adequate for inspection of the child. If there is sudden deterioration, the nurse is told to remove the inner tube immediately and

apply suction to the outer tube while another nurse sends for medical help. They thought that intubation or bronchoscopy should be an emergency procedure only: repeated bronchoscopy would do more harm than good by damaging the inflamed cords. Of Rabe's 347 cases, 35 (12%) required tracheotomy. Of the 39 cases described by Briggs and Heseltine, 9 needed it.

The use of antibiotics is strongly advocated by many workers, but it is not clear which is the best one to use. Penicillin is undoubtedly effective in many cases, but *H. influenzae* Type B is only moderately sensitive to it and is more likely to respond to chloramphenicol, in a dose of 100 mg. per lb. (220 mg. per kg.), or to terramycin or aureomycin, in a dose of 50 mg. per lb. (110 mg. per kg.). In the "virus" type it is probable that only secondary invaders respond to the drug, whichever is used. Some clinicians also give a sulphonamide (such as sulphamezathine). In America type-specific rabbit serum is given for the cases due to *H. influenzae*, but the exact role of this is uncertain, and it is not normally available in Britain. Whatever antibiotic or other "specific" treatment is given, it must always be remembered that the relief of mechanical obstruction is essential, and that death is much more likely to result from suffocation than from the actual infection.

It is clear that "infectious croup," which includes epiglottitis and laryngotracheobronchitis, should be treated with the greatest respect by the family doctor. If there is a sudden onset of stridor, or if there is an insidious onset of stridor which becomes progressively worse, the child should be sent to hospital without delay. Serious harm is done by waiting until the child is cyanosed, has severe intercostal recession, or is otherwise seriously ill before he is sent in. Furthermore, hospitals which admit small children should have an emergency tracheotomy set ready at all times, so that acute emergencies due to laryngeal or bronchial obstruction can be dealt with immediately.

NOTIFICATION OF PUERPERAL PYREXIA

When child-bed fever was a scourge methods were needed of estimating its frequency, investigating its source, and determining how its spread could be controlled. As knowledge of the bacteriology and the modes of transmission of puerperal sepsis increased, there was a decline in the mortality rate in the first 35 years of this century. The introduction of the sulphonamides caused a further rapid decrease in the death

rate, and when this fall had largely lost its impetus the discovery of penicillin and other antibiotics effected a further decline. In Britain a maternal death from sepsis is now a rare occurrence. But the improvement in the mortality rate is not due to chemotherapy alone: better antenatal care, improved methods of prophylaxis, and increasingly high standards of obstetrical and nursing practice have all contributed, and this is reflected in the fact that the mortality from post-abortion infections has not fallen equally with that from puerperal sepsis.

Because of the decline in morbidity as well as mortality, the puerperal pyrexia regulations were amended in England and Wales in 1951, so that any fever of 100.4° F. (38° C.) or more in a woman within 14 days after confinement or miscarriage became notifiable. Under the previous regulations the temperature of 100.4° F. had to be maintained over or recur within 24 hours; the period covered was 21 days, and the first 24 hours after delivery were excluded. One reason given for supplanting these older regulations was that the use of newer drugs reduced the temperature promptly and so prevented an infection from becoming notifiable. This seems peculiar reasoning when it is considered that puerperal pyrexia is not a specific entity like measles or mumps. Moreover, a single innocent spike of temperature is common within 24 hours of delivery and is almost the rule after caesarean section or other operative delivery.

The 1951 regulations were therefore not received without some criticism, and in his health report for 1951 the Medical Officer of Health for Ilford, Dr. I. Gordon, asks some pertinent questions about what is being notified and who is doing the notifying. The object of the regulations is to control infections of the genital tract, but the cause of the pyrexia is not required to be stated on the notification form. Dr. Gordon therefore obtained information on the cause of the fever in 62 of the 65 cases notified to him in the last five months of 1951. In 50 of the 62 cases the fever was unconnected with any genital infection, and in more than half of all the cases it was ascribed to some disorder of lactation. It is possible that in some, perhaps many, of the cases notified the exact cause of the pyrexia was not known but was imputed to engorgement of the breasts. Dr. Gordon also found that in Ilford 89% of the notifications came from hospitals, although only 63% of deliveries took place in hospitals. He reasoned from this that, even though the complicated cases might have gravitated to hospital, the busy family doctor might omit to fill in yet another

form, while the hospital officer, more conscious of temperature charts and of regulations, notified every case of pyrexia. Dr. Gordon therefore concluded that, in his borough at any rate, the notification of puerperal pyrexia bore little relationship to infection of the genital tract and could be dispensed with.

It is indeed doubtful whether the notification of puerperal pyrexia still serves the public health purpose for which it was originally introduced. Maternal mortality from puerperal sepsis is now so low in this country that it is no longer a reliable index of the efficiency of the maternity services or of the state of maternal health after confinement. Yet compulsory notification, if less valuable to the community as a whole, may still be of benefit to the individual woman, for it ensures that the midwife, whose statutory period of attendance on the puerpera is 14 days, summons medical aid at the first possibility of infection. But in their present form the regulations do not provide a satisfactory maternal morbidity index, and, as Dr. Gordon points out, may produce inaccurate statistics, especially in regard to domiciliary confinements. Any system of notification of disease is enhanced in value if the need for flexibility in its application is appreciated. For instance, in the light of present views on the connexion between maternal rubella in early pregnancy and congenital malformations there is much to be said for the compulsory notification of that infectious fever throughout the country. Again, while retaining the present puerperal pyrexia regulations as a rule of the Central Midwives Board, a system of notifying specific complications of labour and abortion, irrespective of the presence of pyrexia and with a more generous time limit, might be useful in evaluating both prophylactic and curative measures in this sphere. Indeed, much could be learnt by making notifiable not only maternal complications such as venous thromboses but also foetal abnormalities the origin of which remain obscure, such as congenital malformations and retrolental fibroplasia. Such notification, if not of purely public health interest, would serve to bring closer together the interests of the community and the interests of the individual.

PROPHYLAXIS OF RHEUMATIC FEVER

It has long been known that the daily administration of a small dose of a sulphonamide, usually sulphadiazine, can be continued without harm for many months, and that it will usually prevent streptococcal throat infection and thus recurrences of rheumatic fever. More recently penicillin has been used for this purpose,

and has usually been given by the mouth. Owing to the very high sensitivity of *Str. pyogenes* of Group A to penicillin the low and variable concentrations resulting from this method of administration are nevertheless enough to keep this organism in check. A course of injections continued throughout the winter is obviously impracticable, particularly in a child, but if the interval between injections could be greatly lengthened this alternative would be worth considering for the increased certainty of its effect. One line of progress has been the development of preparations which in single doses will act for longer and longer periods. One- and two-day effects have been commonplace for some time, but a preparation of which the effect is measured in weeks is now available in N,N'-dibenzylethylene-diamine dipenicillin G, known as "bicillin" or benzethacil. The first full account of this substance was given by Elias, Price, and Merriam,¹ of the Wyeth Institute of Applied Biochemistry. Its outstanding property is the very low solubility of only 200 units per ml.: it is also tasteless, which is claimed as an advantage for oral administration. Injected intramuscularly merely as an aqueous suspension a dose of 300,000 units gave detectable amounts in the blood for five days, and one of 2,500,000 units for as long as 15 days. Admixture with a non-aqueous base can prolong these times further, although presumably amounts in the blood will then be lower and perhaps less constant. The first account of work done with benzethacil in this country is published in this issue of the *Journal* (p. 188). The authors of the report, Drs. A. P. Fletcher and C. R. Knappett, have found that the intramuscular injection of an aqueous suspension of benzethacil "gives sustained levels of serum penicillin considerably superior to any repository penicillin preparation yet developed," though in some subjects assayable amounts of penicillin appeared in the serum intermittently.

Several important uses can be thought of for a form of penicillin possessing such remarkable properties, and it is not surprising that among these the possible prophylaxis of rheumatic fever has been studied. Stollerman and Rusoff² have administered benzethacil to 143 rheumatic subjects (all but eight being children) for periods of 2 to 10 months. It must be said at once that they obtained no proof of its efficacy in preventing rheumatic fever, since although no recurrences took place in treated subjects there was only one in an untreated patient in the same institution during the period of observation. The drug was injected first in simple aqueous suspension and later in a "polyvinylpyrrolidone vehicle." Patients were given 300,000 units weekly, 600,000 units bi-weekly, or 1,200,000 units monthly, and an extensive series of blood assays showed that each of these systems can be depended on to maintain continuously an assayable level (0.02 unit/ml. by the method used) in the blood of most patients. Some even had detectable penicillin in the blood 40 days after the largest dose. Ten patients on admission and three members of the staff were found to have Group A streptococci in the throat, and daily swabs after an injection of benz-

ethacil showed that the organism disappeared in every case within one day. It reappeared in four days in one patient, and another became a carrier during treatment, but later injections abolished the carrier state in both and no patient had a rise in antistreptolysin titre. The drug was well tolerated, and the results of a study of the penicillin resistance of *Str. viridans* from treated patients' throats suggested that no highly resistant strains were being bred, although comparison with similar studies by another author who gave penicillin orally indicates that both methods may have at least some effect in this direction. It may be assumed with some confidence that infrequent injections of benzethacil will be at least as effective as giving penicillin in moderate doses orally in preventing throat infections. To continue either method of treatment for the greater part of a year must necessarily be costly, and in the choice between them the operation of this factor may well be decisive.

APES AND MEN

"*Ex Africa semper aliquid novi.*" For some years past the scientific world has become accustomed to learning every so often of the discovery in increasing numbers of fossil higher primates in Transvaal caves. Mr. J. T. Robinson, of the Transvaal Museum, Pretoria, recently announced the discovery at Swartkrans¹ of some remains, including a fragmentary maxilla with some teeth, of *Telanthropus capensis*. The type is apparently transitional between the still ape-like Australopithecinae and undoubted men, such as the *Pithecanthropus* group (including *Sinanthropus*) of Java and North China. *Telanthropus* was hitherto represented only by a mandible, considered by Broom and Robinson² to be clearly distinct from the *Paranthropus crassidens* (Australopithecinae) remains obtained at the same site. Dr. K. P. Oakley, of the British Museum (Natural History), is now in the Transvaal in the hope of discovering satisfactory geological and palaeontological evidence on the date of the finds. Meanwhile it is worth considering the possible implications of the new discovery to existing ideas about the course taken by human evolution from the ape stage.

Our nearest living relatives, the great apes, have certain features—among others the "simian shelf" in the section of the mandibular symphysis—which were until recently held to be primitive. The Miocene of Kenya, however, yielded to Dr. L. S. B. Leakey in 1948³ an almost complete skull of a chimpanzee-like ape (*Proconsul*) without the simian shelf and with other features of skull and dentition more closely resembling the condition seen in man than do those of any of the surviving great apes. It is therefore thought probable that *Proconsul* stands close to the common ancestor of ape and man, and that human and simian stems have pursued separate courses at least since the Miocene, about 15 million years ago.

¹ *Nature, Lond.*, 1953, 171, 33.

² *Ibid.*, 1949, 164, 323.

³ *Ibid.*, 1948, 162, 688.

⁴ Zeuner, F. E. *Dating the Past*, 3rd ed. Methuen, London, 1953.

The South African Australopithecinae seem to represent an early branch of the distinct human stem. In brain capacity they were not yet men by any standard that we have learnt to use, but they had already developed the erect posture and possessed a remarkably human type of dentition. Their small brains, prominent muzzles, and enormous jaws and teeth nevertheless betray a not very remote simian ancestry.

The *Telanthropus* mandible was less heavily built. The teeth were large by modern standards, but markedly smaller than those of the Australopithecinae; the mandible lacked some typical australopithecine characters, but showed the beginnings of a mental eminence where none is to be seen in apes or Australopithecinae. The new maxillary fragment enables comparison to be made with those of the Australopithecinae and a modern Bushman. It shows that, in *Telanthropus*, the muzzle was markedly shortened, with reduced procumbence of the upper incisors and a right-angled section at the inferior margin of the nasal aperture instead of the smoothly curving transition between the subnasal region of the muzzle and the floor of the nasal cavity seen in the Australopithecinae. Despite their differences, the remains show other features in common with the Australopithecinae, so that the direct relationship of *Telanthropus* to these can hardly be doubted. Mr. Robinson claims that we have here a form transitional between the Australopithecinae and true hominids, though it would be helpful if we could also know something about the cranial capacity of the new species.

Much hangs on the date which may be assigned to *Telanthropus* and the Australopithecinae. It now appears that it may be necessary to regard them as approximately contemporary. The Swartkrans limestone (travertine) is considered to be late Pliocene. The next evolutionary stage is represented by the *Pithecanthropus* group of fossils, found at the eastern extremities of Asia. If the Transvaal specimens can confidently be dated to the Pliocene (at least one million years ago) it is possible to envisage the further development of the types they represent, their diffusion to the Far East, and their reappearance, perhaps half a million years ago, as the *Pithecanthropus* group. The dating of this group to a period more than 400,000 years ago is based on good palaeontological evidence.⁴

We may then regard the possible steps of human evolution as represented by: *Proconsul*, the Australopithecinae, and *Telanthropus* in Africa; the *Pithecanthropus* group, and the late Middle Pleistocene (about 180,000 years ago) palaeanthropic men of Asia and Europe. Should the Swartkrans finds prove to be only half a million instead of a million or more, years old, as is quite possible, we should be obliged to seek for the Far Eastern *Pithecanthropus* fossils some progenitor other than the Australopithecinae or *Telanthropus*.

Whatever the outcome of further investigations into the dating of the particular specimens concerned, their interest will remain paramount for students of human evolution. Morphologically the Australopithecinae represent an evolutionary stage which would readily be acceptable as essentially Pliocene, and therefore potentially a direct forerunner of the *Pithecanthropus* stage.

Even if it should prove that the individuals known to us are late survivals, they must resemble more or less closely earlier members of their species or genus, who could have been the ancestors of *Pithecanthropus*, thus bridging the gap between undoubted apes and undoubted men.

PSITTACOSIS

It has long been known that human beings are susceptible to an infectious disease of parrots, which was given the name psittacosis. The disease is caused by infection with a virus, and in addition to birds of the psittacine group—which includes parrots, cockatoos, and budgerigars—canaries, pigeons, domestic fowls, and ducks all harbour these organisms and have been responsible for infection in man.¹ There are a number of closely related viruses, rather than a single strain; they are called viruses of the psittacosis-ornithosis group, which includes those causing psittacosis, acquired from contact with infected parrots, and ornithosis, which results from contact with pigeons² or other domestic birds. Man can be infected in various ways. The droppings of diseased birds and carriers contain the virus, which may be inhaled by people cleaning the cages or handling the birds. Bites by infected parrots may also convey the disease. Infection with viruses of this group is widespread in susceptible birds, but newly imported birds of the parrot family are a specially dangerous source of human infection.

In 1930, following a serious outbreak of psittacosis, with many deaths, a complete ban was imposed on the importing of parrots into this country. The ban was raised in December, 1951, and it is likely that a number of infected parrots have since been introduced. Indeed, the death on December 4, 1952, of the manager of a pets' corner in a department store was shown at the inquest at Birmingham to be caused by psittacosis acquired from infected parrots in a consignment of birds which he had received in November.

The onset of the disease is usually fairly acute and follows an incubation period of about 10 days. The symptoms are general malaise, severe headache, pains in the back and limbs, and sometimes nausea, vomiting, epistaxis, and photophobia. The patient is febrile, and often no other abnormal signs are found on physical examination. In a number of cases the condition remains a general febrile illness without localizing signs, and after lasting a few days the temperature falls and the patient recovers. In more severely ill patients evidence of pulmonary consolidation is found towards the end of the first week. Cough develops, but sputum is scanty or absent. The spleen is sometimes palpable. With suitable treatment the course of the illness can be shortened and the outlook greatly improved, but without modern chemotherapeutic agents the severe form of the disease carries a high mortality rate.

It is clear that there are no features of the illness

¹ Bedson, S. P., et al., *Virus and Rickettsial Diseases*. London: Edward Arnold, 1950.

² Ellenbogen, B. K., and Miller, C. M., *British Medical Journal*, 1952, 2, 189.

³ Report by the Virus Reference Laboratory, *Lancet*, 1953, 1, 85.

⁴ Tasker, J. R., *British Medical Journal*, 1949, 2, 362.

¹ *Antibiot. and Chemother.*, 1951, 1, 491.

² *J. Amer. med. Ass.*, 1952, 150, 1571.

which point specifically to the diagnosis. Laboratory tests are of great interest and importance, but are not likely to provide immediate help. It is possible to isolate the virus from the patient's blood in the early days of the infection and from the sputum when lung involvement has occurred. A more generally applicable test is the demonstration of psittacosis antibody in the patient's serum. For this test two specimens of serum are required, one in the acute stage, ideally before the fifth day, and the second about the twenty-first day.³ Although the finding of antibody in high titre (1:32 or over) in the first specimen is suggestive, a fourfold or greater rise in the second specimen is required for a firm diagnosis. At least 1 ml. of serum, preferably sterile and not haemolysed, is required for each specimen.

Psittacosis has been successfully treated with large doses of penicillin,⁴ but the virus is more sensitive to the newer antibiotics. In view of the dangers of chloramphenicol, it would seem that aureomycin is the drug of choice, and if this is not tolerated terramycin, or large doses (2 million units or more a day) of penicillin, may be used. Because of the impossibility of diagnosing the disease early, it seems reasonable to regard as possibly psittacosis any illness starting acutely and being either influenzal in type or apparently a virus pneumonia in a person who has been exposed to ill birds of any species, and in particular recently imported parrots. Suitable treatment should be begun at once and the first of the two serum specimens taken. Specimens may be sent for investigation to the laboratories of the Public Health Laboratory Service in Cambridge, Cardiff, Exeter, Hull, London, Manchester, Newcastle, Northampton, and Nottingham.

ANGIOSPERMS AGAINST VIRUSES

The isolation of a substance from the seeds of the Norway maple which has an action against phage and vaccinia virus has recently been announced by Fischer.¹ The seeds were boiled with alcohol and ether, and the ground residue was extracted with dilute alkali, neutralized, and purified further by various procedures. The extract inactivated *in vitro* a phage of *Bacterium coli*, so that no phage multiplication took place when the host organism was added subsequently; the bacteria themselves were not affected by concentrations which were sufficient to inactivate the phage. Fischer also claimed that the extract inactivated phage after it had entered the host cell, but the evidence in support of this is open to question. The extract was not active against a staphylococcus phage, but inactivated vaccinia virus *in vitro*. The active principle in the extract was named acerin. The work reported is in no way unusual, and no exceptional claims are made for acerin by the author, who is rightly concerned to give a bare account of his findings. Observations of a similar nature are commonly made in virus laboratories all over the world.

It cannot be emphasized too strongly that *in vitro* tests are useless for detecting potential antiviral agents.

The agents which inactivate viruses *in vitro* are many and varied, and range from the common antiseptics on the one hand to such innocuous materials as lipids,² physiological saline, and even distilled water on the other. Moreover, those few antiviral agents which are known seem to be active *in vivo* but not *in vitro*, and would thus have escaped detection in tests of the latter type; for instance, benzaldehyde thiosemicarbazone confers significant protection to mice inoculated intracerebrally with vaccinia virus, but does not destroy the virus when incubated with it in the test-tube,³ and the growth of influenza virus in tissue culture is inhibited by certain amino-acids which do not inactivate the virus *in vitro*.⁴ The method of preparation of acerin suggests that it may be a pectin, and the antiviral action of pectins has been known for some time. Thus Green and Woolley found in 1947 that the growth of influenza virus in fertile eggs was inhibited by apple pectin,⁵ yet this discovery has not led to any development of clinical importance. It may thus be concluded that acerin, even if active *in vitro*, does not afford any easy solution to the virus problem nor even an important clue to it.

What hope does acerin hold for the future? Control of vaccinia-variola probably lies in the development of a thiosemicarbazone with a somewhat greater antiviral activity and a much lower toxicity, but Fischer's work on acerin will nevertheless be of importance if it directs attention to the possibility of finding antiviral agents in the angiosperms (that is, the flowering plants other than conifers). The storage organs of the flowering plants contain many compounds of a complexity such as to render them inaccessible by the methods of organic synthesis, and it might well be that some of these compounds might have by chance some activity, as for example against viruses, other than that which they exert naturally.

The Norway maple (*Acer platanoides*) is commonly used in this country for park and street planting, and the purple-leaved var. *Schwedleri* is a familiar object in suburban gardens. Abundant crops of seed are borne every autumn and there is thus no scarcity of material for anyone who wishes to confirm Fischer's observations and extend them by *in vivo* tests. The field maple (*Acer campestre*) and sycamore (*Acer pseudo-platanus*) also provide material for examination. The scope of such an investigation is almost unlimited, since it could be extended to cover the commoner members of the British flora, and it might well afford a better chance of a discovery of major importance in the field of virus chemotherapy than the methods which are being pursued at present. Much labour is required to produce a new synthetic compound, and the substances produced by plants in the course of their metabolism can be extracted at the cost of far less effort. If the report on acerin does nothing more than arouse an interest in flowering plants as a source of potential antiviral agents, it will at least have justified the attention which it has attracted.

¹ *Acta path. microbiol. scand.*, 1952, **31**, 433.

² Casals, J., and Olitsky, P. K., *Science*, 1947, **106**, 267.

³ Thompson, R. L., et al., *Proc. Soc. exp. Biol., N.Y.*, 1951, **78**, 11.

⁴ Eaton, M. D., et al., *ibid.*, 1951, **77**, 505.

⁵ Green, R. H., and Woolley, D. W., *J. exp. Med.*, 1947, **86**, 55.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

ANTENATAL CARE—I. CLINICAL EXAMINATION

BY

W. C. W. NIXON, M.D., F.R.C.S., F.R.C.O.G.

Professor of Obstetrics and Gynaecology, University College
Obstetric Hospital, London

The half-century has turned since Ballantyne, of Edinburgh, published his article—"A Plea for a Pre-Maternity Hospital"—containing the first suggestion of an antenatal clinic or hospital. During these fifty years opinion and practice have changed, in some instances swinging a full circle. Maternity care is now accepted in this country as part of the Health Service that must be provided by the State. In England and Wales in 1951 there were 695,446 births (679,497 live births and 15,949 stillbirths). The number of mothers (new out-patients) who attended antenatal clinics attached to hospitals was 413,805, and 256,931 attended local health authority clinics. The total attendances made by expectant mothers (new and old patients) during 1951 was 2,333,902 at hospital clinics, and 1,450,097 at local health authority clinics. These figures, kindly supplied by the Ministry of Health, serve to indicate the magnitude of the service required for these expectant mothers.

The most striking recent trend in antenatal care is the increasing emphasis that is being placed on function as distinct from structure. The mechanistic approach to the parturient woman is to be deplored: the woman must be taken as a whole; her psyche and soma are so interwoven that neither can be neglected, especially at this most critical time of her life. In view of the ana-improved physique of women in this country the anatomical emphasis that it has had in the past. The emotional aspect of pregnancy and labour is as important as the physical, but it has been neglected by doctors and midwives.

History

In addition to obtaining the history of general illnesses, operations, and so forth, it is of value to know something of the psychological background of the woman and her own mother's obstetric history. One should always inquire whether the mother has had any virus infection, particularly rubella, during the first trimester of pregnancy. It has now been established that there is an added risk of congenital malformations (deaf mutism, cataract, heart disease) when a woman has been exposed to such infection in the very early weeks of pregnancy. Severe vomiting early in pregnancy should be noted, since this is sometimes followed by pre-eclamptic toxæmia in the later months.

In a multipara a full history must be taken of the previous pregnancies and labours, including the puerperium. The weight, health, and method of feeding the baby must also be noted.

Physical Examination

Auscultation of the heart should always be performed. In about 50% of women attending an antenatal clinic a soft murmur will be heard towards the end of pregnancy. This is due to organic disease in only about 1% of cases.

The blood pressure should be taken at every visit, before any physical examination and after the mother has rested and been engaged in conversation for a few minutes. The limit of normal blood pressure in pregnancy is usually taken as 140/90, but as the result of Professor F. J. Browne's

researches at University College Hospital it has been suggested that this ceiling should be dropped to 120/80. He has shown that a rise of blood pressure above this level has been present early in pregnancy in about 65% of cases of pregnancy toxæmia. It is to be regarded as an early warning sign of a future toxæmia of pregnancy.

The urine should be tested for albumin at each visit; if this is found, a catheter specimen must be obtained, since the original specimen may have been contaminated by vaginal discharge. If albumin is present in the catheter specimen then the urine should be examined bacteriologically. It is usual to examine for sugar at the first visit, and in some clinics this is repeated at each subsequent visit.

The height and the rate of increase in weight can provide useful information. Recent studies at Aberdeen by Professor Dugald Baird and his co-workers have revealed a relationship between the stature of a woman and the shape of her pelvis. In some of the small women (under 5 ft.—152 cm.) there was evidence of pelvic flattening as shown by x-ray pelvimetry. In women of normal and adequate stature the pelvic brim was gynaecoid (round) or anthropoid (long oval). When growth was stunted as the result of poor nutrition the pelvis was small and contracted, either android or platypelloid. The tall women in the Aberdeen investigation had no difficulties in their first labour. It has long been known that in the absence of a hereditary factor the stature of individuals is a measure of the nutrition of a community. If a woman is under 5 ft. (152 cm.) in height a careful assessment of her pelvic capacity must be made. A survey in 1940 of 500 London women attending University College Obstetric Hospital revealed a significant tendency for those of shorter stature to have a flatter pelvis.

Regular weighing at each visit is becoming the practice in more and more clinics. In the United States considerable importance is attached to the control of weight as a means of reducing the incidence of toxæmia. This will be referred to in more detail in Part II.

A vaginal examination should be made in all primigravidae, but not at the first visit. It should be postponed till after the sixteenth week, when the risk of abortion has diminished. If an ovarian cyst or other tumour is detected at this time the hazard of removal is minimal. In multiparae who have had normal deliveries there is no need to assess the pelvic outlet.

Pelvimetry

External pelvic measurements as a means of diagnosing pelvic contraction no longer occupy the hallowed place they held two or more decades ago. Nowadays they are taken routinely by medical students and midwives, and serve more as an anatomical exercise than anything else. This does not apply, however, to a woman of small stature (under 5 ft.—152 cm.), since in her case external pelvic measurements when carefully estimated may be a guide to the size of her pelvis.

There is a fairly high correlation between the greatest transverse diameter of the pelvic inlet (5½ in.—13.3 cm.), and the intercrural diameter, which can be measured clinically with callipers with a fair degree of accuracy. Thus this measurement is more reliable in predicting the corresponding internal measurement than is that of the external conjugate in predicting the internal conjugate measurement. The intercrural diameter is measured between the widest points on

the outer borders of the iliac crests, and the average is usually considered to be between 10 and 11 in. (25 and 28 cm.).

A male distribution of pubic hair and hirsuties does not seem to be related to a masculine type of pelvis. The architecture of a female pelvis indicating a masculine tendency is a relatively narrow brim, a narrow sacrospinous notch, a highly curved sacrum, a small subpubic angle, and an unusual degree of convergence of the side walls, or funnelling, leading to a narrow outlet.

The Diagonal Conjugate.—The majority of clinicians agree that this is the most important of all internal measurements. It is a digital measurement taken from the mid-point of the sacral promontory to the subpubic angle and is of value in estimating the internal conjugate. When there is cephalo-pelvic disproportion, and it is necessary to obtain this measurement with accuracy, then an anaesthetic will be needed, since the resistance of the perineum in some primigravidae will make the sacral promontory inaccessible to the examining finger. In the normal pelvis the promontory cannot be reached, and if it cannot be felt at 4½ in. (12 cm.) from the lower border of the symphysis then the pelvic brim is usually adequate. Half an inch (1.3 cm.) is subtracted from this measurement in order to estimate the length of the true conjugate (4½ in.—11.4 cm.). When the angle of inclination of the plane of the brim is greater than usual the promontory will be difficult to "tip" even in the presence of brim contraction.

Pelvic Outlet.—Much can be learnt from a careful digital examination of the outlet. The perineum should be palpated to ascertain its length and rigidity. With two fingers in the vagina the ischial spines, sacrospinous ligaments, lower end of the sacrum, and the subpubic angle can all be examined. The "knuckle" test (intertuberal) is familiar to all, but the measurement across one's own knuckles must be known. A rough estimate of the intertuberal diameter can be gained by pressing the clinched fist between the ischial tuberosities at the level of the anus. This intertuberal measurement is usually reckoned as 4½ in. (11.4 cm.). If the subpubic angle is normal two fingers of average size can be placed within the pubic arch under the subpubic angle. With experience it is possible by these somewhat crude digital methods to detect the type of pelvic outlet that may give rise to difficult delivery.

X-ray Pelvimetry.—Routine radiographic pelvimetry of every primigravida is to be deprecated. There are enthusiasts who would like every pregnant woman to have her pelvis measured with radiological precision. They forget the expense incurred, the time consumed, the fallacies, and, last but not least, the danger with repeated exposures of radiation damage to the foetal gonads. Radiological methods should be used to supplement—not displace—the clinical examination, and x-ray pelvimetry should be considered only in the following clinical categories: (1) primigravidae with a height of 5 ft. (152 cm.) or less; (2) primigravidae with the foetal head not engaged at term and with variation in the anatomy and capacity of the bony pelvis as detected by digital examination; (3) primigravidae with a breech presentation in which external version has failed; and (4) multiparae with a bad obstetric history.

Dental Examination.—It is not sufficient for the doctor or midwife to make a perfunctory examination of the teeth and gums. The mother should be under the care of a dental surgeon as early as possible in pregnancy. He will advise on oral hygiene, further visits, and treatment.

Routine Chest Radiography.—Since 1947 every mother attending the antenatal clinic at University College Obstetric Hospital has had a radiological examination of her chest. The incidence of pulmonary tuberculosis detected early in pregnancy in this way has been about 1 in 200. All these patients had had the usual chest examination by the medical officer and in only one out of 27 were any abnormal signs discovered by this physical examination. Routine chest radiography of pregnant women should be obligatory, and, where it is available, miniature radiography might well be used for this purpose.

Preparation for Lactation

The clinical studies of Dr. Harold Waller at the British Hospital for Mothers at Woolwich have been a major contribution to this subject. He has shown that a defect can be found in one or both nipples in about 40% of women in their first pregnancy. Inspection is not enough, and he has devised a simple test which will reveal tethering of the nipple. Such fixation of the nipple interferes with sucking. Waller's test consists in placing the forefinger just above and the thumb just below the nipple's base at its junction with the areola. The finger and thumb are then pushed a short distance into the breast and squeezed together in imitation of the baby's bite. If the nipple retracts then the baby will have difficulty in feeding.

When this defect is present Waller recommends the use of a shield or "shell" made of glass or plastic.* The nipple projects through the hole in its base and the apparatus is kept in position by a well-fitting brassière. At first it is worn for a few hours daily and then throughout the day. It can be applied from the twentieth week onwards.

Waller has also shown how daily expression of the colostrum during the last eight weeks of pregnancy helps to eliminate lactation difficulties. All primigravidae and all who have had difficulty or have failed in previous lactation should be given prenatal tuition. Attempts to "harden" the nipple are to be condemned.

Special Examinations

As early as possible in pregnancy a sample of blood should be taken and sent to a laboratory for ABO blood-grouping, and Wassermann (Kahn) and Rhesus-factor testing. The haemoglobin should be estimated at the same time and again at the thirty-fourth week.

The simple haemoglobin test may lead to the detection of one of the more serious anaemias of pregnancy.

What is the lower limit of normal for the haemoglobin level during pregnancy? This is a controversial question, since there is a progressive increase in blood volume as pregnancy advances. The dilution of the circulating blood reaches a maximum of about 25% early in the last trimester of pregnancy. This physiological hydraemia results in a fall in the red-cell count and thus in the haemoglobin concentration. In a young woman during the last month of pregnancy 80% haemoglobin may be taken as the lower limit of normal; in an older woman (over 30) this figure is lower, about 76%. With increasing parity the haemoglobin level drops.

For many years the Tallqvist method of estimating haemoglobin has been used by general practitioners. Recently it has been criticized because of its unreliability. It is a useful procedure for the approximate estimation of haemoglobin. Although seemingly a somewhat crude procedure, the Tallqvist method has yielded results which are of about the same accuracy as those obtainable with most dilution haemoglobinometers, such as the Haldane and Sahli.

Frequency of Examination

It is usual to see the mother at monthly intervals until the thirty-second week, then again at the thirty-fourth and thirty-sixth weeks, and then weekly until the delivery. It is quite unnecessary to do an abdominal palpation at every visit. Provided there are no untoward symptoms, this examination should be done at the twenty-eighth, thirty-second, thirty-fourth, and thirty-sixth weeks. If the head is well engaged at the thirty-sixth week there is no need to do another abdominal palpation until term. The urine and blood pressure must be examined and the mother weighed at every visit. There is no doubt that many mothers are subjected to much purposeless palpation during antenatal supervision.

[Part II will appear in our next issue.]

*Distributors are Allen and Hanburys Ltd., London.

CENTRAL PUBLIC HEALTH LABORATORY MINISTER OPENS NEW BLOCK

The Minister of Health, Mr. Iain Macleod, opened a new block of laboratories at the Central Public Health Laboratory, Colindale, on January 15. Mr. Macleod, who was introduced by Lord Limerick, Chairman of the Medical Research Council, paid a tribute to all who worked in the Public Health Laboratory Service.

He recalled that, before the war, there had been a very haphazard service in this field. It had needed the whip and spur of war to start the story, another page of which was turned on this occasion. It was on the recommendation of the Committee of Imperial Defence that an emer-



gency public health service had been set up. Although fears of bacteriological warfare and widespread epidemics were falsified, it had been realized that in peace as well as in war there was an essential need for such a service. It was a strange, casual, but very English way of meeting a great need in the ordinary life of the country.

Mr. Macleod spent an hour inspecting the building and learning about the work which was being carried out. He said that he was most interested to see the various reference laboratories. Some were main centres not only for this country but for Europe, the Commonwealth, and even the world—for example, the Enteric Reference Laboratory. "It is in such places as this," continued the Minister, "that the weapons against disease are to a large extent fashioned and sharpened. It is strange, when so many new diseases which used to be the scourge of this and other countries have yielded their secrets, there are still diseases like the common cold which defy us."

"A Microbiological Palace"

Colonel H. J. Bensted, Director of the Central Laboratory, said that the service had first been established, seven years ago, on the upper floor of a small Edwardian building. Later it extended to the lower floor, but even so its cramped

conditions for working contrasted remarkably with the present "microbiological palace."

The new building has been completed in two years. It has enabled all departments to expand considerably, including those which remain in the old building (occupied before 1946 by the Government Lymph Department). Each floor is provided with sterilizing and wash-up kitchens, preparation rooms, and hot and cold rooms. There are special experimental rooms for the investigation of air-hygiene problems, and there are facilities for sterilizing the air intake of some of the rooms and the air exhaust from others where it may be contaminated by pathogenic bacteria or viruses. One entire floor is devoted to the study of virus diseases. This includes a special low-temperature suite consisting of chambers at 4° C., -30° C., and -70° C.

The following reference laboratories and special departments are contained in the new block and other buildings: the Standards Laboratory for Serological Reagents and the National Collection of Type Cultures (originally established as M.R.C. units many years ago); the Central Enteric Reference Laboratory; the Virus Reference Laboratory; the Salmonella Reference Laboratory; the Food Hygiene Laboratory; the Streptococcal and Staphylococcal Reference Laboratory; the Air Hygiene Laboratory; the Dysentery Reference Laboratory; the Epidemiological Research Laboratory; the Routine Department.

THE TECHNIQUE OF MEDICAL TEACHING

Another highly successful Conference-Course on the Technique of Medical Teaching was held at the Postgraduate Medical School, Hammersmith Hospital, London, on January 9 and 10. At the first session, presided over by the Dean of the School, Dr. C. E. NEWMAN, methods of group teaching were discussed in contrast to the formal lecture.

Group Teaching

Dr. L. J. H. BURTON, medical adviser to the Central Council for Health Education, offered some criticisms of the formal lecture. Sir William Hamilton Fyfe had said, for instance, "The lecture system has survived because it is cheap and easy. The stimulating effect of the lecturer fades away as soon as the lecture is over." And Sir John Simon, 75 years ago, declared that education was not something which one man could receive passively from another, but something which his own nature must grow forth most actively to meet. Dr. Burton pictured the lecture-theatre situation—the 40 minutes' lecture delivered behind the barrier of a rostrum, the front seats of the theatre empty and the back seats occupied by some whose interest was obviously in other things. In contrast with this was the discussion around the table, with its exchange of experiences and information and with each person in the group thinking actively in order that he should not disappoint the others.

Group discussion was partly interpretative and partly informative. It ensured that facts and opinions were scrutinized from many different points of view. Each student could fit his information into his own particular frame of reference. Everybody learned in a different way, and unless a teacher saw a problem in two or three different ways he would miss at least nine-tenths of the audience. Referring to the technique of group leadership, Dr. Burton said it would generally be found that questions which started with "How?" "Why?" or "What?" stimulated more useful discussion than vague questions which began with "Do you think?" The leader's main concern was to encourage all members of the group to participate and avoid the discussion being dominated by one aspect or one personality.

Miss M. L. JOHNSON, of the department of anatomy, University College, London, added some further observations on the value of group discussion. In practice, students selected from the lecture just what they could assimilate or what would fit in with the ideas they already possessed. In the discussion group, on the other hand, students were continually comparing and contrasting views, and examining the facts in their various relations. At a former conference the need to train students to treat patients as anxious and frightened people had been stressed. She thought that teachers should assume also that students are anxious, frightened people, and this was one of the golden rules of teaching.

At a later session, with Professor JOHN McMICAL in the chair, a number of practical demonstrations were given of class teaching. The students taken were in their first, second, or third clinical years, and the teachers were for the most part junior teachers or senior registrars. However, from a conference point of view the result was not wholly successful, because the replies and observations of the students were in almost every case inaudible.

The Overburdened Curriculum

Professor G. PAYLING WRIGHT spoke of the growing size of the medical curriculum, and the need to relieve the burden on the student. Not all students of medicine ought to be forced into the same Procrustean bed. Medical education should be on less rigid lines than at present and try to adapt itself to providing the best fits for the widening variety of professional activities now available to young qualified people. At present, all medical students went through the same formal course irrespective of the branch of medicine in which they would ultimately be engaged. He believed that it would be possible to hold examinations in the preclinical subjects of anatomy, physiology, and biochemistry at two levels, one requiring a general and the other a more advanced knowledge. Every student should take all at the general and one, of his own choice, at the higher level. The load would be lightened and the educative value of the course improved. He thought it unsound psychologically so to arrange the course in some universities that students fatigued by the heavy strain of the second M.B. examination were precipitated after a wholly inadequate vacation into the "bridge term" of pathology and introductory clinical studies. As a result, many students failed to benefit as much as they should from this critically important few months of their training.

In the first clinical year the student had to absorb an enormous array of new facts, and much help could be given him by systematic didactic lectures. But during the remaining years, not only the subject-matter but the manner of its presentation should undergo evolution. With the increasing maturity of the student, the didactic lectures should be superseded by others of a less systematic and more stimulating kind. The aim of the educator should be to encourage mental independence in the student—to replace his natural desire to be "taught" by a capacity to "learn." He recommended that more attention should be directed to helping students to make use of libraries, because after leaving his medical school the reading of periodicals and monographs would be the main means by which a young doctor could improve his professional powers. The student should be introduced to the *Index Medicus* and the *Surgeon General's Catalogue*, and encouraged to use them to amplify his knowledge on interesting cases. Professor Payling Wright also suggested that some simple weekly or fortnightly "journal club," covering a few of the more important medical journals, and led perhaps by a registrar, might help the more senior students to bridge the difficult gap between textbooks and periodicals. Such discussions would ensure the active participation of the better students and train them to the critical appreciation of new advances in medicine.

The Museum in Teaching

Dr. KEITH SIMPSON said that many museums in medical schools and elsewhere had a constant and unchanging character; they were in the worst sense of the term "museums," often lacking reasonable comfort and adequate lighting. The museum at Guy's, of which he was curator, was a very large one, with about 8,000 specimens, but the size of a museum need have no bearing on its general practicability. Dr. Simpson showed examples of many ways in which the teaching facilities of a museum might be furthered, such as the use of photography, or of an artist, or by collating different stages in a condition or process, and by special methods of mounting. Specimens of use to elementary students on the one hand and to advanced students on the other could be marked accordingly, or collected into groups, and the artist could help to co-ordinate the clinical and pathological teaching in the museum by means of diagrams and cartoons. Lecture demonstrations on recent additions might be given as well as routine courses in medical or surgical pathology. No museum should ever appear to the student as an archaic, out-of-date collection of material, but as something abreast of the times and bearing upon the study which the student was making in other departments of the hospital.

Research and the Queue for Security

The last session of the course, with Professor IAN AIRD in the chair, was devoted to the question of how to introduce students to research.

Professor MAX ROSENHEIM stressed the value of research in producing a critical outlook in medicine, and discussed how students might be made more aware of the research in progress in their schools. He said that one of the principal dangers in medical practice to-day was the development of a stereotyped pathway to consultant posts. In America a period spent on investigation was regarded as an essential part of the training of the consultant, but in this country it was possible and even usual for a man to spend five or six years as registrar and senior registrar entirely at the bedside and in the out-patient clinic. Facilities for research existed, but were not fully used. There was lack of encouragement from above, and the young registrar was beset by the fear of turning away from the recognized pathway lest he lose his place in the queue for security. In his opinion every registrar should be given a research problem, however simple, and it should be possible for him to spend a period in a clinical or preclinical laboratory. It must, however, be made clear from the start, whenever a registrar was seconded for research purposes, that if eventually he found himself unsuited for a research career his time would not have been wasted. He should be able to return to clinical medicine not frustrated but enlightened and stimulated by his experience.

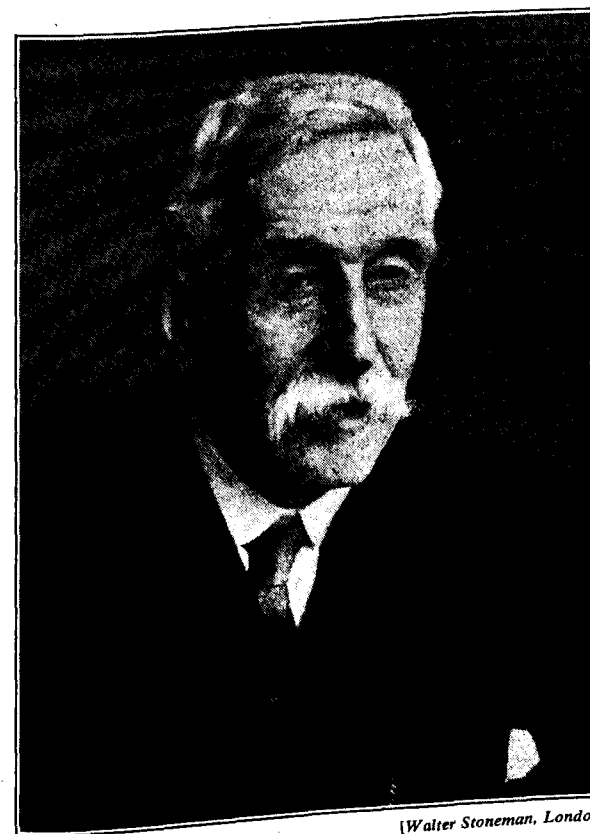
SIR LEONARD ROGERS, F.R.S., AT 85

The good wishes of many friends will have gone out to Sir Leonard Rogers on Sunday last, when he celebrated his eighty-fifth birthday. When he left India in 1921 after 28 years' service in that country the *Indian Medical Gazette* described him as "a prince of science." But the word "prince" suggests ease and glamour, which have been far from Sir Leonard Rogers's experience. No man has laboured more unremittingly, pursued research with a more ardent and inquisitive mind, braved with more unconcern the discomforts of climate and the occasional perils of the jungle or the laboratory. His energy and initiative have been unabated, whether in tracking down the causes of tropical disease to their lair or enlisting the help of business and official people in the beneficent projects he had at

heart. His work as professor of pathology at the Medical College, Calcutta, laid India and the East under his debt.

Those who know anything of the history of tropical medicine since the last decade of the nineteenth century will not need to be reminded of Sir Leonard Rogers's great work on amoebiasis and the placing of emetine treatment on a scientific basis; on cholera, with the working out of treatment by intravenous hypertonic saline; on the investigation of epidemic kala-azar in Assam and the application of antimony treatment; on the pathogenesis of sprue; above all on leprosy, whereby both the standard of treatment of that disease and the social lot of the leper have been extraordinarily improved.

When he came back from India he was still at the zenith of his powers. His labours, begun in Calcutta, were con-



(Walter Stoneman, London)

tinued in London with equal zest. As physician to the Hospital for Tropical Diseases, as medical officer and afterwards president of the Medical Board of India, as founder of the British Empire Leprosy Relief Association, as author of a continual stream of papers and books on tropical diseases, as a vigorous fighter in the cause of freedom for research, his second career has been as strenuous as his first. Many of the present generation will have heard his occasional addresses to the Royal Society of Tropical Medicine or the Research Defence Society, but his work now goes back for 60 years.

When, a year or two ago, he published his autobiography, dedicated to his wife, "the best and most unselfish of women," he gave it the title of *Happy Toil*. The secret of the happiness was to be found, not principally in the ennobling nature of his researches, but in the religious faith which has sustained him through many difficulties and disappointments in accomplishing something for the relief of suffering. His work has gone on into old age: the publication in this *Journal* a few weeks ago of a contribution from his pen on progress in the control of cholera in India shows that he is as eager as ever to promote the welfare of mankind.

Correspondence

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

"There is No Pathology"

SIR,—When a suspect organ or tissue is found to be normal reports about it sometimes state: "There is no pathology." Recently a candidate in an answer to a question in an examination paper stated that "one cause of torticollis was spinal pathology." There is an increasing use of the word pathology (which the *Oxford Dictionary* defines as "the science of diseases") when lesion or disease is meant. I would ask the courtesy of your columns to make a plea for the correct use of the word.—I am, etc.,

Cardiff.

LAMBERT ROGERS.

Elliptocytosis

SIR,—May I ask, through the courtesy of your columns, that any pathologist who finds a case of elliptocytosis should be kind enough to let me know? A family has been found in which the gene determining this anomaly is on the same chromosome as the genes of the Rh blood group system (Goodall *et al.*, *Ann. Eugen. (Camb.)*, 1953, in press). I am therefore anxious to do blood typing in some more families showing the same anomaly.—I am, etc.,

Galton Laboratory,
University College,
London, W.C.1.

SYLVIA D. LAWLER.

The Climacteric and Oestrogen Therapy

SIR,—Your timely annotation, "The Climacteric and Oestrogen Therapy" (January 3, p. 37), will have encouraged many gynaecologists who are so often presented with problems associated with the menopause. Too frequently we see cases where indiscriminate use of preparations containing oestrogens, or a combination of hormones, has been made, and even more often cases of irregular and post-menopausal bleeding are sent to out-patient clinics without any information from the family doctor about previous hormone treatment. Close questioning may reveal that "pink pills" have been taken for some months "off and on," but apparently the patient has not realized for what periods of time they should have been taken. These things, as you have so wisely said, should not be.

I rather suspect, Sir, that I am not alone in regretting that all synthetic preparations of oestrogens are not subject to the Poisons Schedule; such a measure of control might discourage the casual use of these potentially dangerous remedies. Used properly and intelligently, these remedies can, as we know, be of immense benefit to suffering women (and men). But there is far too much careless and, in my view, dangerous prescribing of these things, and it is time indeed that the association of prolonged trickle-dosage with oestrogens and carcinoma in women of menopausal age should be recognized as a real danger.

Your article touches on the use of combined oestrogen-androgen therapy. It is true that extravagant claims have been unwisely made for such preparations, but I should like to put forward the suggestion that this combination may well be given a more extended trial in the suppression of unwanted lactation. Our experience in the Bath hospitals is that it is superior in action to testosterone; we long ago gave up the use of oestrogens alone for this purpose chiefly on account of their undesirable side-reactions.—I am, etc.,

Bath.

A. LEECH-WILKINSON.

SIR,—In your annotation on "The Climacteric and Oestrogen Therapy" (January 3, p. 37) you rightly object to the indiscriminate use of oestrogen in menopausal disturb-

Pain in the region of the second and third metatarsal heads was the cause of symptoms in 20 cases (30%). There was no efficient action of the small toes in these cases, and dorsal dislocation of one or more toes was found in four feet.

Results

Grade	Subjective Function	No. of Feet	Percentage
4	No symptoms. No disability	44	66
3	Intermittent symptoms. No significant disability	18	27
2	Persistent symptoms. Occasional disability	4	6
1	Persistent symptoms. Constant disability	1	1

Analysis of Results

Grade	Cause of Symptoms	Feet
3	Tender operation scar in cold weather	1
	Pain in longitudinal arch or ankle	2
	Intermittent metatarsalgia	15
2	Persistent metatarsalgia	4
1	Severe metatarsalgia	1

Metatarsal bars had been provided in five cases, four of whom at examination were free of symptoms: these cases are, however, included in Grade 3.

In conclusion, Keller's arthroplasty can give a reasonable proportion of good results. When there is no efficient action of the small toes, some form of forefoot support should be prescribed post-operatively.—I am, etc.,

Oxford.

G. P. MITCHELL.

Ageing Cartilage

SIR,—There is no doubt that purely chemical analysis of body tissues has yielded much valuable information. The paper contributed by Dr. B. F. Matthews (December 13, 1952, p. 1295) draws attention to the inconstancy of the collagen/chondroitin sulphate ratio in certain joint cartilages, and differences in the composition of the articular cartilage of different joints. From what is known of collagen gels, and in view of the unequal distribution of force, both muscular and gravitational, such differences may be expected and have also been shown to occur with advancing age and in degenerative processes of cartilage.

It should, however, be emphasized that the matrix of articular cartilage of at least the juvenile and middle-aged subject is a complex gel in which there is a coarse, but relatively uniform, network of fibre-protein which one may regard as the disperse phase. The continuous phase is water, and the physical properties of the cartilage matrix may be modified by changes in the relative amounts of all three major components—water, collagen, and ester mucopolysaccharide. There are also small amounts of other compounds in the gel, some non-ionic, which may also influence the response of the gel to physical factors such as pressure and friction. A simple illustration of the importance of the water component of the gel is the changes which take place in a thin slice of cartilage upon dehydration. Toughness and rigidity are markedly increased and there is the concomitant optical change from opacity to transparency. This modification implies reduction of the "pore size" of the protein network, and is associated with markedly increased molecular orientation as shown by the enhanced birefringence and bireflection.

It is therefore suggested that the application of chemical analytical methods to the separation and estimation of the solid components of the matrix gel may confuse the picture when taken alone, since an appreciation of the physical chemistry of protein gels indicates clearly that the characteristic behaviour of the gel is not only concerned with the type and number of molecules present but also with their mode of association—i.e., linkages by primary valence bonds, Van der Waals forces, or longer-range ionic forces. The physical features of any gel substance and its *in vivo* function should therefore not be considered without due regard being given to the degree of hydration of the gel, as well as to the relative proportions of the two major organic constituents.—I am, etc.,

Bristol.

C. H. G. PRICE.

The College of General Practitioners

SIR,—During the festive season our thoughts were wafting to the distinguished sponsors whose report adorned the front pages of the *Journal* of December 20, 1952, and firmly implanted the embryonic college in the history of British medicine. Nor do we forget, Sir, your words of blessing in the leading article (p. 1344). Among the college objectives the prestige of general practice takes precedence. Our president uttered auspicious words in his annual address: "The general practitioner should occupy a position second to none in the profession." But does the opening statement under "Conclusions"—"General practice is the oldest branch of medicine"—do justice to the noble cause that the college represents? May we more aptly conceive it as the parent of medicine—the "root and trunk" of the "tree of healing" with the specialties among its fruitful branches?

Conditions have changed in this half-century, and greatly to the disadvantage of the family doctor. The ethical core of medicine is the doctor-patient relationship. This intimate social bond has deteriorated gravely. Happily it is receiving signs of solicitude; but equally impeded is the mediatory function of the doctor in the extending specialist-patient relationship. The latter is causing dissatisfaction in the ranks of general practice, curbs the comity of the profession as a whole, and deserves a high place on the college agenda.

The profession falls into three groups: (a) general practitioners, (b) pre- and non-clinical laboratory staffs and research workers, and (c) specialists. The G.P.'s relations with group (b) are remote, affected little in the present issue, and need no more comment. It is regarding groups (a) and (c) that elucidation is urgently needed. Clear orientation of their relative positions is the first step in relieving the doctor of a grievous sense of lost terrain and caste. That he is too busy battling in the front line with the grim realities of human suffering to protest vehemently about his own degradation does not mean he lacks the sensibility of common humanity. Apparent indifference instead of vocal sympathy on the part of his colleagues makes him fret the more. But a manifestly intact professional camaraderie would confirm his determination to fight on until the good conditions in practice essential for decent professional work are won, and with them the final objective—prestige.

Encircling the layman nowadays is an assembly of diverse specialists with daunting polysyllabic titles. They are of two kinds, (a) "Harley Street," (b) "public health." Members of group (a) hold clinical positions, and it is to them the title of specialist ordinarily applies. Their variety has multiplied greatly owing to the advances of medical science. Group (b) embraces preventive medicine generally and includes those engaged at schools, factories, etc. Their notable increase is due to the urbanization of society. Humanity—already belonging to a general practitioner—now tends to congregate for its various occupations; there are often M.O.s attending who are engaged solely on specialist aspects of hygiene. Their contacts with patients are light and rather *ex officio*.

Despite the specialist's rather impersonal relationship his brilliant achievements capture public imagination, and the family doctor, who bears the major load of healing, is apt to lose in favour. In so many directions there have been encroachments on his province, although the most exacting parts of general practice remain his. Keeness suffers *pari passu* with loss of hold over his patients and increasing sense of detachment from his specialist brethren and hospital. The balance needs redress urgently—analogy points the way.

In his nuclear role the G.P. should be related to his specialist neighbour like a nucleus to nucleoli in the cell, and co-ordinate the team-work for the good of his patient. Someone must be captain, and, as he is primarily responsible for his patient's health, he is the obvious intermediary. He knows of each illness, the whole history, the personality and home background, and is honoured by the implicit trust of the patient. At the same time, aware of things from the consultant's angle, he must loyally represent his colleague's interest. Because society respects individuality and health is at stake, an adaptable service is vital. This ideal is attained by a harmoniously integrated group with the general practitioner pivotal. Judgment is constantly called for when dealing with suffering humanity—rigid regulations of commerce are out of place.

Why is the pre-eminence of the G.P. in the patient's purview indispensable? Because the patient who refers with assurance and confidence to "my doctor" is the most content; and the

doctor, conscious of such regard, is put on his mettle. *Per contra*, everybody's patient is nobody's patient. Again, the higher the esteem of the patient for his doctor, the earlier does he take his troubles to him and thence to the specialist, whose unceasing warning is, "The earlier the intervention the greater the chance of success." The patient, guided by his G.P., gets to the right specialist(s); unaided he would usually fail. From his viewpoint the young consultant needs to recognize that it is from the G.P. that there come the patients who add to his technical skill, the experience by which he rises to the top of his specialty and carries on the good work of riper years. Thus, in an evolving professional structure the G.P. remains on firm ground regarding status, and the debt due to him by his specialist colleagues is clearly manifest.

Prestige is a foremost topic in general practice to-day and of primary concern for the college, and is within as well as without the profession. Less dramatic as the domestic sphere may be, prudent reformers will first redress the lost balance there. Having consolidated their professional base, they will extend with unmitigated assurance on the wider public front.—I am, etc.,

A. WILFRID ADAMS.

Bristol, 8.

SIR,—I am sure that I will not be alone in wishing to reply to the letter of Dr. Bernard Kendrick (January 10, p. 97), and would be grateful if you would accept a few observations on his diatribe. First, the college has been formed to satisfy the wishes and needs of a large body of general practitioners. Those, like Dr. Kendrick, who are self-sufficient in matters of clinical research and postgraduate education, and who do not feel that they have anything to offer or gain from their colleagues, will remain aloof. In other words, there are already a sufficient number of interested doctors to form the college and they have every right to do so, just as Dr. Kendrick has the right to remain an individualist and plough his furrow alone. The suggestion that "it is hoped to thrust upon us" such a college is quite erroneous. The college has in fact been formed by those interested, and the latter have no wish to thrust it upon anyone who prefers to remain without.

Dr. Kendrick calls for "a body of doctors who are persistent in helping to improve the medical service." What is the medical service if not the doctors who serve in it, together with their ancillary colleagues? If the aim is to improve themselves, how better could the general practitioners seek to improve the service as a whole? It is interesting to learn that principals do not need help in finding suitable assistants. I had always been under the impression that to sort and evaluate 50 applications for a post was a very difficult task when the applicants' previous experience might be to a large extent unsuitable for the type of practice in question and, in some cases, their interest superficial and pecuniary. If Dr. Kendrick wishes to devote his energies to "helping assistants to become principals"—a very laudable aim—the various medico-political organizations offer suitable channels, and in the meantime the College of General Practitioners will carry on with the work of giving them every opportunity, if they wish to accept it, of becoming good or even better principals.

As for the suggestion that the college may restrict entry into general practice, I am sure that the sponsors have never dreamed that such power might one day be theirs—and when that time comes I am sure that they will be content to allow the law of supply and demand to remain unaltered.—I am, etc.,

H. H. PILLING.

Sheffield.

SIR,—With reference to the proposed College of General Practitioners, I would like to support Dr. A. G. Cruikshank (January 10, p. 98) in his proposal for membership examination. Membership is worthless while it can be obtained for 10 guineas and a promise to do three days' "refreshing" a year.

Twenty years' successful doctoring does not always prove a high standard. A large "successful" practice means little more than an ability to please the patient—and this

not by good doctoring in every case. Examinations, for all their defects, are the only practical way to assess one's knowledge. Let us combine, say, five years' general practice with an examination on the most general and practical lines—eliminating as far as possible theoretical questions.

As to functions of the college, not the least should be teaching and research. In general practice one often recognizes unrecorded epidemics, unrecorded because the cases never reach hospital; to mention a few—Bornholm disease, streptococcal infections, often followed by epidemics of fibrositis, herpes zoster, urticaria, and minor "influenza" infection. Even cystitis seems to be epidemic at times. One of the faults of the present system is that each consultant has such a limited field of knowledge that he is unable to weigh up the importance of his own special findings in the picture of the patient as a whole. Who is to assess which is the most important factor in, say, a case of mitral stenosis, pregnancy, and anxiety neurosis? The college might encourage the emergence of a consultant general practitioner of wide knowledge, whose function would be to assess the importance of all the specialist findings.

We would then arrive at the position where the reflections on general practice would be replaced by, "Poor old Smith has failed his M.C.G.P. so he will probably have to specialize."—I am, etc.,

Dundee

RONALD A. B. RORIE.

Emphysema

SIR,—The report of the erudite address by Dr. A. G. W. Whitfield (December 6, 1952, p. 1227) has raised some important issues. Dr. Whitfield refers to the use of morphine in patients with cardio-respiratory failure, and rightly asserts that its dangers are "well, but not sufficiently well, known." However, your correspondent Dr. W. N. Leak (December 27, 1952, p. 1416) appears to hold the view that morphine can sometimes be used with benefit in such cases. Unfortunately, he made no attempt to define the clinical criteria which would enable the practitioner to decide which of these cases could be given morphine with "safe and useful" results. On the contrary, there is a wealth of evidence to show that the use of morphine in cases of the asthma-emphysema complex, etc., is fraught with grave danger. This drug not only depresses the respiratory centre, but also inhibits the cough reflex. In the case of status asthmaticus the patient's very life depends on the untrammelled activity of these physiological mechanisms. Furthermore, morphine is an addicting drug which should not be given to those suffering from a chronic, painless malady. The fact that many patients survive an injection of morphine is no justification for its use, since others are less fortunate. The value of morphine in so-called cardiac asthma is, however, generally accepted.

The use of ephedrine is logical in cases of emphysema with marked bronchospasm. Nevertheless, I have seen the rapid onset of congestive heart failure immediately following the use of ephedrine in a case of cyanotic emphysema with minimal bronchospasm. The patient improved somewhat on withdrawal of the drug, and made further progress with its substitution by thiouracil. The increased metabolic rate produced by ephedrine may be dangerous to these precariously situated (cyanotic) patients.—I am, etc.,

Littlemore, Oxon.

J. TODD.

Post-epileptic Automatism

SIR,—I am grateful to your correspondents who have expressed their views regarding post-epileptic automatism. It is significant that no one has produced any evidence to support the idea originally put forward by Mercier and repeated by Norwood East. This is that the automatism repeats some previous behaviour: the woman wringing out washing has a fit and wrings her child's neck, the man peeling potatoes cuts someone's throat, and so on. Such a theory is too good to be true and is obviously erroneous.

of the more important references of Jawetz *et al.*^{1,2,3} His work is confirmed by Lepper and Dowling,⁴ who have shown definite antagonism between penicillin and aureomycin in the treatment of meningococcal meningitis.

Our patients who received mixed antibiotics were treated in this manner before we were aware of antagonism—that was in 1950. They only received one dose of crystalline penicillin, and I feel that it is unlikely to have caused a resistance, but this statement is made purely on impression.—I am, etc.,

Winnipeg, Manitoba.

J. NIXON BRIGGS.

REFERENCES

- ¹ *Arch. intern. Med.*, 1951, 87, 349.
- ² *Amer. J. med. Sci.*, 1951, 222, 404.
- ³ *Arch. intern. Med.*, 1952, 90, 301.
- ⁴ *Ibid.*, 1951, 88, 489.

Foetal and Neonatal Death

SIR,—The memorandum "Neonatal Death due to Ligation of Umbilical Cord by an Amniotic Band," by Drs. F. O.K. Craven and C. J. M. Geddes (January 10, p. 81), contains an unfortunate example of confused terminology.

The memorandum begins: "The following case of neonatal death is interesting enough to be placed on record. So far as we can ascertain no previous foetal death due to this exact cause has been published." This wording suggests that neonatal death and foetal death are the same thing, but this is not so. *Neonatal death* means death within the first 28 days after birth of a child that had been born alive, whereas *foetal death* means that the child had died before or during birth. It is important in many ways that this distinction be understood and maintained.

It is stated later in the memorandum that "a dead baby had . . . been delivered." This being so, the use of the term "neonatal death" is quite inappropriate in this case.—I am, etc.,

W. P. D. LOGAN,
Chief Medical Statistician,
General Register Office.

London, W.C.2.

POINTS FROM LETTERS

The College of General Practitioners

Dr. D. D. MACDONALD (London, N.1) writes: The College of General Practitioners has been launched and looks gay in the paint of good intention, rich in the promise of high performance. One watches with the interest of good will from the bank and hopes the correct solution will be available, in full measure, to resolve its problems to come. In wishing this great venture, this New Elizabethan vessel, all success in real usefulness, the words of Samuel Langhorne Clemens (Mark Twain) come welcome to mind: "Diligently train your ideals upwards and still upwards towards a summit where you will find your chiefest pleasure in conduct which, while contenting you, will be sure to confer benefits upon your neighbours and the community. This has been taught by all the great religions for ten thousand years. The only thing new about it is that this time it has been candidly stated. That has not been done before."

Dr. A. E. STEVENS (Jersey) writes: "The College and the Hall" (M.R.C.S., L.S.A.) were good enough for our medical forebears. To-day we have the Royal College of Physicians and the Royal College of Surgeons, which are surely sufficient seeing that so many of us derive our registration on the strength of their diplomas. The Royal College of "Accoucheurs" is quite redundant and unnecessary; and now there is a demand for a College of General Practitioners. If it has to be, why not indicate from its name that it is at least connected with medicine? Why not College of Medicine, or better still College of Apothecaries? But it should be borne in mind that such a college is tantamount to the acceptance of our lowered status.

Otitis and Ear Syringing

Dr. W. STANLEY SYKES (Morley, near Leeds) writes: Mr. A. Tumarkin (December 20, 1952, p. 1361) recommends that cases requiring ear syringing for wax should be sent to an E.N.T. specialist. Surely, Sir, there should be two groups of specialists or operations of this magnitude—one for the right ear and one for the left.

Obituary

F. E. SAXBY WILLIS, M.C., M.D., M.R.C.P.

Dr. F. E. Saxby Willis, who died on January 2 in Hampstead General Hospital, had been the senior physician there for many years.

Frederick Edward Saxby Willis was born in London on October 21, 1889, the son of Frederick and Alice Willis, and received his early education at Dulwich College. He then entered St. Bartholomew's Hospital Medical College and qualified M.R.C.S., L.R.C.P. in 1913. On the outbreak of war in 1914 he enlisted in the South Staffordshire Regiment and was severely wounded at Ypres in 1915. On recovering from his wounds he entered the R.A.M.C. and was attached to the Seaforth Highlanders until the end of the war, being awarded the Military Cross in 1917 for attending to wounded under heavy fire. After demobilization he obtained the degrees of M.B., B.S. of the University of London in 1920 and became casualty physician and chief assistant in the children's department at St. Bartholomew's Hospital, a position he held for several years. In 1922 he proceeded M.D. and took the M.R.C.P. In due course he was elected to the honorary staff of the Royal Chest Hospital and the Hampstead General Hospital. Despite the handicap of his war wounds and, later, diabetes, he refused to allow them to interfere with his daily activities, and he built up a large consulting practice in lung diseases and general medicine. At the time of his death Dr. Saxby Willis was senior physician to Hampstead General Hospital and to the Royal Chest Hospital. He was also physician to the Weir Hospital and consulting physician to the Metropolitan Ear, Nose, and Throat Hospital, to Yateley Cottage Hospital, and to the Alexandra Orphanage.

With the advent of the National Health Service in 1948 he became a member of the teaching staff at the Royal Free Hospital School of Medicine and gave clinical lectures to students and postgraduates there. He contributed many papers on diseases of the lungs to the medical journals, and his joint contribution on cystic diseases of the lungs has been included in Davidson's *Practical Manual of Diseases of the Chest*. At the time of his death he was keenly engaged in a research survey of "atypical pneumonia" for the Royal Free Hospital School of Medicine, and it is to be regretted that his personal conclusions on the aetiology and clinical aspects of this syndrome will not be available to the profession.

Saxby Willis's sympathetic manner and genial personality endeared him to his many patients. His colleagues also had a deep affection for him, and, whether at hospital board meetings, clinical lectures, or social functions, he was the centre of attraction. He leaves a widow and two sons and two daughters, to whom we offer our deepest sympathy.—J. V. A.

B. L. JEAFFRESON, M.D., F.R.C.S., F.R.C.O.G.

Mr. B. L. Jeaffreson, well known in Leeds as a gynaecological and obstetric surgeon, died at his home at Leeds on January 7 at the age of 56.

Bryan Leslie Jeaffreson was born in London on August 29, 1896, the son of Mr. H. J. Jeaffreson. Several of his forebears, who came from Framlingham, in Suffolk, were eminent surgeons in their day. He was educated at Hurstpierpoint College, and at St. Bartholomew's

Hospital Medical School, which he entered in August, 1914. A year later, having passed the first M.B. examination of the University of London, he enlisted as a private in the Honourable Artillery Company and served as a combatant in France. In 1917 he was invalided out of the Army and returned to the study of medicine at St. Bartholomew's Hospital, graduating M.B., B.S. in 1921 and winning the Willett Medal for operative surgery in the same year. He held successively the posts of house-surgeon and resident intern midwifery assistant at St. Bartholomew's Hospital, and then, having proceeded M.D. in 1924, he became house-physician at the London Chest Hospital.

In 1926 Jeaffreson went to the Jessop Hospital for Women, Sheffield, where he worked for two years under Professor Miles Phillips and where he began in earnest his career in obstetrics and gynaecology. In 1928, while working in Birmingham as assistant to the late Sir Beckwith Whitehouse, he obtained the F.R.C.S., and in 1930 he went to Leeds as tutor in obstetrics and gynaecology, later becoming senior clinical lecturer in gynaecology in the university. He told, always with amusement, how a lay member of one of the committees which appointed him at Leeds gave voice to her thought that his travels had made him a rolling stone and that soon he would be moving on again. But he settled down to a brilliant career in Leeds, being appointed honorary assistant surgeon to the Hospital for Women in 1930 and becoming honorary surgeon to the Maternity Hospital in 1934. Jeaffreson was admitted a Member of the Royal College of Obstetricians and Gynaecologists in 1936, becoming a Fellow in 1950, and he served on the council of the College from 1942 to 1949. The work which interested him most was teaching, and indeed he was a great teacher. His lucid exposition and infinite patience endeared him to a large number of Leeds students. He himself had remarkable diagnostic powers, and he insisted on the painstaking elicitation of physical signs by his juniors. But his modesty in that, as in other respects, made the lesson on each occasion the more telling. If he will be honoured as a teacher, he will be remembered, particularly by his junior colleagues, as a kindly chief and an approachable friend.

He was a good organizer, and the success which attended the thirteenth British Congress of Obstetrics and Gynaecology, held at Leeds last year, was in no small measure due to his efforts as senior secretary. Many were looking forward to his term of office this year as president of the North of England Obstetrical and Gynaecological Society. He leaves a widow, and a son and a daughter.—A. V. G. B.

Sir T. DRUMMOND SHIELDS, M.C., M.B., Ch.B.

A. B. W. writes: "T. D." as he was known to many of us who graduated with him at Edinburgh, had something about him which drew us to him. Perhaps it was his seniority in years and his wider background of experience, but in those early days we recognized those sterling qualities of heart and mind—his humanism, his kindly sympathy and understanding, his quiet courage and patience, his intellectual endowments, and his dry humour—which he put to such good use later in the service of his profession, his country, and the Commonwealth. His concern was never for himself but for others, especially those struggling with ill-health or adversity. He was a fearless espouser of lost causes, like that of Oscar Slater, if he felt that a wrong had been committed. A devoted husband, a loving father, staunch and true to his many friends, "T. D." was indeed one of Nature's "veray parfit" gentlemen. He passes to his rest leaving the world better and nobler by his efforts.

Dr. E. G. L. GOFFE, who practised for many years in Kingston-upon-Thames, died at Ferring, in Sussex, where he had lived in retirement for only a few months, on November 28, 1952, at the age of 85. Ernest George Leopold Goffe was born in Jamaica on September 12, 1867, the son of Mr. J. B. Goffe, J.P., and received his early education at York Castle High School, Jamaica. He then came to London and entered University College as a medical student, distinguishing himself as an athlete and as a rugby footballer. He graduated M.B. in 1897, and proceeded M.D. two years later. After holding a number of house appointments at University College Hospital he became assistant medical officer and later assistant medical superintendent at Lewisham Infirmary, subsequently holding posts at other hospitals in the London area. He then settled in practice at Kingston-upon-Thames and continued his hospital association by joining the staff of the Kingston Victoria Hospital, where his charm of manner and vast store of knowledge and experience endeared him to all his colleagues. The closure of the hospital to general practitioners in 1951 greatly saddened him. Dr. Goffe gave up general practice in June last year to enjoy a well-earned retirement, a retirement which proved to be tragically short. A member of the British Medical Association for 56 years, Dr. Goffe was chairman of the Kingston-upon-Thames Division in 1924-5, and he represented his constituency at the Annual Representative Meeting on six occasions. He married Edna Mary, daughter of the Reverend E. Pierce Powell, and she survives him, together with three sons. Mrs. Goffe is herself a member of the medical profession, and one of the sons is Dr. Alan Powell Goffe, also a medical practitioner.—T. W. M.

We are greatly indebted to Dr. DAVID NABARRO for the following appreciation: I first met Leopold Goffe more than 60 years ago, when I entered University College as a medical student in October, 1890. He had a fine physique which made him very noticeable in any assembly. A friend once remarked of him that he resembled a Greek god. His infectious laugh and his good humour made him a valuable acquisition to any company. In his student days he was a great athlete, and in 1892-3 he won the Quain challenge cup for athletic sports. He also played rugby football for University College Hospital from 1892 to 1894. Goffe was a great altruist. As an undergraduate he was very interested in the University College Boys' Club Society and attended the club every week to give the boys instruction in athletic sports. In the summer he helped to take them on their annual trip on the Norfolk Broads. He was also the honorary treasurer of the society. Further examples of his altruism in setting up and managing trusts for the sons of deceased colleagues will be well remembered by some of his friends. Goffe took the London M.D. in 1899, and at the presentation for degrees in May, 1900, at which the Prince of Wales—afterwards King Edward VII—distributed the prizes, I well remember the applause which greeted Goffe when he ascended the platform, a striking figure in scarlet and purple gown, to receive his degree from His Royal Highness. He was a most lovable man, and his patients must be considered fortunate to have had so good a doctor and so sympathetic a friend as their medical adviser. It was remarkable how he retained his interest in medicine to the end. Each year he attended the course for old students at University College Hospital, and 1952 was no exception. For several years we sat beside one another at the annual dinner, and it was only a few weeks ago that we sat alongside for the last time. And now this great man has gone to his rest, but his personality will endure. Our sympathy is extended to his widow and three sons in their bereavement, but theirs is the satisfaction of knowing that Leopold Goffe's name will live for many years in the affection of his multitude of patients and friends.

Dr. HILARY LEDGERWOOD, who died in London on December 6, was born on December 7, 1890, and was educated at Queen's University, Belfast, where she graduated M.B., B.Ch. in 1921. After holding a house appoint-

Universities and Colleges

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

M.D.—*Branch I (Medicine)*: P. J. Banks, A. F. Barnett, H. Barrie, B. Bass, Mary Bateman, S. I. Cohen, Phyllis M. E. Cook, Betty B. Dyer, F. R. Ellis, D. G. Evans, D. M. D. Evans, D. D. Felix Davies, I. T. Gabe, P. J. D. Heaf, Cherry D. Heath, B. W. Jaslowitz, R. P. V. Jayewardene, A. M. Johnson, J. C. Leonard, W. E. Medd, L. P. A. Newborne, C. P. Newcombe, B. E. C. Nordin, M. A. Pears, Betty E. Powe, S. J. G. Semple, R. G. Shorter, K. A. Sowden, C. J. Stevenson, F. Taylor, W. B. Thomson, Brenda D. Van Leuven, B. W. Webb. *Branch II (Pathology)*: A. Bernstein, J. L. Brennan, Patricia C. Brown, L. H. Collier, H. R. Colquitt, J. C. Crook, Phyllis Dagnall, D. Marrack, D. J. O'Brien, F. R. Philips, K. A. Porter, J. I. Pugh, M. V. Salmon, W. J. L. Sladen, C. S. Treip, S. P. B. Way, W. J. Williams, A. L. Woolf, E. A. Wright. *Branch III (Psychological Medicine)*: A. A. Cashmore, J. Denham, A. Folkson, W. P. Gurassa, J. Merry, D. J. Parr (Mark of Distinction, University Medal), H. P. Tarnesby, D. L. C. Thomas, G. C. Turle. *Branch IV (Midwifery and Diseases of Women)*: J. C. Brace, S. Burke, F. Denny, J. Elstob, G. W. Garland, D. W. S. Gordon, J. M. Holmes, R. Moolan-Feroze, Elsie M. Sibthorpe, N. G. G. Talbot. *Branch V (Hygiene)*: J. D. B. Andrews, J. R. Mayers, Anita J. Thomas. *Branch VI (Tropical Medicine)*: J. C. L. Adams, P. B. Adamson, A. C. S. Hobson.

The following candidates at the London School of Hygiene and Tropical Medicine have been approved at the examination indicated:

ACADEMIC POSTGRADUATE CERTIFICATE IN PUBLIC HEALTH.—I. Ash, Dorothy J. Ball, S. Bano, Mary M. M. Boyd, D. E. Boye-Johnson, R. Bradley, J. H. Brodie, P. P. M. Browne, Gwen S. Clark, J. Clearkin, C. Eid, A. J. Essex-Cater, R. S. Gibson, L. P. Harington, I. K. Hay, G. B. Hopkins, I. A. Hussein, Dorothy D. Jones, F. R. S. Kellett, A. J. I. Kelyack, S. Khuri-Otaqui, J. H. Lewis, K. H. Lim, B. Mahadevan, Mavis H. Mortimer, H. Mowchenson, A. Natarajan, F. G. Neild, B. Nicholson, W. L. Palmer, G. A. Real Jimenez, E. P. Rigby, W. F. Ross, M. C. Sanyal, J. H. Taylor, M. Tha Tun, D. E. Thompson, A. M. Thomson, D. R. Thomson, G. F. Willson, A. B. Wittek, C. H. Wood, A. Zahra, A. A. Zaki.

Dr. Mary F. Lockett has been recognized as a teacher of physiology and pharmacology in the University at the Chelsea Polytechnic. (Corrected announcement.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on January 8, with Sir Cecil Wakeley, President, in the chair, the Cecil Joll Prize for 1953 was awarded to Mr. Geoffrey Keynes. A Laming Evans Research Fellowship was awarded to Dr. Angus McPherson for his research into the blood-flow changes in the limbs in poliomyelitis. A Hunterian Professorship was awarded to Professor H. R. Dew for a lecture to be delivered during his visit as Sir Arthur Sims Commonwealth Travelling Professor in 1953. Erasmus Wilson Demonstratorships were awarded to Mr. V. E. Negus, Sir Frank Colyer, and Dr. B. E. Heard, and an Arnott Demonstratorship to Mr. L. E. C. Norbury.

The following were elected to the Fellowship of the Faculty of Anaesthetists: Dr. J. G. Bourne (Salisbury), Dr. H. G. Epstein (Oxford), Professor Fernando Hudon (Quebec), Dr. J. V. Mitchell (Oxford), Dr. G. Jackson-Rees (Liverpool), Dr. Arnold Robertson (Brisbane), Dr. A. Slater (New Zealand), Dr. B. N. Sircar (Bombay).

Diplomas of Membership were granted to A. G. N. Calder (Middlesex), K. G. Lupprian (St. Thomas's), and N. E. Pitts (Sheffield).

Diplomas were awarded, jointly with the Royal College of Physicians of London, as follows:

DIPLOMA IN ANAESTHETICS.—D. E. Argent, A. Banerjee, D. W. Barron, M. McC. Burrows, K. B. Chambers, C. C. D. Chandler, H. S. Cohen, E. A. Cooper, J. S. Crawford, D. W. J. Cullingford, L. D. Davidson, B. H. Egerton, S. Galloen, Rosalinde J. Harrison, Pamela M. Hellings, Frances S. Huxley, E. G. A. Jackson, J. W. Latham, R. A. L. Leatherdale, S. McKechnie, A. V. McVey, A. H. B. Masson, R. A. Millar, A. C. Milne, P. R. H. Molesworth, Ruth Molphy, E. J. O'Mullane, Doreen B. Pallot, J. Parkhouse,

C. Pearce, D. J. Pearce, S. Ponnambalam, L. T. Rees, P. W. H. Robinson, F. M. Sandford, P. H. Simmons, W. D. Turner, D. C. White.

DIPLOMA IN LARYNGOLOGY AND OTOTOLOGY.—T. L. Bradbeer, D. C. J. Carter, G. O. Clark, D. A. Clements, J. B. David, J. W. T. Dixon, A. K. Ghosh, H. V. Jones, K. V. Krishnamurthy, J. Lapper, J. Littlejohn, A. Majali, J. S. Martin, H. W. H. Shepherd, D. W. Stuart, J. K. Suryodayam.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—R. H. Boardman, K. N. Kothaneth, T. R. Malloy, T. L. Pilkington, J. W. Warboys.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—H. Barakat, M. S. Boparai, T. Mirza.

DIPLOMA IN PATHOLOGY.—J. N. Dearnaley, J. S. Elwood, M. M. Friedman, E. M. Stirk, Jean E. D. Taylor.

DIPLOMA IN CHILD HEALTH.—A. Banerjee.

Hospitals were recognized under paragraph 23 of the F.R.C.S. regulations as follows: Royal Hospital, Wolverhampton, *Paragraph 23c*, senior registrar (senior house officer); house officer. Doncaster Royal Infirmary, *Paragraph 23c*, ear, nose, and throat house-surgeon (senior house officer). Barnet General Hospital, two house-surgeons (general surgery); house-surgeon (orthopaedics), all for six months. Haywards Hospital, Bishop's Stortford, senior house officer (surgical) for six months. Royal Surrey County Hospital, Guildford, *Paragraph 23b*, ophthalmological and neurological senior house officer. Harrogate and District General Hospital, *decennial revision*, registrar, general surgery; registrar, orthopaedics; two house-surgeons, all for six months. Croydon General Hospital, principal surgical officer (or senior surgical registrar); surgical registrar, both for one year. St. Bartholomew's Hospital, Rochester, casualty house-surgeon (January 1, 1954). Gravesend and North Kent Hospital, casualty officer (January 1, 1954). St. Mary's Hospital, Portsmouth, *extension of temporary recognition until January 1, 1954*, senior surgical registrar; surgical registrar, each for 12 months; house-surgeon (general surgery and orthopaedics); house-surgeon (general surgery), each for six months. Clare Hall Hospital, Barnet, registrar (surgical); senior house officer (surgical), each for six months. Southport General Infirmary, *revision*, registrar (in place of senior registrar); two house-surgeons for six months (until January 1, 1954). Queen Elizabeth Hospital, Gateshead, house officer; surgical registrar, both for six months. Sunderland General Hospital, *additional recognition*, first house-surgeon for six months. Ryhope General Hospital, Sunderland, first house-surgeon; senior house-surgeon, both for six months. Mayo Hospital, Lahore, three registrars and six house-surgeons for six months (for one year). Central Middlesex Hospital, *decennial revision*, two registrars (general and neurology); one registrar (general and urology); one registrar (general and orthopaedics), all for one year; three house-surgeons (general and neurology); two house-surgeons (general and urology); one house-surgeon (orthopaedics), all for six months. *Casualty posts*, two senior house-surgeons, casualty, from January 1, 1954. Doncaster Royal Infirmary, *Paragraph 23b*, ophthalmic house-surgeon. Royal Homoeopathic Hospital, London, *decennial revision*, house-surgeon (general) for six months. St. Martin's Hospital, Bath, *additional recognition*, orthopaedic house-surgeon for six months. Cheltenham General Hospital, *decennial revision*, resident surgical officer, two house-surgeons, all for six months. King Edward VII Hospital, Windsor, *decennial revision*, surgical registrar for one year; first, second, and third house-surgeons for six months. *Casualty posts*, casualty officer (senior house officer), from January 1, 1954.

Vital Statistics

Infectious Diseases

A large rise occurred in the incidence of infectious diseases in England and Wales during the week ending January 3. The numbers of notifications always rise in the week after Christmas, compensating for the fall recorded in the preceding week, but the rise recorded this year is larger than usual. The increase included 16,308 for measles, from 14,189 to 30,497, 1,048 for whooping-cough, from 1,117 to 2,165, 597 for acute pneumonia, from 826 to 1,423, 358 for scarlet fever, from 1,358 to 1,716, and 78 for dysentery, from 184 to 262.

The rise in the incidence of measles was mainly concentrated in and around London. The largest increases were

London 1,709, from 996 to 2,705, Middlesex 1,723, from 784 to 2,507, Essex 1,347, from 1,415 to 2,762, and Kent 1,282, from 771 to 2,053. The largest rises in the number of notifications of whooping-cough were 137 in Essex, from 41 to 178, and 106 in Middlesex, from 31 to 137. The only large rises in the incidence of scarlet fever were Lancashire 60, from 170 to 230, and Essex 41, from 85 to 126. 25 cases of diphtheria were notified, one fewer than in the preceding week.

No case of paratyphoid fever and only 1 case of typhoid fever were notified during the week. This is the lowest level of the enteric fevers for almost three years.

During the week 37 cases of acute poliomyelitis were notified. These were 3 fewer for paralytic and 7 more for non-paralytic cases than in the preceding week. The largest returns were Sussex 5 (Chichester R.D. 3), Berkshire 3, Nottinghamshire 3, and Derbyshire 3.

The largest centres of infection for dysentery were Lincolnshire 53 (Grimsby C.B. 47), Lancashire 39 (Liverpool C.B. 19), Surrey 36 (Carshalton U.D. 32), London 26, and Warwickshire 14.

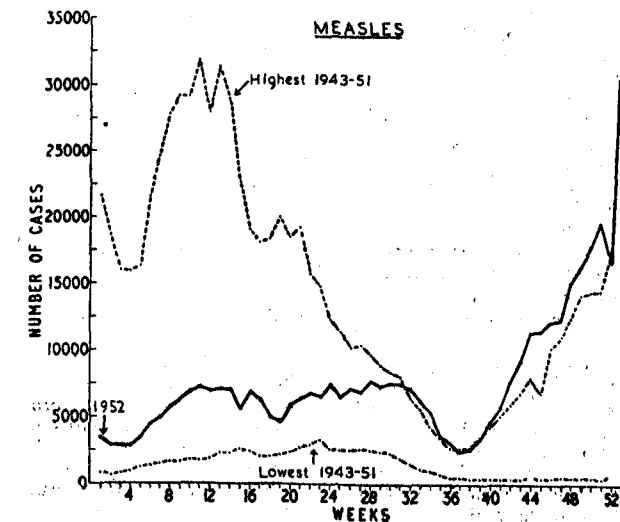
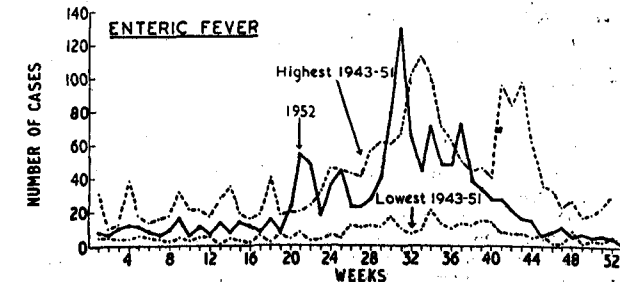
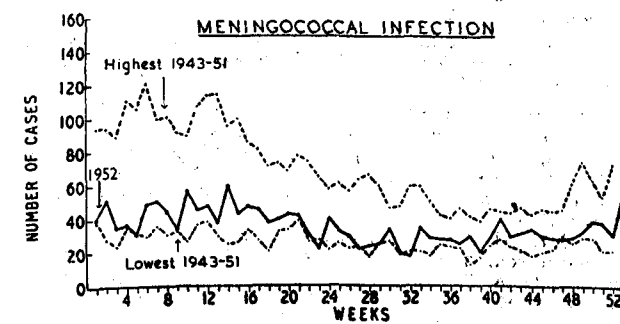
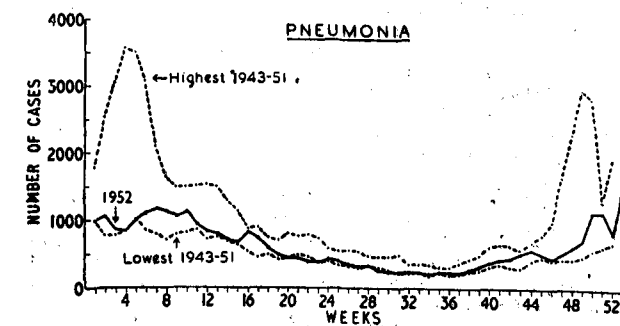
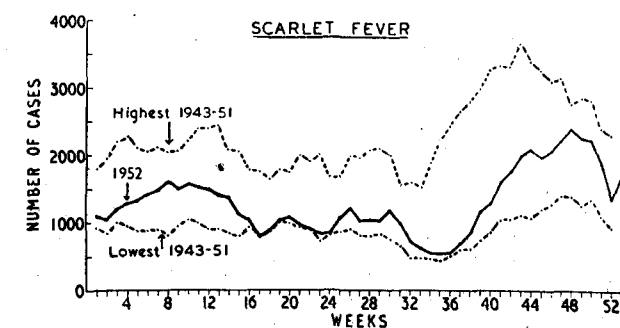
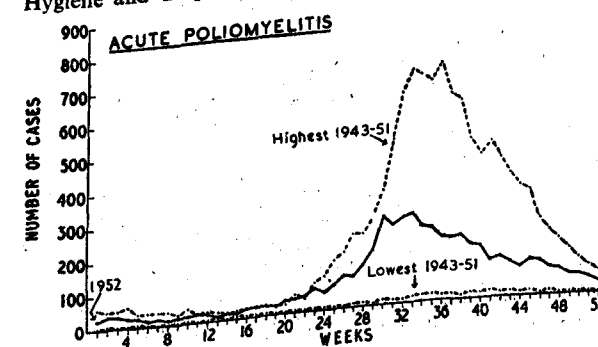
England and Wales in 1952

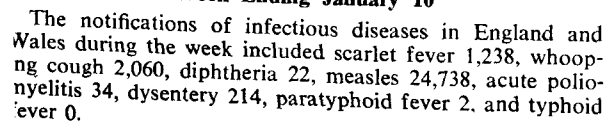
The chief feature of the returns of infectious diseases during 1952 was the absence of an outbreak of influenza in the spring. In the first 13 weeks only 485 deaths were recorded in the great towns from this disease, compared with 7,859 in the first quarter of 1951. The incidence of with 7,859 in the first quarter of 1952, but the rate of diphtheria continued to fall during 1952, but the rate of decline was slower. The notifications of diphtheria in 1952 were only 2.9% of the notifications in 1941. The total notifications of acute poliomyelitis were 46% above the half of 1951. The notifications of dysentery were about half of 1951, but the incidence remained high. The total of 1951, but the incidence was mainly due to the high level of the enteric fevers was mainly due to the persistent outbreak in South Wales during the third quarter. A comparison of the notifications with those of the four preceding years is given below:

	1948	1949	1950	1951	1952
Scarlet fever	75,460	71,753	66,852	49,431	69,091
Whooping-cough	145,878	102,516	157,714	169,394	116,311
Diphtheria	7,903	4,929	2,858	1,969	1,473
Measles	396,841	384,361	366,116	615,332	400,838
Acute pneumonia	31,096	34,624	30,714	43,181	31,403
Meningococcal infections	1,971	1,586	1,745	1,956	1,687
Acute poliomyelitis	2,175	6,850	8,699	3,093	4,504
Dysentery	5,587	4,819	18,135	29,488	15,665
Typhoid and paratyphoid fevers	873	1,138	654	1,438	1,190
Deaths from influenza in the great towns	?	?	2,052	8,338	1,019

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1943-51 are shown thus ————, the figures for 1952 thus ————. Except for the curves showing notifications in 1952, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

DEATHS in Great Towns	1952					1951				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	1	0	1	0	0
Dysentery	0	0		0			0		0	
Encephalitis, acute..		0			0		0			0
Enteric fever	0	0		0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	25	4	2	0	0	12		3	0	2
Influenza	29	4	2	0	3	22	5	0	0	0
Measles		1	0	0	0		0	0	0	0
Meningococcal infection		0	0				0	1		
Pneumonia	510	104		8	11	250	44		7	6
Poliomyelitis, acute	3	0			0	0	0			0
Scarlet fever		0	1	0	0		0	0	0	0
Tuberculosis: Respiratory	179	{ 24 1	{ 10 4	{ 3 3	{ 3 6	131	{ 11 0	{ 28 2	{ 10 0	{ 5 0
Non-respiratory ..										
Whooping-cough ..	3	1	0	0	0	0	0	2	1	0
Deaths 0-1 year ..	342	47	33	14	17	217	30	35	4	9
Deaths (excluding stillbirths) ..	7,842	1372	709	157	253	5,033	816	612	115	104
LIVE BIRTHS ..	8,668	1235	708	240	468	5,082	707	804	138	91
STILLBIRTHS ..	202	20	20			159	25	34		

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

Nuffield Lodge.—The removal of the headquarters of the Nuffield Foundation, the Nuffield Provincial Hospitals Trust, and the National Corporation for the Care of Old People to Grove House, Regent's Park, London, N.W.1, takes place on January 24 (see *British Medical Journal*, September 6, 1952, p. 571). Grove House, which is the large mansion opposite St. John's Wood Church, has been renamed Nuffield Lodge with the consent of the Commissioners of Crown Lands. The telephone number is Primrose 8871-5. The address of the Trust's Investigation into the Function and Design of Hospitals will be 33, Doughty Street, London, W.C.1 (Terminus 5288).

Sir Allen Daley, medical officer of health to the London County Council from 1939 to 1952, has gone to Australia for an eight-weeks tour of the State health services. The Nuffield Foundation is sponsoring the tour. Sir Allen will lecture to medical audiences and advise on public health problems. He is due to arrive at Melbourne on February 6.

Emergency Bed Service: Applications and Admissions.—During the seven days ending January 19 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 1,700, of whom 83.97% were admitted. A white warning, indicating that the percentage of admissions fell below 85, was issued on January 6.

COMING EVENTS

The British Council for Rehabilitation has arranged a one-day conference on "Speeding recovery through the closer co-operation of hospitals and industry," which will be held at the Royal College of Nursing, Henrietta Place, London, W.1, on February 4. The conference is intended for industrial medical officers and nurses. The fee is 15s., and bookings should be made in advance with the general secretary, British Council for Rehabilitation, Tavistock House (South), Tavistock Square, London, W.C.1.

Oxford Graduates Medical Club.—Sir Rudolph Peters, F.R.S., will take the chair at the winter dinner of the Oxford Graduates Medical Club at the Royal College of Surgeons on January 30 at 7 p.m. Tickets (price 30s.) may be obtained from Mr. Selwyn Taylor, 3, Roedean Crescent, Roehampton, S.W.15.

The Psychology of Eating.—The Scottish Group of the Nutrition Society will hold a conference on "The Psychology of Eating" in the Anatomy Lecture Theatre, Marischal College, Aberdeen, on January 31 at 1.20 p.m. Professor Rex Knight will be in the chair, and other speakers will include Professor W. M. Millar, Professor C. F. W. Illingworth, Dr. C. F. Rolland, Dr. J. M. Walker, and Dr. C. G. Kennedy.

SOCIETIES AND LECTURES

Details in this column are necessarily brief. Further information and tickets where required (marked ●) should be obtained from the institution concerned.

Monday, January 26

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: Lecture-demonstration for postgraduates.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., discussion to be introduced by Mr. W. J. Dempster, Mr. B. W. Rycroft, and Mr. A. L. Schofield: Present Status and Future Prospects of Homologous Tissue Transplantation.

Tuesday, January 27

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Sir Frederic Bartlett, F.R.S.: Nature and Place of Thinking in Medicine.

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. Wade: Treatment of the Epithelioma.

LONDON UNIVERSITY.—At London Hospital Medical College, 5.30 p.m., Professor A. Claude (Brussels): Technical Aspects of Cell Research.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Mr. J. Minton: Ocular Manifestations in Nervous Disease: Part II.

Wednesday, January 28

CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, 8.15 p.m., A.G.M. Professor J. Dixon Boyd: "Pigment Cells" in Man.

EDINBURGH CLINICAL CLUB.—4 p.m., visit to Experimental Practice Dispensary, Richmond Street.

●ILLUMINATING ENGINEERING SOCIETY.—At Royal Institution, 6 p.m., Second Trotter-Paterson Memorial Lecture by Dr. E. D. Adrian, O.M., F.R.S.: Nervous Reactions of the Retina.

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Precancerous Conditions of the Skin.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, W.C., 4.30 p.m., Dr. R. Thomson: Laboratory Aids to Diagnosis.

RENAL ASSOCIATION.—At 41, Portland Place, W., 4 for 4.30 p.m., Mr. A. W. Wilkinson: Biochemical Changes after Transplantation of the Ureters; Mr. D. Innes Williams: Long-term Results of Transplantation of the Ureters for Ectopia Vesicae.

ROYAL EYE HOSPITAL CLINICAL SOCIETY.—At Royal College of Surgeons of England, 8 p.m., demonstration of work of Ophthalmological Research Unit, Royal Eye Hospital, and Royal College of Surgeons of England.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Finlayson Memorial Lecture by Professor E. J. Wayne: The Heart in Endocrine Disease.

SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP—NUTRITION PANEL.—At Burlington House, W., 6.15 p.m., Dr. G. A. C. Herklots and Professor J. Yudkin: Food and the Future—Present Methods of Attack on the Problem.

Thursday, January 29

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Sir Alexander Fleming, F.R.S.: Recent Progress in Antibiotics.

EDINBURGH UNIVERSITY.—At University New Buildings, 5 p.m., Professor Jean Fiolle (Aix-Marseille): Diagnosis and Treatment of Embolisms of Arteries of the Limbs.

EPSOM AND SUTTON INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At St. Ebbas's Hospital, 6 p.m., clinical meeting. Dr. H. H. Robinson: Combined Insulin Coma and E.C.T. Treatment; Dr. D. E. Sands: Some Observations on 200 Patients Treated by Leucotomy with the Use of Three Forms of Operation.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Mr. A. W. Kay: Ulcer Problem: The Quest for Achlorhydria.

●INSTITUTE OF CHILD HEALTH.—5 p.m., Mr. H. S. Sharp: Upper Respiratory Tract Disorders.

LONDON UNIVERSITY.—At London Hospital Medical College, 5.30 p.m., Professor A. Claude (Brussels): Morphological and Biochemical Aspects of Cell Structure and Function.

OXFORD UNIVERSITY.—5 p.m., Dr. G. W. Corner (Washington): Anatomical Illustration and the Fine Arts.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Sir Geoffrey S. Todd: Modern Methods in the Treatment of Pulmonary Tuberculosis.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor J. M. Mackintosh: Medical Care To-morrow.

Friday, January 30

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. G. B. Mitchell-Heggs: Acne Vulgaris, Acne Excoriata, and Dermatitis Attracta.

ROYAL INSTITUTE OF PHILOSOPHY.—At University Hall, 14, Gordon Square, W.C., 5.15 p.m., Mr. D. A. Rees, M.A.: Greek Views of Nature and Mind.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Dr. K. W. Miller: Allergy. UNIVERSITY COLLEGE.—At Physiology Theatre, 5.30 p.m., Professor F. Bergel: Some Chemical Aspects of Normal Growth.

APPOINTMENTS

EYTON-JONES, JACK, M.B., Ch.B., D.Obst.R.C.O.G., Obstetrical and Gynaecological Registrar, Scarsdale Hospital, Chesterfield, Derbyshire.

HAMMOND, GEOFFREY T., M.D., M.R.C.O.G., Consultant Obstetrician and Gynaecologist to Winchester Group of Hospitals.

NOTTINGHAM, CITY OP.—Elspeth M. Warwick, M.B., Ch.B., D.P.H., Deputy Medical Officer of Health; Patricia H. S. Shaw, M.D., D.P.H., Senior Medical Officer.

O'RIORDAN, J. P., M.B., B.Ch., D.P.H., D.C.H., Lieutenant-Colonel, I.M.S.(ret.), Port and Airport Medical Officer, Dublin.

RICE-OWLEY, J. M., D.M., M.R.C.P., Consultant Physician to the Chesterfield Royal Hospital and hospitals at Worksop and Retford.

ST. HILL, CHARLES A., M.B., Ch.B., Home Office Pathologist (Liverpool Region), attached to Forensic Science Department, Preston.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—A. E. Fyfe, M.B., B.S., Registrar in Obstetrics and Gynaecology, Southmead Hospital, Bristol; Z. L. Szur, M.B., B.Ch., D.M.R.D., D.M.R., Assistant Radiotherapist, Exeter Clinical Area; J. B. Gordon-Russell, M.B., Ch.B., M.R.C.P., D.P.M., Consultant Psychiatrist to South Somerset Clinical Area; R. J. Hart, M.B., B.S., Orthopaedic Registrar in North Gloucestershire Clinical Area.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Lewis.—On January 11, 1953, at The Maltings, Boars Hill, Oxford, to Dr. Evelyn, wife of Dr. Charles Lewis, a sister for Alexandra—Joanna Augusta.

DEATHS

Atkinson.—On January 14, 1953, Wilfred Percy Tindal Atkinson, M.R.C.S., L.R.C.P., of Old Manse, Fair Green, Sawbridge, Herts, aged 68.

Browne.—On January 13, 1953, at the Bristol Royal Infirmary, Frederick William Browne, M.B., B.Ch., of Penhill, Shirehampton, Bristol.

Cooper.—On January 15, 1953, at Packhorse Cottage, Bessels Green, Sevenoaks, Kent, John Gerald Cooper, M.B., B.Ch., aged 78.

Cuthbert.—On January 17, 1953, at Dundee, James Arthur Cuthbert, M.B., Ch.B., D.P.H., of 247, Strathmartine Road, Dundee.

Elsner.—On January 12, 1953, at Desmesne House, Heighington, Darlington, Co. Durham, Otto William Alexander Elsner, C.B.E., D.S.O., L.R.C.P.&S.I. & L.M., D.P.H., Colonel, R.A.M.C., retired, aged 81.

Fowler.—On January 14, 1953, Henry Fowler, L.R.C.P.&S.Ed., L.R.F.P.S., of 160, Chislehurst Road, Orpington, Kent.

Grant.—On January 14, 1953, at his home, Hazel Coppice, West Mersea, Essex, Alexander Smeaton Grant, M.R.C.S., L.R.C.P., aged 83.

Hayman.—On January 9, 1953, at his home, Royden House, Sharnbrook, Beds, Frank Keith Hayman, M.B., F.R.C.S., formerly of Great Yarmouth, Norfolk, aged 59.

Lee.—On January 7, 1953, at his home, 7, Upper Maze Hill, St. Leonards-on-Sea, Sussex, James Carrel Lee, M.D., C.M., J.P.

McGregor.—On January 12, 1953, at the Princess Royal Hospital, Halifax, Yorks, Robert McGregor, L.R.C.P.&S.Ed., L.R.F.P.S., of Moor View, Walsden, Todmorden, Yorks.

March.—On January 14, 1953, Charles March, M.B., Ch.B., of The Little House, Gerrards Cross, Bucks, aged 40.

Martin.—On January 6, 1953, at Hampstead, London, N.W., Alfred John Martin, O.B.E., M.R.C.S., L.R.C.P., D.P.M., of Norgrove, The Bishops Avenue, London, N., aged 43.

Mosse.—On January 7, 1953, Cotton Grimley Tenison Mosse, M.R.C.S., L.R.C.P., of Southminster, Essex.

Robertson.—On January 6, 1953, at Banbury, Oxon, James Fenwick Robertson, M.R.C.S., L.R.C.P., aged 76.

Scott.—On December 8, 1952, at the National Hospital for Nervous Diseases, Queen Square, London, W.C., Philip Dennis Scott, M.B., B.S., of Clifton Hill, London, N.W., aged 61.

Wilson.—On January 14, 1953, at her home, Roseneath, Fairmount Road, Cheltenham, Glos, Sarah Wilson (formerly Kaye), M.B., aged 85.

Williamson.—On January 18, 1953, at 11, Chaffer's Mead, Ashted, Surrey, John Rutter Williamson, M.D., aged 81.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Malaria Prophylaxis during Pregnancy

Q.—What is the best malaria suppressive to use during pregnancy?

A.—Chloroquine is probably the best suppressive for all forms of malaria during pregnancy. Proguanil and mepacrine are likely to be equally active against the parasites, but in the former case there is the possibility of having to deal with a proguanil-resistant strain of falciparum malaria, and in the latter the skin is stained yellow. If falciparum infection is suspected a full therapeutic course of chloroquine, mepacrine, or proguanil should be given before starting on the suppressive regime. None of these drugs is likely to affect the pregnancy. Quinine should be avoided because it is less efficient than the other drugs; in the dosage used for therapy or suppression it is not likely to affect the pregnancy.

Ellis Classification of Nephritis

Q.—Is the Ellis classification of nephritis now universally accepted or is one still justified in using the old acute, sub-acute, chronic, etc.? Could you give me a résumé of the Ellis classification, including percentage of recovery or ultimate fate in each group? What is Ellis's view on "nephrosis," and is his view generally accepted?

A.—The Ellis classification of nephritis has been widely accepted both in this country and abroad. It is more popular, on the whole, with clinicians than with pathologists. Reference to current textbooks shows that many pathologists still make use of the time-honoured terms: acute haemorrhagic glomerulo-nephritis, subacute and chronic nephritis, and so forth. This is due not to a reactionary bias on their part but to a certain scepticism arising from the frequent difficulty in reconciling the histological appearances with the clinical diagnosis of Ellis's Types I and II. In particular they observe, from time to time, that a nephritis may appear to start as Type I but proceed later to the clinical manifestations of Type II with retention of the glomerular features of Type I; there are many transition forms, histologically, between the two.

Ellis described his classification in his Croonian lectures on "The Natural History of Bright's Disease," which he gave in 1941. Type I nephritis mostly affects young subjects and corresponds to the "acute haemorrhagic nephritis" of older classifications. It is generally reckoned that from 80-85% recover completely; of the remainder a few die in the acute stage or the rapid progression of this to a "subacute stage." The remainder do not clear up completely but enter a latent stage, which may last for several decades, ending with contracted kidneys, secondary hypertension, and uraemia. Type II nephritis occurs over a wider age range, is of insidious onset, and characterized by the "nephrotic syndrome." The disease is steadily progressive, and recovery is rare. If death does not occur at an early stage from secondary infection the condition may progress, over months or years, to a stage of renal failure with secondary hypertension. If of renal failure with secondary hypertension "lipoid nephrosis" is taken to signify the "lipoid nephrosis" of Munk, Volhard, and Fahr and others this would be included in Type II nephritis, but other forms of nephrosis such as the amyloid and mercurial forms are included in Ellis's "miscellaneous conditions." Apart from Type I

and Type II nephritis Ellis also recognized a hypertensive group, in which "essential hypertension" is subdivided into "benign" and "malignant" groups. One does not speak of recovery in these, but the prognosis differs widely. In the malignant form the course is usually rapid, with death in less than two years; the benign is compatible with a normal life over many years, especially in women.

Slow Convalescence after Virus Infections

Q.—To what is attributed the slow rate of recovery to full vigour from virus infections, such as pneumonia treated with chloramphenicol or similar antibiotics? What is the prognosis and treatment of protracted insomnia with which this prolonged convalescence is sometimes associated?

A.—The rapid response of the toxæmia in virus infections of the lung following therapy with the new antibiotics makes it important to realize that return to normal vigour depends upon structural recovery of the affected part, a process which takes some weeks. The patient has had a severe illness, and convalescence should never be cut short however dramatic the initial response seems to be.

Protracted insomnia following these illnesses is part of a general state of depression, which is especially common after infection with the influenza virus. It is best treated by giving a mixture of amylobarbitone 1 gr. (65 mg.) and amphetamine sulphate 5 mg. in the morning and at mid-day, and an adequate dose of barbiturate at night. Quinalbarbitone 1½ gr. (0.1 g.) with amylobarbitone 3 gr. (0.2 g.) is generally suitable. The condition clears up as a rule within a few weeks.

Anaesthesia for Cataract Operations

Q.—What is the best general anaesthetic for cataract operations?

A.—It is difficult to lay down hard-and-fast rules about any anaesthetic—the choice depends so much on the patient, and the result on the skill of the anaesthetist. As post-operative vomiting, and straining and coughing, must be avoided the operation is usually performed under local analgesia; but general anaesthesia can be wholly satisfactory. For an "average" patient, 0.5 g. thiopentone and 40 mg. gallamine triethiodide can be given; the pharynx, epiglottis, and larynx are sprayed with 3 ml. of 4% cocaine by a Macintosh spray; a pharyngeal airway is inserted and nitrous-oxide-oxygen is given. The anaesthesia may be reinforced with a small quantity of trichlorethylene or intermittent doses of thiopentone, but if the customary local analgesic is given after the patient is asleep the depth of narcosis need not be deep.

Anosmia and Cacosmia

Q.—What are the likely causes of loss of the sense of smell gradually following its perversion? This has occurred in an elderly man who has always been troubled with nasal catarrh. Now he cannot smell creosote or bonfires; formerly he thought he could smell fat frying and burning pastry when there was none. What investigations and treatment are advised?

A.—Anosmia and cacosmia are usually the result of some local disturbance of the olfactory area of the nose itself. The commonest cause of anosmia is inability of the vapourized substances to reach the olfactory cells in the lining of the upper third of the mucous membrane lining the nasal cavity. It is usually a temporary accompaniment to the common cold and fortunately lasts only a few days. Sometimes it follows a very severe upper respiratory infection of the influenza type. Anosmia also occurs in cases where the nose is full of polypi. Some patients with allergic rhinitis, where there is much swelling of the mucosa, may also be unable to smell.

Cacosmia, or an abnormal olfactory sensation, is fortunately unusual. It may follow an upper respiratory infection or may appear for no reason at all. A few cases have been recorded in which it has followed the use of tyrothricin locally. An olfactory aura is not uncommon in epilepsy. Very occasionally tumours involving the olfactory tracts in the brain may give rise to abnormal olfaction or to loss of the sense of smell. In the case in question a full nasal and neurological examination is recommended. Apart from dealing with any disease in the nose no other form of local treatment is advised.

Risk of Transmitting Trichomonal Infections to Children

Q.—A girl of 18, who is being treated for a *Trichomonas vaginalis* infection with a heavy purulent discharge, is in charge of a baby girl aged 1 year. Is the child likely to become similarly infected, and, if so, what precautions should be taken?

A.—There is a good deal of evidence to show that trichomonal infection is transferred from one individual to another, but the exact mode of transfer is in most cases unknown. Newly born babies of infected mothers occasionally have *Trichomonas* in the vagina (R. E. Russell *et al.*, *Amer. J. Obstet. Gynec.*, 1942, 44, 292), and trichomonal vaginitis does occur in infancy and childhood. Nevertheless, considering how widespread is trichomonal vaginitis in adults, there are remarkably few cases of this infection in infancy. Even when groups of cases of vulvovaginitis in infancy are analysed, trichomonal vaginitis is a rare cause. Thus, although there is a risk of transfer of infection in a case such as the one described it must be extremely small.

As regards precautions, the first essential is to institute treatment for the nursemaid. The risk should also be explained to her, and she should be given strict instructions about always washing her hands thoroughly before handling the child, its clothing, and its napkins. The nurse's bedding, underclothes, and bath-towels should be kept separate, even during laundering, and she should not use the same bath as the baby—even though it is scrubbed out after use.

Disturbed Menstruation after Parturition

Q.—Since the use of oestrogens to inhibit lactation a multipara of 30 has had irregular periods. There have been two peculiarities; a period has started the day following intercourse on each of the only three occasions since the birth when it has been practised, and the periods have been associated with breast engorgement and the secretion of milk. What is the explanation of these associations?

A.—Assuming that oestrogens were given only for the usual period of four to eight days and have long been discontinued, their use can be dismissed as having no bearing on the present symptoms. The data imply that the confinement occurred only a few months ago, and it is common enough to see some disturbance when menstruation is resumed—especially if the woman does not breast-feed the baby. Absence of lactation tends to delay involution and to result in a return of menstruation at a time when the uterus is still large and vascular. Extreme congestion of the uterus could result in bleeding after coitus, although the relationship of coitus to menstruation in this case might be coincidental.

Some enlargement and tenderness of the breasts is also common at the time of menstruation, and especially premenstrually. It takes months and sometimes years before secretion disappears entirely from the breasts after pregnancy, and it is likely to be more noticeable at the time of premenstrual engorgement.

The clinical features of this case do not suggest anything which could not be regarded as a minor functional disturbance which is frequently seen after pregnancy—and especially

ally if breast-feeding is avoided. They should settle of their own accord within a few months; if they do not, further investigation will be required.

Medical Hazards of Sand-pits

Q.—What are the medical hazards of children's sand-pits in public parks? How seriously should such hazards be taken, and what preventive measures are worth while?

A.—The medical hazards of children's sand-pits are that infections may be spread from pollution of the sand, and that the sand itself may cause injury to the eyes through being blown or thrown about.

Pollution would occur from excretion either by the children themselves or by dogs and cats. The risk of infection being spread from child carriers is very small indeed. The diseases most likely to be involved are the enteric fevers and dysentery. In the former, young children are very rarely found to be carriers, and in the latter a child carrier would almost certainly be a clinical case and would therefore be unlikely to be playing in a sand-pit. Other infections which might be spread through children playing in sand-pits would be due more to the circumstances of their aggregation than to the conditions of the sand-pit itself.

The hazard, though small, should not be neglected. The sand-pit should be adequately fenced and animals rigorously excluded. There should be sanitary accommodation close at hand. The sand should be raked daily to remove surface debris and turned regularly in order to bring moist sand to the surface and to disperse sand that has been polluted. In hot dry weather the sand should be sprayed to reduce the risk of eye injury. Treatment with rock salt has been employed to increase the cohesion of the sand. It is inadvisable to have trees overhanging the sand-pit, as they are likely to reduce the bactericidal action of sunlight, while the fallen leaves tend to produce a compost. Finally, whenever the sand shows signs of becoming dirty it should be removed.

Alcohol and Barbiturates

Q.—In cases of "drunk in charge" the accused sometimes says that he has taken barbiturates as well as alcohol. Do alcohol and barbiturates potentiate each other?

A.—Barbiturates and alcohol are both cerebral depressants. Consequently the effect of one will certainly be potentiated by a dose of the other. Whether they are pharmacologically synergistic to one another is more controversial. This question is discussed by Dille and Ahlquist¹ and by Ramsey and Haag.²

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- ¹ *J. Pharmacol.*, 1937, 61, 385.
- ² *Ibid.*, 1946, 88, 313.

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SUBDURAL EFFUSIONS IN INFANCY: 24 CASES

BY

A. N. GUTHKELCH, M.Ch., F.R.C.S.

(From the Royal Manchester Children's Hospital and the Department of Child Health, Manchester University)

Subdural effusions in infancy have received little attention from British writers. Brief communications have been made by Northfield (1939, 1 case), Hinden (1939, 1 case), and Gimson (1945, 3 cases); while Wolfe (1948) has reported two cases of subdural haematoma treated successfully by operation, and Fine and Herson (1951) a fatal case. While this paper was in preparation Everley Jones (1952) recorded six cases of subdural effusions complicating purulent meningitis.

It should be emphasized that infantile subdural effusion is not a rare condition. Study of the records of the Royal Manchester Children's Hospital for the four years covered by this series shows that, of all surgical conditions of the central nervous system occurring in the first two years of life, only spina bifida and hydrocephalus were seen more often than subdural haematoma. Tumours and abscesses of the central nervous system in infants were much less common. Similarly, Smith and her co-workers (1951) have reported finding subdural effusions in almost a half of their cases of bacterial meningitis in infancy, and Everley Jones's (1952) figures are similar. To paraphrase Ingraham and Heyl (1939), the frequency with which these effusions are found is proportional to the intensity with which they are sought.

The series here reported comprises 24 cases—18 cases of subdural haematoma in infancy; 5 cases complicating purulent meningitis; and 1 case of subdural effusion in a patient with sagittal sinus thrombosis. These groups are considered separately.

SUBDURAL HAEMATOMA IN INFANCY

The recognition of the importance of this condition is virtually the work of one man—Franc Ingraham, of Boston, whose classical papers with Matson (1944, 1949) record a much larger series of cases than any other writer. A further 55 cases are reported by Elvidge and Jackson (1949). Their series includes 10 cases of birth trauma treated by immediate operation and 9 cases of severe post-natal head injury, both of which groups had a very high mortality—even in the more chronic group 19.2% died. Statten (1948) reported 13 cases treated by miscellaneous methods and compared them with 15 cases treated by the regime advised by Ingraham and Matson (1944). He showed that in the former group inadequate treatment led to many deaths and to mental deficiency among the survivors; in the latter, 10 cases were normal.

Age and Sex.—Most cases occur in the first few months of life. Of the series reported here 11 developed

symptoms before the age of 3 months, five between 3 and 6 months, and only two thereafter (Table I). Ingraham and Matson (1949) found a preponderance of males over females in the ratio of 5:3. In this series the preponderance is even more striking, being 5:1.

Aetiology and Pathology

Ingraham and Matson (1949) found evidence of birth trauma in about a quarter of their cases. In the present series a comprehensive history was available in 16 cases. Eight of these sustained definite birth trauma with a history of obvious damage to the head, difficulty in resuscitation, or a bloody cerebrospinal fluid in the neonatal period. Two infants were members of twin pregnancies and two were born prematurely (at 30 and 34 weeks respectively). In a further two cases the baby had sustained a definite head injury a fortnight before the onset of symptoms, though no sign of fracture of the skull was found on x-ray examination. In only two cases was the antecedent history completely negative.

Obviously, therefore, subdural haematoma is very often associated with an abnormal or difficult labour (75% in this series). Furthermore, the fact that it most frequently presents in the first months of life also suggests that the cause is to be sought at or near the time of birth; finally, the preponderance of males might be explained on the basis that male infants have bigger heads than females, and are therefore more likely to sustain intracranial injury at birth.

There is no evidence that the haemorrhagic diseases play much part in the aetiology of the condition. Ingraham and Matson have noted that 31.5% of their cases showed some anaemia, but this is a common finding in infants who have been ill for long, whatever the cause. In the present series haemoglobin estimations were made at the beginning of treatment in 14. Nine of these infants had been ill for 14 days or less; only two of them showed some anaemia, while in seven the haemoglobin was within the normal limits for age. Of the five infants who had been ill for more than 14 days three showed a haemoglobin of less than 60%; in the other two it was 68%.

Much has been written on the pathology of subdural haematoma. The conventional theory is that the original haemorrhage occurs from a cortical vein, probably in many cases one crossing the subdural space to reach a major venous sinus. This haemorrhage clots, and the clot then liquefies and eventually becomes surrounded

cough for eight days. On examination the head circumference was as before, the fontanelle tense. His temperature was 101° F. (38.3° C.) and there was slight meningism. An immediate subdural tap yielded 8 ml. of very deeply blood-stained fluid on each side. The subdural taps were repeated daily for a further 18 days, 850 ml. of fluid being removed. The composition of this was similar in all respects, at first, to that obtained before. Later the fluid became almost clear yellow.

First Operation.—On June 13, under general anaesthesia and with a blood transfusion from the beginning, a right temporal osteoplastic flap was turned down. There was found to be a large cavity lined with a thin membrane in the subdural space extending mainly anteriorly over the frontal lobe of the brain. Most of the membrane was dissected away, the cavity filled with saline, and the wound closed. Convalescence was uneventful except for a considerable recurrence of effusion on the operated side during the next 14 days, a total of 210 ml. being aspirated.

Second Operation.—On June 27, again under general anaesthesia and with continuous blood transfusion, a left temporal osteoplastic flap was turned down. This time the haematoma was found to be mainly over the post-frontal, parietal, and temporal regions, and was easily dissected away.

The child again made a smooth recovery, and this time further aspirations of the subdural spaces were negative. He left hospital on July 20. He has since been seen at intervals of a few months in the out-patient department and is developing normally in all respects.

Case 17. Neglected Subdural Haematoma

This baby was admitted at the age of 14 months. His had been a very difficult forceps delivery, and he sustained a depressed fracture of the left side of the skull. At 4 days he had several fits (right side). At 10 weeks he had a febrile illness with screaming attacks and vomiting which lasted a week. Since then he had had repeated generalized epileptic attacks, and occasional projectile vomiting. He had not sat up or begun to play with toys.

On examination he was found to be very backward, paying no attention to sounds or to objects moved in front of him and making no effort to sit up. There was a gross depression of the left fronto-parietal region of the skull; the head circumference was normal. The pupils reacted briskly to light, the fundi were normal, and there was no obvious hemiparesis. Lumbar puncture showed 5 white blood cells per c.mm. with a normal chemistry.

First Operation.—Under general anaesthesia an exploratory burr-hole was made over the site of the depressed fracture, but nothing abnormal was found. A burr-hole over the left parietal eminence, however, revealed a rather tough subdural membrane, densely adherent to dura and brain, from which a small piece was removed for biopsy. It showed mature fibrous tissue with no evidence of calcification.

Second Operation.—A week later, under general anaesthesia, a small bone flap was turned down over the site of the biopsy. The dura was lined with a tough fibrous tissue several millimetres thick, adherent everywhere to the arachnoid. The subarachnoid space was abnormally deep, the cerebral cortex yellow and tough, with small atrophic gyri and wide sulci. In one area it contained multiple small cysts. There seemed no point in dissecting away the subdural

membrane in the presence of such severe brain atrophy, so the bone flap was replaced in the usual way.

This child has not been seen recently, but was making little progress during the few months after his operation.

Comment

Case 14 shows how with early diagnosis one can hope to achieve a rapid and smooth recovery without recourse to major surgery. If the subdural spaces can be emptied early enough no membrane is allowed to form and there need be no craniotomy.

Case 6 taught a lesson which has since been emphasized by Ingraham and Matson (1949). The majority of these haematomas extend into the temporal region and will be found by the diagnostic burr-holes already recommended. From time to time, however, a case occurs in which the clot is situated elsewhere, so that, if the suspicion of subdural haematoma is very strong but temporal exploration is negative, further burr-holes should be made in the frontal and parietal regions. The sudden "drying-up" of the subdural spaces should have suggested that there was still some effusion, but in a situation not accessible to needling through the fontanelle. The recurrence of symptoms 12 weeks after the first admission was doubtless due to the further expansion of a haematoma which had been only partially aspirated before. It is fortunate that the delay has had no permanent effect on the child's mental development.

It would be wrong to claim that Case 17 could necessarily have been saved by prompt treatment. Although there was certainly an old subdural haematoma, the atrophy and sclerosis of the underlying cortex may well have been the end-result of contusion, laceration, and vascular disturbance occurring during the actual birth trauma.

SUBDURAL EFFUSION IN PURULENT MENINGITIS

There are several different circumstances in which infection and subdural effusion can be associated. Spitz *et al.* (1945) pointed out the fundamental distinction between subdural effusion complicating purulent meningitis and a collection of pus in the subdural space complicating osteomyelitis of the skull. Schiller *et al.* (1948) noted that the latter condition might be either localized or spreading. If it were spreading they preferred to call it "purulent pachymeningitis." They also mentioned the possibility of subdural abscess occurring as a complication of cerebral abscess or through the infection of a subdural haematoma. Finally, as is reported in the next section, a subdural effusion may complicate cerebral thrombophlebitis.

The complete classification of subdural effusions associated with infection is therefore:

- | | | |
|--------------|----|--|
| A. Localized | .. | (1) With osteomyelitis of the skull.
(2) With cerebral abscess. |
| B. Spreading | .. | (1) With osteomyelitis of the skull—"purulent pachymeningitis."
(2) Due to infection of a subdural haematoma.
(3) With purulent meningitis.
(4) With cerebral thrombophlebitis. |

Of the spreading effusions, purulent pachymeningitis has a strong tendency to localize, and therefore presents a surgical problem of great difficulty. We are here concerned only with the meningitic variety, the five examples being shown in Table II.

TABLE II.—Clinical Features in Five Cases of Subdural Effusion Complicating Purulent Meningitis

Case No.	Sex	Age on Admission	Infecting Organism	Presenting Symptoms	Time from Onset of Meningitis	Site of Effusion	Craniotomy	Result
19	F	4 months	Not identified	Fits	4 weeks	L. and R.	L. and R.	Fits continued; died a year later
20	M	12 "	Streptococcus	Vomiting	1 week	"	No	Developing normally (2½ years)
21	M	8 "	Pneumococcus	Fits	3 weeks	"	L.	Behaviour disturbed (2 years)
22	F	6 "	Staph. pyogenes	"	2 "	"	No	Appears well (2 months)
23	F	12 years	Pneumococcus	Fits. Right hemiparesis	5 years	L.	L.	" " (6 ")

Incidence.—Most of these cases occur in the first year of life (McKay *et al.*, 1950; Smith *et al.*, 1951; Everley Jones, 1952), but cases may be found in adults (Spitz *et al.*, 1945). The incidence between the sexes seems to be about equal, in contrast to the marked preponderance of males in subdural haematoma.

Aetiology and Pathology

The causative organism of the initial meningitis is most commonly *Haemophilus influenzae* or a pneumococcus, but several others have been recorded. In this series two were pneumococcal, one was staphylococcal, one streptococcal; and in one no organism was isolated. The reason for the effusion is obscure. McKay *et al.* mention the possibilities of exudation or haemorrhage into the subdural space as a complication of either antibiotic therapy or of repeated lumbar puncture, or of "minimal trauma in a critically ill infant"; Smith *et al.* postulate a transudation of fluid containing cells and bacteria across the inflamed arachnoid into the subdural space, where the lysis of the cells produces a fluid of high protein content, and osmotic processes subsequently cause the effusion to enlarge until it produces symptoms. It is known that an effusion can occur without intrathecal administration of antibiotics, while the fact that it does not complicate tuberculous meningitis must surely nowadays exclude lumbar puncture as a cause. There may in fact be two separate conditions. The minimum protein content in the nine cases of McKay *et al.* was 700 mg. per 100 ml. The 20 cases of Smith *et al.*, however, showed a variation between 40 and 1,920 mg. of protein per 100 ml. In Everley Jones's series there were four cases with a protein content of 1,000 mg. or more, and two in which it lay between 150 and 250 mg. per 100 ml. In the four patients now reported in whom the estimation was made, the reading was between 1,000 and 5,000 mg. per 100 ml.

It is tempting to suggest that the lower-protein group represent cases of simple transudation across the arachnoid, while in the high-protein group some additional element exists. A suggestion about the nature of this additional factor is made below. The difference is not due simply to the age of the effusion, for a high reading was found by Everley Jones in his Case 6 on the eighth day of the illness, and a low one in his Case 4 on the sixteenth day.

Whatever the reason, it is certainly unexpected and interesting to find in the present series that the protein content of the fluid is exactly the same as it is in subdural haematoma (1–5 g., average 2 g., per 100 ml.), nor were the white cell counts very dissimilar (30–2,500, usually 400–600, per c.mm.).

Diagnosis and Treatment

It is generally agreed that a subdural effusion should be suspected, and diagnostic subdural taps made, in any infant with meningitis whose clinical progress is unsatisfactory after three days' treatment, or who has persistent fever, vomiting, convulsions, or a tense fontanelle.

The routine of daily subdural taps, exactly as advised for subdural haematoma, should be followed. After 10 days, at any rate in all but the smallest effusions, bitemporal burr-holes should be made and the subdural space inspected. Where membrane formation has occurred, craniotomy with removal of the membrane is indicated.

In Case 20 the fontanelle had closed and the diagnosis was made by exploratory burr-holes. Here membrane formation was minimal and a good result was obtained by simple tube drainage for four days.

Results

No one yet knows the long-term results in these cases. Case 23 (this patient is older than the others, but is included here because her condition was the same as that of the infants) the membrane was too adherent and wide-spread to be totally removed. Of the two cases in which a very thin membrane was present, Case 20 has been

followed for 2½ years and is developing normally, and Case 22 seems well but not enough time has elapsed for assessment. Of the two with membranes requiring craniotomy, Case 19 was always backward, suffered from fits, and died a year after operation from a further attack of meningitis. Case 21 has been followed for two years, and is a bad-tempered and intractable child.

Nevertheless, from the literature referred to previously one gets the general impression that with early diagnosis the results may approach those obtained in infantile subdural haematoma.

Case 20. Effusion without Membrane Formation

A male baby aged 12 months was transferred to the Royal Manchester Children's Hospital with a seven-day history of streptococcal meningitis complicating a left otitis media. He was pyrexial and vomited repeatedly. There was a left external rectus palsy, the head circumference was 20½ in. (51.5 cm.), and x-ray films of the skull showed gross separation of the sutures. There were no localizing neurological signs. The lumbar cerebrospinal fluid contained 110 mg. of protein per 100 ml. and 33 cells per c.mm. Bitemporal burr-holes made under general anaesthesia revealed large collections of turbid yellow subdural fluid. This contained 3.75 g. of protein per 100 ml. and 2,500 white blood cells (80% polymorphs). As there was only a very thin membrane craniotomy was not performed. Instead the subdural spaces were drained by rubber tubes for four days. The child made an uninterrupted recovery, and aspiration of the burr-holes seven days after the removal of the tubes showed no evidence of recurrence of the effusion. As noted above, he is developing normally.

Case 21. Subdural Effusion with Membranes

A male infant of 8 months was admitted to the Royal Manchester Children's Hospital on March 13, 1950, with a history of vomiting and a squint for three days, followed by convulsions within the last 24 hours. On examination he was having frequent right-sided epileptic attacks, there was no meningism, and the fundi were normal. There were rales over both lung fields. Immediate lumbar puncture yielded a turbid fluid containing 500 white cells per c.mm. and many Gram-positive diplococci, later established as pneumococci; the protein content was 300 mg. per 100 ml. Treatment with penicillin intramuscularly and intrathecally together with sulphadimidine was begun at once. By March 30 the cerebrospinal fluid showed 45 cells (all monocytes) per c.mm., 110 mg. of protein per 100 ml., and sterile culture, but the child was still irritable and pyrexial, and was developing a right hemiparesis. As the fontanelle was closed and the diagnosis was uncertain, bilateral occipital burr-holes were made on March 30 with a view to ventriculography if necessary. These showed the presence of large subdural effusions on each side, the fluid being xanthochromic and slightly turbid, with a protein content of 5,000 mg. per 100 ml. The wounds were closed and a further 80 ml. of similar fluid was aspirated during the next week from the left side. The right side produced only a further 20 ml. of fluid.

Craniotomy.—On April 10, under general anaesthesia, a left temporal osteoplastic flap was turned down and a rather thin but tough subdural membrane dissected away. The cavity was filled with saline and the flap replaced and sutured.

During the immediate post-operative period there was some pyrexia and swelling of the scalp, but no frank sepsis developed. Further aspirations of the left subdural space were negative. On May 1 a right temporal burr-hole was made, but there were no signs of effusion or membrane formation on this side. Meanwhile, the right hemiparesis had almost completely cleared, and the child was discharged a week later. Two years later he was bad-tempered, destructive, and dirty in his habits. There was still slight stiffness of the right arm and leg.

Case 23. Neglected Subdural Effusion

A girl aged 12 years was admitted some five years before with a history of pneumococcal meningitis which had been complicated by the development of a right hemiparesis, dysphasia, and fits. Cerebral thrombophlebitis had been suspected at the time. When seen at the Royal Manchester Children's Hospital she was having about one major and one minor epileptic fit per week, the right face and limbs twitching more than the left. She had some difficulty in speech and definite clumsiness of the right hand, but a normal gait. Air encephalography showed a gross dilatation of the posterior part of the left lateral ventricle.

Operation.—Under general anaesthesia a left-sided posterior osteoplastic flap was turned down. The dura was found to be everywhere densely adherent to a membrane about 1 cm. in thickness. This in turn was very adherent to the underlying cortex, and only a limited amount could be dissected away. There was also, on the other hand, a well-localized cerebral scar; this was excised down to the ventricle, leaving healthy white matter on all sides. The usual closure of the wound was made.

The child made a good recovery. There has been no increase in her neurological signs and so far (six months after operation) she has had no further fits.

Comment

In Case 21 the relatively poor result may be due either to the severity of the original infection or to the fact that diagnosis was somewhat delayed. In Case 23, which closely resembles the neglected case of subdural haematoma (Case 17) there was so typical a sheet of fibrous tissue lying in the subdural space and extending far beyond the bounds of the cerebral scar that the diagnosis of old encapsulated subdural effusion can hardly be doubted. It is conceivable, however, that the findings represent spontaneous resolution of a cerebral abscess with a subdural effusion overlying it.

The high proportion of cases with membrane formation recorded by McKay *et al.* (1950) and in this series, both from neurosurgical clinics, contrasts with the very much lower figures of cases submitted to operation from paediatric clinics: Smith *et al.* (1951)—two cases in twenty—and Everley Jones (1952), one in six. The explanation is doubtless that if subdural effusions are sought for early in cases of meningitis they will rapidly respond to treatment, without need for major neurosurgical intervention. But where they are not so sought, though a proportion may resolve spontaneously, the others will become encapsulated. These latter, if untreated, may cause either a fatal issue or (as in Case 23) serious disability later.

CEREBRAL VENOUS THROMBOSIS WITH
SUBDURAL EFFUSION

The whole question of the importance of cerebral thrombophlebitis as a cause of neurological symptoms and signs in infancy is a somewhat controversial one. The condition is rarely fatal, and even modern cerebral angiography with special methods designed to demonstrate the venous sinuses has failed, both in cases investigated by me and in those of others (Logue, 1952, personal communication), to demonstrate an obstruction with any regularity. None the less there are certain forms of illness in infants, particularly with a sudden onset of fits and a varying degree of hemiplegia associated with fever and moderate increase in the cells and protein content of the cerebrospinal fluid, in which the diagnosis of cerebral thrombophlebitis provides an acceptable explanation. The occurrence of a subdural effusion in such a case has some theoretical importance.

Case 24.—A female infant aged 4 months was admitted to Booth Hall Hospital under the care of Dr. W. H. Patterson, by whose kindness I record this case. She was the daughter of an epileptic mother and suffered from congenital heart disease. The immediate reason for admission was a history

of five convulsions in the past ten days, with irritability and vomiting. On examination the child was severely dehydrated, but with a tense bulging fontanelle. Lumbar puncture showed a faintly xanthochromic fluid under a pressure of more than 300 mm. It contained 40 mg. of protein per 100 ml. and 12 leucocytes, 50% being lymphocytes and 50% endothelial cells. Subdural taps yielded 5 ml. on the left side and 3 ml. on the right of a dark-brown slightly blood-stained fluid containing 110 leucocytes on the left and 60 leucocytes on the right. The child was not improved by this procedure, and died within 48 hours. Necropsy showed a thrombosis of the sagittal sinus and of its tributary veins on both sides, together with pulmonary stenosis and a patent interventricular septum.

Comment

The similarity, already noted, of the fluid found in cases of infantile subdural haematoma to that found in the majority of cases of subdural effusion complicating purulent meningitis suggests that a similar cause is responsible for both. The haematomas are generally believed to arise from haemorrhage from a vein bridging the subdural space from cortex to venous sinus, so that it would seem reasonable to suppose that a similar effusion in purulent meningitis might arise from necrosis of the wall of a vein involved in a process of thrombophlebitis. Spitz *et al.* (1945) have already made this suggestion, claiming indeed to demonstrate in their necropsy material a "necrotizing involvement of the bridging veins which had allowed their contents to escape through their damaged walls." But as their case was also suffering from purulent meningitis the transudation theory previously mentioned might still conceivably have accounted for the effusion observed.

In Case 24 no such explanation is possible because there was no evidence of meningitis. The objection that the effusion was small can be answered in two ways. On the one hand, the thrombosis was so massive that the infant died before the effusion could grow to any size. On the other, there is a case in the literature (Penfield, 1923) in which a boy of 16 months was found to have huge bilateral subdural effusions after a febrile illness with otitis media. Penfield observed this boy for many weeks and noted further febrile episodes accompanied by a lymphocytic reaction in the cerebrospinal fluid. At that time little was known of the cause of "otitic hydrocephalus," as it was then termed, but Penfield obviously leans to this diagnosis in his discussion. The case would probably be regarded now as one of cerebral thrombophlebitis, and there is therefore no reason to regard Case 24 as unique.

Accordingly it may be concluded that cerebral thrombophlebitis, whether it occurs from extension of infection from purulent meningitis or from a focus elsewhere, may give rise to a subdural effusion, and that the likely mechanism is the giving way of the necrotic walls of veins crossing the subdural space.

Finally, now that we know (Symonds, 1952) how commonly an intracranial venous thrombosis may complicate any infective focus, however trivial and wherever situated in the body, it is tempting to attribute to the same process those cases of infantile subdural effusion in which convincing evidence of either trauma or intracranial suppuration is entirely absent.

Summary

A series of 18 cases of subdural haematoma of infancy is presented. The clinical features of the condition are described and the method of treatment is indicated. There is reason to suppose that nearly 70% of these children will grow up normally.

Five cases of subdural effusion complicating bacterial meningitis are described. The clinical details are given, and the similarity of the effusion to that found in subdural haematoma is noted.

A case of subdural effusion complicating sagittal sinus thrombosis is also described. On the basis of this case and of those of other workers it is concluded that certain types of subdural effusion complicating purulent meningitis may be due to a leakage of blood from the necrotic wall of a vein involved in thrombophlebitis.

It is a pleasure to acknowledge the co-operation of all the paediatricians in the Manchester Region in collecting the material for this paper. I am also indebted to Mr. L. P. Lassman and Mr. A. Jolleys, and to many residents at the Royal Manchester Children's Hospital, for help in the documentation and management of the cases, and to Sister N. Kewley for devoted nursing care. There is no doubt that the credit for the low operative mortality recorded in this paper belongs very largely to Dr. Tom Dinsdale, who gave the anaesthetics for almost all the operations.

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THE TREATMENT OF STEATORRHOEA
IN CROHN'S DISEASE

BY

JOYCE BURKE, M.D., D.Obst.R.C.O.G., D.C.H.
(From the Royal Infirmary, Sheffield, and the Department
of Pharmacology and Therapeutics, University
of Sheffield)

During recent years it has been recognized that Crohn's disease, or regional ileitis, is not always confined to the terminal ileum, but may be widespread, involving the proximal ileum, jejunum, colon, and even the duodenum. Surgery is definitely indicated for the relief of intestinal obstruction, and possibly for treatment of localized forms of the disease, when the affected portion of bowel may be excised. Patients with widespread disease present a difficult therapeutic problem. Surgery has proved disappointing, as complete extirpation of the affected bowel is seldom possible and recurrence after operation is common. In such circumstances therapy is directed towards improving the general nutrition of the patient and correcting deficiencies of vitamins and minerals. The main purpose of this paper is to describe the effects of a high-protein diet and intravenous iron, observed in three patients suffering from Crohn's disease with steatorrhea, and to draw attention to the beneficial result that may accrue from a carefully planned diet.

Case 1

A schoolboy aged 12 was admitted to hospital on April 4, 1948, complaining of diarrhoea and of colicky pain in the right iliac fossa. Intermittent slight pyrexia was present, but otherwise his general condition was good. He passed several loose green stools daily, from which no pathogenic organisms were isolated. Agglutination reactions to the

typhoid and dysentery groups were negative. A barium enema revealed nothing abnormal. After treatment with sulphonamides and penicillin he was discharged home on May 27. His symptoms persisted and his weight fell from 7 st. 3 lb. (45.8 kg.) to 4 st. 10½ lb. (30.2 kg.). He was readmitted to hospital on July 2. Apart from his wasted appearance clinical examination was negative. A hypochromic anaemia was present: Hb, 13.6 g. per 100 ml.; red cells, 4,300,000 per c.mm. The E.S.R. was 28 mm. in one hour (Westergren). Agglutination reactions were again negative, including those to *Brucella abortus*. The diagnosis of Crohn's disease was considered at this time, but attempts to demonstrate the terminal ileum radiologically failed. A low-residue diet was prescribed and his weight had risen to 5 st. 1 lb. (32.2 kg.) when he returned home on August 19. He remained under observation until March, 1949, when he weighed 6 st. 11½ lb. (43.3 kg.), and although his stools were still loose he was free from pain and attending school regularly.

In September the diarrhoea became worse and colicky abdominal pain returned, accompanied by vomiting. In April, 1950, examination by barium enema and sigmoidoscopy was normal. His condition deteriorated steadily until he was admitted to hospital on February 7, 1951, weighing 4 st. 3 lb. (26.8 kg.). He was passing about 10 loose offensive stools daily and vomiting most of his food shortly after it was eaten. He also complained of numbness and paraesthesiae in the extremities. Clinical examination revealed gross emaciation and faint brown pigmentation of the skin. The blood pressure was 110/75. No mass could be felt in the abdomen.

The results of laboratory investigations at this time are summarized briefly: E.S.R., 40 mm. in one hour (Westergren); Hb, 63% (9.3 g. per 100 ml.); red cells, 3,350,000 per c.mm.; C.I., 0.95; M.C.D., 7.2 µ; white cells, 12,000 per c.mm. The iliac marrow showed a marked normoblastic reaction of iron-deficiency type; macronormoblasts were also present, but no megaloblasts were seen. Microscopy of the stools showed no exudate; a few undigested meat fibres were seen. No faecal pathogens were isolated. Blood culture was negative. The titre of serum agglutinating *Br. abortus* was 1:640 ± 1:1,280, and *Br. melitensis* 1:320 ± 1:640. The total serum proteins were 5.4 g. per 100 ml. (albumin 3 g., globulin 2.4 g.). The average daily output of fat in the faeces was 7 g.; full details are given in the Table.

Radiological examination of the bowel showed marked narrowing and irregularity of the terminal ileum. There was narrowing in the middle of the transverse colon, with destruction of normal mucosal pattern, continuing to half-way down the descending colon.

As a result of the above findings a clinical diagnosis of chronic ileocolitis due to Crohn's disease was made.

The temperature varied between 99 and 100° F. (37.2 and 37.8° C.) for the first six weeks in hospital. The agglutination reactions to *Br. abortus* and *Br. melitensis* were still at the same high titre a week after admission. Blood cultures for these organisms were negative. A course of aureomycin was given, 60 g. in 21 days. There was little effect on the temperature, but the titres fell to 1:80 to both organisms four days after starting the drug and to 1:20 one month later, and have remained at this level. In view of the rapid fall in titre of agglutinins, it was unlikely that active brucellosis was present.

Feeding presented a great problem at first, owing to vomiting and anorexia. The patient was given a low-residue, high-protein, low-fat diet, containing daily two or three eggs, liberal helpings of meat and fish, and 75 g. of protein in a proprietary preparation. Bread-and-butter, small quantities of sieved vegetables, and boiled potatoes were included. His condition improved rapidly, and at the end of three weeks his weight was 5 st. 5 lb. (34 kg.), a gain of 16 lb. (7.3 kg.). The hypochromic anaemia responded to iron, 30 ml. of "ferrivenin" being given intravenously in the week before he was discharged from hospital.

As his appetite improved, his stools increased greatly in bulk and it was even more evident that steatorrhoea was present than on admission. Estimations in April showed the average daily output of fat in the stools over four days to be 36 g. The fat intake was approximately 90 g. daily during the period of collection (see Table). A glucose-tolerance test was normal.

When the patient returned home on April 27 he weighed 7 st. 6 lb. (47.2 kg.).

Subsequent progress has been excellent. After three weeks' convalescence he returned to school, and has attended regularly for nine months. His activities are not restricted. He plays games, swims, and rides a bicycle for the first time since the start of his illness in 1948. His basic diet consists of an egg for breakfast with bread-and-butter, banana or cheese sandwiches for lunch, and a meal at night of meat or fish, potatoes, and a milk pudding. Milk is not restricted and fats are allowed in moderation. His mother has been advised to add different articles to the diet, one at a time, noting the effect on the stools. It has been found that he can tolerate boiled carrots, stewed apples, and fresh oranges. Most other foods cause an increase in the number of stools. This diet is supplemented by oral iron, vitamins of the B group, and ascorbic acid.

The patient was reassessed in January, 1952. His weight was then 10 st. (63.5 kg.), a gain of 81 lb. (36.7 kg.) in 11 months. He had grown taller and secondary sexual characters had appeared. He was passing two or three semi-formed stools daily, as compared with six stools at the time of discharge from hospital, in spite of the fact that he was taking most of his fat ration. The average daily output of fat in the faeces over three days was 8 g., on a measured intake of 100 g. daily (see Table). A barium enema showed normal haustration and outline as far as the middle of the transverse colon, where persistent narrowing was still present. The proximal part of the transverse colon, ascending colon, and caecum showed a normal outline, as in previous studies. The terminal ileum remained narrowed, with a distorted mucosal pattern. Healing of the lesion in the descending colon and splenic flexure had undoubtedly taken place.

Case 2

A man aged 20 began to have attacks of right-sided abdominal pain and occasional diarrhoea in 1945. Three months after the onset of symptoms appendicectomy was performed, but no report on the condition of the bowel is available. He was in bed for six weeks after the operation and then returned to work. Symptoms recurred two years later. The pain increased in severity, and was accompanied by abdominal distension and the passage of flatus. Four loose stools were passed daily. He lost 3 st. (19 kg.) in weight before admission to hospital in May, 1948. A tender mass was palpable in the right iliac fossa. The blood count was normal. A diagnosis of regional ileitis was made. This was confirmed at laparotomy in August, 1948, and was treated by resection of 4 ft. (1.2 metres) of terminal ileum, ileo-colostomy, and right hemicolectomy. The histological appearance of the diseased ileum was that of Crohn's disease. He was discharged from hospital in October, 1948, and was well until February, 1950, although he continued to pass loose stools three or four times daily. Abdominal pain then returned and the diarrhoea became worse. A barium meal in February, 1950, showed recurrence of the disease, just distal to the anastomosis. In September, 1950, a fistula appeared at the upper end of the abdominal scar and discharged intermittently.

He was readmitted to hospital on May 1, 1951. Examination revealed a pale, wasted young man, with early finger-clubbing. A tender mass was palpable in the right iliac fossa, deep to the discharging fistula. He was passing three or four bulky offensive stools daily. The results of laboratory investigations are summarized as follows: Hb, 63% (9.3 g. per 100 ml.); red cells, 3,750,000 per c.mm.; C.I., 0.88; M.C.D., 7.2 μ ; white cells, 15,000 per c.mm. The blood film showed a simple polymorphonuclear leucocytosis. Two types of red cells were seen: (1) microcytic and slightly

hypochromic, and (2) macrocytic and normochromic. The iliac marrow showed a normoblastic reaction of iron-deficiency type, along with megaloid cells and macro-granulocytes which suggest liver-factor deficiency. Free hydrochloric acid was present in the stomach. The urine was normal. Microscopy of the stools showed scanty leucocytes only. No faecal pathogens were cultured. The total serum proteins were 7 g. per 100 ml. (albumin 3.4 g., globulin 3.6 g.) Culture of the pus from the fistula grew *Staph. pyogenes*, sensitive to penicillin. The average daily output of fat in the stools was 38 g. measured over three days, while the intake was approximately 70 g. daily (see Table).

There was continuous pyrexia for the first four weeks in hospital, the temperature varying between 99 and 101° F. (37.2 and 38.3° C.). Sulphadimidine, penicillin, and chloramphenicol were prescribed in turn. The abdominal mass finally became fluctuant. It was incised, and approximately 500 ml. of thick pus drained. Thereafter he was afebrile.

A diet similar to that given to Case 1 was prescribed. He also received iron intravenously—90 ml. of "ferrivenin" being given in 10 days—and folic acid, 15 mg. daily by mouth. When he left hospital on June 20 his weight was 8 st. 8 lb. (54.4 kg.). The abdominal fistula had closed by August and he returned to work. In November he weighed 10 st. 2 lb. (64.4 kg.), a total gain of 23 lb. (10.4 kg.). His haemoglobin was 110% (16.3 g. per 100 ml.), and the red blood cells numbered 5,200,000 per c.mm.

A full assessment was made in February, 1952. By this time he had worked regularly for six months, had married, and was feeling extremely fit. His weight was stationary and the fistula had remained healed. For the first time since the start of his illness in 1945 he was passing only one stool daily, and this was usually formed. His basic diet resembled that of Case 1. He said that as fats precipitated diarrhoea he avoided them, but he tolerated fruit and vegetables quite well so long as they were taken with meals. He continued to take ascorbic acid, yeast tablets, and small doses of iron by mouth. Folic acid had been discontinued four months previously.

The average daily output of fat in the stools, on a fat intake of 100 g. daily, was 32 g. (see Table). A glucose-tolerance test was normal. The blood count was as follows: Hb, 95% (14.1 g. per 100 ml.); red cells, 4,100,000 per c.mm.; C.I., 1.15; M.C.D., 7.4 μ ; white cells, 11,000 per c.mm. Slight macrocytosis persisted and megaloid cells were still present on examination of the iliac marrow. Folic acid, 15 mg. daily for 21 days, failed to correct this abnormality.

Case 3

A man aged 39 first complained of colicky pain in the right iliac fossa in 1945. It was relieved by the passage of flatus. Diarrhoea was noticed at the same time and the stools remained loose. In November, 1949, he had to give up work as he was passing up to 20 loose stools daily. His weight had fallen from approximately 10½ st. (66.7 kg.) to 7 st. 10 lb. (49 kg.). He was admitted to hospital in February, 1950, and a diagnosis of Crohn's disease was made, narrowing of the terminal ileum being demonstrated radiologically. At laparotomy the disease was confined to the terminal ileum, but there was a fistula into the upper ileum. Three feet (0.9 metre) of terminal ileum was resected and ileocolostomy and right hemicolectomy were performed. The diagnosis of Crohn's disease was confirmed histologically.

The patient returned to work in May, 1950. He gained weight and remained well until November, 1951, although mild diarrhoea persisted. At that time the number of stools increased to four or five daily and slight abdominal pain had returned.

In January, 1952, he was admitted to hospital. Clinical examination showed obvious recent loss of weight and considerable pallor. His tongue was normal. No abdominal mass was felt. He weighed 8 st. 3 lb. (52.2 kg.). Laboratory findings were as follows: Hb, 48% (7.1 g. per 100 ml.);

red cells, 3,270,000 per c.mm.; C.I., 0.73; M.C.D., 7.3 μ ; white cells, 7,000 per c.mm. The iliac marrow showed a normoblastic reaction of iron-deficiency type, along with macronormoblasts. Scanty leucocytes were seen in the stools; no faecal pathogens were isolated on culture. The glucose-tolerance test was normal. The total serum proteins were 6.2 g. per 100 ml. (albumin 3.5 g., globulin 2.7 g.). No abnormality was found in the urine. The average daily output of fat in the faeces was 41 g., on a measured intake of 100 g. daily (see Table).

He was started on the same diet as the other two patients and received iron intravenously, 100 ml. of "ferrivenin" being given in 14 days. After six weeks he had gained 14 lb. (6.4 kg.) in weight and his haemoglobin had risen to 78% and his red cells to 4,500,000 per c.mm.; C.I., 0.86. He was able to return to work.

Discussion

It is fully appreciated that regional ileitis is characterized by remissions and relapses. During a remission rapid gain in weight is common. Crohn (1949) mentions figures of 15, 25, and even 50 lb. (6.8, 11.3, and 22.7 kg.). Case 2 was undoubtedly benefited by the evacuation of a large abscess, and all three patients were at rest in hospital for several weeks. All received intravenous iron, and two of them were given antibiotics. However, it is believed that the rapid improvement was largely due to the diet, especially in Case 1, this patient having already gained 14 lb. (6.4 kg.) in weight before aureomycin was started. He was well and had gained 38 lb. (17.3 kg.) before intravenous iron was given to correct a persistent hypochromic anaemia. During the year on the high-protein diet he gained 81 lb. (36.7 kg.) in weight. Case 3 did not receive antibiotics. In all three cases diarrhoea was controlled for the first time after institution of the diet.

Steatorrhoea, which was present in the three cases, has been observed previously in regional ileitis (Bockus, 1945; Frazer, 1949), and Crohn (1949) mentions tropical sprue in the differential diagnosis. The high incidence of malnutrition, vitamin deficiencies, and anaemia is well recognized, and the great importance of a high-protein diet, with supplementary minerals and vitamins, is stressed by Brown and Donald (1942), Bockus (1945), Crohn (1949), and Kiefer *et al.* (1950).

In order to obtain the extra meat rations granted to patients with steatorrhoea in this country at the present time the diagnosis must be established by analysis of the stools. It is therefore worth while having this carried out. Steatorrhoea can easily be overlooked if the stools are inspected shortly after admission to hospital, when the food intake is often reduced, or if only a single specimen of faeces is sent to the laboratory for routine examination. The diagnosis of steatorrhoea is most readily established by investigating the response of the patient to an increase of dietary fat. In normal subjects the fat excretion shows a minimal change even when the intake of fat is raised as high as 200 g. daily. Thus Cooke *et al.* (1946) found that with a 50-g. intake the maximum fat excretion was 4.5 g. daily. Fourman *et al.* (1948) state that the output of fat should not exceed 23 g. in four days on a fat intake of 70 g. daily. Wollaeger *et al.* (1946) gave 13 subjects 208 g. of fat daily, and the average output in the stools was 8.7 g., the range being 5.5 to 13.6 g.

On the other hand, when steatorrhoea is present the total fat excretion is within limits proportional to the fat intake, and defective fat absorption can be made more obvious by increasing the dietary fat (Fourman *et al.*, 1948). It is accordingly suggested that patients be given 70 to 100 g. of fat daily two days before and during the time that the stools are being collected, instead of 50 g. as often recommended (Cooke, 1952). By this means more elaborate balance studies using coloured markers may be avoided. These points are clearly shown in the Table, where the measurements of the faecal fat excretion of the three cases of Crohn's disease are summarized. In addition, for com-

parison, there are included observations on a case of idiopathic steatorrhoea and on four subjects with normal intestinal function.

Details of Fat Intake and Output

Diagnosis	Date of Faecal Fat Estimation	Daily Fat Intake in g.	No. of Days of Stool Collection	Average Daily Weight of Faeces in g.	Total Fat Percentage of Dried Faeces	Average Daily Output of Fat in g.
Crohn's disease (Case 1)	23/2/51	Very small owing to anorexia and vomiting	5	302	32	7
	11/4/51	90	4	820	32	36
Crohn's disease (Case 2)	9/1/52	100	3	200	39	8
	28/5/51	70	3	461	73	38
Crohn's disease (Case 3)	18/2/52	100	4	391	48	32
	12/2/52	100	4	649	67	41
	29/2/52	70	3	264	51	19
Idiopathic steatorrhoea	7/3/52	50	3	285	35	9
	17/10/51	70	3	96	38	10
Convalescent pneumonia	29/10/51	150	3	179	56	22
	12/11/51	100	3	44	58	5
Treated Addison's disease	20/11/51	150	3	60	41	5
	14/3/52	150	3	61	37	2
Normal	14/3/52	150	3	179	24	3
	19/3/52	150	3	55	43	2

It will be seen that when the faecal fat was first estimated in Case 1 the daily output just exceeded the upper limit of normal. However, when the fat intake was increased gross steatorrhoea was evident. When the third estimation was done the daily output of fat was only 8 g., although the intake was 100 g. for two days before and during the time the faeces were being collected. The capacity to absorb fat had clearly increased. In Case 3 the faecal fat was estimated on intakes of 100, 70, and 50 g. during the patient's first admission to hospital. The fat excretion increased with the fat intake. The findings were similar in the case of idiopathic steatorrhoea. In contrast to this the excretion of fat in the normal subjects did not exceed 5 g. a day even when the intake was as high as 150 g. The total fat content of the dried faeces was, however, over 30% in three of the normal subjects, and it is clearly fallacious to base a diagnosis of steatorrhoea on this figure alone.

Davidson and Fountain (1950) reviewed all patients with the sprue syndrome who applied for extra rations between January 1, 1943, and December 31, 1948. These included 1,303 cases of coeliac disease, 311 cases of idiopathic steatorrhoea, and 403 cases of tropical sprue. Among the 58 cases of steatorrhoea due to causes other than the sprue syndrome there were only five cases of regional ileitis. In addition there were 15 in which the diagnosis was uncertain; 12 of these had undergone resection of gut or short-circuiting operations. Even if it is assumed that all these patients had regional ileitis, this only makes a total of 20 applying for extra rations. No information is available regarding the incidence of steatorrhoea in a large series of cases of regional ileitis, though it is probably high, especially if the disease is extensive. It was certainly present in all the three cases of regional ileitis that we have investigated during the last two years. It accordingly seems improbable that steatorrhoea, either due to sprue or of the idiopathic variety, is over 30 times commoner than that due to regional ileitis, as is suggested by the figures of Davidson and Fountain.

In an effort to ascertain the relative frequency of steatorrhoea due to regional ileitis and other causes the records of cases admitted to the Royal Infirmary, Sheffield, have been studied during the two years 1950-1. There were 10 cases of steatorrhoea. These included five cases of idiopathic steatorrhoea, one case following gastro-enterostomy and vagotomy, one due to carcinoma of the suprarenal gland

with infiltration of the pancreas, and the three cases of regional ileitis mentioned in this paper. These findings suggest that steatorrhoea due to regional ileitis is commoner than is generally appreciated. This may be because estimations of faecal fat are not regularly carried out in these cases, and so steatorrhoea is overlooked. Alternatively, Davidson and Fountain suggest that doctors fail to realize that priority rations are available to all patients with steatorrhoea, whatever the cause.

Anaemia, which may be hypochromic, megalocytic, or dimorphic in type, is a well-recognized complication of steatorrhoea (Barker and Hummel, 1939; Bennett and Hardwick, 1940; Cooke *et al.*, 1948). Hypochromic anaemia was present in the three patients described. The value of intravenous iron in the treatment of refractory hypochromic anaemia has been mentioned by Hawkins *et al.* (1950). It is particularly useful in regional ileitis, in which large doses of oral iron are apt to aggravate the intestinal disturbance. Cases 1 and 2 now tolerate a small maintenance dose of iron by mouth. In Case 2 there was also evidence of liver-factor deficiency, and he received folic acid. No effects were observed on the macrocytosis present in the peripheral blood or on the megaloid changes in the iliac marrow.

The patients found that with the five extra meat rations allowed weekly it was possible to have an appetizing and varied diet, although many articles of food had to be excluded to avoid diarrhoea. Their daily protein intake is estimated to be approximately 130 g. Bread, sugar, bacon, cheese, milk, fish, and eggs were not restricted. Fats were allowed in cooking and bread was thinly buttered. They were advised, however, to avoid fried foods. For the rest they were encouraged to find out for themselves the foods that caused diarrhoea by adding different articles to the basic diet one at a time. In addition, they received vitamins of the B group, ascorbic acid, and small doses of iron by mouth.

It is difficult to say for how long the diet outlined above should be continued, for the cost of the extra meat is considerable. Nevertheless, it would seem advisable to continue the high-protein intake so long as there are signs of activity of the disease or of persisting steatorrhoea. Indeed, one of these patients commented that the extra expense of the diet was repaid many times by his restoration to full earning capacity.

The presence of steatorrhoea in regional ileitis suggests that the disease is widespread, and this is of grave prognostic import, but complete clinical recovery has been recorded with medical treatment alone (Crohn, 1949). The regime outlined above is simple and worth a trial in the type of case described. It is probable that there are many patients with steatorrhoea, malnutrition, and anaemia due to this disease attending the out-patient departments of hospitals in this country. With treatment on the lines indicated, particularly by the provision of extra protein rations, they may be restored to reasonable health and normal activity, and even be spared extensive resection of the bowel.

Summary

Detailed case histories of three patients with Crohn's disease are given. Steatorrhoea, considerable malnutrition, and anaemia were present in all.

A high-protein diet led to great improvement, indicated by a considerable gain in weight and restoration to normal activity. The value of intravenous iron for the correction of hypochromic anaemia in these patients was demonstrated.

Faecal fat estimations are recommended in patients with this disease, as steatorrhoea is often overlooked. If the presence of steatorrhoea can be established patients are eligible for extra meat rations in this country at the present time, and by this means they can obtain an appetizing high-protein diet.

I wish to thank Professor E. J. Wayne for permission to publish these cases; Professor R. S. Illingworth, Mr. J. Lytle, and Mr. C. Jones for access to their records; Dr. E. K. Blackburn for the haematological reports; Mr. D. A. Podmore for carrying out the faecal-fat estimations; and especially Dr. G. M. Wilson for his encouragement and advice.

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A NEW LONG-ACTING INSULIN A PRELIMINARY TRIAL OF "LENTE" NOVO INSULIN

BY

R. D. LAWRENCE, M.D., F.R.C.P.

AND

WILFRID OAKLEY, M.D., F.R.C.P.

The Novo Laboratories, in Copenhagen, have recently produced a series of three new insulin preparations whose composition and action have been described by Hallas-Møller, Petersen, and Schlichtkrull (1952). The makers have kindly provided us with a supply of these insulins on which to carry out a therapeutic trial, and the results obtained justify the publication of this preliminary report.

New Insulin Preparations

In 1934 Scott, of Toronto, found that various metals were of importance for the formation of insulin crystals. This led to a study of the influence of zinc on the insulin effect. This research resulted in the discovery that small quantities of zinc (1-2 mg. per 1,000 units) fail to retard the action of soluble insulin, whereas large amounts increase its length of action. It was further found that the effect of protamine insulin and similar combinations was substantially protracted by the addition of small quantities of zinc (2 mg. per 1,000 units). The practical outcome of these investigations was protamine zinc insulin.

Subsequent research has been largely directed towards the discovery of new and more suitable preparations, new substances being tried to replace protamine. The idea of increasing the zinc content alone was regarded as impracticable, because of the local reactions produced when sufficient zinc is added to prolong the action of insulin.

Novo Laboratories were, however, aware that different anions influenced the reaction between insulin and zinc. Hallas-Møller and his co-workers in Copenhagen found that insulin, in the presence of a very small quantity of zinc (1 mg. per 1,000 units) was less soluble at the pH of the blood than protamine insulin, provided that anions such as phosphate and citrate were not present. Phosphate buffer has been thought the most suitable at pH 7, and is normally

used to adjust insulin preparations to that figure. This may explain why more than 15 years of research failed to lead to the simple discovery that if a different buffer is used it is wholly unnecessary to add such materials as protamine, globin, surfene, etc., to make insulin insoluble at the pH of the blood.

With the use of acetate buffer, Hallas-Møller was able to prepare a suspension of pure insulin in media at the pH of the blood in the presence of very small quantities of zinc. Further work led to the discovery that the length of action of such preparations varied with the form of the insulin, whether pure amorphous, amorphous and crystalline, or pure crystalline. This apparently minor difference in the form of insulin would seem to determine the range of activity of the preparations, varying from 12 to 36 hours. The action of amorphous insulin is shorter than that of crystalline, the larger the size of the crystal the greater being the length of activity. Three such insulins have been produced and given the names of "semi-lente," "lente," and "ultra-lente," the first having the shortest and the last the longest range of activity, lente being intermediate in duration. These insulins are miscible to produce preparations of intermediate ranges of activity. They cannot, however, be mixed with the present soluble insulin.

Our present trial has been carried out mainly on lente insulin, the intermediate preparation, and the one which seems the most promising of the three for treatment. The number of diabetics to whom lente has so far been given is very small—some 11 cases—and before briefly describing

the results obtained the conditions necessary for the therapeutic trial of any insulin preparation will be considered:

(1) In view of the variability of diabetes at the onset of the disease only those patients whose diabetes has been controlled for a reasonable period of time can be considered suitable.

(2) The diabetes should be of the severe type which relapses heavily when insulin action is finished.

(3) There must be no intercurrent complicating disease.

(4) The patient must be in hospital long enough for good control on existing methods to be compared with that obtained with a new type of insulin in similar dosage.

These essential requirements are often forgotten and explain, in the present shortage of our hospital beds, so occupied by acute work, the few cases on which we have so far been able to carry out therapeutic trials.

Clinical Material

The therapeutic trial of lente insulin was carried out on 11 adult diabetics, 6 of whom were men and 5 women, their ages varying between 25 and 92. They all fulfilled the conditions of suitability described above, and were in-patients in the diabetic department of King's College Hospital.

The patient's diabetes was controlled on two injections of S.I., P.Z.I. alone, a combination of the two given as a single mixed injection before breakfast, or a single injection of globin insulin. When adequate control was established,

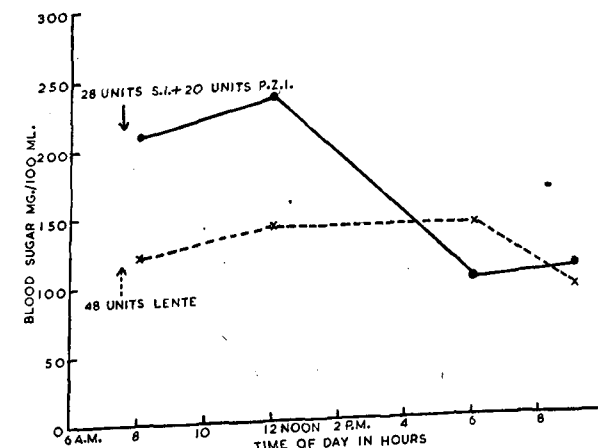


FIG. 1.—Case 1. Comparison between equal doses of a mixed injection of S.I. and P.Z.I., and lente insulin.

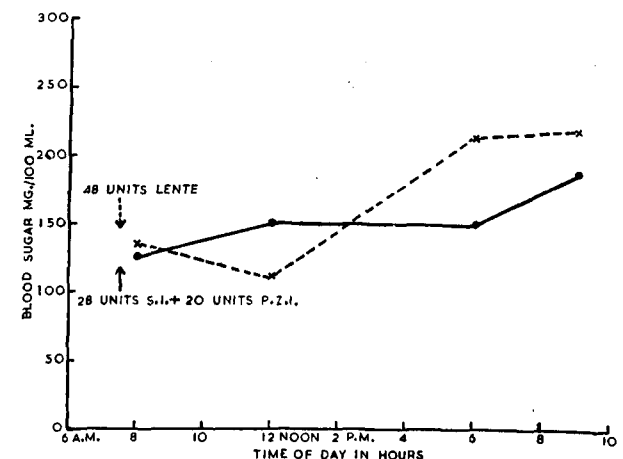


FIG. 2.—Case 2. Comparison between equal doses of a mixed injection of S.I. and P.Z.I., and lente insulin.

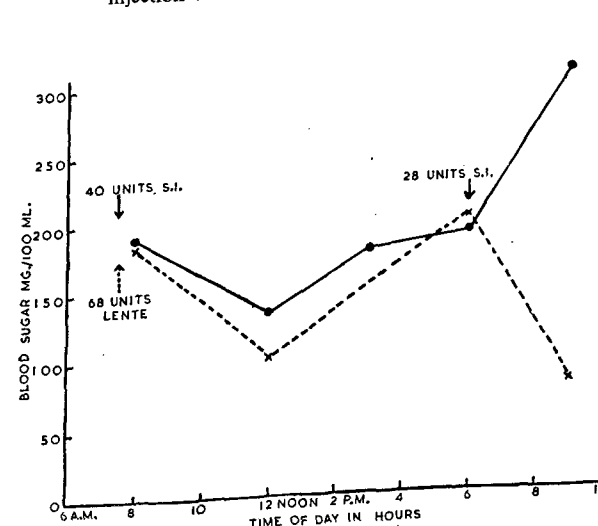


FIG. 3.—Case 7. Comparison between two doses of S.I. and a single dose of lente insulin of same total amount.

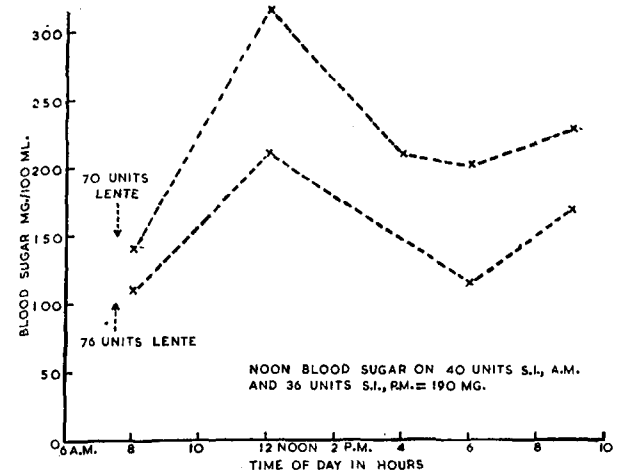


FIG. 4.—Case 8. Comparison between two doses of lente insulin of slightly different sizes to show regularity of action. The noon blood sugar on 76 units of S.I. to be compared with that on 76 units of lente insulin.

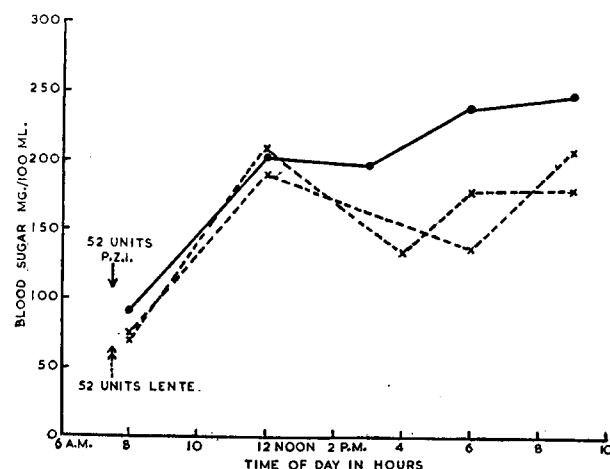


FIG. 5.—Case 9. Comparison between a single dose of P.Z.I. and the same dose of lente insulin given on two occasions. Note the regularity of action of lente insulin.

blood-sugar determinations were made before breakfast, at noon, at 6 p.m., and at 9 p.m.; the patient was then changed over to a single dose of lente insulin, given before breakfast, and equal in amount to the total quantity of insulin required to stabilize the diabetes. When the patient had been on lente insulin for not less than two days the blood-sugar estimations were repeated at the same times and the results plotted in the form of graphs (Figs. 1 to 5). In addition to blood-sugar determinations, seven daily urine sugar tests were made at informative times. In two cases the blood-sugar estimations on lente insulin were repeated in order to see whether consistent results could be obtained with this insulin.

Results

In six cases comparison was made with mixed doses of S.I. and P.Z.I., the total dose varying from 36 to 60 units. In two cases the patients were previously stabilized on 68 and 76 units of S.I. respectively, given in divided doses, before breakfast and the evening meal. Two cases received single injections of 52 units of P.Z.I. and one of 28 units of globin. It will be seen that in all 11 cases lente insulin produced fasting blood sugars of the same order as those obtained with the other insulin preparations, the figures varying between 70 and 200, being 150 or less in eight. At noon lente produced a degree of control as good as, or better than, that obtained with the other insulins in all but two cases. At 6 p.m. the blood sugar on lente was comparable with but tended to be slightly higher than that produced by the other insulins, but at 9 p.m. the reverse was seen to be the case in most instances (see Table).

Comparison of Blood Sugars in the Six Cases Not Shown in Figs. 1 to 5

Case No.	Insulin	Blood Sugar in mg./100 ml.			
		8 a.m.	Noon	6 p.m.	9 p.m.
3	44 S.I.+16 P.Z.I.	165	260	140	118
	60 Lente ..	200	375	260	255
4	20 S.I.+16 P.Z.I.	168	238	95	190
	36 Lente ..	105	100	155	155
5	24 S.I.+20 P.Z.I.	110	155	130	195
	44 Lente ..	130	105	110	95
6	24 S.I.+16 P.Z.I.	155	210	170	—
	40 Lente ..	140	180	135	—
10	52 P.Z.I.	190	178	195	250
	52 Lente ..	95	140	175	180
11	28 Globin ..	155	245	165	—
	28 Lente ..	165	205	170	250

It would appear, therefore, from this small series of experiments that lente insulin possesses the prolonged action claimed by the manufacturers, and also that it exerts a shorter hypoglycaemic action, comparable with and equal to that of soluble insulin alone or mixed with P.Z.I. Throughout the course of these and other experiments with

lente insulin, hypoglycaemia occurred only two or three times and was never severe. There were no local reactions or undesirable side-effects. In the few cases in which tests were repeated with lente insulin the results obtained were remarkably constant.

We hope to carry out further trials on lente insulin in order to determine: (1) the length of action and time of maximum action of lente insulin in varying dosage; (2) whether there is significant variation between different batches of the same preparation; (3) whether lente insulin produces satisfactory control in ambulatory cases; (4) the arrangement of diet best suited to the action of these insulins; the diet of the cases reported was kept constant, and the carbohydrate content was arranged to suit the insulin or insulins with which comparison was made; (5) the suitability of the new insulins for initial stabilization of severe diabetics.

Summary

A preliminary trial of the new Danish lente insulin supports the claim that it exerts a prolonged hypoglycaemic action, lasting at least 24 hours, which is strong enough to control the blood sugar of moderately severe diabetics throughout the day without causing hypoglycaemia during the night. It has not in our experience produced either local or general reactions and appears to be no more likely to produce hypoglycaemic reactions than the insulin preparations at present in use.

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ACUTE BENIGN PERICARDITIS

A REPORT OF FOUR CASES IN CHILDHOOD

BY

B. D. BOWER, M.B., M.R.C.P.
Paediatric Registrar

JOHN GERRARD, D.M., M.R.C.P.
Lecturer in Paediatrics

(Department of Paediatrics and Child Health, University of Birmingham)

AND

M. E. MacGREGOR, M.D., M.R.C.P., D.CH.
Consulting Paediatrician, South Warwickshire Area

Acute benign pericarditis has been recognized more often in America than in Europe, and its existence in Britain has even been denied (Andrews *et al.*, 1948). Having recently seen two typical cases, we decided to examine the notes of all children with pericarditis treated at the Birmingham Children's Hospital between 1942 and 1951, and thus discovered two other probable examples of the condition.

Case 1

Both parents of an 8-year-old boy had a feverish illness, one a week before and the other a week after their son was taken ill with shivering and left-sided chest pain. Penicillin and sulphonamides in adequate dosage had no effect on his high temperature or irritating cough. A week later he developed severe abdominal pain and was transferred to hospital. He was then only moderately ill; temperature 103° F. (39.4° C.), pulse 124, and respirations 28. Fine crepitations and distant bronchial breathing were heard at the left base; clinically the heart was normal. Chloramphenicol—40 mg. per lb. (88 mg. per kg.) per day—reduced the temperature, but pain increased and the child developed both a loud pericardial friction rub and an apical systolic murmur. Yet he was not critically ill. The E.C.G. strongly

suggested pericarditis, with raised RS-T segments in Leads I and II and P-R interval 0.18 second. An x-ray film showed a wide heart shadow with a trace of fluid at the left base (Fig. 1).

After five days aureomycin was substituted for chloramphenicol, and in the following week there was a fall in temperature and the pericardial friction disappeared. On the day after stopping aureomycin the boy complained of right shoulder pain. Apical gallop rhythm together with venous congestion and bronchial breathing at the left base suggested, and x-ray examination confirmed, the presence of a pericardial effusion, areas of consolidation in the lower lobes, and a small right pleural effusion. All these signs disappeared without treatment, and after a week the heart size was almost normal (Fig. 2).

A month after admission there was another relapse, with pain in the left shoulder, chest, and abdomen, a raised temperature, and signs of pericardial effusion. A second course of aureomycin, lasting two weeks, led to improvement, and after three weeks' freedom from symptoms he was discharged from hospital on the 59th day. There was a further relapse two and a half weeks later, but recovery was spontaneous.

The Mantoux test, cold agglutinins, streptococcus MG antibodies, Q fever complement fixation, and examination

for antibodies to four strains of Coxsackie viruses were negative repeatedly throughout the illness. A typical blood count showed white blood cells, 12,500, 83% polymorphs.

Case 2

A boy aged 9 walked into the out-patient department after two weeks' illness with fever, anorexia, and chest pain. He was pale but not ill; temperature 102° F. (38.9° C.), pulse 100, respiration 20, blood pressure 105/65. The heart was large, and there was pericardial friction but no evidence of valvular disease, nodules, or joint involvement. Blood-stained, sterile serous fluid was obtained by paracentesis of the pericardium. The Mantoux test was repeatedly negative; white blood cells 14,500, with 90% polymorphs.

Penicillin and sulphadiazine were given in adequate doses, but the friction rub persisted for a week. There was no evidence of endocarditis or persistent cardiac enlargement when discharged two months afterwards, nor when he was examined again clinically, electrocardiographically, and radiologically four years later.

Case 3

A boy aged 3½ years had central abdominal pain and anorexia, and vomited once, and three days later developed a painful cough. On the seventh day of his illness he looked moderately ill, and was orthopnoeic; temperature 98° F.

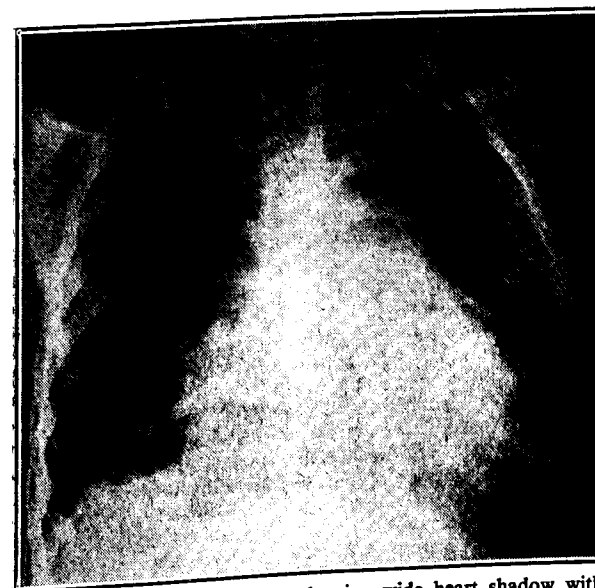


FIG. 1.—Case 1. Radiograph showing wide heart shadow with trace of fluid at left base.



FIG. 2.—Case 1. Radiograph showing return of the heart to normal size.

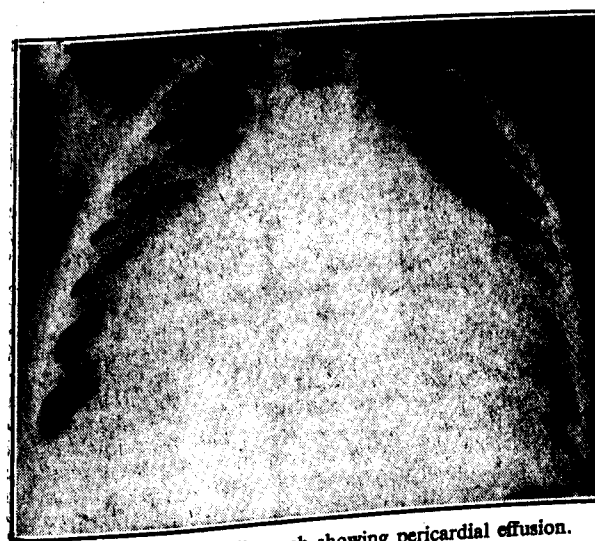


FIG. 3.—Case 3. Radiograph showing pericardial effusion.

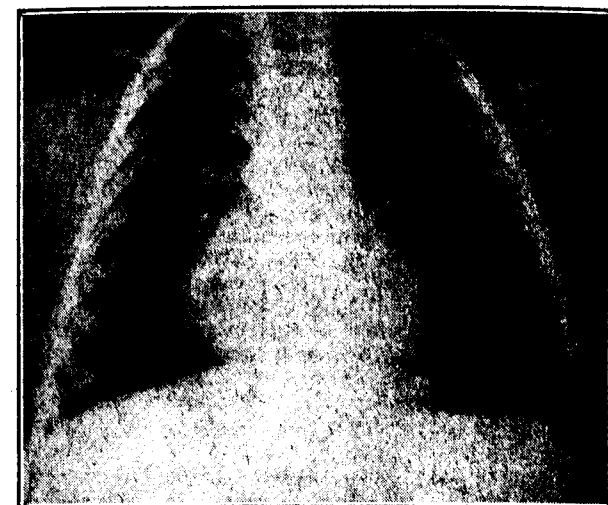


FIG. 4.—Case 3. Radiograph taken five years after Fig. 3.

(36.7° C.), pulse 140, respirations 44. There were no nodules or joint changes. Venous congestion, hepatic enlargement, increased cardiac dullness, and muffled heart sounds suggested a pericardial effusion, which was confirmed by x-ray examination (Fig. 3), and 210 ml. of fluid was aspirated. The fluid was blood-stained, contained a few polymorphs, and was sterile. Relief was great, but, although receiving penicillin, the child relapsed within a week and further aspiration was required. Guinea-pig inoculation was negative.

The temperature was raised for three weeks, and, although the pericardial effusion was resolving by the end of the second week, fluid appeared at the right base. He was discharged after three months and his heart has remained normal in size, with no E.C.G. or radiological evidence of disease, for five years (Fig. 4). The Mantoux reaction was then, and is still, negative.

Case 4

An 11-year-old boy developed a temperature of 102° F. (38.9° C.) with pain in the front of the chest and abdomen aggravated by breathing. His symptoms subsided, but soon returned with such severity that he had to be propped up in bed. A week after the onset his temperature was 100° F. (37.8° C.), pulse 100, and respirations 20. There was no venous congestion or liver enlargement; the blood pressure was 120/78. His heart was enlarged, with normal sounds but loud pericardial friction, and a pleural rub at the left and later at the right base posteriorly. There were no nodules.

A week later x-ray examination showed considerable cardiac enlargement and the E.C.G. revealed a raised S-T segment with upright T in Lead II, suggestive of pericarditis. Within a week the x-ray picture was normal and the E.C.G. showed an iso-electric S-T segment with inverted T₂, which a week later had returned to normal. The white cell count was 7,600 per c.mm., with 77% polymorphs, and the E.S.R. was raised to 70 mm. in one hour (Westergren) at the height of the illness. The Mantoux test was repeatedly negative. He was discharged from hospital after five weeks, free from all symptoms and clinically normal.

Diagnosis

In America acute benign pericarditis seems to be as common in young adults as rheumatic pericarditis, though less frequent than coronary artery disease (Logue and Wendkos, 1948); in this country it may be commoner than is generally realized. Among 40 cases of pericarditis seen in the past ten years at the Birmingham Children's Hospital, 27 were rheumatic, 8 were pyogenic, 1 was tuberculous, and 1 was uraemic. The remaining three (Cases 1, 2, and 3 above) were thought to be due to acute benign pericarditis. Other examples may have been missed, for pericardial friction and/or effusion are by no means invariable in acute benign pericarditis, and in patients with atypical pneumonia pericarditis may be recognized only if serial E.C.G.s are taken (Levy and Patterson, 1950). Other cases might well be sought among children with acute unexplained abdominal pain, especially when accompanied by fever and a painful cough.

We based the diagnosis on exclusion of other recognized causes of pericarditis with effusion. Rheumatic fever was regarded as unlikely because there was no joint involvement, there were no nodules, there was no permanent damage to the heart or its valves, and the patients were not as ill as children with rheumatic pericarditis are. A tuberculous origin was rejected because Mantoux tests, carried out repeatedly for at least four months, were constantly negative, guinea-pig inoculation was negative in one case, there was no evidence of a tuberculous focus in any other part of the body, and the recovery was relatively rapid. Pyogenic pericarditis was thought to be improbable in view of the relatively low white-cell count (the highest being 14,500 per c.mm., with 90% polymorphs), the relative mildness of the illness, a failure to culture organisms from the pericardial

fluid in Cases 2 and 3, the ineffectiveness of penicillin, sulphadiazine, and chloramphenicol, the spontaneous recovery of Case 4 without specific therapy, and the absence of a primary septic focus such as osteomyelitis. There were no reasons to believe that any of the patients had renal disease, cardiac infarction, disseminated lupus erythematosus, Still's disease, myxoedema, or traumatic pericarditis.

Each of the four patients had illnesses which corresponded with that recorded for acute benign pericarditis.

1. The illness was relatively mild, and one child actually walked into the out-patient department, although he had a pericardial rub at the time. Three of our children had an obvious friction rub, but only one was critically ill, and in this case aspiration of a large pericardial effusion immediately transformed his general condition. Large effusions are uncommon, although they may occur (Levy and Patterson, 1950).

2. The pericardial fluid may be straw-coloured or haemorrhagic; it is conceivable that trauma may have been responsible for the blood-staining in our two cases.

3. Pain, a striking feature in adults, affected all four children, and in two was severe enough to simulate appendicitis.

4. Each child had associated pleurisy, and in Cases 1 and 4 it was bilateral.

5. A relapsing course such as that observed in Case 1 sometimes occurs (Taubenhaus and Brams, 1950), but the ultimate prognosis is good. All our patients have remained well, and none has any residual abnormality, but the longest follow-up period is only five and a half years.

Aetiology

Although the cause of acute benign pericarditis is unknown it has been recognized in patients with primary atypical pneumonia (Finkelstein and Klainer, 1944), a condition usually due to a virus infection. The disease has many features in common with acute benign dry pleurisy (Scadding, 1946) or Bornholm disease, and the latter is often associated with, if not always caused by, the Coxsackie group of viruses (Findlay and Howard, 1950). Friedman *et al.* (1952) examined sera of five cases of acute benign pericarditis, but found no evidence that there had been recent infection with two strains of Group A or one strain of Group B Coxsackie virus. In one case we also failed to demonstrate infection by any of four different strains of the virus. However, there are many strains of Coxsackie virus, and it remains tempting to link acute benign pericarditis with Bornholm disease even though there are minor differences in the seasonal incidence. Both diseases run a benign, sometimes relapsing, course with severe abdominal, thoracic, and even shoulder pain, which may lead to suspicion of appendicitis or coronary occlusion. Pleural friction may be present in both. Pericarditis may complicate Bornholm disease; one case of this kind reported by Heckscher (1933) and six described by Bing (1933) seem to have been very like cases of acute benign pericarditis. Our fourth patient was taken ill during an outbreak of epidemic myalgia, and during this same outbreak Dr. S. R. F. Whittaker had under his care two adults with acute benign pericarditis. Another of our patients (Case 1) developed his illness within a week of a vague febrile illness in both parents.

Treatment

It is difficult to assess response to treatment in a disease with a uniformly good prognosis and a natural tendency to relapse. Sulphonamides, penicillin, and streptomycin (Levy and Patterson, 1950) are almost certainly valueless. In one of our patients a pericardial rub developed during treatment with chloramphenicol, but this child later responded twice, though only temporarily, to aureomycin. Taubenhaus and Brams (1950) have reported favourably on the effects of aureomycin, but Friedman *et al.* (1952) state that neither aureomycin nor any other antibiotic has any effect on the illness. These last authors report that either A.C.T.H. or cortisone will lead to prompt and dramatic improvement. It seems, however, scarcely justifiable at the moment to use these agents for a disease with no apparent sequelae.

Summary

Four cases of acute benign pericarditis in childhood are recorded.

It is suggested that this disease may sometimes be a complication or manifestation of Bornholm disease.

We are grateful to Professors A. V. Neale and J. M. Smellie for permission to record details of cases under their care, to Dr. S. R. F. Whittaker for access to his cases, to Dr. F. O. McCallum for the serological investigations, to Dr. Clifford G. Parsons for his interest and advice, and to Mr. J. G. Williamson for the illustrations.

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AN INVESTIGATION INTO STERILITY AFTER LUMBAR GANGLIONECTOMY

BY

S. S. ROSE, M.B., F.R.C.S.

First Assistant, Surgical Professorial Unit, Manchester
Royal Infirmary

"We are obtaining increasing evidence that males may not be sterile or have any alteration of sexual function after bilateral excision of the first lumbar ganglion or even the upper three ganglia." This observation of White and Smithwick (1942) crystallizes a belief contrary to the usual teaching and supports a view held in this clinic for some time. Professor A. M. Boyd instigated this work because of a clinical impression arising out of and sustained by a follow-up of several hundred cases of bilateral lumbar ganglionectomy in which there was every reason to believe that the first lumbar ganglion had been removed on both sides.

Before proceeding with a discussion on sterility following this operation it is important that a clear distinction should be made between sterility and impotence. Many patients arrive at this clinic under the impression that the two terms are synonymous, and alarm and despondency are created on these grounds. No one has ever suggested that an impairment of gross sexual function follows this operation, and this should be emphasized to the patient at the outset. Furthermore, the substitution of the term "seminal anorrhoea" for sterility conveys to the practitioner a full understanding of the symptom under consideration.

For many years there has existed a widespread belief that the bilateral removal of the first lumbar ganglion results in sterility. This belief has been based on experimental evidence which has implied a loss of ejaculatory function and clinical evidence which has perhaps been given undue prominence by the fact that only the patients in whom this symptom has occurred return to complain of sterility.

During the course of this investigation it has become increasingly clear that sterility, far from being a common post-operative complication, is only rarely encountered, and even then, as is shown later, is usually the

result of a much more extensive sympathetic denervation. The present communication is in the nature of a progress report, and the work is by no means complete. The conclusions drawn from the data at present available may be modified by further evidence.

Method of Investigation

The problem has been approached by posing the following questions: (1) Is there a failure of seminal emission after bilateral removal of the upper three lumbar ganglia? (2) If so, what is the mechanism of this failure? (a) Does the semen fail to reach the posterior urethra? Or (b) is it due to reflux of the semen into the bladder through a lax internal sphincter?

The subjects of this research have been divided into three groups: patients who have been subjected to bilateral lumbar sympathectomy; patients who have had a much wider sympathetic interruption for hypertension; and patients who have had an operation of similar or greater degree of severity to act as a control of sexual resilience.

In the sympathetomized patients the level of denervation has been ascertained by the use of the electrodermometer, an electronic apparatus devised by Hall Ratcliffe and Jepson (1950) for measuring the alteration in surface resistance consequent on drying of the skin. The constancy of the post-ganglionectomy skin-resistance patterns has been described by the same authors, and when a pattern showing an upper-thigh distribution is obtained (Fig. 1) it is safe to assume that the first lumbar ganglion has been included in the section of chain removed. It is certain that when the lumbar chain is followed under the internal arcuate ligament with division of the diaphragmatic crus if necessary, and the ganglion thus exposed is removed, this pattern is obtained. The high lumbar ganglionectomy is performed as a routine at this centre, for it is only by this means that an adequate sympathetic denervation of the lower limb can be achieved (Boyd *et al.*, 1949).

The purpose of the investigation has been carefully explained to the patients, and there has been no lack of co-operation. They were instructed to obtain a specimen of semen at a convenient time, a few hours before the proposed examination, and immediately afterwards two specimens of urine. The first specimen was to wash out the urethra, and the second specimen contained the rest of the bladder contents—making a two-glass test. The volume of semen was noted, a sperm count was carried out, and centrifuged specimens of the urinary samples were examined for the presence of spermatozoa. In addition the urinary specimens were tested for fructose by the Selivanoff test.

A questionnaire was also submitted with regard to the pre-operative and post-operative sexual function, with particular reference to any alterations noticed.

This simple routine has given the answer to Question 1 without difficulty—that is, does sterility occur in these cases? There is no doubt that in the majority of them the bilateral removal of the upper three lumbar ganglia does not cause sterility. If, however, a more extensive

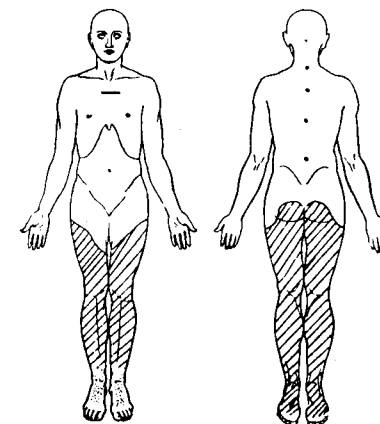


FIG. 1.—Pattern shows area of sympathetic denervation achieved by bilateral removal of L1, 2, and 3.

sympathectomy is carried out sterility will almost certainly occur. The cases in the three groups were as follows.

Group I.—Thirty cases of bilateral lumbar ganglionectomy.

Group II.—Ten cases of various surgical procedures 21 days after operation. These consisted of three partial gastrectomies, two perforations, one ureterolithotomy, one pyelolithotomy, one bilateral inguinal hernia, one intestinal obstruction with gut resection.

Group III.—Eight cases of hypertension in which some extensive form of sympathectomy had been carried out. In this series the segment of sympathetic chain removed extended from T9 to L3 at least, and in all cases the splanchnic nerves were removed in addition.

The groups of cases are further analysed in the Table.

Group Analysis of Cases

	Normal	Sterile with Reflux	Sterile No Reflux	Total
Group I	27*	1	2	30
Group II	10	—	—	10
Group III	Nil	3†	5	8

* One case had no emission for three months and then gradually recovered.
† One case of this group has now a small seminal emission.

Results

Group I

Of these 30 cases 27 had normal ejaculation. One of this number, however, stated that he had no ejaculation for a month after operation, while noticing no abnormality in other respects; but at the time of examination four months later he was found to be quite normal. He had also noticed that there was some post-coital cloudiness of his urine during the first post-operative month. Another patient in this series had passed the acid test and become a father since the operation.

Of the three patients who showed no ejaculation one was a young man of 28 with a history of congenital syphilis and recent gonococcal infection. Unfortunately, no pre-operative test was carried out, but there was reason to believe that his functions were already considerably impaired. The second patient was a healthy man of 50 who had lost all seminal emission up to the time of examination 15 months post-operatively. There was no evidence of bladder reflux in his case. The third patient was a young man of 26 referred from another clinic on account of a post-operative loss of seminal emission. There was definite evidence of reflux of semen into the bladder when he was examined after a year.

It is seen, therefore, that there was no ensuing abnormality of seminal emission in 27 out of 30 cases of high bilateral lumbar ganglionectomy in which there was every reason to suppose that the first ganglion was removed. Furthermore, one of the cases regarded as sterile had an intercurrent disease which may have been responsible.

It should be added that many other cases of bilateral lumbar ganglionectomy in which there was a detectable failure to remove the first lumbar ganglion on one or both sides were subjected to post-operative examination, and all of these were perfectly normal in every respect.

Group II

Tests were carried out on these widely differing cases of general surgical procedures on about the twenty-first post-operative day; it was apparent that, normally, the function of ejaculation was not impaired and no case of lack of emission was found at this early period.

Group III

These are the most interesting patients of all, and it is here that some light is thrown on the ejaculatory mechanism.

In striking contrast to the simple bilateral ganglionectomy, seven out of eight of these extensive sympathectomies

resulted in complete absence of ejaculation, while there were no other sexual abnormalities. The eighth case was remarkable in that, after several months of failed ejaculation, there was a gradual return of this function, albeit to a diminished degree. It is seen, therefore, that the more radical procedures nearly always result in lack of seminal emission. How, then, is this form of sterility brought about? The answer lies obviously in the study of the anatomy and physiology of the sympathetic chain, the splanchnic nerves, and the musculature of the bladder-neck, vas, vesicles, and ejaculatory ducts.

The occasional occurrence of seminal anorrhoea after a high lumbar ganglionectomy would seem to indicate that the critical level is close to the first lumbar ganglion, and a working hypothesis to explain these cases must postulate an abnormally high removal of the chain, an abnormally low exit of the ejaculatory pathway, or a coincident removal of important medial branches.

Modern knowledge of the function of the ganglionated chain and its branches is based largely on the classical work of Professor Learmonth carried out at the Mayo Clinic in 1930-1, and this has supplanted and supplemented the somewhat fragmentary information gained earlier in this field by other workers (Budge, 1858; Langley and Anderson, 1895).

Learmonth took a unique opportunity of studying these nerves at operation, and systematically stimulated the individual roots of the presacral nerve while recording the effects on the prostate, posterior urethra, and bladder-neck.

He proved without doubt the sympathetic origin of the innervation of the accessory genital apparatus, and put forward the denervation theory of post-sympathectomy sterility. He also produced an unrivalled description of the roots of the presacral nerve, which is diagrammatically represented in Fig. 2. For the sake of clarity multiple branches arising from the same nerve have their course demonstrated by a single line. An abnormally high removal of the chain may be brought about by extensive upward dissection or by the removal of a fused first lumbar and twelfth thoracic ganglion, thus interrupting the ejaculatory pathway before it leaves the sympathetic chain. The important medial branches carrying this pathway probably leave, in the majority of cases, just above the L1 level, as removal of the lumbar chain and therefore its splanchnic branches does not usually interfere with ejaculatory function. Reference to Fig. 2 reveals a possible route for the fibres under discussion—namely, from the region of the twelfth thoracic ganglion through the renal and possibly the aortico-

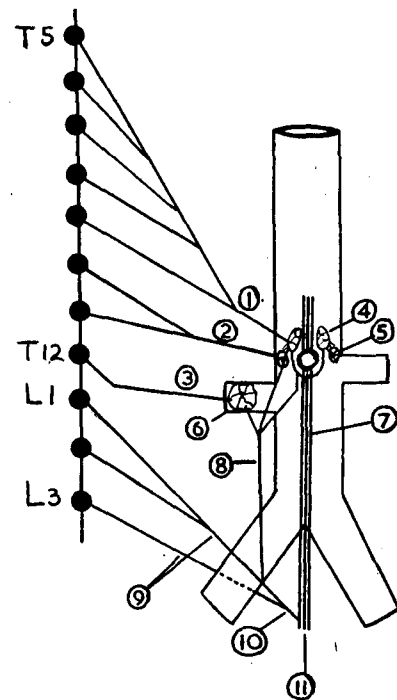


FIG. 2.—Formation of presacral nerve (after Learmonth). (1) Greater splanchnic nerve; (2) lesser splanchnic nerve; (3) least splanchnic nerve; (4) coeliac plexus; (5) aorticorenal plexus; (6) renal plexus; (7) pre-aortic plexus; (8) inner part of lateral root of presacral nerve; (9) outer part of lateral root of presacral nerve; (10) lateral root of presacral nerve; (11) presacral nerve. It is postulated that (8) may carry the ejaculatory pathway.

renal and coeliac ganglia to the nerve or bundle of nerves which run down the aorta lateral to the pre-aortic plexus. This bundle forms an inner part of the lateral root of the pre-sacral nerve and should normally escape damage during lumbar ganglionectomy. The pre-aortic plexus is not regarded as an alternative pathway, for, as Learmonth pointed out, it is largely vasomotor in function. Possible avenues of escape through aberrant ganglia have been suggested, and these merit further consideration, but the part played by sympathetic filaments accompanying the testicular vessels is thought to be of little importance.

It is seen, therefore, that a high or extensive sympathectomy such as is undertaken for hypertension will produce sterility, while removal of L1, 2, and 3 with the intervening chain should leave intact the ejaculatory function.

Sterility after Extensive Sympathectomy

The patients in whom extensive sympathectomy has been carried out show interesting variations in the manner in which sterility has been produced. (1) Five patients have no evidence of sperm entering the urethra at all; (2) three have evidence of reflux of semen into the bladder; and (3) one patient, although sterile for six months after operation, now has a small seminal emission.

De Takats and Helfrich (1941) report a similar case of recovery of seminal emission after extensive sympathectomy, and Lake (1944) describes two more.

In the first group (1), without seminal emission, if there are no urethral sperm, no bladder sperm, and no urethral fructose, ejaculation into the urethra has not taken place, and it must be assumed that denervation of the vas, vesicles, and ejaculatory ducts has occurred.

This is the first mechanism by which post-operative seminal anorrhoea is brought about, and there is a considerable amount of clinical and experimental evidence to support this view. Experimental evidence brought forward by Simeone (1933) confirmed the innervation of the vas, by the sympathetic in the guinea-pig; and those vesicles, etc., by the sympathetic in the guinea-pig; and those findings which are of especial interest from the point of view of this investigation are summarized below. It was found that (1) the normal vas deferens and epididymis undergoes peristalsis; (2) sympathectomy abolishes this movement and substitutes a segmentation movement; (3) spermatozoa float inertly along the vas while reaching maturity; (4) sympathectomy slows the passage of spermatozoa by four-fifths and many degenerate by the time they reach their destination; (5) motility of spermatozoa occurs only at ejaculation; (6) sympathectomy abolishes prostatic contraction and secretion, and therefore limits the production of the activating hyaluronidase; (7) the vesicles become enlarged after sympathectomy.

These effects were not usually permanent in the guinea-pig, and recovery tended to occur after several weeks. It is true, however, that considerable caution must be used in the application of these findings to man, but investigation of those cases which showed no evidence of ejaculation into the posterior urethra suggests that in man, under these circumstances, there is also no prostatic secretion or these circumstances, further work is in progress on the size of contraction. Further work is in progress on the size of the seminal vesicle after sympathetic block, and there is reason to believe that there is an increase.

Seminal emission following bilateral vasoligation does not become completely absent for almost three months post-operatively (Wells, 1948), while it disappears immediately after an extensive sympathectomy, as would be expected following a sudden denervation of the ejaculatory organs.

Seminal Reflux into Bladder

The second mechanism to be discussed is that of seminal reflux into the bladder, and, of the patients under review, five are considered under this heading. In Group I—that is, after high bilateral lumbar ganglionectomy—one patient is, after high bilateral lumbar ganglionectomy, but no had definite ejaculation into the posterior urethra, but no external emission; while the other, although functioning normally at the time of examination, had a history which

suggested that regurgitation had occurred during a period in which ejaculation had failed. In Group III—that is, after extensive sympathectomy for hypertension—two patients showed definite evidence of seminal reflux, and one who had complete seminal anorrhoea for six months post-operatively now had a small seminal emission, coupled with some degree of bladder reflux.

In cases in which all the emission regurgitates into the bladder, it would seem that, although the vas, vesicles, and prostate are still able to act normally, there is a free communication between the posterior urethra and the bladder at the moment of ejaculation. A consideration of the neuromuscular arrangement at the bladder-neck throws some light on this mechanism.

The internal sphincter is an arrangement of muscular loops curving round the anterior aspect of the bladder-neck and continuous below with the inner circular muscle of the prostate. It is supplied by both sympathetic and parasympathetic fibres, the former carrying motor impulses and the latter inhibitory impulses.

The mode of opening of this sphincter has been the subject of much controversy, and the part played by the trigonal muscle alternately magnified and minimized.

This broad triangular band of fibres runs immediately beneath the mucosa from the inter-ureteric bar and converges on the internal meatus to plunge through the internal sphincter and to be inserted at the base of verumontanum. Contraction of this muscle, or, as some authorities believe, its inherent elasticity combined with inhibition of the internal sphincter, causes opening up of the bladder-neck and posterior urethra in the manner shown (Fig. 3). The relative importance of the component parts of this action has been variously stressed by different authors, but it is felt that the conception of a balance between the two is more in keeping with physiological principles.

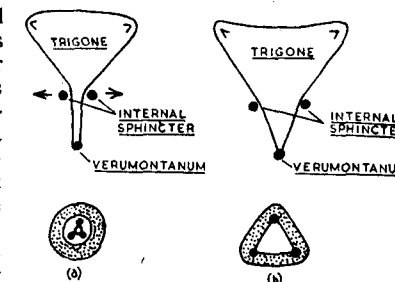


FIG. 3.—Mode of opening of internal sphincter. (a) closed; (b) open. (After Young.)

The Internal Sphincter after Denervation

It is now necessary to consider the effect of sympathectomy on micturition, and in particular on the behaviour of the internal sphincter after denervation.

Although it has been reported that a funnel bladder-neck may occur after sympathectomy, it is certain that if any permanent loss of tone did occur one would expect rather more than just a few days' post-operative frequency of micturition; and if it is argued that the external sphincter takes complete control—undoubtedly true after prostatectomy—it can be stated with equal confidence that no case of frequency or incontinence has developed after radical sympathectomy in parous women—that is, those patients whose external sphincters are notoriously unreliable. Furthermore, the results of investigation of the pre-operative and post-operative pressures of the sphincters, although, it is admitted, carried out with a crude home-made instrument, lead us to the opinion that normal resting tone is quickly recovered. A new instrument is at present being devised, and the experiment will be repeated.

It is probable, then, that the competence of the internal sphincter is dependent on a certain basic tone which is inherent in the muscle itself. Its competence during ejaculation, however, depends on superadded spasm, which is achieved through its sympathetic nerve supply. The simplest possible explanation of post-operative reflux, therefore, is the failure of this superadded spasm to occur. This will

explain all our cases of seminal reflux except the case in which a return of ejaculatory power occurred after a six-months interval. This patient had noticed a post-coital cloudiness of the urine at first—a sign common to the other cases which showed reflux—although there was no actual emission. Later, with the return of emission, the cloudiness had become less obvious. A further point of extreme interest was the fact that he believed the return of seminal emission coincided with a much more virile erection. He was one of the few patients who thought he had not been quite normal in this respect after operation.

This case raises the point of production of urethral obstruction by erection. Apart from the narrowing produced by the erect corpus spongiosum, it is obvious that if the erectile verumontanum enlarges proportionately it would help to block the posterior urethra. This would account for the well-known difficulty of micturition in full erection, and is beautifully illustrated, for example, by a case reported by Swift Joly (1929).

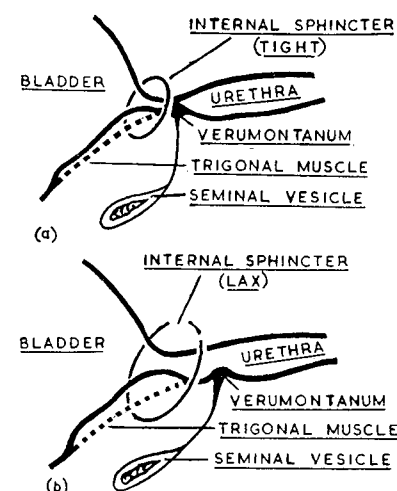


FIG. 4.—(a) Tight internal sphincter. The dotted line represents shortened trigonal muscle, and the verumontanum is pulled up to plug the internal meatus. (b) Lax internal sphincter. The dotted line represents straightened-out trigonal muscle with open bladder-neck. The verumontanum is not pulled up.

unyielding ring of a spastic internal sphincter, expends its energy in shortening its fibres as it is prevented from straightening itself out. It therefore pulls up the erect colliculus, thereby shortening the posterior urethra and plugging the bladder-neck (Fig. 4, a). This renders doubly secure the closure of the internal meatus, and possibly even opens the ejaculatory ducts. If this theory is correct it is easy to visualize how the denervated internal sphincter now yields to the contracting trigonal muscle, so that shortening of its fibres fails to occur. The verumontanum is not elevated, therefore, and seminal reflux occurs into the bladder (Fig. 4, b).

This hypothesis postulates that in normal ejaculation the internal sphincter is of predominant importance, thoroughly able to resist the antagonistic attempt of the trigonal muscle to open it, and indeed assisting in the action of this muscle to elevate the verumontanum. The combined tight spasm of the internal sphincter aided by the obstructive effect of the erect colliculus seminalis serves to prevent seminal reflux. If, however, the sympathetic denervation of these muscles occurs, the internal sphincter, although it may recover sufficient tone to remain closed under normal conditions, cannot undergo the accentuated spasm which normally occurs at ejaculation and therefore fails to resist even the weakened attempts of the trigonal muscle to open it. The resulting incompetence is aggravated by failure of the plugging action of the verumontanum secondary to the shift in the balance of muscular power.

Summary

Thirty cases of bilateral lumbar ganglionectomy in which the first, second, and third lumbar ganglia had been removed have been followed up with regard to post-operative sterility (seminal anorrhoea). Only three of this series were found to be sterile.

Eight cases of extensive sympathectomy for hypertension were followed up, and seven were found to be sterile.

The sterility in 11 of the above 38 cases was due in seven cases to complete failure of ejaculation to occur, while four cases showed that there was reflux into the bladder. There was no obvious reason for the difference in these two groups.

The mechanism of sterility in these cases is discussed and a theory of normal ejaculation is advanced.

This paper is regarded as a report on work that is as yet incomplete, and further investigation is in progress. I am grateful to Professor A. M. Boyd for his constant stimulation and advice and for his original idea which initiated this investigation.

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COMBINED USE OF HEXAMETHONIUM BROMIDE AND PROCAINE AMIDE IN CONTROLLED HYPOTENSION

A PRELIMINARY REPORT

BY

A. A. MASON, M.B., B.S.

Senior Anaesthetic Registrar,
Queen Victoria Hospital, East Grinstead

AND

JOHN F. PELMORE, M.R.C.S., L.R.C.P., D.A.

Consultant Anaesthetist,
Queen Victoria Hospital, East Grinstead

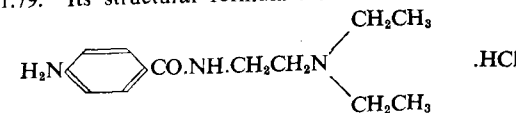
Despite increased experience in the use of hexamethonium bromide it was felt that this drug was not of itself wholly satisfactory, and there still remained the small percentage of patients in whom it seemed impossible to produce a blood pressure low enough to achieve the required ischaemia for relatively "bloodless field" surgery. Successes had risen from 50% (Enderby, 1950) to 85% (Enderby and Pelmore, 1951). Failures were almost always in the younger age group of patients, and it was observed that such patients often responded to the administration of hexamethonium bromide by an increased pulse rate (up to 120–140 a minute) and a small and often inadequate fall in blood pressure.

A constant search has been maintained for a drug which would either replace or enhance the action of hexamethonium bromide. Procaine amide appeared likely to achieve the latter for two reasons: (1) its vaso-

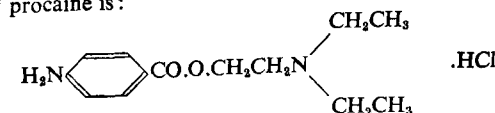
dilatory action would enhance the similar vasodilatory action of hexamethonium bromide; and (2) its effect in increasing the refractory period of the heart muscle might prevent the tachycardia which usually occurred and which may well be the cause of failure when using hexamethonium bromide.

Pharmacology of Procaine Amide

Procaine amide hydrochloride is *p*-amino-N-(2-diethyl-aminoethyl) benzamide hydrochloride, with the empirical formula $C_{13}H_{21}N_3O.HCl$, and the molecular weight of 271.79. Its structural formula is:



It differs from procaine only by the substitution of the amide group for the ester group. The structural formula of procaine is:



Procaine is a more potent local analgesic than its amide (Newman and Clark, 1950), but it causes much more central stimulation (Kayden, Steele, *et al.*, 1951). Both drugs are slight respiratory depressants, procaine having the greater effect. Both drugs produce hypotension when administered intravenously, but in conscious patients this is only a temporary effect.

Bradycardia is a feature of the action of both drugs, with depression of the T wave and QRS complex. Such production of bradycardia may well be one of its important features in its power to enhance the action of hexamethonium bromide.

Joseph *et al.* (1951) studied the mechanism by which procaine amide is believed to influence ventricular arrhythmias, and suggested that by some means, not yet satisfactorily determined, it depressed ventricular irritability—specifically the refractory period, as measured by the Q-T interval.

Whether the effect of procaine amide was due to the direct action of the circulating drug, or whether its effect was mediated through either the nervous system or some humoral mechanism, or both, has not yet been clarified. In view of the observation at operations, that inadequate ventilation was associated with most of the ventricular arrhythmias was encountered, it was thought possible that the efficacy of procaine amide lay in the diminution of the oxygen requirement of the ventricular musculature, and the cardiac component of the intracellular oxidative processes to participate in the intracellular oxidative processes to increase the oxygen utilization of the tissues (Kayden, Steele, *et al.*, 1951).

Procaine amide is absorbed rapidly and completely from the gastro-intestinal tract, permitting oral dosage when such is desirable. It is excreted in the urine, approximately 60% being recovered unchanged (Mark *et al.*, 1951). Plasma levels decline slowly, approximately 10–20% an hour after intravenous administration (Mark *et al.*, 1951). The amide of procaine is not hydrolysed by the enzyme which affects procaine, and hence is relatively stable *in vivo* (Brodie *et al.*, 1948).

Procaine has been used for the correction of cyclopropane-induced cardiac arrhythmias during anaesthesia (Burststein, 1949). He claimed satisfactory results in 50 cases. Joseph (1951) and Joseph *et al.* (1951) had similar results with procaine amide. No toxic effects of procaine amide have been produced, as evidenced by haematological, renal, and hepatic studies in dogs (Mark *et al.*, 1951).

Effect on Ventricular Arrhythmias

Ventricular fibrillation is usually rapidly fatal, and search has long been made for a drug which will prevent its onset. Among the drugs that have been used are diethylaminoethanol, potassium chloride, quinine, "dibamine," procaine, and procaine amide. Intravenous procaine has been the most widely used during anaesthesia, and has provided the best results (Burststein, 1949).

Ventricular arrhythmias leading to fibrillation may occur under the following conditions: (1) If the patient has pre-existing ventricular extrasystoles, which may be occasional or paroxysmal. (2) With direct mechanical stimulation of the ventricle such as occurs in cardiac catheterization, or operations on the heart itself. (3) The administration of drugs which have a tendency to produce ventricular irregularities—for example, chloroform, cyclopropane, trilete, and adrenaline. (4) Ventricular arrhythmias are sometimes produced for no apparent reason. Stimulation of the larynx, peritoneum, or pleura, and section of the vagi have all been implicated.

Effect on Supraventricular Arrhythmias

Kayden, Steele, *et al.* (1951) stated that the effectiveness of procaine amide in auricular arrhythmias may be influenced by the duration of the arrhythmia. Chronic auricular flutter (10 cases) and chronic auricular fibrillation (14 cases) failed to respond, whereas auricular fibrillation of recent origin (4 cases) responded and reverted to normal rhythm (Kayden, Brodie, and Steele, 1951). Auricular premature contractions were eliminated by procaine amide, although its effect was of shorter duration than in ventricular premature contractions.

Schaffer *et al.* (1951) treated 14 patients with procaine amide and found the drug clinically effective in the treatment of auricular extrasystoles, tachycardia, flutter, and fibrillation. They observed that procaine amide had a depressant influence on abnormal auricular stimulus formation and on normal conduction, as well as having an atropine-like action.

Procaine amide, while protecting the heart from arrhythmias, has been shown to be less toxic than procaine (Mark *et al.*, 1951). It is therefore the drug of choice when treating arrhythmias from any of the above causes. One side-effect of both procaine and its amide is the production of hypotension. In view of the increasing use of hexamethonium bromide for the deliberate production of hypotension in all branches of surgery, the possibility of a series of conditions occurring which necessitate the use of both these drugs in the same patient is becoming more likely—for example, one of us (A. A. M.) was recently faced with the problem of anaesthetizing a patient who showed pronounced irregularity of the pulse. Ventricular extrasystoles were diagnosed, and the control of these with procaine amide during operation was thought advisable. The operation was for removal of a retrobulbar tumour, and because of the ease with which these tumours are removed under the hypotensive technique the surgeon requested that if possible hexamethonium bromide should be used.

It was not known whether the hypotensive action of hexamethonium bromide would be further potentiated by the previous or simultaneous use of procaine amide. The result of this first case encouraged us to study a series of cases using hexamethonium bromide following the previous administration of procaine amide.

We have compared this series with figures taken from 50 unselected cases in which hexamethonium bromide alone was used. Anaesthesia in the two series was exactly the same—namely, induction was with a mixture of thiopentone and gallamine triethiodide, and maintenance was with nitrous oxide and oxygen (2:1), in a semi-closed absorber system, together with intermittent thiopentone or pethidine.

Present Series

Table I shows plainly that after the previous administration of procaine amide a blood-pressure fall to below 60 mm. Hg occurs in more than twice the number of cases

TABLE I.—The Blood-pressure Levels in 50 Unselected Cases Using Hexamethonium Bromide Alone, Compared with the Levels Achieved when Hexamethonium Bromide is Given After 1 g. of Procaine Amide

Control Series: Hexamethonium Bromide Alone; Average Dose, 95 mg.		Hexamethonium Bromide; Average Dose, 65 mg., after Procaine Amide, 1 g. Given in Two Divided Doses of 500 mg.	
Average Blood-pressure Level during Operation	No. of Cases	Average Blood-pressure Level during Operation	No. of Cases
80 and over	16	80 and over	5
70-80	21	70-80	15
60-70	10	60-70	23
50-60	3	50-60	7
	50		50

(30 against 13 in the control series) in which hexamethonium bromide alone was used. It is also evident that the dose of hexamethonium bromide needed to produce a similar fall in blood pressure is reduced by about 30 mg. after the administration of procaine amide. From this we may conclude that the drugs show a true potentiation of each other's hypotensive effects.

In the case of retrobulbar tumour mentioned both procaine amide and hexamethonium bromide were used in the following manner.

Case A.—A woman aged 42 had a neurofibroma of the left orbit. Her general condition was good. "Omopon," $\frac{1}{2}$ gr. (22 mg.), and scopolamine, 1/150 gr. (0.43 mg.), were given one hour pre-operatively. Her pulse was 84 and irregularly irregular; and blood pressure 130. Anaesthesia was established with a mixture of 0.9 g. of thiopentone and 80 mg. of gallamine triethiodide. An oral tube was passed and anaesthesia was maintained with N_2O+O_2 (2:1) and intermittent thiopentone. The table was then tipped to a 35-degree foot-down position. Her blood pressure was 110, pulse 86 and irregular. Procaine amide was injected intravenously as two doses of 500 mg. each. The pulse became regular two minutes after this and remained so throughout the remainder of the operation. The blood pressure fell to 80 and the pulse rate to 82. Surgery was begun and after only three minutes the blood pressure began to rise, reaching 100 mm. in six minutes. Hexamethonium bromide was then administered intravenously, 20 mg. at a time. After 60 mg. had been injected the blood pressure fell to 60 mm. and remained steady at this level until the operation finished 35 minutes later. The colour remained excellent throughout, the surgical field was clear of blood except for the merest ooze, three swabs only being used. Respirations were unlaboured at 24 a minute. Post-operatively the patient was levelled to a 5-degree foot-down tilt. The blood pressure rose to 100 mm. and the pulse rate was 86. She was transferred at this tilt to her bed. Recovery was uneventful.

It may also be said that cases with a blood pressure of over 80 mm. Hg are often unsatisfactory from an ischaemic point of view. The number of such cases was reduced from 16 with hexamethonium bromide alone to 5 when procaine amide had first been administered. We did not, however, find that all cases with a blood pressure of 80 or over were necessarily unsatisfactory. In fact, many were relatively bloodless, and did not require the pressure to be taken any lower in order to facilitate surgery.

It must be emphasized that the primary object of the anaesthetist is to produce a field which is satisfactory to the surgeon, and not necessarily to produce a particular level of blood pressure. The optimum blood pressure for any particular case varies enormously with the age of the patient, the site of operation, the state of the blood vessels, the pulse rate, and probably many other variables which have not yet been fully assessed. Many cases—for example, excision of a rodent ulcer of the face in a patient of over

70—are virtually bloodless with a pressure of 80-85 mm. Hg, while a young patient may bleed profusely from any site with a blood pressure as low as 65 mm. Hg.

It is estimated that in approximately 85% of all cases in which hexamethonium bromide is used alone a satisfactory surgical result is achieved. That being so, it would be unnecessarily wasteful and troublesome to administer procaine amide to every case, in an attempt to avoid the small number of failures (15%) (Enderby and Pelmore, 1951) which occur when hexamethonium bromide is used alone.

It was therefore decided to restrict the use of procaine amide to cases in which the use of hexamethonium bromide alone had failed to produce adequate ischaemia. A series of 17 such cases were subsequently treated with 1 g. of procaine amide. It will be seen (Table II) that in all except one of these cases a satisfactory operative level was achieved. In no case was any toxic effect seen, and in no case was the blood-pressure fall so severe as to cause concern. The maximum fall occurred within five minutes of administration.

TABLE II.—Blood Pressure in Cases of Failure with Hexamethonium Bromide (H.M.B.), Showing Subsequent Levels Following the Use of Procaine Amide (P.A.)

Case	Age	Dose of H.M.B.	B.P. after H.M.B.	B.P. after Addition of P.A.	Dose of P.A.
1	34	200 mg.	120	65	1 g.
2	25	100 "	90	60	1 "
3	23	200 "	100	80	1 "
4	10	100 "	105	70	1 "
5	18	100 "	90	65	1 "
6	16	200 "	90	55	1 "
7	32	80 "	80	65	800 mg.
8	46	100 "	85	65	700 "
9	14	100 "	80	70	1 g.
10	27	100 "	70	50	1 "
11	40	100 "	95	45	1 "
12	26	100 "	90	65	1 "
13	24	160 "	100	80	1 "
14	25	100 "	80	60	600 mg.
15	22	100 "	120	120	1 g.
16	23	95 "	80	60	1 "
17	23	95 "	100	85	1 "

Cases Illustrating Response to Procaine Amide

Two case histories show the type of response to procaine amide.

Case B.—A boy aged 10 had an operation for the removal of a neurofibroma of the orbit. Premedication was with omopon, $\frac{1}{2}$ gr. (11 mg.), and scopolamine, 1/300 gr. (0.22 mg.). Induction was with 3 ml. of thiopentone (0.15 g.) and maintenance was with N_2O+O_2 and ether, using an Ayre's T-piece. An endotracheal tube was passed and the table tipped to a 35-degree foot-down position. The systolic blood pressure was 110 mm. Hg, and pulse 120. Hexamethonium bromide, 100 mg., was injected intravenously. After five minutes the pulse rate had risen to 140, and the blood pressure had dropped only 5 mm. Hg. Positive pressure could not be used because of the Ayre T-piece. Procaine amide, 800 mg., was given intravenously. The blood pressure fell in five minutes to 60 mm. Hg and the pulse rate resumed its original level of 120. Operation was begun and the field was virtually bloodless. Four swabs only were used during the entire operation, and these only to mop the merest ooze. The pulse remained steady up to the completion of the operation 50 minutes later, and the blood pressure climbed slowly to 80 mm. Hg. On levelling the patient the blood pressure rose to 95 mm. Hg and subsequently recovery was uneventful.

Case C.—A girl aged 18 had an operation for nasal reduction. Premedication was with omopon, $\frac{1}{2}$ gr. (22 mg.), and scopolamine 1/150 gr. (0.43 mg.). The pre-operative blood pressure was 120 mm. Hg, pulse 84. Induction was with 0.9 g. of thiopentone and 80 mg. of gallamine triethiodide. The blood pressure was then 110 and the pulse 80. An oral tube was passed and anaesthesia maintained with N_2O+O_2 in a semi-closed circle system. Intermittent thiopentone was used. The patient was tipped to a 35-degree foot-down tilt, and hexamethonium bromide, 100 mg., was injected intravenously. After five minutes the blood pressure became 110 and the pulse 116. A second dose of hexamethonium bromide, 100 mg., was then injected and positive pressure respiration began. After five minutes the blood pressure became 85 and the pulse 118. The operation was started and after ten minutes the bleeding was brisk. The blood pressure was 100

and pulse rate 124. Procaine amide, 1 g., was injected intravenously. Within five minutes the blood pressure became 65 and pulse fell to 90. The bleeding stopped. The operation was continued uneventfully, there being only three swabs used, and the sucker was discontinued completely once the blood pressure had fallen to 65 mm. The blood pressure gradually rose to 75 mm. after 70 minutes, but no further bleeding occurred. The pulse was 92. On levelling, the blood pressure rose to 100 mm. Hg. Recovery was uneventful.

Discussion

Cases B and C show an interesting relationship between pulse rate and blood pressure. On the administration of hexamethonium bromide the pulse rate is seen to rise, and the fall in blood pressure is only slight. The injection of procaine amide causes both the blood pressure and the pulse rate to fall. It seems highly probable that the main action of the procaine amide is on the pulse rate, and that the fall in blood pressure is secondary and due to the prevention of this tachycardia.

It would seem reasonable to suppose that the rise in pulse rate following hexamethonium bromide is an effort by the body to compensate for the fall in blood pressure, and occurs possibly through the secretion of adrenaline. The prevention of this compensatory tachycardia seems to be a necessary concomitant of a successful hypotensive anaesthetic, for it has long been observed that almost all the unsuccessful cases have an elevated pulse rate.

It may well be that the omission of gallamine triethiodide, with its tendency to produce tachycardia, will further increase the success rate. This substance was used in our first hexamethonium bromide/procaine amide series so as to make it strictly comparable with the 50 control cases to which it has been added. Enderby has omitted using hexamethonium bromide recently, but continues to use of gallamine triethiodide in cases in which a compensatory tachycardia detracts from a good ischaemic result.

Another point of interest is the age group of the 17 cases in which the addition of procaine amide was deemed advisable. Thirteen of the total were under 30 years of age, and this strengthens our previous view that the failures were mostly in the younger age group of patients. Thus the anaesthetist who deals more with the older age group will have greater success with hexamethonium bromide alone and less need for an adjuvant in order to achieve hypotension.

Conclusions

If it is deemed advisable to use hexamethonium bromide and procaine amide together—for example, with ventricular arrhythmias and maxillo-facial operations—no toxic effects occur. The blood pressure, however, does fall more than with either one of these used separately, and also with smaller doses. The drugs show a true potentiation of each other's hypotensive effects. The anaesthetist must use supreme caution and vigilance when using them together.

If hexamethonium bromide fails to bring the blood pressure down to a level in which bleeding is negligible the result will almost always be safely and quickly achieved by the subsequent addition of 1 g. of procaine amide intravenously. Failure of hexamethonium bromide alone seems to occur with the greatest frequency in patients under the age of 30, and it may be anticipated that procaine will be required most often in this age group.

Summary

A series of 50 cases is reported in which procaine amide was used before the administration of hexamethonium bromide, and the results are compared with a control series.

A further series of 17 cases is reported in which hexamethonium bromide failed to produce a sufficient fall in blood pressure, and which responded after the administration of procaine amide.

The effect on the pulse rate and its relationship to the hypotensive effect of these two drugs are clearly demonstrated.

We wish to thank our colleagues for their encouragement and assistance with these investigations and their permission to use some of their records, and Messrs. Squibb for generously supplying procaine amide ("pronestyl"). We are also indebted to Dr. D. A. Robertson, cardiologist at this unit, for his help and advice.

[ADDENDUM.—Since completing the foregoing article in February, 1952, work has gone forward with procaine amide, and 150 additional cases have received this drug. Careful observations have been made and records kept. So far no cases of allergy or untoward side-effects have been noticed. The pulse rate has almost invariably been reduced, with resulting benefit. The drug is being used by us in doses of 0.5 to 1 g. in those cases in which the pulse rate remains higher than 110. An additional paper is being produced on this series.

We are indebted to Messrs. May and Baker Ltd. for supplying the entire requirements of this later series of cases.]

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TREATMENT OF ACUTE MALARIA
WITH PYRIMETHAMINE

BY

T. WILSON, M.D., D.P.H.

AND

J. F. B. EDESON, M.B., Ch.B.

Institute for Medical Research, Kuala Lumpur,
Federation of Malaya

Pyrimethamine, which is 2:4-diamino-5-p-chlorophenyl-6-ethylpyrimidine, is the latest of the new synthetic anti-malarial drugs to be tested by us in the Malaria Research Division of this institute. This compound is produced by Burroughs Wellcome & Co. under the trade name "daraprim," and was formerly known by the experimental number B.W. 50-63.

Falco *et al.* (1951) found that pyrimethamine was active in very small doses against *Plasmodium gallinaceum*, *P. berghei*, and *P. cynomolgi*, and its toxicity was slight. Rollo (1951) reported that proguanil-resistant strains of *P. gallinaceum* and *P. berghei* were susceptible to pyrimethamine, and found that *P. gallinaceum* could not readily be made resistant to pyrimethamine by the usual methods. Archibald (1951) gave the first account of the effect of pyrimethamine in human malaria. Single doses of as little as 5 mg. cleared *P. falciparum* trophozoites from the blood of Nigerian schoolchildren; his patients, however, seem to have been parasite carriers rather than sufferers from acute malaria.

Through the kindness of Brigadier J. S. K. Boyd, Director of the Wellcome Laboratories of Tropical

Medicine, we obtained a supply of pyrimethamine, and have used it to treat 126 patients with acute malaria. This paper includes the results up to June, 1952.

Experimental Methods and Standards

Our patients were drawn from the Asian population of the Kuala Lumpur and Tampin districts of the Federation of Malaya. They may be regarded as semi-immunes; but they came to hospital seeking treatment for fever, and were admitted to the General Hospital, Kuala Lumpur, or the District Hospital, Tampin, where they were under the personal supervision of one or other of us. The cases here recorded were previously untreated and uncomplicated infections due to a single species of malaria parasite, and usually with fever and other symptoms of acute malaria.

Parasite counts were made daily on all patients, using the Dreyer-Sinton fowl-cell technique, and thick blood films stained by Field's rapid method were also examined once or twice daily to check progress. A film was reported negative if no parasites were seen in 100 thick film fields. Pulse rates and temperatures were charted four-hourly.

The doses of pyrimethamine were given to each patient by one or other of us, and were seen to be swallowed along with a drink of water. The drug was supplied in tablets of two sizes, containing respectively 10 and 25 mg. of pyrimethamine base, and all doses are stated in terms of base.

At the start of our trial little was known about the effectiveness of pyrimethamine in the treatment of acute malaria or what the optimum dose should be. Treatment was therefore restricted to patients in good physical condition whose parasite counts were relatively low. After a single dose of 20 mg. had proved ineffective in one falciparum and one vivax infection, we decided to begin with single doses of 50 mg.

Results

(1) *Acute Falciparum Malaria*.—Fifteen patients were treated with a single dose of 50 mg. of pyrimethamine; 39 received 100 mg., in divided doses of 50 mg. each at intervals of 4 to 12 hours, and 26 received a total dose of 300 mg. in five days—100 mg. on the first day, followed by 50 mg. daily for the next four days. The results are summarized in Table I. They were disappointing. The

TABLE I.—Average Duration of Asexual Parasitaemia and Fever after Treatment of Acute Falciparum Malaria with Pyrimethamine

Dose of Pyrimethamine Base	No. of Cases	No. of Failures*	Average Duration of Parasitaemia and Fever in Days (Excluding Failures*)		Average Asexual Parasite Count per c.mm. Before Treatment	Range of Parasite Counts
			Parasitaemia	Fever		
50 mg. × 1	15	2	1.9	2.0	16,400	1,000–92,600
100 mg. in 12 hours	39	4	2.4	2.1	9,200	600–27,400
100 mg. × 1 50 mg. × 4	26	7	2.6	2.3	12,600	2,100–46,400

* Failure means that asexual parasites were still present on the seventh day, or that therapeutic intervention with another drug was necessary before the seventh day.

most disturbing feature was the failure to cure so many of the patients. But, apart from these failures, the clinical action of the drug was slow, and more than one-third of the successfully treated patients had persistence of fever and symptoms for a day or two after trophozoites had disappeared from thick blood films. A similar delayed action on fever is often seen when treating falciparum malaria with proguanil, but is rare with other synthetic drugs. In a comparable series of 25 patients treated with single doses of 300 mg. of chloroquine base there were no failures; the average duration of parasitaemia was 2.3 days, but the average duration of fever was only 1.2 days.

Many of our patients came from areas where proguanil-resistant strains of *P. falciparum* were known to exist. It was possible that such strains were also resistant to pyrimethamine, and that this would explain the failures and indeed the persistence of symptoms in so high a proportion of our patients. We tested this hypothesis by giving pyrimethamine to patients whom proguanil had failed to cure.

(2) *Treatment of Proguanil-resistant Falciparum Infections with Pyrimethamine*.—Twenty-four patients with acute falciparum malaria had responded little or not at all to doses of 300 mg. of proguanil daily for an average of 3.7 days; they were then given 100 mg. of pyrimethamine in two doses of 50 mg. each. The results are summarized in Table II. Apart from the two immediate failures, one

TABLE II.—Average Duration of Parasitaemia and Fever in Proguanil-resistant Falciparum Infections Treated with 100 mg. Pyrimethamine

No. of Cases	No. of Failures*	Average Duration of Parasitaemia and Fever in Days (Excluding Failures*)		Average Asexual Parasite Count per c.mm. on Day Pyrimethamine was Given	Range of Parasite Counts
		Parasitaemia	Fever		
24	2	1.9	1.8	7,814	200–54,700

* Failure means that asexual parasites were still present on the seventh day, or that therapeutic intervention with another drug was necessary before the seventh day.

TABLE III.—Average Duration of Parasitaemia and Fever after Treatment of Acute Vivax Malaria with Pyrimethamine

Dose of Pyrimethamine Base	No. of Cases	Average Duration of Parasitaemia and Fever in Days		Average Asexual Parasite Count per c.mm. Before Treatment	Range of Parasite Counts
		Parasitaemia	Fever		
50 mg. × 1	11	3.1	2.0	5,470	600–14,600
100 mg. in 12 hours	11	3.4	1.9	5,640	400–18,600

patient treated with pyrimethamine on day 4—that is, after three full days' treatment with proguanil—and discharged from hospital apparently cured on day 12, returned six days later with a temperature of 102° F. (38.9° C.) and falciparum trophozoites in his blood. Excluding the two failures and two afebrile patients, only 2 patients out of 20 had persistence of fever and symptoms after trophozoites had disappeared from their peripheral blood. These results are so similar to those in Table I as to suggest that resistance to proguanil plays little part in determining how falciparum malaria will respond to treatment with pyrimethamine.

(3) *Acute Vivax Malaria*.—Eleven patients with acute vivax malaria were treated with the 50-mg. single dose, and 11 with the 100-mg. dose. The results are summarized in Table III. Parasite clearance was slow, but there were no failures; fever and symptoms did not persist after trophozoites had disappeared from the peripheral blood.

Discussion

Comparison with Results from Elsewhere.—During the progress of this work accounts of therapeutic trials of pyrimethamine in other countries became available. One, by Schneider *et al.* (1952), was from Tunisia and Indo-China; another, by McGregor and Smith (1952), was from the Gambia. More recently still, Goodwin (1952) has reviewed these results, and has also given details of other clinical trials in Assam. The general tenor of these reports is favourable, yet occasional failures appear in the records, and Schneider *et al.* make special mention of the slow clinical response, and of the fact that results were not improved by using more than a 50-mg. single dose. More

work is needed before the value of pyrimethamine in the treatment of malaria can be assessed. Our own results indicate that it is unsuitable for the treatment of acute malaria caused by Malayan strains of *P. falciparum*; its effect on parasitaemia is so uncertain that it could not be relied upon in a heavy infection.

Drug-resistance.—In recent years, and particularly since the advent of proguanil, the problem of drug-resistance in malaria parasites has assumed a new importance. Not only must the ability of parasites to develop resistance against a drug be investigated, but also the possibility of cross-resistance between different drugs. Schmidt (1953) found that *P. cynomolgi* in monkeys could quickly be made resistant to pyrimethamine, that the resistant quality was transmissible through the mosquito, and that resistant trophozoites were also refractory to treatment with proguanil. Rollo (1952) produced resistance to pyrimethamine in *P. gallinaceum* and *P. berghei*, but found that the drug was almost as active against proguanil-resistant strains in the laboratory as against normal strains. We are still uncertain whether falciparum infections which fail to respond to pyrimethamine are also resistant to proguanil; but the figures in Table II suggest that proguanil-resistant strains of *P. falciparum* behave similarly to unselected Malayan strains of falciparum when treated with pyrimethamine.

Summary

Pyrimethamine, a new antimalarial drug of the 2:4-diaminopyrimidine series, has been used in Malaya for the treatment of 126 patients with acute malaria.

Eighty patients had previously untreated acute falciparum malaria. A single dose of 50 mg. of pyrimethamine failed to cure 2 out of 15 patients; a dose of 100 mg. (in two doses of 50 mg. each) failed to cure 4 out of 39; and a total dose of 300 mg. (100 mg. on the first day and 50 mg. daily for the next four days) failed to cure 7 out of 26 patients. Apart from the failures, the action on fever and symptoms was usually slow.

Twenty-four patients whose falciparum infections had proved refractory to treatment with proguanil were given 100 mg. of pyrimethamine. Results were so similar to those described above as to suggest that resistance to proguanil does not affect the response to pyrimethamine, and is therefore unlikely to have been responsible for the failures in the other groups.

Workers in other countries have obtained better results than these, but occasional failures have been encountered, as has also the slow action on fever and symptoms. Whatever the verdict elsewhere, pyrimethamine must be regarded as unsuitable for the treatment of acute malaria due to Malayan strains of *P. falciparum*.

Eleven patients with acute vivax malaria were treated with the 50-mg. single dose, and eleven with the 100-mg. dose. Disappearance of parasites was slow, but there were no failures.

We are greatly indebted to Brigadier J. S. K. Boyd, Director of the Wellcome Laboratories of Tropical Medicine, for the supply of pyrimethamine and for information about its properties.

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USE OF LOCAL ANALGESIA IN SEPTIC-FINGER SURGERY AT A TEACHING HOSPITAL

BY

P. E. B. HOLMES, M.B., B.S., B.Sc.
Senior Casualty Officer, King's College Hospital

AND

D. J. C. GRAFF, M.R.C.S., L.R.C.P.
Late Second Casualty Officer, King's College Hospital

The purpose of this limited survey is to ascertain whether local analgesia is an advantage over general anaesthesia in septic-finger surgery. The operations have been performed by the casualty officers and the casualty dressers; although the latter change once a week, they have operated on two-thirds of the cases. Each new dresser has one or two practical demonstrations of the technique of analgesia and the principles of drainage; he is then allowed to operate single-handed, but with a casualty officer present.

The investigation began in February, 1952, and covers 256 patients operated on between that time and July, 1952. In the final analysis the case records are complete enough in only 209. The youngest patient was 3 years old and the eldest 85.

For the most part we have followed the terminology used in Professor Pilcher's clinic at University College Hospital (Pilcher *et al.*, 1948; Bailey, 1952). We have used local analgesia for the fingers and thumb. The types of infection classified are: (1) Acute paronychia (40.2%). (2) Pulp abscess: this includes the terminal pulp only (24.2%). (3) Apical abscess: the "apex" being that space lying between the true pulp and the end of the finger (9.3%). (4) Subcutaneous abscess, both volar and dorsal (17.9%). (5) Subungual abscess: we use this group to include sepsis following on splinters under the nail (8.2%).

Method of Treatment

Most cases were operated on at their first attendance. When pus has not been obvious on examination we have found that throbbing pain and loss of sleep are the symptoms which are most suggestive of its presence.

Analgesic.—2½% procaine solution without adrenaline was used. For the first two months the injections were given at the sides of the proximal phalanx—but later the nerves were injected as they leave the palm, just distal to the deep transverse metacarpal ligament. After cleansing with tincture of cetrimide, the dorsal skin between

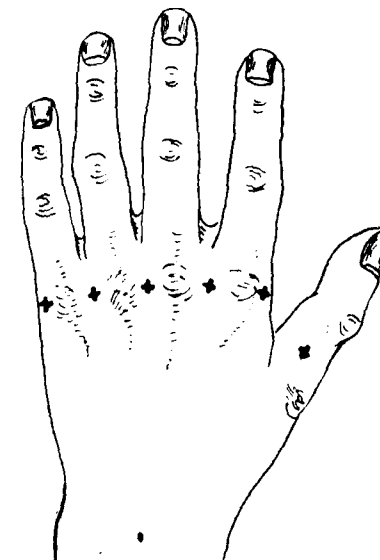


FIG. 1.—Sites for injection of the various fingers.

the knuckles is stretched and a very fine needle introduced here (Figs. 1 and 2). It is directed distally and forwards—fairly near to the proximal phalanx. Before withdrawal the needle is directed across the knuckle to block the dorsal nerves and the site for injection of the opposite side of the finger: the second injection is then made. In all, 6 ml. is usually more than enough. At this stage we allow at least five minutes, preferably ten minutes, for the block to become effective.

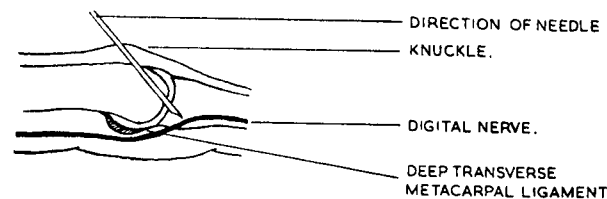


FIG. 2.—A longitudinal section at the level of a metacarpophalangeal joint; for the sake of clarity, the other structures at this level have been omitted.

A tourniquet of thin rubber is placed on the finger at its base. This is essential, since the extent of dead tissue and "collar-stud" sinuses cannot be seen without a bloodless field. We stress to students that (1) incisions must be adequate in extent, placed if possible over dead skin, and in the direction of Langer's lines; (2) all slough must be removed and the cavity mopped out; (3) deep extensions must be carefully sought with a probe; and (4) drainage must be ensured by the use of a small piece of tulle gras (which serves solely to hold the edges of the incision apart) and often by the excision of a narrow diamond of skin.

We have not used "through-and-through," "hockey-stick," or "alligator" incisions for pulp lesions. For paronychia we used the classical lateral incision, as merely elevating the nail-fold has not been found effective. When possible, distal healthy nail has been left *in situ* as protection. For infections at the side of the nail we have removed a strip wide enough to ensure drainage rather than the whole nail.

After operation a dry dressing is applied and the tourniquet removed; the circulation is checked and a tubular bandage applied. This has been found much more useful than the orthodox finger bandage. The affected arm is rested in a sling for at least two days. The patient is given a small supply of codeine tablets.

Dressings.—These are done as infrequently as possible. The patient attends the day after operation, but if, as expected, he has had a good night and the dressing is comfortable it is not touched for 48 hours. Then the wick is removed and suitable dressings are continued. These are performed in a morning hand clinic, where the same casualty officer and nurses deal with the cases daily. There is also a physiotherapist in attendance. For certain cases we have soaked the wound in chloramphenicol solution (24% in propylene glycol) for five minutes. Otherwise we have kept the wounds dry and have instructed the patients to do likewise.

Chemotherapy and Bacteriology.—In all but nine cases penicillin (300,000 to 600,000 units of procaine penicillin daily) has been given. Five patients received systemic chloramphenicol because of the isolation of penicillin-resistant organisms and a tendency to chronicity. Bacteriological sampling was not undertaken as a routine measure except for a short period during April, May, and June, 1952, when bacteriological swabs were taken from the lesions of all patients at the time of incision. In 100 consecutive cases comprising all types of hand infection, cultures were sterile on two occasions; in the remaining cases the organisms isolated were: *Staphylococcus aureus*, 94 cases (in pure culture, 88 cases); *Streptococcus pyogenes*, 7 cases (in pure culture, 2 cases); coliform bacilli, 4 cases (in pure culture, 2 cases). Infections with two or more organisms were found in six cases. Of the staphylococci 77% were sensitive to penicillin.

Results

The results are expressed in days of disability from the first symptoms until operation and from operation until the end of treatment, and of total disability. The pulp abscess is the most common type of infection to become chronic. We have had 12 such complicated cases in this series; in these, the total disability has been over 14 days. In Table I are shown separate results for the straightforward cases and for the 12 cases with complications. In the last column are shown the results achieved by Bailey.

TABLE I.—Disability Times from Onset Until Operation and from Operation until Discharge

No. of Cases	Type of Infection	Average Disability Time in Days			Total Time U.C.H. Series
		Pre-operative	Post-operative	Total	
85	Paronychia	4.7	8.4	13.1	14.3
48	Pulp abscess (total)	5.0	12.5	17.5	18.7
36	Pulp abscess (uncomplicated)	4.9	6.9	11.8	
12	Pulp abscess (complicated)	7.6	30.9	38.5	
37	Subcutaneous abscess	4.3	8.0	12.3	14.5
21	Apical abscess	4.9	11.1	16.0	11.0
18	Subungual abscess	4.8	10.1	14.9	

From the point of view of this investigation it is necessary to compare local analgesic with general anaesthetic cases as regards post-operative time. This has been done from the records of this hospital for 1951, when general anaesthetics were used. The cases were selected according to letters A-L of the names record. The unbiased comparison is shown in Table II.

TABLE II.—Comparison Between the 1951 and 1952 Series

	Type of Infection	Post-operative Time in Days	Type of Infection	Post-operative Time in Days
1951 series (G.A.)	Paronychia (80 cases)	11.6	Pulp abscess (50 cases)	15.0 (22 cases >14 days)
1952 series (L.A.)	Paronychia (85 cases)	8.4	Pulp abscess (48 cases)	12.5 (12 cases >14 days)

The results reveal that: (1) The figures for disability time are similar for the large University College Hospital series and this small series; in both, local analgesics were used. (2) The figures at this hospital are better when a local analgesic has been used. We are convinced that the reason for this is unhurried careful operation in a bloodless field. (3) The disability time for "simple" pulp abscesses (three-quarters of the cases) is seen to be about the same as that for paronychia. (4) Failure to obtain a quick recovery has been due to osteitis (three cases); inadequate drainage by doctors outside the hospital (three cases); inadequate drainage at the hospital (four cases); far-advanced initial lesions (four cases); fracture of terminal phalanx (two cases); and lack of co-operation (one case). (5) The difference in disability time between the local and general anaesthetic cases may seem slight; however, for the cases in Table II alone it represents one man's work for 18 months. (6) It would seem from Table I that the average patient, no matter what type his infection, lingers about five days before coming to hospital; this time allows for the formation of pus.

Discussion

As a result of the investigation we are of the opinion that local analgesia is definitely superior to general anaesthesia for infections of the fingers. The reasons are:

From the patient's point of view.—We have found that the majority prefer an injection to a "whiff" of gas, with its attendant period of starvation and the chance of post-anaesthetic debility and vomiting.

From the surgical point of view.—The advantages are many. They are summarized thus: Local analgesia has

been objected to because it is said to endanger the blood supply of the finger. We do not use adrenaline, and if the injection is given as above there is no mechanical constriction except by the tourniquet. We have watched the colour of the finger-tips post-operatively and found it normal in all cases. Another objection is the injection of fluid into potentially infected tissues—making them oedematous and thereby risking spread of infection. We have met neither of these complications, nor sensitivity to procaine. General anaesthesia involves a small risk and, in addition, a wait until the statutory four hours has passed since a meal. Its possible unpleasantness has been mentioned.

Above all, it is preferable to be able to operate with care on a stationary finger rather than to make a quick incision on a patient who is perhaps not too well anaesthetized. This type of operation leads inevitably to inadequate drainage.

The knowledge that operation can be performed immediately under local analgesia is of great value; there is no temptation to defer operating should the patient attend in the evening, nor are superficial pustules opened without anaesthesia and without proper exploration.

Local analgesia can be attained by anyone working alone, and from the point of view of casualty officers in small hospitals it is excellent; in fact, it has been practised in many such hospitals for some years. It is a better method for teaching purposes, since the student learns to work with care and sees the lesion clearly. There is also the extra time which the inexperienced operator needs.

In conclusion, we would stress that students under supervision have performed most of the operations; the results indicate that this is a satisfactory method.

We thank Mr. E. G. Muir for his helpful criticism and permission to publish these cases, also the other casualty officers, Sister Doris, the nursing staff, and the students who have done most of the operating. We also acknowledge the help we have received from the Bacteriology Department, and in particular thank Mr. K. Tippet and Mr. L. Rutty, who undertook the cultural investigations.

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SOME ASPECTS OF CATHETERIZATION IN RETENTION OF URINE

BY

J. A. LLOYD DAVIES, M.B., B.S., F.R.C.S.

The closed methods of prostatectomy introduced by Harris (1934), Hey (1945), and Millin (1945) require the absence of urethral and urinary sepsis for their safe performance. The undertaking of these closed operations on patients with urinary-tract infection offends surgical principles, and may lead to ascending pyelonephritis, wound sepsis and diastasis, and suprapubic urinary leak, despite the use of chemotherapy and antibiotics. It is clear that previous catheterization jeopardizes the patient's recovery if infection has been introduced with the catheter. This is particularly so in cases of acute on chronic retention of urine, in which immediate closed prostatectomy is now so often feasible. The advantages of this procedure need no emphasis when compared with the alternative of catheter drainage until urethral and bladder infection are well established, followed by suprapubic cystostomy, and transvesical prostatectomy at a later date.

Present Investigation

With this factor of urinary infection in mind, an investigation was carried out into a series of 117 consecutive patients admitted to hospital for the treatment of retention of urine caused by prostatic enlargement, fibrosis, or neoplasm. A history of any catheterization prior to admission was obtained, and the first specimens of urine collected in hospital were examined. In some cases these samples were midstream specimens, some were from suprapubic drainage of the bladder, others were obtained at prostatectomy or cystoscopy, while in a small group specimens were collected by catheterization when the patient's general condition precluded any other manoeuvre. A specimen of urine in which pus cells were seen on microscopy of the centrifuged deposit and from which pathogens were grown on culture was regarded as infected. The following results were obtained:

Total No. of cases	117	No. infected	31 (26%)
No. uncatheterized	86 (73%)	"	15 (17%)
No. catheterized	31 (27%)	"	16 (52%)

A further review with regard to frequency of catheterization disclosed the following:

No. catheterized once	13 (11%)	No. infected	3 (23%)
" repeatedly	18 (15%)	"	13 (72%)

In those patients who had been catheterized *Bact. coli* was present in only four, while the remaining 12 cases had mixed infections of two or more of the staphylococcal, coli, *Sr. faecalis*, pyocyanus, or proteus groups. The corresponding figures for the uncatheterized showed a *Bact. coli* infection in ten and mixed infections in the other five cases.

It is not surprising that retention is sometimes associated with urinary infection even when no urethral instrumentation has taken place, for the stasis of urine in the bladder provides a relatively undisturbed haven for the growth of bacteria.

That previous catheterization in retention of urine should raise the numbers infected from 17% to 52%, and, in addition, noticeably increase the proportion of mixed infections is of grave significance. Particularly is this so in view of the relative insensitivity of many strains of these organisms to antibiotics and chemotherapy. It is not only in the patient's home but in the hospital out-patient clinics and wards that urethral catheters are passed. How may such catheterization be avoided?

The discomfort of acute on chronic retention is often such as to lead to urgent demands from the patient for relief. In these circumstances there are several courses open to the practitioner. The time-honoured method of trying to get the patient to micturate while he is sitting in a warm bath with the taps running is rarely of avail, and recourse is generally had to one of the following procedures: (a) giving the patient morphine and transferring him to hospital; (b) the passing of a rubber catheter, partial or complete decompression of the bladder, removal of the catheter, and the transfer of the patient to hospital; (c) catheterization and decompression, removal of the catheter, and the hopeful waiting for return of spontaneous micturition—this happy occurrence is by no means usual, and the catheter may be passed again and thereafter repeatedly; (d) the passing of a catheter and tying it in.

The Best Course

Which course should the practitioner adopt? Although the arranging of a patient's admission to hospital nowadays is sometimes a difficult and exasperating matter, there is no doubt that generally, so long as there is no excessive delay, this is the best course, with the patient adequately sedated and with no catheter passed. It is felt that, normally, recourse should never be had to repeated catheterization or the tying in of a catheter. The safe performance of a closed prostatectomy, in itself necessitating an indwelling catheter

Reviews

MACHINE AND BRAIN

Design for a Brain. By W. Ross Ashby, M.A., M.D. (Cantab.), D.P.M. (Pp. 260. £1 16s.) London: Chapman and Hall. 1952.

One of the methods by which we try to understand biological processes is that of seeking a model or artifact which imitates the process we are studying. In the past almost every known mechanism—clocks, pulleys, levers, pumps—has been fruitfully used in physiology to this end. Recent developments in mathematics and in electrical engineering, based on the principle of "feed back" (which created guided missiles, automatic aeroplane pilots, and giant computing machines), have given a fresh impetus to the interpretation of the activities of mind in terms of machines—and, it must be added, the activity of machines in terms hitherto reserved for minds, such as memory, purpose, and intelligence.

Dr. Ashby's book is a remarkable contribution to this field. Its major extravagance is its title *Design for a Brain*, for the thesis it presents is much narrower. It is indeed confined to the answer to the questions: Can a machine learn from past experience? Having erred, can it so adjust itself that its next effort is likely to be more successful than its last?

To these questions Ashby's machine, the homeostat, supplies an affirmative answer. He describes in detail the data of its construction and discusses, first in non-mathematical language and then in appendices with the full panoply of advanced mathematical symbolism, the concepts and principles which lead him to suggest that these may "account fully for the development of adaptive behaviour even when the adaptation is as complex as that of man." The crucial criticism of all the ingenious artifacts which mimic vital behaviour lies in the validity of the analogy. Although Ashby has shown that his homeostat acts like the living organism in that it can adapt itself to its environment, learn from experience, and even repair itself when damaged, what evidence is there that the organism acts like, or has a similar structure to, the artifact? Ashby concedes that such evidence is almost entirely lacking, but says that it has never been searched for systematically. He candidly admits, however, that the behaviour of the homeostat differs markedly from that of brain. Among the differences are, first, the absence of gradation of success in the homeostat; it either fails or it succeeds—unlike living organisms, in which adaptation becomes "better and better every day." Secondly, the homeostat cannot conserve its learning; the readjustments necessary for a second adaptation destroy those which brought about the first; except in very primitive organisms learning does not destroy what was earlier learnt. And, thirdly, if the time factor in adaptation in the homeostat is analysed, it will be found that, "if we were like homeostats waiting till one field gave us, at a stroke, all our adult adaptation, we would wait for ever." Yet, on theoretical grounds, Ashby postulates that by increasing the number of fields and using repeated partial systems, the objection to the time factor is not insurmountable. But conceptual possibilities do not always emerge as physical realities!

Ashby's work and that of others interested in the field of cybernetics raise issues which are relevant to at least two currently important problems: first, the relationship between the concept of mind and the percept of brain; and, secondly, the nature of neurophysiological mechanisms and its therapeutic implications. The latter tends to be approached by all with commendable objectivity; the former still gives rise to intemperate comment. The mechanists in an orgy of unrestrained extrapolation tend to exaggerate the implications of machine behaviour, and to press too far on present evidence its analogy with brain. The vitalists seek to mask these achievements by a cloud

of fervent and emotionally toned appeals to faith and mysticism. But the scientist will acknowledge Ashby's work as a significant though difficult contribution to the analysis of the problem it tackles—namely, adaptive behaviour in machines—even if he is not prepared to accept on the evidence Ashby adduces all the suggested inferences.

HENRY COHEN.

CLINICAL EXAMINATION

The Essentials for Medical Diagnosis. By the Rt. Hon. Lord Horder, G.C.V.O., M.D., F.R.C.P., and A. E. Gow, M.D., F.R.C.P. Second edition, revised with the assistance of Ronald Bodley Scott, D.M., F.R.C.P. (Pp. 462; 6 colour and 17 black-and-white plates, 22 figures in text. £1 2s. 6d.) London: Cassell and Company. 1952.

Methods of clinical examination tend to have a local flavour. That must be the reason why Messrs. Cassell, who already publish Hutchison and Hunter's *Clinical Methods*, have now, after an interval of 25 years, issued a second edition of this very similar book from St. Bartholomew's Hospital. In writing the book in the first place, and in revising it for a second edition, Horder, Gow, and Bodley Scott reacted against the modern tendency to parcel out the patient to a number of ancillary investigations, biochemical, radiological, and the like, and tried to secure that the student should approach clinical problems by the application of his trained senses. Normal anatomy and physiology are emphasized, and the book is essentially a textbook of physical diagnosis, attention being concentrated on physical symptoms such as cough, dyspnoea, and vomiting, and on objective findings. There are some excellent x-ray photographs, but the section on the E.C.G. is too brief to be instructive.

The charm of the book lies in the numerous aphorisms with which it is studded, for they are of a kind likely to stick in the student's head. That is not to say that one agrees with all of them. One could certainly produce examples to disprove the statement that an enlarged spleen does not cause eversion of the lower ribs. Indeed, in a book of this kind it might be well to warn the student of the wide range of error of physical signs and laboratory data which has been revealed by C. M. Fletcher and other workers in this country and the U.S.A. In fact, one of the jobs for this generation of clinical teachers is to work through the classical physical signs and divide them into the reliable and the unreliable.

The book is well produced at a most reasonable price. It is handy in size and has a useful appendix of tables of normal data, such as the circumference of the head at different ages and the commoner biochemical findings. Bart's students and others will be well catered for now for some years to come.

L. J. WITTS.

THE UNIVERSAL SEROLOGICAL REACTION

Serology with Lipid Antigen: With Special Reference to Kahn and Universal Reactions. By Reuben L. Kahn, M.S., D.Sc. (Pp. 328. £2 6s. 6d.) London: Baillière, Tindall and Cox. 1950.

An Introduction to Universal Serologic Reaction in Health and Disease. By Reuben L. Kahn, D.Sc. (Pp. 155. £1 2s. 6d.) London: Geoffrey Cumberlege. 1951.

There must be few workers who have spent so much time and energy on the investigation of one test as Dr. Kahn. When such a test has a world-wide reputation, and has proved its worth over a period of more than 25 years, it is surprising that Dr. Kahn's investigations concerning the "universal serologic reaction" as revealed by the application of the Kahn test have not received more attention. This interesting work, the results of which may explain the occurrence of some of the troublesome non-specific reactions obtained with serum tests for syphilis, has not been investigated with sufficient zeal by serologists in general. Perhaps this is due in part to Dr. Kahn's method of presenting the results of his researches. Thus his book entitled *Serology with Lipid Antigen* is a hotchpotch of the universal sero-

logical reaction (Part I), the serology of syphilis with Kahn procedures, including the use of cardiolipin antigens (Part II), the technique of Kahn procedure (Part III), and the "Practical Aspects of the Kahn Universal Reaction" (Part IV).

Part I is interesting and contains sufficient evidence to warrant the investigation of the universal serological reaction by other serologists. Part II is disappointing, as for example when the author fails to indicate whether it is an advantage to use cardiolipin or the original Kahn antigen in the test. Part III gives much that has already been published, and it might well have been omitted. Part IV is mainly a recapitulation of, though adding a little to, the information contained in Part I.

Clinicians and serologists might benefit from reading Parts I and IV of this book, but are recommended to study Kahn's next book entitled *An Introduction to the Universal Serologic Reaction in Health and Disease*. This is written in a much happier vein and consists of some 155 pages of subject-matter profusely illustrated with graphs. He discusses the universal serological technique with lipid antigen, and serological reactivity in normal human beings, in different animals, in syphilis, yaws, leprosy, malaria, and tuberculosis. Curiously enough no mention is made of the reaction in pregnancy, virus diseases, and people immunized against enteric fever or smallpox. Because these conditions are the most frequent causes of non-specific reactions with serum tests for syphilis in Britain the omission may cause some comment, but no doubt Dr. Kahn or some other worker will remedy this defect in due course. The last two chapters (11 and 12) deal with technical studies on, and the nature and significance of, the universal serological reaction.

This book should be read by clinicians as well as serologists, who will find much food for thought, the digestion of which will help them in the interpretation of some of the results of serum tests for syphilis obtained with "problem" sera.

I. N. O. PRICE.

CONTRAST PSYCHOLOGY

Contrast Psychology: A Concept of the Movements of the Human Spirit. By Murdo Mackenzie, M.D., M.R.C.P. (Pp. 304. £1 1s.) London: George Allen and Unwin. 1952.

There must now be almost as many systems of psychological explanation as there are shades of religious belief, and with those which are to be taken seriously there is no alternative to learning the terminology and basic tenets of each and applying these sympathetically to a variety of known situations. Only then is it possible to hold an opinion on its validity. Contrast psychology is worth this effort because its originator has tried to subject his experiences as a psychotherapist to a philosophical scrutiny. From this process he has derived certain basic principles, and in this book he applies them to problems of the behaviour of communities, both historical and contemporary. Briefly, he discounts the possibility of a psychological universal and interprets the activities of mind in terms of dissimilarity and polarities. His schema is a tetrad: immediacy in the individual outlook is opposed to deliberation, and amplification in the outlook of the community in contrast to simplification. The uneasy personality created by an anxious mind can reveal itself in four ways only: by assertion, depression, hysteria, and the obsessional ritual.

Armed with this schema, contrast psychology proceeds to explain the attitudes of civilizations and the groups within them in its own terms. The theme is traced from Pericles through Karl Marx to Franklin D. Roosevelt, whose personalities represent deliberation, and from Lynders to Churchill, both of whom the author regards as immediates—thinking solely in terms of the here and now. Freud and Adler, Communism and Fascism, are polar opposites with minimal emphasis on similarities. The hormic view, with the driving force, is taken for granted, together with the Freudian theory of intrapsychic conflict. The solution to community problems lies in psychological awareness

and recognition of the significance of contrast. Whether this must necessarily be in terms of contrast psychology is not made clear.

Dr. Mackenzie is not lacking in confidence in his system and its applicability to the problems of civilization in its widest sense, and there is no middle to his road. Deeply influenced by Hegel and A. N. Whitehead, and assuming what he calls "modern psychological concepts," he has leaped to some interesting conclusions. Whether he has over-simplified or over-amplified his basic system or not, his asides are readable and his logic challenging to anyone who will give the time to learn the terminology of one more system of explanation of the behaviour of mankind having its origins in the autisms of the psychotherapist's consulting-room.

ALEXANDER KENNEDY.

THE KNEE

The Knee and Related Structures: Injuries, Deformities, Diseases, and Disabilities. By Professor Philip Lewin, M.D., F.A.C.S., F.I.C.S. (Pp. 914; 333 figures and 2 coloured plates. £6.) London: Henry Kimpton. 1952.

The author states in the preface that "I am determined to present the matter as it has never before been presented." Certainly no such complete summarization of the views of all possible lesions related to the knee-joint has been produced before, though one feels that his determination to include everything has occasionally got the better of his judgment. It is perhaps a misfortune that Dr. Lewin has been the orthopaedic editor of the *International Abstracts of Surgery* for 35 years. His encyclopaedic knowledge of the works of others has studded the volume with names known and unknown. Pages read like an abstract of abstracts. As a result, the quick decision of the practical surgeon is hidden in a mass of facts and often difficult to find; nor is it always entirely satisfactory. The discussion on total removal of a meniscus versus partial removal is summarized by this final sentence: "Improve your technique to the point where complete removal can be accomplished without undue prolongation of the operation or added trauma during the procedure." This to most readers will seem to be begging the question. Where the subject is obscure or largely academic—for example, intermittent hydrarthrosis—the summary of viewpoints given is excellent.

As neither the initials nor dates are given with names referred to in the text (for example, King), a search of the bibliography at the back will give a choice of Don King, Byron King, and E. S. J. King as the possible author. Nor are all the names referred to in the text—for example, Pulvertaft—included in the bibliography.

In order to vary the format of his pages, certain lists are enclosed in frames. This naturally emphasizes them, and, if this is intended for the uninformed, equal weight is given to each statement and the student may therefore be misled. If it is intended for the knowledgeable, many of the statements included seem unworthy of their place—for example, "Treat the periosteum as gently as you would the eye-ball." The "Ten Commandments," "Ten Simple Analogies," and "Wise Words" offer little pungency. Hiding in the appendix are those orthopaedic dodoes, rupture of the plantaris muscle and rupture of the plantaris tendon.

Although the book on the whole is well illustrated, it is remarkable that no illustrations of arthrography of the knee-joint are included. While the technical varieties of arthrography are well described, and there is some discussion of their theoretical helpfulness, no practical guide to their use is given, and it can only be concluded that the author has not handled the method himself. Its value may be limited but ought not to be as completely underestimated as it appears to be here.

The author's volume in similar format on *The Foot and Ankle* has now run into its third edition, and I have no doubt that this volume will do the same, but it is a volume primarily for reference and not for easy reading.

J. G. BONNIN.

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SIX GUINEAS' WORTH

A letter in this week's *Supplement* draws attention to two prevailing misconceptions. The first is that six guineas a year is a large subscription for belonging to the B.M.A., and the second is that the increase this year is, in our correspondent's words, due to "the increased expenditure now necessary to produce the *British Medical Journal*." The annual subscription to the B.M.A. must be among the smallest of subscriptions paid by doctors anywhere in the world for belonging to a voluntary national medical association. Corresponding rates are, for example, much higher in the Scandinavian countries and in the U.S.A. The "ordinary" subscription of six guineas is in fact paid by little more than one-third of the 68,000 members of the Association, in view of the many concessions made to various groups and of the fact that overseas members pay only two guineas a year. But some members forget how greatly the B.M.A.'s obligations and responsibilities have increased since 1939, when membership was little over half what it is now. There is, for example, the valuable work now done by the Medical Practices Advisory Bureau, and by the Empire Medical Advisory Bureau, neither of which was in existence in 1939: these are services to members and have to be paid for. The N.H.S., it should hardly be necessary to point out, has put an enormous burden of work on those in the Association who have to negotiate constantly and continuously on behalf of various groups of doctors. The Treasurer, it may be recalled, informed the Representative Body at Dublin¹ that in 1951 expenditure in connexion with central meetings had increased by over £4,000 above the previous year's level to a total of £22,400. He reminded them, too, that the cost of maintaining B.M.A. premises in 1951 had risen by over £4,500. The implications of all this, surely, should be self-evident. The B.M.A.'s experience reflects that of every householder in the country, and every institution. Costs have risen by 100% in this item and by more in that. It is surprising, not that the "ordinary" subscription has risen to six guineas, but that it has not risen sooner than this.

¹ *British Medical Journal Supplement*, July 12, 1952, p. 25.² *Ibid.*, p. 21.

The cost of producing the *B.M.J.* has increased two- or three-fold since 1939, but increased revenue from sales to non-members and from advertisements has, coupled with prudent management, kept its financial position fairly stable. Even in 1951, when the price of paper soared to previously unknown heights, the *B.M.J.* cost each member only just on 9s. for the whole year, or £30,000 out of the total membership subscription of £196,000; in 1938 the cost of the *Journal* to each member was 10s. As the Chairman of the Journal Committee, Dr. O. C. Carter, further explained to the Representative Body at Dublin last year,² surpluses earned by the *B.M.J.* in the previous nine years had been used for the general purposes of the Association: it was these surpluses that made it possible for the Association to delay raising the subscription. Dr. Carter also pointed out that the publication of quarterly journals on various medical specialties enabled the Association to fulfil its principal object—"to promote the medical and allied sciences." These publications not only do this; they are a service to members and to British medicine. But they, too, cost money to produce. The publishing crisis of two years ago subjected the publishing activities of the Association to a severe strain, which is being successfully borne. Members should realize, and most doubtless do, that the increase in the subscription is not the result of a costly *B.M.J.* The present subscription is a realistic assessment of the cost of the whole range of the Association's activities on behalf of its members, and, if it may be stated in these columns, it seems a small price to pay when so much is received in return.

TOXICITY OF CHLORAMPHENICOL

During last summer a sudden spate of papers appeared in the *Journal of the American Medical Association* describing aplastic anaemia, often fatal, in patients who had been given chloramphenicol.¹ The same condition was described in two reports^{2,3} in this *Journal*. Since then the medical profession in both countries and indeed throughout the world may well have been uncertain how to regard this drug and what indications to recognize for its use. Opinions have varied widely; some workers have looked on these findings as rare pathological curiosities; others have condemned chloramphenicol for any purpose except the treatment of typhoid fever, the single serious disease for which no equally effective alternative form of chemotherapy has been available. It was evidently necessary that extensive inquiry should be made into the frequency of this complication,

which had been recognized only by a few astute observers or by physicians who happened to have given exceptionally long courses of the drug. Such an inquiry has been undertaken in the U.S.A., and its results have now been published as a report⁴ from the Food and Drug Administration in Washington. This is an interesting but inconclusive document, and its recommendations are little more than such platitudes as might have been voiced about the proper use of any antibiotic suspected of causing some toxic effect.

The scope of the "nation-wide survey" on which the report is based is not clear, but it was carried out "mainly, but not entirely, in cities of more than 100,000 population." Inquiries addressed to an unstated number of hospitals for information about cases of aplastic anaemia, granulocytopenia, and related blood disorders occurring since 1949 produced information about 539 such cases. In only 55 of these, of which 44 had aplastic anaemia (fatal in 23), was chloramphenicol the only drug used. A second group of 143 patients, mostly with aplastic anaemia, had received other drugs in addition to chloramphenicol. Out of this group 83 patients died. The other drugs included antibiotics, sulphonamides, arsenicals, analgesics, anticonvulsants, barbiturates, and antipyretics. It is perhaps not surprising that this group was considerably larger than the first, since in any severe illness more than one drug is usually prescribed. No details about these other forms of therapy are given, and some would have been helpful. For example, sulphonamides and at least one analgesic, amidopyrine, have been known to damage the bone marrow, and it would have been useful to know how many of these patients were given any other drug known to be capable of causing such damage and how many had adjuvant treatment which, so far as is known, is blameless in this direction. The third and largest group of patients—341 in all, of whom 157 had aplastic anaemia, 80 granulocytopenia, and the remainder various other blood disorders—had received no chloramphenicol: 133 had had various drugs or been exposed to x rays, and in 208 the condition was termed "idiopathic." It is interesting that inquiry should bring to light so many cases of blood disorders of obscure aetiology. The possible significance of this part of the report depends much on how searching were the inquiries into these patients' drug-taking histories. Many had granulocytopenia, and it is not to be forgotten that 25 years ago people were dying with agranulocytic angina in this country for

some time before it was recognized that the cause was amidopyrine in a widely advertised patent medicine described as a "tonic."

Age distribution, which was wide, did not differ significantly in the three groups of patients, but analysis by sex reveals the unaccountable fact that in the group with blood disorders due only to chloramphenicol females were affected three times as often as males. Analysis of dosage systems is singularly unhelpful in indicating a safe system of administration. Of all patients in whom chloramphenicol could be incriminated, 73 were given a single course, 53 two courses, and 28 had intermittent and 61 prolonged therapy; but nothing is said about how often these different systems were used. If, for instance, in the practice of the hospitals studied "single" courses were ten times as common as "prolonged," it would have been evident that a prolonged course involved a greater risk. No analysis of total dosages is given, but it appears from earlier reports that very small amounts of the drug may suffice to affect the marrow.

The conclusions reached by the authors of the report are that a warning of this possible complication should appear on packages of the drug; that it should not be used indiscriminately or for minor infections; that prolonged administration should be controlled by blood counts; and that further study of marrow damage caused by this and other drugs should be pursued. The report leaves the impression that something remains to be discovered. It is still not clear why it should apparently be possible on the one hand to point to thousands of cases treated with chloramphenicol with no ill effects, whereas in the practice of other physicians or institutions substantial numbers of disasters have occurred. The true incidence of this complication has yet to be determined, and on it a final assessment of the place of chloramphenicol in therapeutics must depend.

BREAD

It is now more than ten years since the Government of the day ordered that the extraction rate of flour should be increased from the prevailing 70% up to 85%. This step was mainly taken to save shipping space, but the new, somewhat coarser kind of flour had long been advocated by most dietetic experts. Thus it was much richer than the old fine white flour in most vitamins of the B complex and was also superior in iron. Typical values of 0.35 i.u. per gramme for vitamin B₁ and 0.85 µg. for riboflavin in the old flour were raised to 1.15 i.u. and 2.0 µg. in the new variety. Although there was some apprehension that the much higher concentration of phytic

¹ *J. Amer. med. Ass.*, 1952, 149, 912, 914, 918, 1293, and 1301.² Hawkins, L. A., and Lederer, L., *British Medical Journal*, 1952, 2, 423.³ Wolman, B., *ibid.*, 1952, 2, 426.⁴ Lewis, C. N., et al., *Antibiot. and Chemother.*, 1952, 2, 601.

acid in the new flour might depress the absorption of calcium and so cause rickets, this danger was averted by fortifying the flour with chalk. Throughout the intervening years there have been many minor variations in the extraction rate, which has sometimes reached 90%, but the general procedure in flour milling has not been changed. The national "off-white" flour seems indeed to have stood the test of time without any serious criticism of its nutritional qualities—apart from the vexed question of the use of "agene" and other so-called improvers. Many have regarded it as one of the mainstays of the official food policy which has seen us through difficult times.

For every virtue it is usually possible to find a corresponding vice. Wheat offals make an important contribution to the feeding of pigs and poultry, and the adoption of a more nutritious loaf has been at least one of the causes of our reduced home production of bacon and eggs. The millers also argue that the average Briton prefers white flour when he can get it, and that its use allows the production of more attractive cakes and pastries. By fortifying white flour with synthetic vitamins the manufacturers should have no difficulty in endowing it with the nutritive virtues which are at present the chief argument in favour of a coarser flour, and it would then seem quite reasonable to leave the public to make their own choice between faithfulness to the old "off-white" bread and the attraction of a new vitaminized white loaf, offered with the additional inducement of better supplies of bacon and eggs.

A White Paper¹ on the decontrol of cereals and feeding-stuffs shows that the choice will soon be offered to the public. After consultations with farmers and with representatives of many trades the Government has decided that the present feeding-stuffs rationing scheme is unsatisfactory. By removing the present controls on the prices and supplies of all cereals and feeding-stuffs, and by returning imports to private trade, the Government expects to make economies and to increase efficiency. The existing subsidy on flour is to cease, and millers will be allowed to produce any flour they choose, provided it is fortified with the nutrients which are known to be lost in the processes of refining. But a national flour of 80% extraction will continue to be made, and the subsidy on bread made from this flour will be continued and modified to take account of the disappearance of the flour subsidy. The national bread, moreover, will still be controlled in price. Bread made from the new white flour will be neither subsidized nor subjected to price control.

¹ Cmd. 8745, H.M.S.O., London.

These changes will come into force at the end of the next harvest. In the meantime we may speculate, perhaps with a little anxiety, on how the farmers, the millers, and the general public will react to the new conditions. Dietitians may worry whether the vitamins which are to be added to the new flour will give complete compensation for the losses incurred during refining. Is vitamin E to be added? Can we overlook the danger that coarse flour may contain important dietary factors which have not yet been recognized? Doubts about the answers to these questions will make many dietitians hope that white flour will be used only for the special purposes for which it is suited, and that it will not displace the present coarser flour as our main material for making bread.

KINDNESS TO PATIENTS

Earlier this week the Minister of Health sent out to hospital management committees and boards of governors a report of the Central Health Services Council entitled "The Reception and Welfare of In-Patients in Hospitals." This document owes much to a similar report of the Scottish Health Services Council published in 1951. Among the more important recommendations are the following:

Meal times should be spaced so that patients have no long fasts; a serious effort should be made in all hospitals to reduce noise to the absolute minimum; ear-phones or pillow-phones should replace loud-speakers in wards; patients should not be wakened earlier than 6 a.m. and later if possible; in all their dealings with patients and their relatives, members of the staff should find time to show consideration and understanding of their point of view.

If there are many hospitals which need to be given these elementary instructions it is surprising that the reputation of the hospital service stands as high as it does with the public. Perhaps the dangerous notion that the Health Service is free has something to do with it. Most patients have a deep sense of gratitude to doctors and nurses and would feel it was hardly sporting to complain about anything except life-and-death matters, especially when their hospital treatment apparently costs them nothing. Perhaps the putting on of a hotel charge would make patients more effectively critical: so long as they suffer in silence their recovery will continue to be hindered in the sort of hospitals, mentioned in the report, where sheets must be tucked in tightly over their feet, where the tea is sugared whether they like it or not, and where the wards are cleaned and painted with the patients still in occupation.

The great majority of hospitals must obviously be well aware of their responsibilities to patients and anxious to make them as happy as possible. Those in charge of these hospitals can skip the depressing parts of this report and turn to the constructive suggestions. Lack of information probably causes patients and their relatives more worry than anything else, but, as the report shows, only a little extra thought and effort are required to banish the bewilderment and apprehensiveness of the ordinary patient. In our correspondence columns this week Dr. G. Roworth describes how a simple printed sheet of information has changed the atmosphere of his ward greatly for the better.

The interval between entering the hospital doors and getting safely into bed in the ward is an anxious time for most patients. Some may have to find their own way along confusing and ill-lighted corridors, others are trundled about like sacks of potatoes on noisy trolleys which look as though they had seen their best days at Paddington. The Central Health Services Council, attaching "great importance to the personality and suitability of the person who first receives the patient," makes the excellent suggestion that hospitals should employ receptionists as hotels do. The sooner some hospitals try this idea out the better. The best nursing-homes and private hospitals long ago adopted to good effect some of the principles of hotel management. The majority of ill people attach very great importance to their meals, but it is doubtful whether the time will ever come when the hospital chef accompanies the matron on a morning round and presents an *à la carte* menu to each patient. Such was the admirable practice in one well-known nursing-home some years ago.

The report also has some useful things to say about the handling of relatives and about visiting. It appears that in hospitals where daily visiting has been introduced the initial doubts of the ward staff have changed to wholehearted support. Not long ago Mr. David Patey, speaking at the annual dinner of the Middlesex Hospital Medical School, mentioned that a special room had been set aside for the relatives of patients who were seriously ill. This is only one of the many ways in which the anxieties of relatives can be eased. Mr. Patey also raised, with some delicacy, a matter which concerns only the teaching hospitals. He suggested that more consideration might be given to the dignity of the patient as a human being. The report of the Central Health Services Council puts it even more plainly: "The welfare of the patient must never be subordinated to the needs of teaching."

PROCAINE AMIDE

Procaine amide has been used during the last few years in the treatment of arrhythmias and other irregularities of the heart. It is a substance with properties similar to those of quinidine and procaine, and these are also similar to one another. Quinidine is ordinarily thought of as a drug for treating auricular fibrillation and procaine as a local analgesic. But quinidine differs very little in action from quinine, and solutions of quinine-urea were used, and perhaps still are used, to produce local analgesia. Again, procaine is known to prevent the ventricular fibrillation caused by adrenaline in dogs anaesthetized with chloroform. Procaine amide is a slightly different chemical substance with properties of this kind. The Council on Pharmacy and Chemistry¹ of the American Medical Association, whose reports are usually conservative and trustworthy, points out that it depresses the irritability of ventricular muscle, having a more prolonged action than procaine and one-half to one-third the toxicity. It can be taken by mouth, and it is useful for the treatment of ventricular arrhythmias and extra systoles occurring in heart disease or during general anaesthesia. When given intravenously it causes a fall of blood pressure.

On another page Drs. A. A. Mason and J. F. Pelmore describe a new use of procaine amide in conjunction with hexamethonium to lower the blood pressure in maxillo-facial and other operations, and so to allow the surgeon an unobscured field. The depressor effect of hexamethonium is often counteracted, especially in younger patients, by a reflex increase in heart rate, and the authors find that when procaine amide is given in conjunction with hexamethonium a satisfactorily low blood pressure is obtained in a much larger proportion of patients than when hexamethonium is used alone. However, they say that "the anaesthetist must use supreme caution and vigilance when using them together." In the two cases they describe in detail, when procaine amide was given after hexamethonium, the effect they obtained was a slowing of the pulse rate, which might have been due to a direct action on the heart or to exclusion of the rise in rate caused by the fall of blood pressure. It will be interesting to learn whether this procedure is adopted by other anaesthetists.

On the use of procaine amide for cardiac irregularities papers have appeared recently by Shack, Hoffman, and Vesell² and by Lucas and Short.³ The authors of the latter paper found that intravenous administration was more effective than oral, and by the intravenous route they were successful in arresting ventricular tachycardia in four out of five cases, and ventricular extra systoles in five out of five. Supraventricular tachycardia and extra systoles were controlled in about half the cases, while auricular fibrillation was rarely benefited. Toxic effects were confined to gastro-intestinal disturbances and hypotension.

¹ J. Amer. med. Ass., 1950, 144, 1465.

² Brit. Heart J., 1952, 14, 465.

³ Ibid., 1952, 14, 470.

⁴ New Engl. J. Med., 1952, 247, 673.

⁵ Amer. J. med. Sci., 1952, 224, 573.

Davis⁴ has described the successful treatment of a patient with angina pectoris which was brought on by exercise and was accompanied by pulsus bigeminus. The patient was given 0.25 g. of procaine amide at four-hour intervals and remained free from attacks of angina during 16 months. Finally, Goldman⁵ has treated hereditary or Huntington's chorea with procaine amide. Its use in this condition was due to the chance observation that a patient sitting in a dentist's chair had little or no choreiform activity after receiving an injection of procaine for removal of a tooth. The effect of procaine amide varied with different patients, though all benefited to some extent and a few were almost completely relieved from symptoms of chorea. A large dose, 1.0 g. four or five times a day, was used, and this amount was tolerated only by raising the dose gradually during two or three weeks from an initial dose of 0.25 g. The immediate use of a large dose caused somnolence and feelings of faintness and numbness. Since there has been no treatment for this form of chorea hitherto, these results sound hopeful.

A NEW LONG-ACTING INSULIN

Since the original discovery of insulin in 1921 great improvements have been made in its manufacture. The ordinary insulin now in use is very pure and has a quick action which is over in eight to ten hours. This necessitates, in most cases, a second dose of insulin to control the blood sugar after the evening meal and during the night. Many attempts have been made to prolong the action of insulin, and the two best-known preparations are the protamine and globin insulins, both of which are combined with zinc. In many patients the action of these insulins is too slow at the onset but may last 20 to 26 hours, so that the fasting value of the blood sugar may be within normal limits. The slow onset of the action of protamine zinc insulin may be overcome by mixing it with some of the ordinary quick-acting insulin. This often gives good results but does entail either two injections or measuring the two insulins in one syringe. Some patients find difficulty in doing this. In November last Hallas-Møller, Petersen, and Schlichtkrull¹ described a new modification of insulin which seems to have many advantages. They found that the addition of protamine or globin to make the insulin insoluble was unnecessary, since this could be done by using a neutral acetate buffer with the addition of 2 mg. of zinc per 1,000 units. Crystalline insulin cannot take up more than 0.8 mg. zinc per 1,000 units, but this new insulin in some way is made to take up 2 mg. Its action seems to depend on the amount of amorphous insulin which is present, since this has a quick action, on the amount of the crystalline insulin, which has a slow action, and on the size of the crystals, since large crystals have a long-delayed action. Three preparations have now been made by the Novo Laboratories in Copenhagen: the "semi-lente," "lente," and "ultra-lente." Elsewhere in this issue Drs. R. D.

¹ *Science*, 1952, 116, 394.

Lawrence and Wilfrid Oakley describe the results of giving lente insulin to eleven adult patients who all had a severe type of diabetes. Some of these patients were having two doses of soluble insulin, some one dose of protamine zinc insulin or globin insulin, and some a mixture of soluble and P.Z. insulin. When the diabetic condition was reasonably stable under this treatment the blood sugar was estimated four times a day. The patients were then changed over to a single daily dose of lente insulin (the amount of insulin remaining the same), and two days later the blood sugar was estimated at the same times as before. The figures differed from case to case, but in the individual patients the blood-sugar values after injection of lente insulin were roughly similar to those obtained with the other insulins. The injections were well tolerated and the liability to hypoglycaemia was slight. Lawrence and Oakley have thus confirmed the observations of Dr. Jersild of the Hvidøre Hospital in Copenhagen.

As only one injection a day of this new insulin is needed it is certainly worthy of further trial; and if it produces more constant results than mixtures of protamine zinc insulin and soluble insulin it will be much appreciated. A minor drawback is the introduction of one and perhaps three more insulins to those already available. Doctors who seldom have to treat diabetes and patients new to insulin, are occasionally confused by the varieties at present in use. However, if the new insulins give a better control of the disease this is a difficulty which must be faced and which experience will soon eradicate. It is to be hoped that the new lente insulin will soon be available for general use.

THE CATHETER AND PROSTATIC RETENTION

In days past the need for operation in prostatic disease was determined by the onset of retention of urine or by the amount of residual urine. To estimate the latter a catheter was passed, as it was, too, for the immediate treatment of retention. But it has long been recognized that repeated catheterization in the presence of residual urine leads to infection, and this alone may undo the advantages of modern methods of prostatectomy by which the bladder can be closed completely and convalescence made shorter and sweeter. Wilson Hey¹ went so far as to condemn catheterization entirely in prostatic cases, and the ardour of his advocacy as well as the excellence of his results led many surgeons to follow his practice. While the dangers of sepsis are now fully recognized, the problem of retention from prostatic obstruction remains, and the conflicting opinion on its management have been debated in our correspondence columns recently—as they were before a smaller audience at the meeting of the Association of Surgeons in Cardiff last year.

The problem concerns the general practitioner first and the urological surgeon second. If the best result are to be obtained, agreement between them is much to be desired. The patient with chronic retention may not know that his bladder is distended; the condition

is usually painless, and no good and possibly much harm is done by emptying his bladder by catheter. He should be sent into hospital as soon as possible. Acute retention on the other hand can be a most painful condition, and the doctor's first desire and duty is to relieve the pain. The rational treatment is to remove the immediate cause of it by emptying the bladder. But this is only a small part of the doctor's duty. If the retention is due to prostatic obstruction, hospital treatment is necessary, and the doctor should see that his patient agrees to having it, preferably before the bladder is emptied.

If the doctor is skilled in the use of a catheter and can work aseptically, he should pass it and empty the bladder. If he has no suitable catheter available, or if he is sending the patient to a surgeon known to object to its use, he would do better to adopt the more tedious process of emptying the bladder by suprapubic aspiration. The danger of the catheter lies in lack of skill or practice in its use, and urethral trauma must be avoided at all costs. The patient in whom catheterization has failed is even worse off than the one who has been catheterized repeatedly.

The surgeon's problem is rather different from the family doctor's. When taking charge of a case of prostatic retention he has to decide whether to drain or not, and, if so, by what route. Followers of Wilson Hey or Wells will doubtless do an "immediate" prostatectomy with the minimum of investigation and pre-operative treatment. This entails, as Fergusson² has pointed out, "a full-time urological service backed by radiological and pathological facilities throughout the 24 hours." It also tends to exclude full medical assessment and treatment of an elderly man about to undergo what is still a major operation. Allanby³ has stressed the advantages of operating on these patients at leisure after an interval when they could be taught breathing exercises and generally made as fit as possible.

If the surgeon decides to drain the bladder, he must choose between the urethral catheter and the suprapubic tube. The urethral catheter will cause urethritis if used repeatedly or left indwelling for more than two days, and it is usually impossible at the outset to forecast how long drainage will be needed. The formal suprapubic long drainage will be needed. The formal suprapubic cystostomy mars the field for the subsequent prostatectomy and makes closure of the bladder without leakage more difficult. The small suprapubic catheter⁴ does not have this disadvantage. If drainage is deemed necessary—whether because the patient is in general unfit or shows extreme renal deterioration—it can safely be used provided the bladder is fully distended. The same conclusion seems to be indicated by the ingenious method described by Mr. Lloyd Davies at page 257 of this issue. A fine polythene tube is passed into the distended bladder through a cannula inserted above the pubes; the procedure would be safer and even less likely to cause extravasation if the track were made oblique. The figures quoted by Lloyd Davies for infection after

urethral catheterization are illuminating. Of the patients catheterized only once 23% were infected, an even smaller proportion than those not catheterized at all, although the numbers are small. Of those catheterized repeatedly 72% were infected.

The problem of when and how to relieve retention has arisen because it is now possible, in skilled hands and with a clean field, for the convalescence after prostatectomy to be as easy as that after interval appendicectomy. The difficulties could be avoided by treating patients at an earlier stage—before the onset of retention. That they are not treated earlier is due more to lack of hospital beds than to lack of knowledge by their medical attendants.

RISKS OF BUTAZOLIDIN THERAPY

The need for caution in administering "butazolidin" is emphasized again by the death of a Nottingham woman from agranulocytosis caused by the drug.¹ This is the third death attributed to butazolidin, the other two having occurred towards the end of last year.² And a paper³ from the U.S.A. now reports five more cases of agranulocytosis, ending in recovery, in addition to those recently referred to in a leading article in this *Journal*.⁴ Clinical trials, the first of which was reported by Currie⁵ (not by American workers as was inadvertently stated⁴), have shown that it may have a useful part to play in the treatment of patients with various types of arthritis; and so common are these disabling conditions that doctors in every part of the country are now being posed the problem whether or not to administer butazolidin to their patients. According to reports reaching us many patients, too, are well aware of the benefit that the drug may confer and are pressing their doctors to prescribe it. This is partly the result of some ill-judged publicity in a Sunday newspaper article, and many doctors will echo the words of Dr. H. M. Rice, who gave evidence at the Nottingham inquest, that "whoever was responsible for that article cannot have been aware of the implications."

Butazolidin bears a structural similarity to amidopyrine, a drug known to have caused agranulocytosis many times. Though the evidence so far accumulated does not indicate that butazolidin is too dangerous a drug to use, there is no doubt that certain precautions should be taken when it is administered, and contraindications to it borne in mind. A history of peptic ulcer or dyspepsia should put the physician on guard, because of the risk that butazolidin may induce gastrointestinal haemorrhage, and special care against precipitating heart failure is also indicated. The patient must be warned to watch for and to report immediately to his doctor the onset of purpura or any signs or symptoms that may herald agranulocytosis. These include malaise, fever, dryness of the mouth, and sore throat. The dose should not exceed 0.6 g. in one day.

¹ *Nottingham Evening Post*, January 16.

² *British Medical Journal*, 1952, 2, 1427.

³ *J. Amer. med. Ass.*, 1953, 151, 38.

⁴ *British Medical Journal*, 1952, 2, 1401.

⁵ *Proc. II Cong. Europeo de Rheumat.*, 1951, 417.

¹ *Brit. J. Surg.*, 1946, 33, 41.

² *Postgrad. med. J.*, 1952, 28, 35.

³ *Arch. Med. Hosp.*, 1952, 2, 162.

⁴ *Riches, E. W., Lancet*, 1943, 2, 128.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

ANTENATAL CARE—II. ADVICE FOR THE EXPECTANT MOTHER

BY

W. C. W. NIXON, M.D., F.R.C.S., F.R.C.O.G.

Professor of Obstetrics and Gynaecology, University College Obstetric Hospital, London

The subject of diet in pregnancy is so important that it is considered in a separate section. Alcohol and tobacco need not be vetoed provided moderation is practised.

Exercise.—There is no harm in cycling, gardening, or swimming, provided it is not vigorous. Some miscarriages have been directly attributed to the lifting of heavy weights or to turning of a mattress. Walking, if possible for an hour a day, is the best exercise. Driving a motor-car can be allowed, but long journeys are not desirable. High-heeled shoes should be changed during pregnancy for those with heels not more than 1½ in. (3.8 cm.) high. Employment involving much standing should be given up, at least during the last two months of pregnancy.

Rest.—A mother who is learning how to relax is usually advised to practise this after the midday meal. In any case she should at this time take a rest with her shoes off. When sitting down the feet should be raised whenever possible. Sleep at night can be helped by taking a hot drink.

Clothes should hang loosely, and any constricting bands—garters, rolled stockings, tight belts—should be avoided. A brassière that lifts the breasts up but does not compress them should be worn.

Bathing.—If a daily bath is impossible, then the mother should have a sponge down. Personal hygiene is of particular importance during pregnancy. Douching should never be performed.

Bowels.—A daily bowel action can be maintained by attending to diet. Fresh salads, fruit eaten with its skin (plums, prunes, tomatoes, apples), wholemeal bread, and hot water all help to ensure a regular bowel action. The ritual of purgation and the taking of laxatives should be avoided. It should also be remembered that the bowel is a creature of habit. When there is obstinate constipation then a bran recipe will be helpful.

Diet in Pregnancy

During recent years diet has become a subject of universal interest, and from the spate of scientific and lay publications it might be concluded there is something novel about it. Yet since the dawn of history food has played a dominant part in the survival and evolution of man. Pregnancy is a "diet-efficiency" test, and during this period of physiological strain borderline states of malnutrition may be revealed which otherwise would have remained latent.

In a community in which diet is faulty or restricted the children and mothers, expectant and nursing, suffer first. This does not mean, however, that the baby born of an undernourished woman is necessarily small and feeble, for it is a common experience in obstetrics to see ill-fed and unfit women give birth to babies who are apparently healthy and of average weight. At present we are fortunate in not having in this country the severe degrees of malnutrition seen in Asia and the Middle East. But no one can deny that there are groups in our population who do not enjoy

optimum nutrition—that is, a state of well-being in which improvement cannot be effected by a change in diet.

A doctor is sometimes asked by an expectant mother if she can affect the weight of her baby by dieting. Normally there is no correlation between maternal diet and the birth weight of the baby or between maternal gain in weight and birth weight. It is only under famine conditions, with the maternal diet dangerously restricted for a long time, that the baby's weight will be significantly reduced. This was seen in Holland and in the sieges of Leningrad, Budapest, and Vienna in the last war.

It is well known that during pregnancy—and still more during lactation—a woman needs to pay careful attention to her diet. In 1933 Sir Edward Mellanby chose as his Lloyd Roberts Lecture the subject of "Nutrition and Child-bearing," and it is interesting to compare the advice he gave then with the modern view. There has been little change.

"Proper nutrition is essential to healthy child-bearing, and the diet should include throughout pregnancy and lactation a sufficiency of what are known as protective foodstuffs. When plenty of these are taken there is every reason to believe that the rest of the diet will take care of itself.

"As a general guidance, the diet of pregnancy and lactation ought to include:

- 2 pints (1.1 litres) of milk daily.
- 1 or 2 substantial servings of green vegetables—cabbage, spinach, or lettuce—daily.
- 1 or 2 eggs or egg-yolks daily.
- An apple or orange or some fresh fruit daily.
- Sea fish twice or more a week.
- Calf's liver once a week.
- If cod-liver oil can be taken, 2 teaspoonfuls (7 ml.) daily is advisable.

"The rest of the diet can be made up as the woman wishes."

The extra rations and allowances for expectant mothers (milk, eggs, meat, orange juice, vitamins A and D, ferrous sulphate) go a long way in 1953 to supplementing what might be thought a meagre diet.

Should calcium be prescribed in pregnancy? This element is best obtained from food. Milk and cheese are the best sources of calcium, green vegetables less so. The ideal amount of milk is a quart (1.1 litres a day), since this would meet all requirements for calcium and phosphorus. Some women find difficulty in drinking raw milk. For these there are different ways in which the daily milk ration can be taken—soups, gravies, milk puddings, hot drinks, including coffee, milk shakes, cereal. The administration of iron should be regulated by the haemoglobin level, and the Tallqvist test is a simple and quick way of doing this.

Control of Weight

In the United States much importance is attached to controlling the weight of a woman during pregnancy. At every visit her weight is accurately measured, and if there is an increase of more than 1 lb. (0.45 kg.) a week her diet is then restricted. Some obstetricians in that country view even an increase of more than ½ lb. (0.23 kg.) as abnormal and try to limit the total gain to 20 lb. (9 kg.). The reason for the attention to this aspect of pregnancy during recent years is the recognition that a sudden and rapid increase of weight may herald toxæmia of pregnancy. On the other hand, there are some women who put on many pounds in weight yet pass through pregnancy and labour normally;

this group usually remains overweight after the pregnancy over. By regular weighing it is possible to detect the sharp rise of weight which sometimes occurs before the classical signs of toxæmia present themselves.

During the first trimester there is little gain in weight, in fact there may be a loss. It is during the second and third trimesters that the weight increases. In the last trimester about half the total gain takes place, and for the last 24 weeks of pregnancy there is an average gain of about 1 lb. (0.45 kg.) a week. Of this 24 lb. (10.9 kg.) increase, 14 lb. (6.4 kg.) is distributed as follows:

Baby	7 lb. (3.2 kg.)
Placenta	1 lb. (0.45 kg.)
Amniotic fluid	1½ lb. (0.68 kg.)
Increase in weight of uterus	2 lb. (0.9 kg.)
Increase in blood	1 lb. (0.45 kg.)
Increase in weight of breasts	1½ lb. (0.68 kg.)

(Taken from *Expectant Motherhood*, by Professor Nicholson Eastman, Johns Hopkins University, Baltimore, 1948.)

The 10 lb. (4.5 kg.) that remain are accounted for by increased deposit of fat and fluid. A very real attempt should be made to keep the total weight gain between 20 and 24 lb. (9.1 and 10.9 kg.) for two reasons: (1) the risk of toxæmia, particularly of the fulminating type, can be lowered; and (2) most women are sensitive about their body curves not turning to normal after pregnancy.

In many women the abnormal weight gain is due to reversion of appetite and the excessive ingestion of food of high caloric value (carbohydrate and fat). There is, on the other hand, a physiological reason for the increase in weight apart from "the reproductive weight gain" of the products of conception. During pregnancy there is much later elaboration of those hormones—oestrogen and other steroids—that are responsible for sodium and fluid retention.

Below is a diet which should be taken when there has been a rapid increase in weight. This can be taken as an alternative for some weeks provided vitamins and minerals are prescribed as extras.

Low-sodium Reducing Diet for Pregnancy*

1,800 calories. Sodium intake, 0.8 g. daily. Total of 1½ pints skimmed milk daily.

Breakfast

- Tea or coffee, milk, no sugar.
- 2½ oz. salt-free bread.
- ½ oz. salt-free margarine.
- 1 egg.
- 4 oz. orange or juice.

Mid-morning

- Tea or coffee, milk, no sugar.

Dinner

- 2 oz. lean beef or lean mutton, lean veal, liver, heart, rabbit, chicken, rationed cheese (Cheddar type).
- 6 oz. green vegetables.
- 6 oz. potato.
- ½ oz. rice with milk.
- 4 oz. fruit.

Tea

- Tea, milk, no sugar.
- 2 oz. salt-free bread.
- ½ oz. salt-free butter.
- 4 oz. fruit.

Supper

- 4 oz. white fish.
- 5 oz. root vegetables.
- Salad—e.g., 2 oz. lettuce, 3 oz. tomato, 1 oz. watercress.
- 2½ oz. salt-free bread.
- ½ oz. salt-free butter.
- 4 oz. of fruit.

Bedtime

- Any milk left from 1½ pints.

½ oz. salt-free butter or margarine may be added daily to complete the ration of 4 oz. of each per week. In the above table this is calculated as butter.

*1 oz.=28 g. 1 pint=0.57 litre.

Calcium and iron supplements are necessary as well as vitamin supplements (A, B complex, C, D). The actual vitamin content of fruits and vegetables is always doubtful. Food yeast, which is a good source of vitamin-B group, might be used to improve the flavour of the skimmed milk.

Drugs and Pregnancy

It is surprising how seldom drugs harm the foetus. When given in therapeutic doses during pregnancy, even those with a known oxytocic effect—for instance, ergotamine tartrate for migraine—need not be contraindicated. Quinine in the treatment of malaria will even prevent an abortion or maceration of the foetus by destroying the parasites. It has been suggested that sulphonamides might interfere with foetal development if prescribed in large doses for longer than 14 days. In the case of streptomycin, a report has been published in which a woman with pulmonary tuberculosis was treated with this drug in the early months of her pregnancy up to a dosage of 75 g. The baby was normal and on follow-up has not revealed any damage to its auditory system.

Antenatal Preparation

Increasing attention is being paid to the psychological preparation of the mother and the elimination of the fear of delivery which affects most expectant mothers, especially primigravidae. The mother must be considered as a person. The family doctor is in a favourable position to give the mother this confidence by explaining the process of birth and the changes that take place during pregnancy. He can train the mother in muscle control, breathing, and relaxation. The publications of Dr. Grantly Dick Read are familiar to all, and the late Helen Heardman's monograph, *A Way to Natural Childbirth* (Livingstone, 1948), gives useful advice. It is, of course, understood that the attendants during labour have more influence on a mother's happiness than antenatal training.

The expectant father has been too long neglected and relegated to a back place. He should be brought much more into the picture and told how he can help his wife during pregnancy and labour. An advantage of home delivery is that the husband can be present during most or all of his wife's delivery if both of them wish it. Unfortunately, the rigid regimentation so often seen in hospitals precludes husbands seeing their wives till after delivery. A husband can quickly become an adept "back-rubber" and give his wife much support, both psychologically and physically.

It is not possible in the scope of this article to give details of what should be included in a programme of antenatal preparation. The emotional aspects of pregnancy and labour have been neglected in the past. They should receive much more attention in the future.

Next Refresher Course Article.—"Chest Pain," by Dr. Howard Nicholson.

The American Army Medical Service has started an influenza vaccination programme to protect military personnel against a mild form of the disease occurring both in the United States and abroad. All American troops in Korea, and those under orders for Europe or the Far East, are receiving a one-injection vaccination which has proved effective against the A-prime virus of influenza in previous trials. Military personnel in Europe will also be vaccinated if the situation warrants. Major-General George E. Armstrong, Army Surgeon General, said all Continental armies and major overseas commands are making detailed reports on the occurrence of influenza in their areas and are submitting estimates of their probable requirements of vaccine. The A-prime virus, believed responsible for the current influenza outbreak, is related to strains which accounted for the disease in 1950-1. The virus was identified at Fort Leonard Wood, Missouri, on December 31, 1952.

blood from the back of the hand or front of the wrist when nothing can be felt or seen in the antecubital fossa. Within the limits of the diameter of the vein, the wider the bore of the needle the easier it is to withdraw blood without frothing or clotting.—I am, etc.,

Edinburgh.

W. H. F. BOYD.

SIR,—May I be permitted to supplement your answer to the question ("Any Questions?" January 10, p. 115) raised under this heading? Many other simple precautions will help. Preferably the patient should be recumbent in bed or on a couch. The arm selected should be warm, and those with very difficult veins can be warmed either by hot towels, a hot-water bottle, or other suitable means, and should be kept out of a draught. The arm should be extended, since any flexion at the elbow slacks the tension on veins and allows them to move; hyperextension tends to flatten veins. The hand and elbow should be lower than the shoulder so as to prevent gravitational drainage. Light, preferably daylight, should fall transversely across the arm, preferably from without inwards. This tends to give slight shadows with even the smallest veins. Instead of the broad band you recommend, a sphygmomanometer cuff on the upper arm is much to be preferred, the pressure being raised to 60–80 mm. of mercury—that is, just below the diastolic. With the sphygmomanometer so used the operator can work single-handed and has complete control over the distension of the veins.

Attention should be given to the selection of syringe and needle. A syringe with a well-fitting plunger and needle should be used, preferably of the all-glass type, with the plunger lubricated with a small but adequate amount of liquid paraffin. The needle should be of the right bore and not too long. For quantities of 5 ml. blood and over a needle of 20 gauge and about 1 in. (2.5 cm.) long is to be preferred. Needles longer than this, unless they are very stout, tend to be "whippy" and difficult to guide straight. The needles should be sharpened to a fine point, and the edge of the bevel near the point especially should be keenly sharpened. Needles should be examined and, if necessary, resharpened each time they are used. Needles straight from a new supply are usually not satisfactory. In the case of a practitioner who cannot afford time to sharpen his own needles and prepare his own syringes and has not access to a syringe service, the use of evacuated venules, each of which has its own needle, has much to recommend it.

In conclusion, may I add one further general precaution? Veins should be treated gently and with great respect. Slapping the antecubital fossa and massaging the forearm are to be deprecated, since both tend to produce venous contraction in many cases.—I am, etc.,

Epsom.

W. W. KAY.

SIR,—May I supplement your reply to the inquiry regarding the collection of blood ("Any Questions?" January 10, p. 115) by recommending as routine in potentially difficult cases the following points relating to technique?

A sphygmomanometer cuff with the pressure set between the systolic and diastolic blood pressures should replace the tourniquet. The chosen vein should be flicked with the finger to cause dilatation and to counter reflex spasm before the needle is introduced. If the vein does not fill following proper application of the arm band and hand movements it may be distended by stroking the forearm veins towards the antecubital fossa. The needle point should be introduced, bevel up, almost parallel with the vein in a more superficial plane, and slowly advanced by stages in the line of the vein until the dimple which usually appears in the skin overlying the needle point suddenly disappears as the anterior vein wall is pierced.

When it is necessary to withdraw blood from the dorsal veins of the hand it should be remembered that they lie very near to the skin and that it is easy to pass the needle through the posterior as well as the anterior wall of such a vein. The needle point should be advanced well into

the lumen, and, after withdrawing a small quantity of blood into the syringe to confirm that the needle is correctly placed, the blood specimen required should be collected and the constricting arm band should be released before any intravenous injection is given.

Using this technique, I have found that it is necessary to cut down upon veins as a preliminary to blood transfusion in only one flying-squad case out of 30. In these cases the blood pressure is seldom over 80/50, and has been as low as 40/0. A specimen of venous blood is collected as routine prior to any such transfusion.—I am, etc.,

Newcastle-upon-Tyne.

W. HUNTER.

Sister Kenny

SIR,—Professor H. J. Seddon writes (April 12, 1952, p. 802) that Sister Kenny "outlived her welcome in the United States," etc., but the *Daily Mail* (December 1, 1952) states: "It is in America that Sister Kenny is most widely acclaimed and honoured. She was recently voted 'Woman of the Hour' there, and the United States House of Representatives in 1950 passed a Bill granting her the unprecedented privilege of entering and leaving America at will without passport or immigration papers."

In your obituary notice of Sister Kenny (December 6, 1952, p. 1262) no mention is made of Sister Kenny's most important book, published in 1943 by the Bruce Publishing Co., Minneapolis, St. Paul, U.S.A.—*The Kenny Concept of Infantile Paralysis and Its Treatment*, by Dr. John Pohl, M.D., in collaboration with Sister Kenny, with a foreword by Frank R. Ober, M.D., President of the American Orthopaedic Association.

The British Medical Association Library, I am informed, has no printed catalogue of its books available for members; in this way books vital and valuable to the progress of medicine and public health, such as all the books by Sister Kenny, may not become known to members of the Association.—I am, etc.,

Callander, Perthshire.

GERALD G. SANDERS.

*All the books in the B.M.A. Library are listed in a card-index which can be consulted by members. A printed catalogue would quickly become out of date, and to publish supplements at short intervals would be expensive. Lists of books added to the Library are printed from time to time in the *Supplement*.—ED., B.M.J.

Operative Treatment of Hallux Valgus and Rigidus

SIR,—The letter of Mr. J. M. P. Clark (January 17, p. 162) in criticism of my article on the above subject (December 27, 1952, p. 1385) contains some misconceptions which need correction. In that article I stated the well-known and obvious objections to the Mayo, Keller, and Girdlestone operations without "pouring scorn" on them, for I know from much experience that a fair number of patients are satisfied with the results. I maintained, however, that by the operation of arthrodesis, making the metatarsophalangeal joint rigid in the normal resting position of the great toe, the function of the toe in taking the body weight in walking, which is so important for the balance and strength of the foot, is better preserved than by those operations (the Mayo and Keller) which leave weak and poorly controlled movement, or a toe too short to act as a lever (the Girdlestone). It is because, after arthrodesis, the great toe remains as a long and firm lever for propulsion of the foot rather than as a shortened and weakened lever that its function is better preserved than after the other operations. A glance at the wear of the sole of the shoes of patients after these operations will show the difference.

The operation of arthrodesis and the aftercare are not "complicated manoeuvres" to any surgeon used to treating bones and joints. The only small difficulty is in inserting the screw or other means of internal fixation while keeping the functional position of the toe. My registrars and house-surgeons have readily and successfully done this operation in many of my cases. Getting the patient walk-

ing in a plaster casing after two weeks is not claimed as an "advantage" of the operation. Indeed, the plaster casing is recognized as a disadvantage. But it is a small hardship in the treatment of a condition which has usually given trouble for years and has to be borne for no longer than the period of rehabilitation which must follow after the period of arthrodesis. In any case it is the permanent effect of arthrodesis as of other procedures which must be considered and by which the value should be assessed.

Cosmetically the result of arthrodesis is indeed satisfactory, as the great toe is restored to an almost normal appearance—an important matter to the patient. Nor does the position of the toe cause trouble in putting on a shoe. The position of the toe caused by the proximal phalanx at an angle of 30 degrees of dorsiflexion with the metatarsal, the toe is in its normal resting posture, to which both shoe and surgical shoes conform. It is as well, however, for the shoe not to have a toecap so that there is no restriction by hardened leather over the toe, and to have also a metatarsal bar.

Mr. Clark becomes fanciful and unfair when he writes of the operation of arthrodesis producing a "semi-rigid foot"; for, of course, only the metatarsophalangeal joint of the great toe is made rigid and either stiffening of the rest of the foot does not occur during the few weeks of walking in a plaster casing or tends to disappear soon after the plaster is removed, with the more normal use of the foot which the restored strength of the great toe allows.—I am, etc.,

Bournemouth.

N. ROSS SMITH.

SIR,—I had prepared quite a long letter on this subject, but having read the polite one by Mr. J. M. P. Clark (January 17, p. 162) I will content myself by warmly supporting what he says and by adding that in Liverpool any orthopaedic surgeon who, using "Keller's operation," could not get very nearly 100% "quite satisfactory" and well over 58% excellent results would soon be taking down his plate.—I am, etc.,

Liverpool, 1.

BRYAN MCFARLAND.

Measurement of Tissue Components Radiologically

SIR,—The correspondence of Drs. B. C. H. Ward and G. N. Weber in the *Journal* of January 17 (p. 161) brings out some interesting points regarding asymmetrical objects which call for a further amplification of the method as given. Primarily it must be noted that the objections raised by Drs. Ward and Weber, although valid from a purely geometrical consideration of the factors involved, cannot be accepted in this particular method, as other limiting considerations invalidate them from the practical viewpoint.

Under the conditions given as suitable for the method, it will readily be appreciated that the convergence angle of the x-ray tubes is only about 8 degrees. Thus the section parallel to the plane of the x-ray plate through any object will present only a small difference when viewed from tube position I or tube position II, provided the ratio of the axes of asymmetry is not abnormal in relation to this plane (for example, a needle lying in the vertical plane would give such conditions of asymmetry). Any significant difference in the measured diameter of the object in a direction parallel to the tube shift will immediately indicate such an asymmetrical body, when the conditions can be adjusted to suit the asymmetry.

In the method as applied, and as recommended for child study, it is improbable that the major axis of any body will exceed by more than twice the minor axis. For an analysis of this type of body the theoretical considerations can, for this purpose only, assume that the rays from the x-ray tube are parallel. (Although this assumption is justified here, it cannot be justified when the case of the magnification ratio is considered, as assumed by Drs. Ward and Weber.) Thus this gives an equivalent condition to the fixation of the tube in one position for the two exposures,

and a rotation of the object about its centre in the vertical plane containing it and the tube. It is immediately obvious from this consideration that the worst conditions will occur when the longitudinal axis of the object lies in the vertical plane and along the axis of the tube.

Considering an object of size 2 cm. in the major axis and 1 cm. in the minor axis, then if the major axis lies parallel to the plate the shadow lengths will be, under the system adopted by Falkner and Wisdom, 2.18 cm. and 2.32 cm.

The separation of the true centres of the shadow images will be 0.727 cm., and the calculated separation will be 0.797 cm. and 0.657 cm. by measuring the edge separations. Thus a mean value of 0.727 cm. is obtained for the shift.

Assuming initially an approximate distance from x-ray plate to body, the equation for plate-body distance becomes:

$$d = \frac{(K-d') \text{Im}}{s}$$

where d is the distance between x-ray plate and object

d' is the estimated distance between x-ray plate and object

s is the tube shift

Im is the mean image shift

K is the distance between tube and x-ray plate

(NOTE.—As K is large compared with d an approximate value d' may be used with safety in the factor K-d'.)

$$\text{Hence } d = \frac{56 \times 0.727}{8}$$

$$= 5.089 \text{ cm.}$$

Finally the object size in this plane can be calculated as:

$$\begin{aligned} \text{Object size} &= \frac{\text{Mean image size} \times 55}{60} \\ &= \frac{2.25 \times 55}{60} = 2.06 \text{ cm.} \end{aligned}$$

This is in close agreement with the actual object size of 2 cm. in this plane.

The example quoted gives a good indication of the error which may be expected under the adverse conditions chosen; it also illustrates how a study of the two images will give a good approximation to the type of asymmetry present in the body.—I am, etc.,

London, W.C.1.

E. A. MISKIN.

SIR,—Drs. B. C. H. Ward and G. N. Weber in their letter (January 17, p. 161) appear annoyed that we claimed our method was "new." We realize the principle is well known and tried by radiologists, to whom we are most grateful for their guidance and stimulation. It is only new as applied to its use in a growth study.

Various technical objections are raised, which are answered as follows:

1. We do not assume that the outlines of skin, muscle, and bone in a cross-section of a limb are symmetrical, represented by concentric circles, or that their maximum diameters all fall in one plane parallel to the film. First, it is important to measure separately shadow-shifts for each tissue being measured, thus finding separate film-object distances. This is done. Secondly, because the tube-shift distance is small compared with the tube-object distance, measurement of a symmetrical object gives no theoretical error; while the error for an asymmetrical object in the worst position is small.

Our method is intended for the measurement of tissues in such parts of limbs as the upper arm, calf, thigh, etc., in both infant and adult. The effective distance in a plane parallel to the film plane will, in the case of asymmetrical bodies, resolve itself into two planes whose mutual separation will determine the amount of the displacement involved. The distance between these planes in the vertical direction, if the limb is correctly posed (and this can be a source of error, as we pointed out), is always less than 1 cm. This displacement relative to a convergent angle of approximately 8 degrees can be considered insignificant from a practical viewpoint.

The possible errors for normal limbs can never reach a significance which invalidates the method. Other corre-

spondence, which we have had the opportunity of seeing, gives the geometrical considerations which indicate that this assumption is valid. We are not therefore including in our letter any considerations of the geometry of the problem.

We would at this point mention the other possible sources of error, common to any radiological method of measurement.

(a) Focal spot of tube.—Probably not exceeding 0.2 mm.

(b) Density of image on film.—Probably not exceeding 0.2 mm.

(c) Blurring due to movement.—Probably not exceeding 0.2 mm.

These three factors give lower degrees of definition of the image lines. Russel H. Morgan (*Amer. J. Roentgenol.*, 62, 870) points out that various combinations of these errors probably interact and that in practice the error is small.

(d) The measurement of the tube shift.

(e) The measurement of the tube-film distance.

(f) The subjective error of measurement of the measurer.—Say ± 0.2 mm. (A reliability test shows that this has a mean error probably not exceeding ± 0.2 mm.)

(g) The error of measurement of the callipers themselves.—Negligible if checked carefully.

2. Drs. Ward and Weber say that the image shift is "a few millimetres at the most," and "cannot be judged with any great accuracy." Using our film-tube distance and tube-shift, this shift is of the order of 1 cm. and can be measured with photogrammetric callipers to the order of ± 0.2 mm. This gives a possible error of 2% in this measurement.

3. The correspondents are unable to accept the results of a carefully planned experiment with a sectioned human cadaver. The previous notes should explain why in fact the results were so accurate.

4. Drs. Ward and Weber suggest that we should use teleradiography with our 15-mA apparatus at a distance of 6 ft. (1.8 m.) and an exposure of one second. As we pointed out, it is very difficult to keep an infant's limb still that long. The 100-mA machines that they recommend are now unobtainable second-hand, and we have not the necessary resources to obtain a machine capable of supplying 135 mA, which would enable us to cut our exposure time to one-eighth of a second.—We are, etc.,

FRANK FALKNER.

SYLVIA WISDOM.

London, W.C.1.

Butazolidin

SIR,—It is unfortunate that such exaggerated claims have been made for this new drug in the lay Press, and that certain of our medical colleagues have allowed enthusiasm to influence their judgment, particularly as such serious consequences may result from its improper use. It would be a great pity if this valuable drug fell into disrepute through unwise and uncritical employment at the present stage. Data collected by me over the last three years are not yet complete, but certain points have emerged and may briefly be summarized as follows: (1) Butazolidin produces more prolonged relief of pain than aspirin in a proportion (roughly 70%) of cases of rheumatoid arthritis. (2) It produces no greater relief of pain than aspirin in the more common rheumatic disorders such as osteoarthritis and intervertebral disk degeneration. (3) Butazolidin is as effective by mouth as by intramuscular injection. (4) No advantage is gained by increasing the individual dose above 0.4 g. in rheumatoid arthritis, nor in repeating it before the effect of the previous dose has begun to wear off. The duration of the effect varies from one to ten days in different individuals. The dosage should thus be 0.4 g. every one to ten days according to individual requirements, which can readily be determined. If butazolidin is given in this way the maximum benefit will be obtained and toxic effects are unlikely to arise. In my three years' experience I have only had one toxic reaction—a transient erythematous eruption. (5) Butazolidin should not be regarded as a substitute for standard methods of treating rheumatoid arthritis with gold and physiotherapy, but is a useful means of tiding the

patient over the early stages of such treatment. It is also of value in those patients whose sensitivity to gold prevents complete suppression of the rheumatoid process by this means.

Of the value of butazolidin in rheumatic fever, gout, and ankylosing spondylitis I am unable to speak.—I am, etc.,

Walkden, Manchester.

J. STEWART LAWRENCE.

Lung Cancer

SIR,—In their exhaustive paper on lung cancer (December 13, 1952, p. 1271), Dr. R. Doll and Professor A. Bradford Hill do not mention that *rara avis*—the man who 20 or more years ago smoked 2 oz. of tobacco or 50 cigarettes a week, and then stopped smoking. Cancer has a curious tendency to lie latent for years, especially in the case of the industrial cancers. Thus we find cancer due to soot (chimney-sweepers), oil (mule-spinners and shale oil workers), cobalt, and uranium (miners) developing years after men have ceased to work in the offending industry. I suspect that if cancer does follow smoking it will affect the type of individual I have mentioned.—I am, etc.,

Birmingham.

A. P. BERTWISTLE.

Medical Association of South Africa, East London Division

SIR,—We are anxious here in East London to contact any medical visitors to South Africa who may be passing through our port. The Union-Castle mail ships call here every Monday and Friday on their way from and to Britain, so that if we knew in advance of any prospective medical visitor, whether on business or pleasure, we could make contact and arrange for them to visit us. We sincerely hope that once our notable medical visitors know of a welcome awaiting them in East London, and of our keenness to hear their views and news, they will see their way to honour us with a visit and to give us a talk.—I am, etc.,

6. Barnes Court,
St. Michaels Road,
East London, S. Africa.

ELIZABETH M. I. McCABE,
Convener of Clinical Committee.

POINTS FROM LETTERS

The College of General Practitioners

Dr. T. R. THOMSON (Cricklade) writes: Of the societies and institutions which have sprung up in the last 50 years, surely this is the most ridiculous of all. You, Sir, should know as well as most, and more than many, that the *qualifications* of the best type of general practitioner have been, are, and always will be high character, intelligence, independence, and industry. Except for the one word "ability," I can find no interest in these in the *Memorandum and Articles of Association* of the College of General Practitioners. Shall the public be assured that the college boys (after payment of their ten guineas) will have these qualities? The good G.P. will see to it that he does keep up to date. Are the others to be goaded by the college and inflamed by the hope of the Dip.G.P.? A sorry world needs not more politicians and officials, but more poets and saints, not more scientists, but more thinkers and artists.

Early Contraceptive Sheaths

Dr. GEORGE V. BOYLE (Glasgow) writes: I am writing to protest against the inclusion of the article "Early Contraceptive Sheaths" (January 3, p. 40). In my opinion it offends against good taste, and some of the quotations are offensive in many ways as well as being vulgar.

"Et all., etc."

Dr. W. W. ALLISON (Chesterfield) writes: Dr. A. J. Jex-Blake (December 6, p. 1259) is perfectly correct in his condemnation of "etcc.," which was obviously used facetiously. His advocacy, however, of "et all." is not so happy. "Et all." is clearly intended to represent "et alii." To give the term in full would only involve the substitution of two vowels for a consonant and a full stop. I do not think the printer would have reason to complain on the score of brevity or of increased labour. Finally, "et al." though frequently used for "et alius" or "et alii," is not strictly correct in this sense; "et al." really stands for "et alibi," meaning "and elsewhere."

Obituary

T. S. HELE, O.B.E., M.D., F.R.C.P.

We record with regret the death at his Cambridge home of Dr. T. S. Hele, Master of Emmanuel College from 1935 to 1951 and Vice-Chancellor of Cambridge University from 1943 to 1945. He was 71 years of age.

Thomas Shirley Hele was born at Carlisle on October 24, 1881. From Sedburgh School he entered Emmanuel College, Cambridge, as entrance exhibitioner in natural sciences, and took a first in both parts of the Natural Sciences Tripos. He went on to St. Bartholomew's Hospital as Shuter Scholar, and qualified in 1906, graduating M.B., B.Ch. a year later. After holding an appointment as house-physician at Bart's he was awarded a B.M.A. research studentship, and while holding this he worked with Archibald Garrod. Undecided about his future, he tried general practice after working as a house-surgeon at the Bristol Royal Infirmary, and then turned his thoughts towards public health, taking the D.P.H. in 1909. Two years later, a few months after he had proceeded M.D., he was elected a Junior Fellow of Emmanuel College and appointed college lecturer in anatomy and physiology and director of medical students.

For two or three years before the first world war Hele commanded D Company of the Cambridge University O.T.C. During the war he served for five years in the R.A.M.C., mainly in Macedonia, and was appointed O.B.E. for his services. Not long after his return to Cambridge in 1919 he was elected a Senior Fellow at Emmanuel, and two years later he was appointed Tutor of Students in Medicine. In 1921 also he became a university lecturer in biochemistry, a post which he gave up on his election to the Mastership of Emmanuel in 1935. Most of his published work was on the subject of sulphur metabolism. The late Sir Frederick Gowland Hopkins was head of the department of biochemistry in Dr. Hele's time, and for three years during the last war Dr. Hele returned to the bio-chemical department as deputy for Sir Frederick, but he had to give up this work in 1943 when he became Vice-Chancellor. He retired from the Mastership of Emmanuel in 1951. From 1937 to 1942 he was the representative of Cambridge University on the General Medical Council. In 1940 he was elected F.R.C.P.

Dr. Hele's relations with the many Emmanuel medical students were purposely a little casual at first, and to complete strangers he was quite a formidable figure. But as tutor and student got to know each other Dr. Hele's reserve vanished and he showed himself to be the kind and genial man that all his friends remember. He disliked formality, and many an important discussion about a young man's future was conducted while "Timmy" sat on the floor playing with one of his young daughters. This of course was part of his technique, and a very good one it was. For most of his time as Fellow and Master he lived within the college precincts and he came to know the history of every tree, stone, hydrant, and gas-pipe. In particular he gave much time to the interests of the college servants. Some years before the 1939-45 war he introduced for the benefit of the undergraduates at Emmanuel a system of insurance against accident and sickness.

Dr. Hele had very wide experience of university business, and in his time had held nearly every college office save that of dean. He knew better than most the

very heavy load of work put on those responsible for college and university administration, and in his later years he gave a great deal of thought to the problem of how to reconcile the taking of a share in the running of a residential university with remaining an efficient teacher and research worker.

While holding the office of Vice-Chancellor he suffered much physical pain, and the strain of those two years made inroads on his health from which he never recovered. He was twice married. His first wife, the daughter of Mr. Jonathan Hill and sister of Professor A. V. Hill, died in 1941. They had two daughters, one of whom is a member of the medical profession. In 1942 he married Audrey Louise, widow of Mr. F. M. Davis.

Sir LIONEL WHITBY, Vice-Chancellor of Cambridge University, writes: Tim Hele was one whose comfortable figure had become a part of Cambridge. He was affectionately regarded by generations of medical students, being known to them as a lecturer in biochemistry, which he took up on his return to Cambridge after some years in general practice. He became a Fellow and Tutor of his college, then Master, and he was Vice-Chancellor of the University in 1943-5. He was a West Country man from Cornwall with a sunny temperament who did not, however, suffer fools gladly, whether the foolishness was concerned with the elements of chemical pathology or the unwise imaginative adventures of a young undergraduate. His shrewd, forthright, and common-sense judgment on matters of policy or finance or just human nature stood his college and university in good stead, and was greatly appreciated by both. In his last few years he patiently and uncomplainingly endured the discomfort of intractable urticaria.

R. VEITCH CLARK, M.B., Ch.B., D.P.H.

By the death of Dr. R. Veitch Clark in hospital at Galashiels on January 20 at the age of 76 the medical profession has lost yet another of the distinguished veterans of the public health service.

Robert Veitch Clark was born on June 28, 1876, and graduated in medicine at the University of Edinburgh in 1901, having already taken the degrees of M.A. and B.Sc. In 1907 he took the D.P.H. of the University of Oxford. After a short period in hospital appointments, he joined the staff of the University of Leeds and later held a post in the Leeds public health department, which for long has been a training centre from which many medical officers have emerged to undertake responsible appointments in other parts of the country. In 1913 he was appointed medical officer of health for the County Borough of Croydon, and there he laid the foundation of his career as one of the foremost administrators in English public health. After nine years in Croydon he became medical officer of health for Manchester, succeeding Niven, the great sanitarian and statistician, who had occupied the post for 28 years and who had distinguished himself in dealing successfully with the environmental problems of Manchester. Veitch Clark's main task, which he tackled with conspicuous energy, lay in the development of the personal health services. At first these were concerned mainly with infectious diseases, maternity and child welfare, and tuberculosis. The passing of the Local Government Act of 1929, however, increased the duties of the public health departments of local authorities, and in Manchester it resulted in the transfer of the administrative responsibility of some 8,000 institutional beds to the medical officer of health.

Veitch Clark was convinced of the necessity for smoke abatement and was honorary secretary of the Manchester and District Regional Smoke Abatement

Committee, a committee representative of many local authorities. Although it has no statutory powers, this committee has vigorously pursued a policy of public education and investigation in relation to atmospheric pollution. He also took a leading part in the formation in 1928 of the Manchester Committee on Cancer, of which he was chairman and which under his guidance carried out important research into the carcinogenic qualities of oil used in the cotton industry.

Busy though he was in Manchester, Veitch Clark found time to take an active part in national affairs, and his wide knowledge and experience were freely used by central bodies. When the British Medical Association held its Annual Meeting at Manchester in 1929 he served as president of the Section of Public Health. He was president of the Society of Medical Officers of Health in 1934-5, and in 1936 he became president of the Manchester Pathological Society. In 1941 he was appointed an Honorary Physician to the King for a period of three years. He enjoyed excellent health, and on his retirement from his appointment in Manchester in 1942 at the age of 66 he was as active and as virile as ever. The death of Mrs. Veitch Clark was a grievous blow to him, but his strong character and well-founded philosophy helped him in that loss as well as in the increasing loneliness which is the lot of those who survive most of their friends. He rarely missed an opportunity of calling at the health department on his occasional visits to Manchester, to maintain contact with his old colleagues and to keep alive his keen interest in the work of the department where, he so often declared, he had spent twenty happy years. Like so many Scots, he retired to Scotland after a lifetime of service in England. He spent most of the ten years of his retirement at Peebles—well-earned, pleasant, peaceful years—mainly devoting most of his time to the exercise of the art and science of angling, in which he was expert. And so has passed on one whose high sense of vocation, enthusiasm, friendliness, and cheerfulness gave the fullest evidence of a life well lived. In expressing our sorrow we offer our sympathy to his daughter and son.—C. M. B.

A. J. MARTIN, O.B.E., M.R.C.S., D.Phys.Med.

The sudden and entirely unexpected death of Dr. A. J. Martin on January 6 at the early age of 43 has caused the greatest distress to every one of his wide circle of friends.

Alfred John Martin was born on January 1, 1910, at Elstree, and was educated at Rugby School and Emmanuel College, Cambridge, from which he went on to St. Thomas's Hospital to complete his medical training. He qualified in 1937, and after holding the posts of orthopaedic house-surgeon at St. Thomas's and clinical assistant at the Red Cross Clinic for Rheumatism he joined the R.A.M.C. soon after the outbreak of war in 1939. He was three times mentioned in dispatches for gallant and distinguished services in Burma, where he served for most of the war, and in 1945 he was appointed O.B.E. for his work in that theatre of operations. On his release from the Army in October, 1945, with the rank of lieutenant-colonel, he decided to specialize in physical medicine, and he obtained the Diploma of Physical Medicine of the Royal Colleges in 1947. After working as first assistant in the medical rehabilitation unit of the Royal Free Hospital he was eventually appointed to the posts of medical officer in charge of the departments of physi-

cal medicine at the Royal Free Hospital, at Hampstead General Hospital, and at the Queen Victoria Memorial Hospital, Welwyn, the last two appointments being honorary ones.

We are indebted to Dr. G. J. V. CROSBY for the following appreciation: "Tiny" Martin was one of the most lovable, happy, and friendly souls it has ever been my fortune to know. My first memory of him is of his great bulk, clad in bush shirt and bush hat, squeezing into my 180-pounder tent to report as commanding officer of the Indian field ambulance, which became the field ambulance of 33 Corps on the raising of the siege of Imphal. It was the beginning of a very happy association which lasted through the long months and down the long road taken to reach Rangoon. During the whole of that time Martin proved himself to be the most indefatigable worker and one of the best leaders imaginable. His love of the sepoy, his kindness to his patients, and his appreciation of the difficulties encountered by medical colleagues never faltered. It was one of the features of the campaign that the lines of communication became perilously extended and casualty evacuation was at times a near impossibility. It became almost a commonplace to say, "Get hold of Tiny, he'll fix a staging point here or a dressing station there." Somehow or other his field ambulance was the most elastic unit conceivable and it never struck him to say, or even to consider, that a thing could not be done. For his gallantry and devotion he was awarded an extremely well-earned O.B.E. It was not until 1950 that I met him again, and I found him to be the same enthusiast I had known during the war. His one great fault was that he was a "willing horse" and he never gave himself a let-up. Irregular meals and hours and hard work, both in and out of hospital, went a very long way to bring about his sudden coronary failure at the tragically early age of 43. Martin leaves behind him the memory of a happy warrior, a loyal friend, and an ever-helpful colleague. To his wife and young children his loss is bitter, and they must have our deepest condolences. Their sorrow may perhaps be tempered by the knowledge that he was a greatly loved man whose concept of the meaning of service was far wider than normal, and he never hesitated to act accordingly.

We are indebted to Dr. ISAAC JONES for the following appreciation: The very sudden death of Dr. John Martin while having a cup of tea with his colleagues in the out-patient department of the Hampstead General Hospital came as a very severe blow to all who knew him as a man. He was the son of the late Dr. Alfred Martin, who was regarded by all who knew him as one of the finest type of general practitioners, and it is clear by his father's example and teachings that Jack Martin, as soon as he was qualified, entered wholeheartedly into practice and gave of his very best to his patients, whose welfare he considered was his special privilege. At Rugby and Cambridge his genuine character and all-round interest in games won him many friends. He passed on to St. Thomas's, and immediately on qualifying threw himself with the greatest enthusiasm into the study of orthopaedics and physiotherapy. On the outbreak of war he quickly joined up and spent four years in Burma, where his promotion was rapid. On his return from the war he immediately set out to become thoroughly versed in all aspects of physiotherapy, and worked all day and every evening in gaining the required knowledge. His work was soon recognized, and he was appointed as honorary physician in charge of the department of physiotherapy in the Royal Free Hospital group. With his status established he accepted more and more responsibilities, always feeling that he should give his services, no matter where required. There is no doubt that the long hours of work, together with the infections acquired during his long service in Burma, brought about his early demise. At the service held in the very pleasing chapel of the Royal Free, the large attendance of people of all classes gave testimony to Jack Martin's character. He leaves a brave widow and three children.

One of the first women to graduate in arts, science, and medicine at the University of Aberdeen, Dr. A. V. BAXTER THOMSON, died at her home in Aberdeen on December 8, 1952, at the age of 72. Agnes Valentine Baxter was born on May 13, 1880, the daughter of Mr. J. B. Baxter, a Brechin architect, and graduated M.A. in 1902, B.Sc. in 1905, and M.B., Ch.B. in 1907. Her husband, the late Mr. Benjamin Thomson, was rector of Forfar Academy. From 1912 to 1946, when she retired, Dr. Thomson practised in Aberdeen, where she became one of the best known of medical and social workers in that city. The Mother and Baby Home at Richmondhill House, Aberdeen, was founded as a result of her efforts in bringing together the women's organizations in the city for that purpose some ten years ago. At that time Dr. Thomson was chairman of the Aberdeen branch of the Women Citizens' Association, and in 1945 she was elected president of the Scottish Council of Women Citizens' Associations. Other local organizations in which she was keenly interested were the St. Katherine's Community Centre, the Soroptimists, the Aberdeen branch of the Medical Women's Federation (of which she had been chairman), the National Council of Women of Great Britain, and the Aberdeen Old People's Welfare Council. In 1914 she became a medical officer of the Mother and Child Welfare Association, and her work in that capacity was of lasting value to the community. During the last war she served as a medical officer to a first-aid post. Dr. Thomson is survived by her two daughters, both members of the medical profession, Dr. Ann L. Shennan and Dr. Sheila Thomson.

Mr. HENRY THOMAS HICKS, consulting gynaecological surgeon to the Derbyshire Royal Infirmary, died at his home at Derby on December 25, 1952, at the age of 81. Born at Ramsgate on October 26, 1871, the son of Dr. Robert Hicks, a leading general practitioner in that town, he received his medical education at Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1896. He was then appointed house-physician at Guy's Hospital and later became resident surgical officer to the Evelina Hospital for Sick Children, where he was surgeon to the out-patients. He took the F.R.C.S. in 1902, and returned to Guy's Hospital as obstetric registrar and tutor. He was also appointed assistant surgeon to the Samaritan Hospital for Women. As a suitable vacancy in his old medical school seemed improbable he accepted the appointment of honorary gynaecological surgeon to the Derbyshire Royal Infirmary in 1908, when the post was created. He went to Derby with considerable experience behind him, and at once established himself as a brilliant operator and a skilful obstetrician. His advice was sought by colleagues over a wide area, and he attended many doctors' wives, but he was not interested in work which he considered was within the province of the general practitioner. He had a sound knowledge of the natural history of disease, not confined to his own specialty, and he was experienced in morbid anatomy and in the histology of tumours. He introduced the technique of section cutting at the Infirmary. The 1914-18 war, on account of personal circumstances and the general disturbance of hospital work, discouraged him greatly. He never quite recovered the same enthusiasm, though he carried on his work in the changed world until 1929, when, because of failing eyesight, he resigned his appointment at the infirmary and retired from practice. For many years Mr. Hicks was an examiner for the Central Midwives Board—work which he enjoyed. When the British Medical Association held its Annual Meeting at Nottingham in 1926 he served as a vice-president of the Section of Obstetrics and Gynaecology. Mr. Hicks always set a high standard of professional ethics, and, though not interested in medico-political work, was a stimulating colleague behind the scenes of any medical society or committee. He published papers on chorionepithelioma, pyelitis of pregnancy, and other subjects connected with his specialty. As a young man he played both cricket and tennis, and in later years he took up golf. He was extremely musical by nature.

In 1904 he married Miss Getz, matron of the Evelina Hospital for Sick Children and the daughter of a German doctor. After Mrs. Hicks died in 1932 he lived a secluded life. There were no children.—H. B.

Mr. WILLIAM JONES RICHARDS, who died at Port Talbot on January 1 at the age of 79, was born on July 25, 1873, and was educated privately and at St. Bartholomew's Hospital. After qualifying in 1897 he spent a few years in the mental health service of the Middlesex County Council, and then turned to surgery, taking the F.R.C.S. in 1906. After clinical assistantships at St. Luke's Hospital and the Royal London Ophthalmic Hospital, he settled at Port Talbot as a surgical consultant on industrial insurance. He entered the R.A.M.C. at the outbreak of war in 1914 and served with a field ambulance at Gallipoli and as a surgical specialist in Palestine with the rank of major. After the war he returned to his practice and built up a reputation for giving a sound and fair opinion. Mr. Richards was a man of many interests, and was always ready to help in local activities, but he would not seek public office of any kind. His loss will be felt in many circles, and perhaps most in the Church he served so well.—D. R.

Dr. J. C. LEE, who was a Canadian by birth but settled in practice in England after serving in the R.A.M.C. in the war of 1914-18, died suddenly at his home at St. Leonards-on-Sea on January 7 at the age of 64. James Carrel Lee was born at Quebec on March 7, 1888, and was educated at Quebec High School and at McGill University, where he graduated M.D., C.M. in 1914. At McGill he was captain of the rugby football team for two years. After holding appointments at the Hospital for Women and the General Hospital at Montreal, he came to England in 1914 and was house-surgeon at the London Homoeopathic Hospital while studying for the diploma of L.M.S.S.A., which he obtained in 1915. In the latter year he married Dr. Ethel W. Gompertz, who was house-physician at the hospital, and he then joined the late Dr. W. C. Pritchard in partnership at Hastings. His wife carried on his share of the practice while he served with the R.A.M.C. in Mesopotamia in 1916 and later in India. Invalided out of the Army, he returned to Hastings and on the death of Dr. Pritchard in 1928 took over the whole of the practice, being joined later by his nephew, Dr. A. H. Grace. In 1931 he was elected chairman of the Hastings Division of the B.M.A. Dr. Lee gave willingly of his time and skill as a member of the honorary staff of the Buchanan Hospital at St. Leonards. He was also surgeon to the Homoeopathic Hospital at Tunbridge Wells. In 1934 he was appointed to the board of management of the Buchanan Hospital and two years later became a member of its finance committee. He was made chairman of the board in 1945 and held the position until the reorganization of hospitals under the National Health Service. In other ways too Dr. Lee served the community in which he lived, for as a J.P. he brought his wisdom and experience to bear on the human problems coming before the juvenile and domestic courts at Hastings. He had suffered from recurring attacks of bronchitis and pleurisy for some time before his death, but his ill-health did not prevent him from responding readily to emergency calls. He will be remembered for his generosity and friendliness and for his companionable nature. He leaves a widow and one son and one daughter.

Mr. FRANK KEITH HAYMAN, who died at his home at Sharnbrook, Bedfordshire, on January 9 at the age of 59, was born on January 28, 1893, and was educated at Clifton College. He graduated M.B., B.S. of the University of London in 1916, obtained the F.R.C.S. in 1920, and in the following year he settled in practice at Great Yarmouth, where he became honorary consulting surgeon to the Great

Yarmouth and Gorleston General Hospital. He was honorary secretary of the East Norfolk Division of the British Medical Association from 1928 to 1930.

Mr. A. WILFRID ADAMS writes: Keith Hayman and I were friends, and close ones, from schooldays at Clifton till in 1916 the war took us to separate fronts. Never then nor since did he let me down. He was notable for his gadgets, and was always making or acquiring or inventing. In sport, he excelled at swimming and diving; in the arts he was a keen exponent of the piano. Always he was a man of deed not word, and what he wanted he usually effected. His independent, enterprising character led him to start practice on the East Coast, and medicine there gained what Bristol has missed—a doctor who sought the precise truth in diagnosis and hated humbug and self-deception. He tended his patients with a kindly human skill. With his self-effacing nature he had slight regard for ceremony and convention, and in him reliability was combined with an intrepid spirit. In lamenting the loss of a dear friend we sympathize deeply with his family; we recall, too, the passing of a name which, through his father's and uncle's practices, added much to the repute of Bristol dentistry at the turn of the century.

Dr. LEONARD LEY writes: Keith Hayman came to Great Yarmouth in 1921 as a partner in an old-established practice, and within five years was appointed assistant surgeon to the Great Yarmouth and Gorleston General Hospital. He reached full surgical status in 1927, and from then until his retirement through ill-health in 1945 he served the hospital loyally and proved a skilful and successful surgeon. He was always cheerful and unassuming, and perhaps his chief characteristic was his equanimity, which in the war years rose superior to several bombing attacks in his neighbourhood—and to one very large bomb which exploded within a few yards of his house. His recreation was to spend holidays in a motor-drawn caravan, which he built himself. The hands of the surgeon could be adapted at will to another skilled craft. After he left Yarmouth he worked in a Ministry of Pensions appointment for some years, until a love of clinical work made him return to general practice. He died "in harness."

The sudden death on January 16 of Dr. D. V. MAXWELL ADAMS, while at the wheel of his car, has removed a figure familiar at many Annual Representative Meetings of the British Medical Association. Daniel Vere Maxwell Adams was born on October 5, 1875, one of a family of 13. He studied medicine at the University of Edinburgh and at the Royal College of Surgeons of Edinburgh, graduating M.B., Ch.B. in 1898. He was the fourth generation of a family of doctors, his great-grandfather, Dr. Alexander Maxwell Adams, of Edinburgh, having attended Mrs. Agnes Maclehose, a friend of Robert Burns and the "Clarinda" of his poems. After holding a house appointment at Glasgow Royal Infirmary, Daniel Maxwell Adams served as a civil surgeon in the South Africa Field Force in the war in South Africa from 1899 to 1901 and later became a plague medical officer under the Punjab Government. During the war of 1914-18 he served in the R.A.M.C. in France and in the Balkans, attaining the rank of major. After the war Dr. Maxwell Adams returned to practise in Lanark, where he enjoyed the confidence and friendship of his patients and where he had a smile and a friendly word for everyone. A member of the British Medical Association for over 50 years, he was chairman of the Lanarkshire Division in 1927-8 and represented his constituency at the Annual Representative Meetings from 1930 to 1949. He had a bad accident while on a cycling holiday in 1950 and was in hospital for some months, but eventually he was able to walk, to dance, and even to cycle again. In 1951 he was appointed a Deputy Lieutenant for the County of Lanark, an honour which he regarded as belonging to the medical profession and to the town as well as to himself. He was also a town councillor for some years and was

president this year of the Lord Cornets Club, which he joined in 1908. A popular visitor at all social functions, he was an entertaining after-dinner speaker. His death has left the people of Lanark with a sense of personal loss. Dr. Maxwell Adams was a widower, and he leaves one son.

Many friends and acquaintances will regret the untimely death in Manchester of Mr. S. BEEDLE, who was well known to the medical profession in the North of England. For nearly 30 years he was manager of the British Medical Bureau in Manchester and for many years clerk to the Manchester Panel and Local Medical Committees. Since 1949 he was in charge of the Medical Practices Advisory Bureau and the Regional Office of the B.M.A. in Manchester. Mr. Beedle, who died on January 7, was 59 years of age. He had few interests outside his work, and his life was one of devoted service to the doctors who formed his clients. Latterly the strain had told on him and he had arranged to relinquish some of his responsibilities. It was hoped that with partial retirement his health would improve, but this was not to be.

Medical Notes in Parliament

Claims for Drug

On January 22 Mr. EDWARD EVANS asked for a statement on the claims made in respect of the drug B.T.Z. ("butazolidin") as a cure for rheumatic ailments, including rheumatoid arthritis.

Miss HORNSBY-SMITH said the use of this substance was still under investigation in this country. Current evidence suggested that in view of the possibility of undesirable toxic side-effects it should not be taken except under medical direction.

Mr. EVANS said it was undesirable that the lay press should spread extravagant claims among the public, leading them to entertain false hopes.

Miss HORNSBY-SMITH agreed that it was most undesirable that hopes should be raised in respect of drugs which were not fully proved.

Atmospheric Pollution

Colonel M. LIPTON on January 22 asked the Minister of Health what representation his department had on the Atmosphere Pollution Research Committee, and whether he had notified the committee that 4,703 persons died in the Greater London area during the week ending December 13, 1952, as compared with 1,852 during the corresponding week of 1951.

Mr. IAIN MACLEOD said his department was not represented on the committee, but he had confirmed that the committee was aware of the figures quoted. The department looked on the matter as a problem of greatest urgency, but the committee was mainly a scientific body concerned with causes, whereas he was more concerned with effects. There was a link between the committee and the Medical Research Council, which he thought a better method.

Identity Cards

Dr. A. D. D. BROUGHTON asked on January 22 what action the Minister of Health proposed to remove the problems that had fallen on dentists, opticians, doctors, and executive councils by reason of the abolition of identity cards bearing national registration numbers now needed as Health Service identification numbers.

Miss HORNSBY-SMITH said a letter would shortly be sent to executive councils amending the procedure for giving and using these numbers, and describing methods for further acquainting the public with their use in the Health Service.

Block Grants for Hospitals

On January 20 Mr. PETER ROBERTS suggested that Mr. Macleod should consider allowing hospitals to run their block grants over a spread of five years, in the same way as universities were financed.

Mr. IAIN MACLEOD answered that the annual amount involved would be for Great Britain some £280m. Apart from other considerations, a sum of this magnitude must be examined each year by the Government and by Parliament.

Old-age Pensioners

On January 22 Dr. A. D. D. BROUGHTON asked whether the Minister of Health, in view of the hardship caused to elderly people, would take steps to remove the charges for drugs, medicines, and dressings in cases where the patient was in receipt of the old-age pension.

Miss HORNSBY-SMITH replied in the negative.

Prescribing at Clinics

Mr. GERALD WILLIAMS on January 22 asked the Minister of Health to arrange for doctors at child-welfare clinics to give prescriptions which could be exchanged for medicine under the National Health Scheme.

Miss HORNSBY-SMITH rejected the suggestion. She said it was for the family doctor to issue any necessary prescriptions.

Capital Expenditure on Hospitals

Mr. W. FIENBURGH asked on January 22 the estimated capital expenditure on hospitals in 1950-1 in England and Wales as compared with the capital expenditure in 1937-8 after allowing for changes in the price level.

Mr. IAIN MACLEOD replied that the expenditure was about £9m. compared with about £17m.

Psychiatrists in Wales.—Eight consultants in psychiatry have been appointed by the Welsh Regional Hospitals Board, three Welsh-speaking. In addition the board employs fourteen, six of them Welsh-speaking, who were in post when the board was established.

Atmospheric Pollution.—In England and Wales 186 local authorities maintain stations for the assessment of atmospheric pollution.

Vital Statistics

Influenza

The influenza at present prevalent in southern England is fairly mild in type. Virus A-prime has been identified. In the week ending January 17 there were 72 deaths attributed to influenza in the 160 great towns of England and Wales. In the previous three weeks there were 51, 29, and 44 deaths respectively. These figures bear out clinical reports that the influenza is not at present severe. Small outbreaks have recently appeared in the North of England.

England and Wales in 1952

The infant mortality rate in England and Wales in 1952 was 27.6 per 1,000 live births (provisional). This is the lowest ever recorded. The rate was 29.7 in 1951, and 52.8 in 1938.

The death rate was 11.3 per 1,000 population, as compared with 12.5 in 1951 and 11.6 in 1950. The stillbirth rate was 22.6 per 1,000 total births, being 0.4 below the rate for 1951.

The birth rate for the year was 15.3 per 1,000 population, as compared with 15.5 in 1951.

Eire Quarterly Returns

Returns for Eire show that the infant mortality rate in the September quarter of 1952 was 36 per 1,000 births registered, the same as for the corresponding quarter of 1951, while the neonatal mortality rate was 20.

The equivalent annual death rate in the quarter was 9.9 per 1,000 population, being 0.4 below the rate for the third quarter of the preceding year.

The tuberculosis death rate was 0.3 for respiratory and 0.1 for other forms, as compared with 0.4 and 0.2 in the third quarter of 1951.

Road Accidents in 1952.

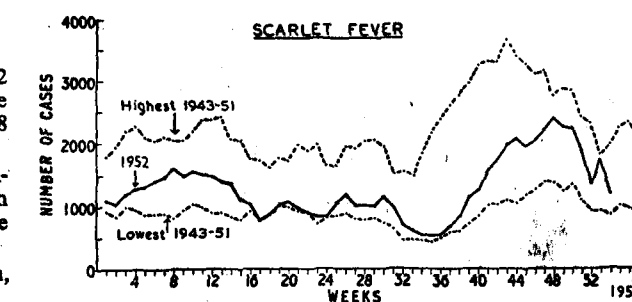
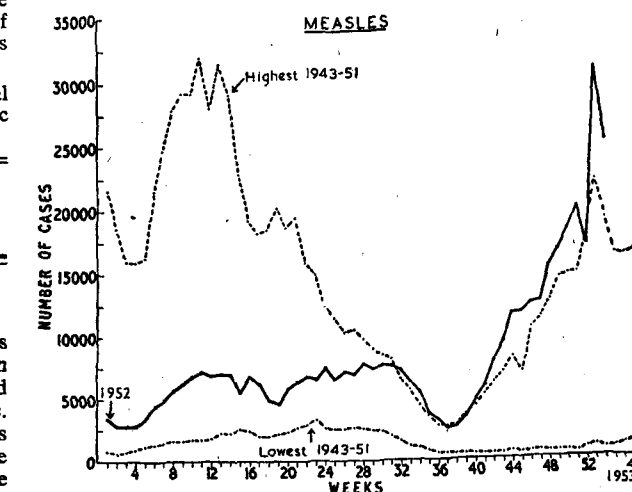
The provisional total of road accidents for 1952 was 208,141. This is 8,352 fewer than in 1951. Included in the total were 4,705 killed, a decrease of 545 on 1951, and 50,371 seriously injured, a decrease of 1,998. Except for the period of petrol restriction, the total is the lowest since 1930, and the number of killed the lowest since records were started in 1926.

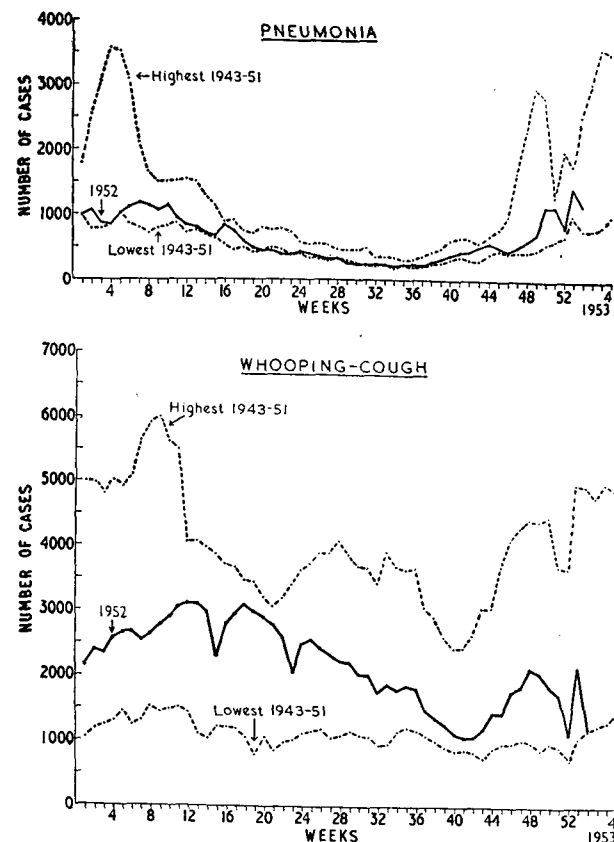
Week Ending January 17

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,589, whooping-cough 2,160, diphtheria 12, measles 21,383, acute poliomyelitis 31, dysentery 312, paratyphoid fever 8, and typhoid fever 1.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1943-51 are shown thus -----, the figures for 1952-3 thus ————. Except for the curves showing notifications in 1952-3, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

Decreases were recorded in the number of notifications of infectious diseases in England and Wales during the week ending January 10. These included 5,759 for measles, from 30,497 to 24,738; 478 for scarlet fever, from 1,716 to 1,238; 256 for acute pneumonia, from 1,423 to 1,167; 105 for whooping-cough, from 2,165 to 2,060; and 48 for dysentery, from 262 to 214.

The largest declines in the incidence of measles were London 800, from 2,705 to 1,905; Middlesex 705, from 2,507 to 1,802; Kent 656, from 2,053 to 1,397; and Southampton County 514, from 2,190 to 1,676. The largest exception to the trend downwards was a rise of 216 in Hertfordshire, from 484 to 700. The largest falls in scarlet fever were 35 in Yorkshire West Riding, from 157 to 122; 33 in Lancashire, from 230 to 197; and 33 in Kent, from 82 to 49. The fall in the incidence of whooping-cough was contributed mainly by the southern section of the country; the largest falls were 98 in Essex, from 178 to 80, and 60 in Middlesex, from 137 to 77; the largest rise was 69 in Lancashire, from 358 to 427. The number of notifications of diphtheria was 22, and was 3 less than in the preceding week. The chief feature of the returns of diphtheria was a fall from 6 to 3 cases in Lancashire. Almost a quarter of the total cases in the country were notified in Birmingham C.B., where 5 cases were reported.

34 cases of acute poliomyelitis were notified during the week; these were 4 fewer for paralytic and 1 more for non-paralytic than in the preceding week. The largest return was 7 in Middlesex, where 3 cases were notified in each of the adjacent areas of Finchley M.B. and Hendon M.B.

The largest returns of dysentery were Lancashire 59 (Liverpool C.B. 29), Lincolnshire 31 (Grimsby C.B. 31), Yorkshire West Riding 21, and Kent 19 (Penge U.D. 15).

51 deaths were attributed to influenza in the great towns, and 29 of these were registered in Greater London. Influenza virus A has been isolated from patients in the London area.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 10 (No. 1) and corresponding week of 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	22	0	11	0		45	6	9	1	0
Dysentery ..	214	12	73	3		295	30	43	4	1
Encephalitis, acute..	1	0	0	0		3	1	0	0	
Enteric fever:										
Typhoid ..	0	0	0	0	2	2	1	0	0	1
Paratyphoid ..	2	0	0	0		6	12	(B)	0	0
Food-poisoning ..	72	15		0		309	23		0	
Infective enteritis or diarrhoea under 2 years ..										
Measles* ..	24,738	1905	267	37	164	3,491	46	135	174	77
Meningococcal infection ..	43	2	22	3	1	40	3	15	2	3
Ophthalmia neonatorum ..	33	2	10	0		24	0	10	0	
Pneumonia† ..	1,167	90	342	18	1	973	86	231	5	1
Poliomyelitis, acute:										
Paralytic ..	23	2		0	0	18	2		0	2
Non-paralytic ..	11	1		0	0	7	0		0	0
Puerperal fever‡ ..	258	33	15	2	1	197	28	4	2	
Scarlet fever ..	1,238	70	303	23	60	1,102	84	229	29	39
Tuberculosis:										
Respiratory ..			113	22				68	13	
Non-respiratory ..			21	9				10	4	
Whooping-cough ..	2,060	121	127	39	135	2,154	74	182	94	66

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0		0	0	0	0		0	0
Dysentery ..	0	0		0		10	0		0	
Encephalitis, acute..		0			0		0			0
Enteric fever ..	0	0		0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	13	4	5	0	3	20		2	0	0
Influenza ..	51	7		0	0	23	4		0	0
Measles ..		1	1	0	1		0		0	0
Meningococcal infection ..		0	2				0			
Pneumonia ..	490	87	41	12	17	305	51		11	10
Poliomyelitis, acute ..	2	0			0	0	0			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis:										
Respiratory ..	127	22	29	7	5	172	18	22	3	5
Non-respiratory ..		3	3	2	3		3	4	0	1
Whooping-cough ..	6	2	0	0	0	2	0		0	0
Deaths 0-1 year ..	283	39	35	6	21	299	26	53	5	15
Deaths (excluding stillbirths) ..	7,617	1216	864	146	236	6,183	909	677	129	193
LIVE BIRTHS ..	7,683	1153	1081	266	430	8,054	1287	874	265	452
STILLBIRTHS ..	201	24	27			183	25	26		

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

Medical News

Regional Board Offers Clinical Research Prizes.—The South-west Metropolitan Regional Hospital Board is offering nine £100 research prizes this year. The object is to encourage minor items of research by members of the board's hospital and clinic staffs who might not feel justified in applying for specific research grants. Three of the prizes are for consultants and senior hospital medical officers, three for senior registrars and registrars, and three for house-officers. The money for the prizes, which are to be annual, will come from the board's allocation of income from the Central Endowment Fund. No Exchequer funds will be used.

Rockefeller Grants.—The Rockefeller Foundation has made a five-year grant of £10,000 to University College, London, for the continued investigation of the selection and teaching of medical students. The study is under the direction of Professor J. Z. Young, professor of anatomy, and he is assisted by Dr. M. L. Johnson. Professor L. S. Penrose is advising on the statistical aspects of the investigation. Other grants for medical work now announced include \$133,940 for psychiatric and psychological work with children in Paris, Vienna, and Florence, \$275,000 for work on viruses both in New York and at field stations in Egypt, India, and Trinidad, and \$23,000 for genetic studies at the Indian Cancer Research Centre, Bombay. Funds have also been provided to allow Dr. W. I. B. Beveridge, professor of animal pathology at Cambridge, to go to America as visiting professor in the department of bacteriology at Ohio State University, and for Dr. Andrew Topping and Dr. Alexander Mair to visit the United States and Canada to observe public health administration and teaching. A grant has been made to Dr. S. W. Stanbury, of the department of medicine, Manchester University, for laboratory equipment.

American Gamma Globulin for Glasgow.—An offer has been made by the American Society in Scotland to present to the Glasgow Public Health Department a limited quantity of gamma globulin similar to that used in recent trials in the United States on the prevention of poliomyelitis. American workers have reported that gamma globulin injected intramuscularly becomes effective seven days after inoculation and the preventive action appears to persist for a period of five weeks. It is as yet unknown whether the American gamma globulin is more potent against poliomyelitis than British gamma globulin. One of the difficulties is to decide the best use for the gamma globulin. The Department at Glasgow is considering the possibility of carrying out small controlled experiments. The short period of immunity, the high cost (estimated at about 30s. a dose), and the fact that poliomyelitis has been relatively less widespread in Great Britain than in America are all arguments against using gamma globulin on a large scale.

Fund for Poliomyelitis Research.—Last month the Infantile Paralysis Fellowship, a lay organization for sufferers from the disease, launched the National Fund for Poliomyelitis Research. The aims of the Fund are to promote and finance research into the causes, cure, prevention, and treatment of poliomyelitis, and research into the rehabilitation of those disabled by the disease. It is stated that the Fund will spend money only at the advice of the medical profession. Among the vice-presidents of the Fund are Lord Horder, Sir Russell Brain, and Sir Cecil Wakeley. The secretary of the Fund is Mr. Duncan Guthrie, 41, Spenser Street, London, S.W. A public appeal for support is to be made at the Mansion House dinner on March 2, and it is hoped to raise £100,000 in the first year.

Local Medical Societies.—Recent meetings have included the following: *Manchester Medical Society.*—On December 22, 1952, Professor W. F. Gaisford read a paper to the

Section of General Practice on "The Treatment of Acute Infections in Childhood." *Liverpool Medical Institution.*—On January 8, after opening papers by Mr. John McFarland and Mr. R. P. Osborne, there was a discussion on the diagnosis and treatment of diseases of the pharynx and larynx, particularly carcinoma of the larynx. On January 15 there was a discussion on "General Practice—Present and Future," opened by Dr. David Johnston and Dr. Thomas Seager. *Chelsea Clinical Society.*—On January 13 Lieutenant-General Sir William MacArthur opened a discussion on "The Small Pocks and the Great Pocks." *North of England Obstetrical and Gynaecological Society.*—The annual general meeting was held on January 23, at which Mr. D. Currie was elected president. Papers on gynaecological and obstetric subjects were read by Dr. T. J. Ryan, Dr. R. M. Corbet, Mr. R. F. Lawrence, and Mr. S. Bender.

Detergents in the River Lea.—The discharge of synthetic detergents into the River Lea, and the consequent foaming of its upper waters, is causing some anxiety to the Metropolitan Water Board, as one of its water intakes is situated not so very far downstream. According to the Board's Water Examination Committee, whose report was adopted at a Board meeting last week, there is no generally applicable test for low concentrations of detergents. It is therefore impossible to tell with any reliability whether the concentration of detergents is increasing or whether it may even be approaching a level at which it might render water unsuitable for supply purposes. The Metropolitan Water Board has drawn the attention of the Ministry of Housing and Local Government to this problem and has suggested research into it.

Supplies of X-ray Film.—Ilford Ltd. have completed two new factories which should lead to a great increase in production of x-ray film in Britain. The first factory is for film-coating, but the second, owned jointly with B.X. Plastics Ltd., is for manufacturing the base from which the film is made. This is a big advance, as until now all x-ray film base has had to be imported, most of it from the United States. Plans for these new factories date from wartime, when enormous quantities of film were needed both for aerial photography and for the medical services.

Reciprocity of Registration with Victoria.—The coming into force of the Medical Act, 1950, at the beginning of this year has had one unexpected consequence. The law in the State of Victoria, Australia, is so framed at present that it now becomes illegal for the Medical Board of Victoria to register qualifications in medicine gained in Great Britain and Ireland. This is because Victorian graduates must produce evidence of experience equivalent to the "pre-registration year" before being admitted to the United Kingdom Register (see *British Medical Journal*, 1952, 2, 774). The Victorian Government—and Victoria is the only State in Australia so to be affected—is now looking into the question of amending its Medical Acts so as to restore reciprocity. Until new legislation is passed, however, the Medical Board of Victoria intends to refuse applications for registration from United Kingdom doctors.

Psychiatry in Wales.—The Welsh Regional Hospital Board has asked the Welsh National School of Medicine to establish a Chair of Psychiatry. Over one-third of the total beds in Wales are for mental patients, and the Board has experienced difficulty in attracting sufficient acceptable candidates for psychiatric posts in the Region. There is particularly a shortage of Welsh-speaking psychiatrists. At present there is no Chair of Psychiatry at either Cardiff or Liverpool, the two medical schools mainly responsible for the training of the Principality's doctors. The Welsh National School of Medicine is sympathetic to the Board's proposal, but at present cannot afford to establish the Chair.

Lady Tata Memorial Trust.—The trustees of the Lady Tata Memorial Fund invite applications for grants, scholar-

ships, or fellowships for research on diseases of the blood, with special reference to leukaemia, in the academic year beginning on October 1. In view of the affinity between leukaemia and other forms of neoplastic disease, candidates with programmes of research on any aspect of malignant disease which may throw incidental light on the related problem of leukaemia will be eligible for consideration. The awards are open to suitably qualified investigators of any nationality, working in any country in which it will be possible to make payments. The normal value of the scholarships is £600 per annum for whole-time research, and for the fellowships £1,000 per annum. Further particulars and forms of application may be obtained from the Secretary of the Scientific Advisory Committee, c/o Medical Research Council, 38, Old Queen Street, Westminster, London, S.W.1. Applications must be submitted before March 31.

Nuffield Dental Fellowships.—The Nuffield Foundation is offering dental fellowships, valued at between £500 and £800 per annum, to graduates in dentistry, medicine, or science. The fellowships for non-dental graduates are to train them for teaching and research on dental health and disease. Those for the dentally qualified are to fit them for an academic career in dentistry. Forms of application and further details may be obtained from the Secretary of the Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1. The last date for applications is March 1.

"The Gift."—Although doctors are naturally sensitive to the presentation of medical subjects on the stage, and tend to react to the portrayal of technical procedures with irritation or mirth according to their mood, the new play at St. Martin's Theatre, "The Gift," can safely be recommended to them. The play turns on the ability to restore sight by corneal grafting. One may perhaps doubt that there could ever be strong enough reasons to make a surgeon take a living corneal graft from his own wife—a fatal procedure in this instance—but this dramatic deviation from probability does not detract from the obvious sincerity of the piece. It is to be hoped that the play will lead to an increase in the number of eye donors.

Journal Index.—The half-yearly indexes to Volume 2 of the *Journal* and the *Supplement* for 1952 are now being sent to members who receive them regularly and to subscribers. Members who have not previously asked for the indexes can obtain copies, post free, on application to the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Red Warning from Emergency Bed Service.—A red warning was issued on January 27, indicating that the percentage of admissions was less than 75. During the seven days ending January 26 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 2,191, of whom 73.48% were admitted.

Mr. Philip Wade has been appointed librarian of the Royal Society of Medicine. Mr. Wade joined the staff of the library in 1935, and was appointed assistant librarian in 1949.

COMING EVENTS

Contraceptive Technique.—A lecture-demonstration on contraceptive technique will be given by Marie Stopes, Ph.D., at the Mothers' Clinic, 108, Whitfield Street, London, W.1, on Thursday, February 5, at 2.30 p.m. No fee is charged, but tickets must be obtained in advance.

Salaried Specialists' Annual Meeting.—The annual general meeting of the Association of Whole-time Salaried Specialists will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on Friday, February 20, at 4.30 p.m. It will be followed in the evening by the annual dinner of the association at the College. Full particulars may be obtained from the secretary of the association at 45, Lincoln's Inn Fields, London, W.C.2.

SOCIETIES AND LECTURES

Details in this column are necessarily brief. Further information and tickets where required (marked ●) should be obtained from the institution concerned.

Monday, February 2

INSTITUTE OF PSYCHIATRY.—8 p.m., Professor Konrad Lorenz (Germany): Comparative Psychology and Psychiatry.

Tuesday, February 3

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor E. J. King, D.Sc.: Silicosis and Asbestosis.

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. W. R. Bett: Preparation and Writing of Papers for the Medical Journals.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Arris and Gale Lecture by Mr. A. A. G. Lewis: Control of the Excretion of Water by the Human Kidney.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Dr. C. Worster-Drought: Neurological demonstration.

Wednesday, February 4

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Blood and Bone-marrow in Dermatology.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, W.C., 4.30 for 5 p.m., Mr. F. R. Kilpatrick: Tuberculosis of the Renal Tract.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., Professor J. M. Smellie: Chronic Diarrhoea in Children.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—3.30 p.m., Mr. S. H. Harrison: Reconstructive Surgery of the Hand.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Arris and Gale Lecture by Mr. C. J. Longland: Collateral Arterial Circulation in the Limb.

Thursday, February 5

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor Matthew Stewart: Pulmonary Asbestosis.

FACULTY OF HOMOEOPATHY.—At Royal London Homoeopathic Hospital, 5 p.m., Dr. W. Lees Templeton: Report on Beryllium Proving; Dr. C. O. Kennedy: Research into the Bowel Flora; Dr. L. R. Twentyman: Observations on the Medical Treatment of Cancer.

●INSTITUTE OF CHILD HEALTH.—5 p.m., Mr. T. T. Stamm: Postural Disorders of School Age.

LIVERPOOL MEDICAL INSTITUTION.—At Stanley Hospital, 2.30 p.m., afternoon clinical demonstration.

OXFORD UNIVERSITY.—5 p.m., Dr. G. W. Corner (Washington): The Autobiographical Writings of Benjamin Rush, M.D.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Professor Geoffrey Hadfield: Co-Carcinogenesis.

ROYAL SOCIETY.—4.30 p.m., Professor A. V. Hill, F.R.S.: "Instantaneous" Elasticity of Active Muscle; Professor H. Munro Fox, F.R.S., and Elizabeth A. Phear: Factors Influencing Haemoglobin Synthesis by *Daphnia*.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. P. L. McKinlay: Statistical Concepts in Medicine and Public Health.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.15 p.m., demonstration of clinical cases; 5 p.m., Dr. F. T. G. Prunty, Dr. E. G. L. Bywaters, and Dr. G. B. Dowling: Cortisone in the Therapy of Skin Diseases.

●WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At South Kensington Hotel, 7.30 for 7.45 p.m., Professor A. M. Boyd: Management of Thrombo-phlebitis of the Lower Extremities and its Complications.

FRIDAY, FEBRUARY 6

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. S. C. Gold: Contact Allergy.

INSTITUTE OF NEUROLOGY.—5 p.m., Professor E. Bay (Heidelberg): Dynamic Factors in Normal and Pathological Visual Perception.

INSTITUTE OF PSYCHIATRY.—3 p.m., Professor H. C. Rümke (Utrecht): Clinical Significance of Obsessional Phenomena.

ROYAL INSTITUTE OF PHILOSOPHY.—At University Hall, 14, Gordon Square, W.C., 5.15 p.m., Professor J. N. Findlay: Wittgenstein's Philosophical Studies.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Dr. P. H. Dootson: Auscultation of the Heart.

UNIVERSITY COLLEGE.—At Physiology Theatre, 5.30 p.m., Professor F. Bergel: Some Chemical Aspects of Normal Growth.

SATURDAY, FEBRUARY 7

INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—11.30 a.m., discussion. Professor F. Eeman (Belgium): Some Problems Facing the Endoscopist.

MIDLAND TUBERCULOSIS SOCIETY.—At Chest Clinic, 151, Great Charles Street, Birmingham. Dr. J. G. Scadding: Chronic Lung Disease with Diffuse Nodular or Reticular Radiographic Shadows.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Craig.—On January 23, 1953, at the Bristol Maternity Hospital, to Dr. Jean (formerly Simpson), wife of Dr. R. A. Craig, a son.

Goulden.—On January 18, 1953, at the Louise Margaret Hospital, Aldershot, to Margaret (formerly Macrae), wife of Major R. P. Goulden, R.A.M.C., a son—Alastair Michael.

Porritt.—On January 19, 1953, at 31, Queen's Gate, London, S.W., to Kay, wife of Sir Arthur Porritt, K.C.M.G., F.R.C.S., a son.

DEATHS

Adams.—On January 16, 1953, at Lanark, Daniel Vere Maxwell Adams, M.B., Ch.B., aged 78.

Langford.—On January 16, 1953, John Charles Cobden Langford, M.R.C.S., L.R.C.P., of Chiswick, London, W.

Ruston-Harrison.—On January 17, 1953, George Herbert Ruston-Harrison, M.B., Ch.B., of Winscombe, Somerset, aged 82.

Wykes.—On January 17, 1953, William Henry Wykes, M.R.C.S., L.R.C.P., of Barton-on-Sea, Hants, aged 82.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Asthmatic Attacks in Infancy

Q.—Could you tell me the best way of dealing with an acute attack of asthma in an infant? Is an adrenaline injection safe to use in a very young patient in order to stop the attack?

A.—Subcutaneous adrenaline (2 to 3 minims—0.12 to 0.2 ml.) is beneficial and not contraindicated in an acute attack of asthma in an infant. This dose can be repeated, if necessary, two or three times at intervals of about 20 to 30 minutes. Rectal aminophylline (0.1 to 0.2 g. in 20 ml. of water) is often very effective and can be repeated in two to three hours. If adrenaline and aminophylline are not effective, syrup of ipecacuanha by mouth, as an emetic (half to one dram—1.75 to 3.5 ml.), followed by lukewarm water may be considered. Steam inhalation is often helpful. If the attack is severe and prolonged, oxygen therapy in a tent and intravenous glucose 10% (300 ml.) and a sedative such as chloral may be necessary. So often an acute attack in an infant follows after a few days of a mild respiratory infection and in these cases sulphonamides, penicillin, and/or other antibiotic therapy are indicated from the start.

Lacerations of the Ear

Q.—Outline the treatment of a wound of the ear, passing from the junction of the pinna with the side of the head and opening into the external auditory canal.

A.—Sound and clean healing of wounds of this type can be assured only by careful attention to detail. Sepsis can give rise to a good deal of trouble, especially if the cartilage of the pinna becomes infected, but with a careful technique it is unusual for serious trouble of this kind to arise.

With a clean wound, after careful cleansing with ether soap or 1% cetrimide, any ragged edges of cartilage are lightly trimmed. The skin edges should not be excised, but if they are ragged a little trimming may be needed. The skin lining of the auditory meatus should be neatly and carefully repaired, first with fine silk sutures inserted at intervals of about 2 mm. It is important to avoid turning in the edges of the skin, which heals better if it is coated with vertical mattress sutures. Unless there is very extensive damage to the cartilage it is best to avoid inserting any sutures in it; but, should this seem necessary in a large wound, an occasional fine catgut suture may be used. The skin of the pinna should then be carefully sutured in the same way as the lining of the meatus. 0.004 in. (0.1 mm.) suture silk is a suitable material, using three or six "eye-curved" needles for the pinna, and small half-circle cutting needles not more than $\frac{1}{4}$ in. (8 mm.) in diameter for the meatus. When the repair has been completed it is best to keep the meatus splinted with a light pack of "vaseline" gauze or similar material. The external suture line is best dressed with collodion or, if desired, left exposed to the air. Skin sutures should not be left more than five days and can be removed sooner, but the ear should be carefully supported for a week or so with wool and bandages in the case of extensive wounds.

If the wound is contaminated it should be cleansed with still greater care, and in these circumstances it may sometimes be better to sacrifice skin and cartilage edges, especially if there has been much contusion of them. But in any case only a narrow margin of tissue should be excised. No strict rules can be laid down about the method of

repair, but, after insufflation with penicillin-sulphanilamide powder, the edges should be sutured as described above. Only judgment and experience can really help the operator in deciding whether it is justifiable to suture as closely as in a clean wound. Sometimes it is wise to insert only a minimum number of sutures. Parenteral treatment with penicillin may be worth while.

In a neglected wound, the first step is to clear out all infected granulations from the meatus and elsewhere, and to ensure that there are no "sequestra" of cartilage or other foreign bodies in the granulations. Generally speaking it will not be possible to do any effective repair of separated or displaced skin edges, and the primary aim of treatment at this stage should be to clear up all infection. Troublesome perichondritis occurs in some cases, and at this stage it is unlikely that antibiotics will be of any real value. Once the infection has settled, the wound should be allowed to heal soundly before any scar correction is attempted. This will generally mean a wait of at least three months, but often longer. After removal of granulations from the meatus it is most important that it should be carefully and systematically cleansed each day until healing has occurred. The problems of later plastic repair cannot be dealt with in this answer. One last point should be mentioned: if the meatus has been extensively involved it may be wise to make a plug of acrylic resin or dental stent to prevent stricture formation. This can usually be admirably done by any good dental surgeon.

Petit Mal and Marriage

Q.—A patient of 19, who has suffered from petit mal since infancy, has consulted me about the possibility of transmitting her disorder, as she is contemplating marriage. What investigations are indicated and how should she be advised?

A.—It is impossible to give a dogmatic answer to this question. An important point is whether epilepsy of any type has occurred amongst the patient's relations, and careful inquiry should be made about this, as if the disorder is found in more than one member of the family there is a greater chance of transmission to future generations. Another important point is whether there is a history of epilepsy in her fiancé's family. If the patient is suffering from true petit mal she is very likely to have an abnormal electroencephalogram, and, though it would be of interest to have this investigation performed, it probably would not be of great help in deciding on the possibility of transmission of the disease: an electroencephalographic record of the fiancé would, however, be of value, as, if this should show an epileptic record even when clinical fits have not occurred, the possibility of children inheriting the disease would be increased. For further information on this complicated subject reference should be made to an annotation published in the *Journal* (1951, 2, 1330).

C.S.F. Changes in Psychoses and Epilepsy

Q.—Are biochemical changes ever found in the C.S.F. of manic depressives, schizophrenics, or sufferers from idiopathic epilepsy?

A.—Very little is known on this subject. The extent of our ignorance is shown by the fact that in the excellent critical review by Gillies in *Recent Progress in Psychiatry* (1950, London), though biochemistry is covered, no mention is made of work on biochemical changes in the C.S.F. About ten or twelve years ago a worker in Germany produced a flocculation test for the C.S.F. which he said gave almost invariably positive results in schizophrenics. This was not confirmed by other workers. More recently H. H. Fleischacker (*J. ment. Sci.*, 1943, 89, 297) described the use of a modified form of the Takata test, but this work does not appear to have been followed up, and his results do not seem of great importance.

No one to the writer's knowledge has ever suggested that biochemical changes are to be found in the C.S.F. of manic-depressives or idiopathic epileptics. It is, of course, a different matter with symptomatic epileptics.

Altitude and Hypertension

Q.—What effect has high altitude on patients with hypertension? What are regarded as reasonable upper limits of altitude for such patients (a) for permanent domicile, when presumably physiological adaptation may take place, (b) for a month's holiday, and (c) for an aeroplane flight?

A.—Altitudes up to 6,000 ft. (1,830 m.) have little adverse effect on patients with hypertension, and there is no reason why such patients should not take a holiday in the mountains up to this level, provided they are not threatened with heart failure. The adaptations that take place at high altitudes include polycythaemia and a raised cardiac output, and neither of these is beneficial to hypertensive states, so that permanent residence in places of 7,000 or 8,000 ft. (2,134 or 2,438 m.) is not recommended. Most modern airliners are pressurized to the equivalent of the atmospheric pressure at 6,000 ft., and in such artificial conditions the height of the plane does not matter. Patients with serious hypertension should avoid non-pressurized planes because no pilot can guarantee that he will not fly above 6,000 ft., owing to the uncertainty of the weather.

Coke in Open Fires

Q.—Is coke safe for regular use in an open fire in a living-room? I have heard that the fumes are dangerous.

A.—Coke is derived from coal by a process of carbonization in which nearly all of the volatile constituents of the coal are driven off by heating, so it should not be any more dangerous to burn than the parent coal. If coke or coal is burnt in a fire which does not allow complete combustion, carbon monoxide may be produced, and this of course would be dangerous if it escaped into the room. This could happen if the chimney were blocked. In this case, if coal were burnt, the smoke and other fumes, particularly sulphur dioxide, would be so irritating that it is unlikely that anyone would tolerate it, but in the case of coke there is much less smoke and fumes, so that the escape of carbon monoxide into the room might not be noticed and poisoning might conceivably result.

Toxicity of Mercury Vapour

Q.—Some laboratory workers think that mercury can have toxic effects when the vapour is inhaled over a prolonged period in an open laboratory. Is there any justification for this belief?

A.—There is abundant evidence that inhalation of mercury vapour causes chronic mercury poisoning. It is not sufficiently appreciated by those who handle mercury in the laboratory, or in industry, that mercury vaporizes at room temperature, and that the concentration of mercury in the atmosphere increases considerably in winter conditions when natural ventilation is reduced and workrooms are artificially heated. Form 332 issued in March, 1950, by the Factory Department of the Ministry of Labour and National Service deals with industrial mercury poisoning. It states: "Mercury gives off vapour to a certain extent even at ordinary temperatures, but warmth greatly increases this tendency. When the metal, as distinguished from its salts, is used, the danger of poisoning arises chiefly from inhalation of the vapour; and in a minor degree from swallowing or from absorption, in a finely divided state, by the skin." Striking examples of the harmful effects of mercury vapour are cited by Buckell *et al.* (1946). They refer to an incident of fire in a quicksilver mine in Austria in 1804. Mercury vapour escaped into the air and spread over the country-

side; 900 persons in the neighbourhood had mercurial tremor and many cows suffered from salivation, cachexia, and abortion.

REFERENCE

Buckell, M., Hunter, D., Milton, R., and Perry, K. M. A. (1946). *Brit. J. Industr. Med.*, 3, 55.

NOTES AND COMMENTS

Short-sighted Boxers.—Mr. LIONEL M. GREEN (London, W.1) writes: Having acted as ophthalmic consultant to the British Board of Boxing Control for a good number of years, I feel that the reply given by your correspondent to the query concerning short-sighted boxers ("Any Questions?" January 3, p. 54) is somewhat misleading. The inquiry confined itself to the degree of myopia among schoolboys which might be considered to constitute a bar to boxing, and the answer virtually debars even low degrees from indulgence in this vigorous and healthy sport. Liability to retinal detachment in moderate myopia (up to -4 D.) at this age is probably no greater than in non-myopes, as the vitreous is usually perfectly healthy, and no evidence of early degenerative changes in the region of the ora serrata can usually be found or is expected. A blow suffered during this age-period sufficient to cause detachment would almost certainly be as likely to cause the same type of injury in a non-myope. Only those with the higher degrees of myopia, and particularly towards the latter years of school life and where the myopia has been rapidly progressive, or associated with marked retinal thinning, large temporal myopic crescents, early evidence of vitreous degeneration such as floaters, and slightly subnormal corrected acuity, should be debarred owing to this greater risk of retinal detachment; and indeed in this type of case the poor uncorrected vision present would in itself effectively prohibit participation in the game. The undue prominence of the myopic eye is very largely a fiction based upon the exploded theory that almost all degrees are mainly axial in origin with an increased antero-posterior length. Recent radiological methods of measuring this axial length have shown that up to -6 D. the myopic eye is only 0.5 to 1.5 mm. longer than normal, a degree of additional prominence which surely can be entirely discounted. In my opinion schoolboy myopes up to -3.0 D. certainly, and up to -4.0 D. in most cases, can indulge in the sport without additional risk as compared with their better-sighted playmates. Except in exhibition bouts all boys should wear rubber orbital prominence goggles, a form of protection which has recently been advocated for use among professionals. Within the range mentioned the acuity present without correction is quite sufficient to enjoy the sport and develop a sound technique.

OUR EXPERT writes: I find myself in total disagreement with Mr. L. M. Green. I have seen so many eyes seriously damaged or totally wrecked as a result of blows from boxing that I feel it is superfluous to make a detailed answer to him. Anybody who takes the trouble to consult the literature will find a large list of tragedies not only among professional but among amateur boxers. For example, Jokl, of Johannesburg, has written extensively upon this subject. In my opinion everything that one says about the vulnerability of eyes to boxing injury is enhanced when the boxer in question is a myope—even if the amount of his myopia is only slight.

Correction.—In announcing the award of a knighthood to Dr. F. P. Montgomery (January 10, p. 92) his appointments as senior radiologist to the Royal Victoria Hospital, Belfast, and to the Belfast City Hospital were regrettably omitted.

"Any Questions?" Book: Second Series.—This is now available, price 7s. 6d. (postage 6d. extra), from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 14 1953

RESULTS OF THE BLALOCK-TAUSSIG OPERATION IN 200 CASES OF MORBUS CAERULEUS

BY

MAURICE CAMPBELL, D.M., F.R.C.P.

AND

D. DEUCHAR, M.D., M.R.C.P.

(From the Cardiac Department, Guy's Hospital)

In 1949 we reported the results in the first 50 patients with morbus caeruleus who had a Blalock-Taussig operation at Guy's Hospital (Baker *et al.*, 1949). We now report the results in those operated on since and a longer follow-up of the earlier patients.

We have included all our 200 patients who have had an anastomosis performed or attempted up to the end of 1951. Most of these (129) have been operated on by Mr. R. C. Brock, but 57 were operated on by Mr. Holmes Sellors and 14 by Mr. Ian Hill. Most of the patients had Fallot's tetralogy, but we use the wider term morbus caeruleus because of uncertainties of diagnosis: even a successful operation proves only that the blood flow to the lungs was inadequate and has been improved. First, the 200 patients are considered together and later in different groups such as tricuspid atresia, pulmonary atresia, and dextrocardia, to assess the operative risk and the improvement to be expected.

Age and Sex.—Most of the patients were children, and the age distribution is shown in Table I. Nearly half were between 5 and 9 years of age, over half were

etc.). Where the diagnosis seems straightforward and there is no doubt about the presence of adequate pulmonary arteries this seems a reasonable policy. These investigations all involve at least some discomfort to the patient and sometimes a definite risk.

Circulation times were done on most patients at one time, but have now been abandoned, in a centre where cardiac catheterization and angiocardiology are available (Campbell, 1951).

Angiocardiology has been used most often—in just over one-third of the patients in this series; it has proved of great value in difficult cases, but has rarely contributed much useful information in the straightforward ones. Briefly, its chief value in selection for anastomotic operations is in confirming the presence of an overriding aorta and in elucidating the anatomy of the systemic vessels and the presence of pulmonary arteries when this is doubtful. It is less effective than might be expected in deciding in a doubtful case whether the blood flow to the lungs is diminished or not. The change in the density of the lung fields and the speed with which the diiodone passes through the lungs to the left side of the heart are better indications than the time at which the pulmonary trunk first fills (Campbell and Hills, 1950). Like the circulation times, it has no place in post-operative assessment.

Arterial oxygen saturations have rarely been estimated except as a part of cardiac catheterization. Alone, they yield little information apart from confirming, perhaps more precisely than the circulation times, the presence of a right-to-left shunt—although they do not, as the circulation times may, distinguish whether the cyanosis is due to a shunt or to some change in the lungs preventing the normal oxygenation of the venous blood. For this distinction a second arterial sample, taken while the patient breathes oxygen, is necessary. If the patient is frankly cyanotic the arterial oxygen saturation is superfluous. Its use as a means of assessing the severity of the shunt or the degree of improvement we have not felt to be justified; its apparent objectivity gives it a spurious appearance of reliability, for the lability of the cyanosis in these patients is well known. Significant increases in the arterial oxygen saturation are nearly always appreciable clinically as lessened cyanosis.

Cardiac catheterization has been performed on many patients with morbus caeruleus, but not all these have had anastomotic operations. About 30 in this series were so investigated, but as the results are in no way

TABLE I.—Age Distribution of Patients and Operative Deaths

	Age in Years					Total
	0-4	5-9	10-14	15-19	20 and Over	
Total No. of cases	18	90	59	21	12	200
Deaths with operation	3	10	4	1	6	24
Deaths at each age	17%	11%	8%	5%	50%	12%
Very good results among survivors	40%	53%	61%	80%	33%	56%

less than 10, and over four-fifths less than 15 years: the youngest was 3 and the oldest 35 years. Boys slightly predominated, there being 114 to 86 girls.

Disability.—This was graded (Campbell, 1948) as IV in 75, III in 77, II in 44, and I in only 4 of the patients before operation. These last four were mostly older patients, about 20, who were not very disabled but were most anxious to be able to lead a more active life.

Symptoms and Signs.—We are not discussing these further, as we have little to add to our earlier remarks (Baker *et al.*, 1949).

The Role of Special Investigations

All the earlier and many of the later patients have been chosen for operation without any special investigations (angiocardiology, cardiac catheterization,

peculiar to them we have reviewed all who were studied by this technique. We have not used catheterization to study the results of the anastomotic operations. The only change that could be detected is the shunt of arterial blood into one of the pulmonary arteries; by the nature of things it is not possible to assess its volume by catheterization and there are simpler criteria by which its mere presence or absence can be judged.

Fallot's Tetralogy.—In 57 catheterizations on patients with this diagnosis there was only one failure to enter the right ventricle. The pulmonary trunk was intubated in 45 and the aorta as well in 9 of these; in no instance was the aorta entered when the pulmonary trunk was not. A defect of the atrial septum was demonstrated by the passage of the catheter in three patients. The systolic pressure in the right ventricle was within the normal range for the systemic arterial pressure. Whenever they were determined at the same time they showed no significant difference. This contrasts with pure pulmonary stenosis, in which the right ventricular systolic pressure often exceeds the systemic. The pulmonary arterial pressure was generally between 17/6 and 10/3 mm. Hg, and nearly always below the normal value of about 23/8 mm. Hg, measured from the mid-axillary line.

In the patients accepted as having Fallot's tetralogy a right-to-left shunt was always present but varied greatly in size; the arterial oxygen saturation fell within the range 47–92%, but in over half was between 70 and 85%. In keeping with the observations of Deuchar and Knebel (1952), the systemic blood flow at rest has always fallen within the normal range, whereas the pulmonary blood flow has been reduced by an amount dependent on the size of the shunt.

Among the straightforward examples of Fallot's tetralogy there was evidence of a left-to-right shunt into the pulmonary artery in one only, and at operation the surgeon found a small persistent ductus arteriosus. A few patients with a provisional diagnosis of Fallot's tetralogy have been found to have left-to-right shunts into either the right atrium or the right ventricle. The former has been observed only where anomalous pulmonary veins were present and the latter where post-mortem control or further study (angiocardiographic, etc.) nearly always proved the presence of some more complex lesion than Fallot's tetralogy—for example, a single ventricle or pulmonary atresia. The finding of a shunt into the right ventricle is therefore a strong indication for reconsidering a diagnosis of simple Fallot's tetralogy.

Pulmonary Atresia.—We have studied 14 patients believed to be examples of this condition, but were able to intubate the right ventricle in 10 only. Naturally the pulmonary trunk was not entered in any, but the aorta was entered in six: it seems that entry of the aorta with failure to enter the pulmonary trunk may help in distinguishing pulmonary atresia from Fallot's tetralogy. A defect of the atrial septum was demonstrated in 8 of the 14, including those in whom the right ventricle was not entered. The arterial oxygen saturation always fell within the range 60–84%. Basing blood-flow calculations on the assumption that the blood to the lungs has the same oxygen saturation as the systemic arterial, the pulmonary blood flow was less than, equal to, or more than the systemic in about equal numbers of cases, although radioscopes gave a different impression in the last group: again it was the pulmonary blood flow that was changed when it differed from the systemic.

Tricuspid Atresia.—Here cardiac catheterization has little to offer, and the findings, being essentially negative, have

little significance. It can contribute useful information only when by intubating the right ventricle it disproves the suspected diagnosis of tricuspid atresia. In six cases studied the atrial septal defect was demonstrated in three; the arterial oxygen saturation fell within the range 56–79%, and in all except one the pulmonary blood flow was less than the systemic.

Nature of Operation

Most of these patients had end-to-side subclavian-pulmonary anastomosis, as this was regarded as the operation of choice. At first, following the original practice of Blalock and Taussig (1945), the operation was performed on the side opposite to the aortic arch; but after the first 50 Mr. Brock decided on surgical grounds that the left side was the best in all cases (Baker *et al.*, 1949). Provided the anastomosis is a good one, there is no evidence that the side on which it is done makes any difference to the result. Departures from this operative technique were dictated by the anatomical findings at operation.

In about one-twelfth of the cases it was found necessary to divide a pulmonary artery and perform an end-to-end anastomosis. This was mainly in patients with pulmonary atresia in whom the pulmonary artery, if present, was often small and thin-walled. The less good results may therefore be due as much to the original defect as to the end-to-end anastomosis. There is no doubt that it can sometimes produce a very good result, and, strangely enough, the anastomotic murmur resulting from it is indistinguishable from the other.

Pott's modification of the Blalock-Taussig operation was carried out in three patients only. In two the result was very good, but one shows some evidence of the shunt being too large. The third, despite the surgeon's fear that the anastomosis was too large, had no anastomotic murmur and no benefit from the operation, which suggests that the stoma failed to function (Case 1).*

Innominate and Other Arteries.—The innominate artery was used once with an ideal result. The right common carotid artery was also used once; the stoma formed was thought to be rather large, and the patient died of pulmonary oedema. Another patient, in whom the carotid had to be divided to mobilize the subclavian sufficiently, died, apparently from the interference with the cerebral blood supply. After this experience Mr. Brock decided that the use of the carotid or innominate arteries was a gamble that should not be taken (Baker *et al.*, 1949). The internal mammary artery was successfully used for an anastomosis in two cases: one yielded a very good result, though the reduction in cyanosis and haemoglobin was only slight, but the other showed little improvement and had no anastomotic murmur. An attempt to use a large intercostal artery on one occasion failed, and the patient recovered from the operation unchanged.

Method of Follow-up

All these patients were seen by one of us before operation and nearly all by both of us afterwards, generally several times. Often the category in which they should be placed was decided in discussion with others who were working in the clinic. We have tried to see the patients annually near to the anniversary of the operation, but could not always adhere to this strictly. We have therefore grouped the visits between 10 and 21 months as one year, between 22 and 31 months as 2 years, between 32 and 43 months as 3 years, and 44 months or over as 4 years.

Nine patients have gone abroad since their operations, but three had already been followed for 18 to 24 months. We have received recent reports from all except two who were doing well when they left the country 19 and 24 months after operation. Of those in this country none has been lost sight of, but we have accepted reports of several who

*Some cases have been given numbers to save repetition when they are referred to again.

live some way from London, especially when we had seen them previously and have been told that their condition is as good as before.

The period of follow-up of the 165 who left hospital after a completed anastomosis was as follows (the patients who died later have been counted as being followed until the date of death): 4 years, 28 patients; 3 years, 37; 2 years, 42; 1 year, 53; less than 1 year, 5. Some of the patients have now been seen at the five-year follow-up, and none of them has lost ground.

At each visit we have assessed the patient's capacity and progress and have recorded the degree of cyanosis and clubbing, the site of the anastomotic murmur, and the blood pressure. Getting the patients to jump up and down for a short time has proved a simple and useful way of helping to assess the disability and the cyanosis after exercise. Haemoglobin estimations and teloradiographs of the chest have been done as a routine. Electrocardiograms were done often at first, but as it became apparent that there was little if any change, even when the heart became larger, we have been less particular about repeating them. The role of the special investigations has already been discussed. In a few cases all the data outlined have not been obtained or we have had to rely on reports forwarded by their doctors.

Assessment of the Degree of Improvement.—This is not always easy. Some patients before operation could walk only a few yards, whereas others could walk a mile or more, so that the improvement cannot be judged simply by the amount they can do after. At first, with the vivid memory of the severe disability, the result seems miraculous, and for the parents often remains so; later, as the memory of this fades, there is more tendency to compare them with a normal child, and in this way it may seem less dramatic, but the examples given will indicate how great the change is. Even moderate improvement may mean a lot to the patient, but our good results mean much more than this, as such patients can often earn a living and lead a life that is nearly normal instead of being almost completely disabled and a drag on their families. The classification

TABLE II.—Results of the Operation

Group	Results of Operation	No. of Patients
I	Very good	99
II	Good	37
III	Some improvement	17
IV	Good of improved at first, but died later	6
V	No improvement	6
VI	No anastomosis possible	11
VII	Death at or shortly after operation	24

*Two other patients who were originally in this group showed some improvement after a second operation.

of the results is shown in Table II. We have taken particular care not to overestimate the improvement, placing the patient in the lower rather than the higher category whenever there was any doubt.

Results of Operation

Group I. Patients with Very Good Operative Result (99)

We have described a result as very good when the patient can earn his living or attend an ordinary school and can walk three to four miles. He is living an almost normal life except for the more vigorous activities that are not essential. If he had been so disabled that he could not walk 100 yards we have classified the result as very good even if he has not reached this standard but was able to walk at least a mile. The following examples will make the position clearer.

A boy of 3 who could walk only 10 yards was soon running about almost like a normal child. A boy of 7 who could walk 400 yards on a very favourable day was soon at school leading an almost normal life except for football: three years later he was persuaded a friend to run away from school with him, and was found by the police 12 miles away. A young man of 18 who had found it hard to walk across the out-patient hall was able to walk 6 miles and to work at light engineering. A boy aged 12

who could walk only 20 yards had walked 9 miles two years later; and another who could walk only a few hundred yards at a normal pace or half a mile slowly has walked 12 miles. One girl of 12 was carried into the room on her first visit and could walk no more than 20 yards in good weather: after operation she was enormously improved, and the day she was seen had walked round the zoo for three hours with one rest. Another girl, aged 15, had been getting so much worse that even dressing provoked attacks in which she nearly lost consciousness: now, two years after operation, she is working regularly as a machinist and can walk four miles and do everything she wants except dancing; her cyanosis has not improved as much as most (see later) and her haemoglobin has fallen from 135 only to 119% (Case 2).

There were other patients who were much less disabled before operation. For example, one girl of 13 could walk half a mile fairly easily and was not very cyanosed: after operation she was walking five miles, cycling in a hilly district, and doing anything she wanted.

The percentage of very good results increases from the youngest patients to those between 15 and 19, in whom it is 80% of the survivors, but then falls off again in those over 20 (see Table I).

Group II. Patients with Good Results (35)

We have been conservative in including cases in the highest class. When a patient leads a normal quiet life but falls short of this high standard in some particular we have recorded the result as good. For example, a girl of 6 was getting worse before operation and walked only the length of the room; she rarely went outside, and was having frequent cyanotic attacks, in which she was unable to stand. A year after operation she is a different child, almost a normal colour and without attacks, but was not put in the highest class because she was not yet going to an ordinary school or walking more than half a mile.

A boy aged 10, with tricuspid atresia, found it difficult to walk a mile and was still moderately cyanosed, with a haemoglobin of 130%. But his mother called the result a miracle, as he was able to attend an ordinary school and go and return alone, whereas before he had walked only 100 yards (Case 3).

Some cases which would otherwise have been classed as very good have developed another disabling lesion, and therefore have been classed as improved or good. This applies to two patients who have developed tuberculosis of the lungs and to others with neurological lesions from which they have not recovered completely.

Group III. Patients Somewhat Improved (17)

This relatively small group contains all those who were still seriously limited in activity but showed real improvement, which sometimes meant a lot to them. Thus one girl who could walk only 20 yards can now get about the house freely and walk 200 yards outside—a tenfold increase—but we regard this as disappointing, though the change it has made to her inside the house seems to her parents enough to justify the operation.

Group IV. Patients who were Improved but Died Later (6)

All these patients were improved at first, the result being very good in two, good in two, and improved in two, but they died 8 to 37 months after operation. The first two were especially disappointing cases.

The first, a boy aged 3, was very disabled, and the large heart—cardiothoracic ratio (c.t.r.) 62%—made us anxious about the chance of success. He was almost normal 15 months after operation and the heart was no larger. Eighteen months later, in Kenya, he developed weakness of one side and was sent back to England: the condition of his heart was still good, but a diagnosis of cerebral abscess was made, and, though operation for this seemed successful, he died suddenly six hours later (Case 4).

The second, a girl aged 7, was able to walk only 50 yards on a good day and had frequent attacks in which she nearly lost consciousness: afterwards she could walk a mile to school and run 20 yards. Three years after operation she was leading an ordinary life except for no games at school; her heart had not

enlarged unduly (c.t.r. 47 to 53% quickly and 54% three years later). A month later, on holiday, she seemed as well as usual, but woke up one night with symptoms of acute pulmonary oedema and died before a doctor could see her (Case 5).

The third, a young woman aged 20, was classed as a good result but died suddenly in the street 17 months later; the inquest did not reveal the cause of death.

The fourth, a boy aged 4 with tricuspid atresia, was classed as a good result, and there would have been no anxiety had he not been seen after five months and found to have an unusual increase in the size of his heart (c.t.r. 61 to 69%). He died three months later with congestive failure: it is true that it followed bronchitis, but this would probably not have proved fatal had the heart been smaller (Case 6).

The fifth, a boy aged 4, was thought to have Fallot's tetralogy with complications, as the heart was large (c.t.r. 59%). Operation was decided on as he was losing ground and seemed unlikely to live long: he was better for a year, but then lost ground and died in his second paroxysm of ventricular tachycardia 17 months after operation. At necropsy pulmonary stenosis with a single ventricle was seen (Case 7).

The sixth, a man aged 21, was classed as improved only, as he had not been very disabled. A pulmonary abscess had troubled him before his operation, but was thought to be quiescent and healed. A year later, however, he was admitted with recurrent haemoptysis; aspergilli were cultured from the sputum, and in spite of treatment he died a few weeks later. Fallot's tetralogy had been diagnosed, but necropsy showed a pulmonary valvular stenosis with only a small patent foramen ovale and an unusual, small, low ventricular septal defect (Case 8).

These deaths give a rough indication of the mortality that may be expected after an operation that has been successful. Of 159 patients, 6 (3.8%) died during the period of follow-up, but two at least from causes quite unconnected with their original operations—a cerebral and a pulmonary abscess. As the average period of observation was 2.5 years the annual mortality rate from all causes was 1.5%.

Group V. Patients Without Improvement After Operation (6)

There were six patients who were little if at all improved by their operation, and three of them have died since. One was submitted to operation after much doubt, as the diagnosis was uncertain. Only an end-to-end anastomosis was possible, and her colour and capacity were somewhat improved, but she developed signs of congestive failure, which persisted in varying degree over the next two years (Case 9). In a second the surgeon was doubtful if he had been able to achieve a functional anastomosis, and the absence of any benefit and of continuous murmur after the operation supported this. A third had a Pott's operation (Case 1). The fourth seemed better at first but became worse again a few days later, probably from a thrombosis at the site of the anastomosis. She died at home a year later from "meningitis." The fifth, with tricuspid atresia, was better in colour and was able to do more, but this was only at the expense of heart failure, and his liver remained enlarged and pulsating. In spite of a period of treatment in hospital his congestive failure progressed, and he died after ten months (Case 10). The sixth, a girl aged 8, should probably not have been operated on, as she had never walked and had chronic nephritis, but her outlook without seemed hopeless. Her dyspnoea and cyanosis were improved after operation, but a month after leaving hospital she developed gross oedema and died suddenly a few weeks later with an exacerbation of her nephritis. At necropsy severe pulmonary stenosis with a single ventricle was found (Case 11).

There were two others who were at first in this group. However, second operations one or two years later have been followed by some improvement, so they have been included in that group.

Four patients, in all, have had a second operation, and none of them has achieved a good result. This may be bad luck, and often the surgeon has thought that he had not been able to make a good anastomosis, but it hardly encourages one to advise a second attempt when the first has not succeeded.

Group VI. Patients in whom Anastomosis was not Possible (11)

In 11 of the 176 patients who survived the operation no anastomosis was possible. They recovered from the operation unchanged, though one or two later claimed that they were somewhat improved. Two of them had transposition of the main vessels. In retrospect, this mistake should have been easy to avoid: the lung fields may look very dense from a heavy collateral circulation, but the markings are finer and more concentrated round the hilum or in the upper right mediastinum. It is, however, important not to make the opposite mistake of thinking that a collateral circulation indicates an increased blood flow to the lungs, and this has been one of the main medical reasons for angiocardiology.

Taussig (1948), in setting down the criteria for a successful anastomosis, included the presence of a suitable pulmonary artery; lack of this has been the most common cause of failure to complete an anastomosis. In four patients who are discussed in the section on pulmonary atresia no pulmonary artery could be found. In a fifth it was thought wiser to stop the search for the pulmonary artery because of the mass of collateral vessels: in retrospect he was thought to have pulmonary atresia though pulmonary arteries could be seen on the angiogram. In a sixth the pulmonary arteries were too small: the left was so minute that no anastomosis could be made, and at a second operation the right, although apparently adequate on angiocardiology, soon divided into three and proved too small even for an end-to-end anastomosis. In the last three technical difficulties prevented an anastomosis being made, and a further operation has been advised.

Group VII. Patients who Died at or Shortly After Operation (24)

Four of the 24 patients who died were in the groups that are discussed separately. Two (Cases 12 and 13) had a single ventricle and pulmonary stenosis, one with isolated dextrocardia and one with isolated laevocardia (Campbell, Reynolds, and Trounce, 1953). The third (Case 14) had isolated laevocardia, a bilocular heart, and pulmonary atresia, and the lungs were supplied through a persistent ductus (Campbell, Gardner, and Reynolds, 1952); the fourth also had pulmonary atresia with a persistent ductus. A fifth, a woman aged 24, had complete transposition of the great vessels and pulmonary stenosis.

Of the other 19, there were 5 (in addition to the two just referred to) who had pulmonary atresia. Surgical treatment is more dangerous in this subdivision of Fallot's tetralogy. The patient's life is dependent on the collateral arteries that have developed, and the division of some of these produces an extra risk of haemorrhage during operation and of lessening a pulmonary blood supply that is already scanty: in addition, the small and often thin-walled pulmonary artery is poor material for an anastomosis. Even after these difficulties were appreciated and special efforts made to avoid them, three patients with pulmonary atresia have died.

The remaining 14 patients had Fallot's tetralogy: 5 were 19 or older, this being nearly half the patients of that age who were operated on. Our figures show that the operation is more dangerous in the older patients (Table I), though the good results justify some extra risk. Those in whom operation has been advised were often losing ground, for the others are usually reasonably satisfied with the quiet life they can lead.

Even among the nine younger patients (all under 12 years) there was sometimes a special feature to account for the fatal issue: one had a single pulmonary artery and died when it was clamped for the anastomosis; a second had an aorta that arose entirely from the right ventricle; and a third had a large heart and almost a single atrium. A satisfactory feature of this analysis, therefore, is that among those who died there were only six young patients with uncomplicated Fallot's tetralogy.

Patients who leave the operating theatre in fair condition can be expected to do well, for nearly all those who died were already causing anxiety by the end of the operation. Of the 24 patients, 6 died during the operation, generally from cardiac arrest; three of these had Fallot's tetralogy and three had more complicated lesions. Another 13 died within the first 24 hours—two early cases from collapse of the lung after a prolonged operation, one from pulmonary oedema, and most of the others from intrathoracic haemorrhage (especially in pulmonary atresia) or from the effects of cerebral anoxia, usually the result of the low blood pressure and defective cerebral circulation during operation.

Only 4 of the 24 who died left the operating theatre in reasonably good condition with a completed anastomosis. These four died on the second or third day after operation—one from intrathoracic haemorrhage, the second suddenly and without any obvious reason, and the third and fourth after developing thrombosis at the site of the anastomosis. Thus, with one exception, all the patients who have died have done so within 72 hours of operation. This one, soon after a difficult operation, had such a severe haemorrhage of about 6 pints (3.4 litres) that she developed cerebral symptoms: after her death on the eighteenth day widespread pontine haemorrhages and thrombosis of the basilar artery were found. In 5 of the 24 patients who died it had not been possible to complete an anastomosis.

Objective Effects of the Operation

Most of the patients who were improved by the operation show a number of objective changes, which are briefly as follows: Less cyanosis at rest and on exercise, and less clubbing of the fingers and toes; some widening of the systemic pulse pressure; the development of a continuous murmur, similar to that of a persistent ductus arteriosus, arising from the anastomosis; a reduction in the polycythaemia; and an increase in the size of the heart as measured by the cardiothoracic ratio.

All these changes are not found in every case, and any one or more may be absent, except the anastomotic murmur, which is rarely so. They vary in degree in different patients, but, generally speaking, the greater the subjective improvement the greater these changes: it is reasonable to deduce that the greater the changes the larger the shunt through the anastomosis. While this is the picture gained by reviewing the group as a whole, individual patients show many exceptions to it. Each of the changes is discussed separately.

Cyanosis

In many of these patients the cyanosis changes greatly from time to time, and the degree present at any moment is determined by a large number of variables—for example, temperature, emotion, and recent exercise. In addition its assessment depends on the subjective judgment of the observer, so that although we have graded the cyanosis at each visit we have not thought it worth while to attempt any numerical analysis. Our general impression, confirmed by study of the data, is that the lessening of the cyanosis and of the disability are well correlated. When the initial cyanosis is only slight at rest, there is less room for improvement, and so the change is less striking, except perhaps after exercise.

Most patients still show cyanosis even at rest, although it may pass unrecognized by the relatives. About a quarter of the very good results and an eighth of the good results showed no cyanosis at rest, but only two patients showed no cyanosis after exercise. One, a girl of 6 with Fallot's tetralogy, had grade IV cyanosis and severe disability. At three and at four years after a successful operation she could do almost anything, and showed no cyanosis even after exercise. Her haemoglobin had fallen from 150 to 70%; the blood pressure had widened from 105/75 to 120/60; and the cardiothoracic ratio had increased from 52% to 65% at three years and to 67% at four years.

There was a very loud anastomotic murmur, and there is little doubt that this patient has a shunt that is larger than the optimum (Case 15).

There are also a few exceptions to the general rule at the other end of the scale—that is, a good result but yet with deep cyanosis. A boy aged 9 is a good example. Before operation he was severely disabled and cyanosed. Two years after operation he was regularly at an ordinary school and could walk two miles; but his cyanosis was still moderate, and his haemoglobin had fallen only to 125 from 141% (Case 16; see also Case 2).

Clubbing of the Fingers

Before operation the degree of clubbing usually corresponds with the degree of cyanosis. It seems to reflect the anoxaemia present during activity, as when it is more than would be expected for the cyanosis at rest the latter often increases more than usual on exercise. Baker *et al.* (1949) found that after operation the clubbing improved for about six months and then reached a stable level; longer follow-up has disclosed no reason to alter this impression.

The regression of the clubbing has generally been striking, but it is less consistent than the reduction of cyanosis. Only 10 patients had no clubbing after operation; all but one of these showed very good results, and none had more than moderate clubbing originally. In no case has severe clubbing been wholly abolished by a successful operation. It has always looked symmetrical in the two hands before operation, but afterwards the clubbing on the side of the division of the subclavian artery has sometimes been less than on the other side. The difference has been slight except for one patient, in whom it was specially noted at both visits, one and two years after a successful operation. These observations seem to be in keeping with the findings of Lovell (1950) and of Wilson (1952), who was able to demonstrate an increased finger blood flow in patients having clubbing from a variety of causes, and also changes in the clubbing in individual patients associated with corresponding changes in the blood flow.

Changes in Pulse Pressure

After subclavian-pulmonary anastomosis the peripheral pulse in the affected arm inevitably disappears. In every case the collateral circulation has developed well and there has been no trouble in the arm, but even four years after operation the radial pulse has rarely been detected and the blood pressure has never been measured by the sphygmomanometer.

Significant changes in pulse pressure due to the anastomosis must be caused by the blood flowing from the systemic to the pulmonary circuit through this. Generally the change is not great: this is hardly surprising, as even with a persistent ductus the pulse pressure is often not very wide and after subclavian-pulmonary anastomosis the flow is not usually expected to be very large. Satisfactory readings were available for comparison in only 103 of the 158 patients showing improvement (Table III), largely because the diastolic pressure was often difficult to determine before.

The blood pressure in these patients is probably not very different from that of normal children of the same age: the systolic pressures are mostly below 115 and often about

TABLE III.—Increase of Pulse Pressure after Subclavian-pulmonary Anastomosis

Result of operation	No Significant Change	Increase Between 15 and 30 mm.	Increase of 30 mm. or More	Total
Very good	53	11	9	73
Good	14	4	0	18
Somewhat improved	11	0	1*	12
Total	78	15	10	103

* The objective changes—the improved colour and capacity when in hospital—show that the operation had succeeded, but ten years in bed prevented her gaining corresponding improvement.

90-100, and the pulse pressures are rather on the small side. Comparison of the pressure before and after operation is complicated by its variability and by the natural increase that occurs with growth; the former has been allowed for so far as possible by comparing readings taken at different times. From Fleisch's (1927) figures it seems that the pulse pressure increases by about 2-4 mm. Hg a year during most of childhood: in the younger patients, therefore, in four years it may rise about 12 mm. Hg naturally, so that an increase of less than 15 mm. Hg may be without significance. In 18 of the 103 cases there was no change or a small fall in the pulse pressure, and in 60 there was an increase of less than 15 mm.; these changes were not thought to be significant. There were only 25, or about one-quarter of those benefiting from the operation, who showed a larger increase. With one exception (see footnote to Table III) all these showed great improvement. Nine of the 73 showing very good results had an increase of 30 mm. Hg or more, while in the four showing good results with the greatest increase, it did not exceed 25 mm.

There is some correlation between the larger pulse pressures and the larger hearts, but it is not very close. These larger increases must almost certainly be associated with large shunts, and all these patients show at least a moderate increase in the heart size, as well as reduced polycythaemia and lessened cyanosis. Case 15, quoted above, is a good example of this group.

The Anastomotic Murmur

After a successful systemic-pulmonary anastomosis, whether it is end-to-side or end-to-end, a murmur similar to that of a persistent ductus almost invariably appears. If it is not heard it may be that thrombosis or kinking has obstructed the opening.

The main characters of the murmur are fairly constant. It is essentially continuous throughout systole and diastole, with systolic accentuation. Its systolic element is nearly always distinguishable from the systolic murmur usually present beforehand by its lower pitch and its site of maximum loudness. The diastolic element is, however, the essential identifying feature. It is nearly always best heard in the first to third spaces below the medial half of the clavicle on the side of the operation, and is usually widely conducted so as to be audible through to the back.

The loudness of the murmur varies greatly, but it is easily heard in nearly three-quarters. Even when loud it is rarely accompanied by a thrill—a feature noted in only three patients, all with very good results.

Table IV shows that in most cases the murmur correlates with the result. The one case in which a very good result was obtained but no anastomotic murmur was heard seemed greatly improved at first and was thought to have a continuous murmur, but some days after operation the patient lost ground, the murmur could not be heard, and a thrombus at the site of the anastomosis was suspected. He was recorded as only somewhat improved, but he got better over the next year and eventually achieved a very good result. Another unusual feature is the development of a most striking collateral circulation over the chest, such

TABLE IV.—Relation of Anastomotic Murmur to Result of Operation

Anastomotic Murmur	No. of Patients Classified by Result of Operation			
	Very Good	Good	Some Improvement	No Improvement
Loud or good (102)	78	20	4	0
Moderate or faint (28)	15	8	4	1*
None heard (10)	1†	0	7	3

* Patients who died during the follow-up period have been classified according to the result judged before death. 27 cases have not been included in this table either because details about the murmur were not known (22 cases) or because they were obscured by a continuous murmur that had been present before the operation (5 cases).

† Case 9, q.v.
‡ See text.

as one sees in coarctation of the aorta; but it seems impossible that the thrombus should have obstructed his aorta when he has made such steady progress without any major illness, his femoral pulses can be felt normally, and there is no rise of blood pressure in the arms. A systolic murmur that is now heard may be part of the anastomotic murmur or may be due to the collateral circulation.

The seven cases that showed some improvement though no murmur was heard may have had small shunts through the anastomosis, or possibly may show the slight improvement that sometimes follows a thoracotomy even when nothing else is done.

Changes in the Blood Picture

A detailed study of the blood picture in morbus caeruleus before and after operation, including many of the cases reported here, has been published by Brinton (1951). From the experience of this longer series we find no need to amend his conclusions, and therefore do not propose to deal with this matter in detail. He found that in spite of some discrepancies there was, as a rule, good correlation between the clinical assessment after operation and the changes in the blood picture. In the two patients in whom the normal blood picture led to a more favourable view than the clinical assessment, the former has proved right and both have now achieved good results. In the 12 patients in whom the improvement was rated less highly on the blood picture than on clinical assessment the latter has generally been confirmed over the next year or two, and their improvement is certainly due to a successful anastomosis. In about half of these the haemoglobin percentage has fallen to somewhere near normal, but in the others it has still remained high (see Cases 2 and 16).

The haemoglobin has fallen to normal or near to normal in most of our patients who have had a successful operation. The mean fall in those with very good results is from 130 to 102% (Table V), but the range both before and after operation is very wide, and is shown in Fig. 1.

TABLE V.—Reduction of Haemoglobin After Operation

Result of operation:	Mean Haemoglobin Percentages				Death
	Very Good	Good	Some Improvement	No Improvement	
No. of cases	91	28	18	4	24
Before operation	130	129	137	119	148
After "	102	102	122	120	—

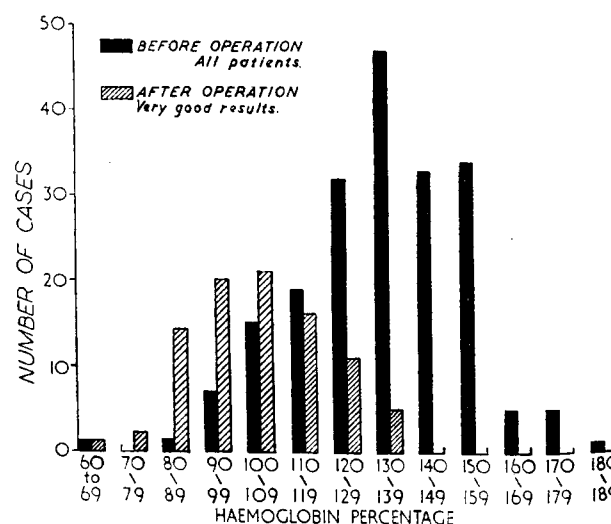


FIG. 1.—Frequency distribution of the haemoglobin percentages in all patients before operation and in those with very good results after operation. Before operation the majority were between 120 and 160%. After operation most were between 90 and 120% (100% = 15.6 g. %).

Before operation the majority were between 120 and 160%: after operation most were between 90 and 120%. Only those with very good results are included in Fig. 1, but the mean change is almost exactly the same in those with good results. It is much less in those who showed some improvement—the mean falling from 137 to 122%—and, as might be expected, does not show any change in the smaller number having no improvement. The high mean value in those who died after operation—148%; range 113-186%—reflects the greater average severity of this group.

Among those patients in whom an anastomosis was completed there were 31 without any significant reduction in haemoglobin. This includes 75% of the small number who were not improved, 39% of those who were somewhat improved, and only 18% of the greatly improved. Why some of the good results should fail to show a fall in haemoglobin is uncertain, but as the overriding aorta remains it is remarkable that so many achieve enough reduction in the anoxaemia to bring the haemoglobin down to normal. The haemoglobin remains high in some in whom the anastomosis is not adequate and probably in a larger number in whom the aorta is so dextroposed that there is still a large amount of mixing. Values less than 100% found in a few patients suggest that they were relatively anaemic—that is, had much less haemoglobin than might be expected for their degree of anoxaemia: correction of this after operation may account for some of those who do not show a fall of haemoglobin in keeping with the good result obtained.

Size of Heart

The reduced anoxia that follows from the increased blood flow to the lungs benefits the heart directly, but this is likely to be offset by the extra mechanical work that an effective anastomosis imposes. No reduction of heart size is therefore to be expected from the operation, and, indeed, an increase would be more likely, and was soon recorded (Blalock and Taussig, 1945).

It is almost a principle of cardiology that, other things being equal, the larger the heart the worse the prognosis. Naturally, therefore, the enlargement following these operations has been viewed with apprehension lest it should be progressive and foreshadow cardiac failure. It has, indeed, been used as the main argument against the opera-

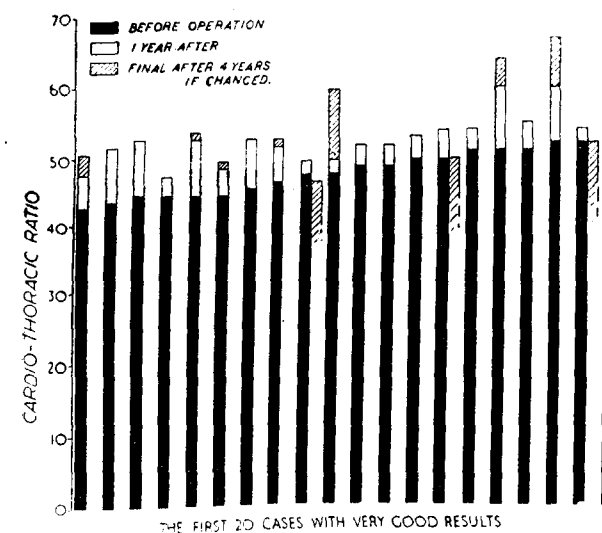


FIG. 2.—Size of heart as measured by cardiothoracic ratio before and after operation. The first 20 patients with very good results have been chosen for illustration and have been arranged according to the initial heart size. The unshaded area above each black column shows the increase in size within the first year. The lightly shaded area above this shows the increase during the subsequent three years, but, as will be seen, there was often no further increase; sometimes there was a decrease, shown by the shaded column on the right. Only three of these patients showed a significant increase after the first year.

tion. We have therefore paid particular attention to the heart size, assessing it for simplicity in terms of the cardiothoracic ratio—the maximum transverse diameter of the heart in the teleradiograph as a percentage of the transverse diameter of the inside of the thoracic cage, just above the diaphragm.

The changes in the heart size in the first 20 cases with very good results are shown in Fig. 2. The mean values in the various groups are given in Table VI, where they have been grouped according to the results, and in Table VII,

TABLE VI.—Cardiothoracic Ratio and Result of Operation

	Cardiothoracic Ratios: Mean and Ranges					
	Very Good Results	Good Results	Some Improvement	No Improvement	No Anastomosis	Operative Deaths
Before operation	48.8 39-63	51.0 44-61	50.1 43-57	57.8 51-64	52.5 43-57	50.8 45-61
After operation	52.0 39-67	53.7 44-69	51.9 41-58	52.6 52-67	—	—

TABLE VII.—Average Cardiothoracic Ratio at each Year After Operation (Very Good and Good Results Combined)

No. of Cases	Cardiothoracic Ratio				
	Before Operation	1 Year After	2 Years After	3 Years After	4 Years After
19	48.0	53.4	53.8	53.5	53.5
28	48.5	51.6	51.9	51.8	—
35	49.7	52.7	52.1	—	—
32	50.0	52.7	—	—	—

where they have been grouped according to the time that has elapsed since operation. The mean cardiothoracic ratio before operation is essentially the same in all groups, except that it is a little less in those who have shown very good results and much more in those who gained no benefit, probably because several of these had some more complex defect than Fallot's tetralogy, in which the heart is usually little, if at all, enlarged. After operation the heart size increases rapidly in the first month or so (figures not included in the table), and this increase on the average persists unchanged, at least for the four-year period of our observation. The average increase in the cardiothoracic ratio was 3 points—that is, from 49% to 52% or from 51% to 54%. This picture, gained from the means of the whole series, obscures some of the individual variations. The majority do behave in the manner described, but there are three smaller groups that behave differently: (1) those in whom the heart size shows no change; (2) those in whom it increases at first but subsequently gets less; and (3) those in whom it increases progressively.

In most instances any decrease during the period of observation probably results from a relatively greater increase in the chest than in the heart. Nearly all the patients in whom the heart later became smaller were about the age of puberty, a period when rapid growth of the chest may be expected. Only three of those who showed little if any improvement had any increase in heart size—presumably a reflection of the inadequate size of the shunt. There are, however, many patients who show very good results but no increase in the size of the heart. These patients and the others in whom the increase is only moderate and non-progressive must represent the ideal, where the general benefit to the patient is correctly balanced against the increased load on the heart. A smaller shunt would not give the benefit sought and a larger one might overburden the heart. It is unfortunate that so far we lack the knowledge and the means to tailor the anastomosis so as to achieve this optimum in everyone, but it is encouraging that, despite this, so many do achieve it.

There are also the patients in whom the shunt is too large as judged by the increase in the size of the heart and by

other changes. Symptomatically, these patients do very well unless the shunt is so much too large that congestive failure develops.

Twenty patients are doing well but have shown an increase in heart size that is progressive or at least greater than one would wish. In ten of these, all but one of whom showed very good results, it has shown no tendency to be progressive. In seven of the ten the increase was 7-9 points, but the heart was small, so the cardiothoracic ratio is still between 53 and 55%, and there seems no reason why the very good result should not last. In the other three the increase was only 6-7 points; but the heart was larger before operation, so that the ratio now is between 58 and 60%: in none does it exceed 60%, and it is hoped this will continue, though the long-term prospects of these patients can hardly be as good as in those with smaller hearts.

Of the ten patients in whom the heart has so far enlarged progressively three were not improved (Cases 9 and 10) or died after some initial improvement (Case 6): none of these had Fallot's tetralogy, two having tricuspid atresia and one some more complex lesion. The remaining seven all continue to show very good results, most of them for three years or more. Three had small hearts before operation, so that an increase of about 10 points still leaves them with cardiothoracic ratios between 52% and 55%, and, provided the increase now stops, they should continue to do well. The last four have ratios between 60% and 67%, either because the heart was larger at the start (one case) or because the increase was from 12 to 15 points (three cases) instead of the average of about 3 points. Case 15, the patient with the largest increase, has already been described. These four are the only patients who make us anxious about the possible onset of congestive failure in the near future, though in all other ways they are extremely well. The increase may be reversed, as has happened at least once (Case 18), but we can have no assurance of this.

The outlook is certainly better if the heart is smaller. The proportion of very good results to poor results combined with those in which the patients showed no improvement or died is 3.5:1 where the c.t.r. was 49% or under and 1:1 where it was above this.

We suggested earlier (Baker *et al.*, 1949) that the heart size helped in choosing patients suitable for operation, and that if the c.t.r. was above 52 or 54% less certainty could be felt about a good result. This is borne out by longer experience, but it is clear that there are several (nearly 10%) with a c.t.r. of 55% or above who have shown a very good result, even if it has less chance of lasting. So far these patients do not include an undue proportion of those with hearts getting progressively larger. One of the largest hearts was in this group, but the largest of all (c.t.r. 62%) was in Case 4; this patient was doing very well and showing some decrease in the heart size when he died with a cerebral abscess.

Progress after Operation

We have written so far, except in the discussion on the heart size, as if these changes occurred at once after operation and remained unaltered thereafter. A survey of the 107 patients followed for two years or more shows that this is generally but not always true. The first few months usually see all the main changes established.

The increased capacity is obvious almost immediately after operation, and the only patients not easy to assess early are the very young and those with such poor muscular development that they need some time to show their improvement (see Case 17 below). Apart from these, only eight patients were noted as improving further a year or two after the operation; in some this was probably no more than increased confidence, but in others, as judged by the objective signs, it seemed real organic improvement. These are balanced by six in whom there has been some suggestion of deterioration. In two this was due to the development of pulmonary tuberculosis and in two others

to chronic infections of the upper respiratory tract. There are, gratifyingly, only two in whom slight objective deterioration and a lessening murmur suggest that the anastomosis may be getting smaller. Even if this is so, and it is not certain, they form such a small proportion of the whole that they need not be regarded as early examples of what is likely to befall the majority at a later date.

Post-operative Complications.—Immediate complications have mostly not affected the results. There were three patients with Horner's syndrome on the side of the operation. Five patients had some intracranial thrombosis after operation, but the paresis has made such an excellent recovery that none find it a source of major disability, except one in whom a cerebral thrombosis has left him less intellectually able to do his work. Two patients showed signs of failure soon after the operation: this lasted a few weeks and cleared up spontaneously or with digitalis; but both have done well since.

Bacterial Endocarditis and Cerebral Abscess.—Later complications of the operation have, apart from the cardiac failure and deaths discussed elsewhere, been few. Rather surprisingly, bacterial endocarditis has not been troublesome, though Taussig *et al.* (1951) report 18 cases in their series of 1,000, two-thirds of them occurring soon after operation. Only one of our patients was treated (elsewhere) for subacute bacterial endocarditis, and the diagnosis was not established; subsequently he had a very good result (Case 17). In these patients a cerebral abscess has been found much more often than bacterial endocarditis. This is not the result of the operation but is connected with the right-to-left shunt which remains; it has also been more common than bacterial endocarditis among other patients.

Five patients developed signs of a cerebral abscess, 3, 4, 18, 26, and 34 months after their anastomosis. All except Case 4 (q.v.), who died, have made a good recovery after a further operation, but with some residual symptoms—for example, one has a visual defect of one quadrant and would otherwise be passed as normal except by those who know him well, to whom he seems to have lost something of his exceptional energy and enthusiasm. Two others have slight residual weakness but are able to lead reasonably normal lives. One other was admitted as a suspected case of cerebral abscess, but was thought to have a cortical thrombophlebitis; she recovered with conservative treatment but did not quite regain her previous activity.

Results in Special Groups

So far we have discussed the 200 cases as a whole, but some special groups are worth separate consideration. Two can be distinguished easily—tricuspid atresia and various forms of dextrocardia and isolated laevocardia—and a third, pulmonary atresia, with less certainty. It is not possible to separate the last completely, because the diagnosis can be certain only in fatal cases, and some successful ones may be listed as Fallot's tetralogy.

Tricuspid Atresia

There were seven cases of tricuspid atresia with a non-functioning right ventricle; this diagnosis was made when there was left ventricular preponderance on the electrocardiogram and left ventricular hypertrophy on radiology. All these seven survived the operation; but this must be regarded as good fortune, as it cannot be safer than in Fallot's tetralogy. It seems, however, that it is at least no more dangerous.

Two of the seven died within a year (Cases 6 and 10). The other five have all done well, three of them for two or three years. One has been described (Case 3). Another boy, aged 19, has been regularly at light manual work for two years and can walk four miles with ease, instead of half a mile with difficulty. His heart was very small, so that an increase in the c.t.r. from 39% to 46% still leaves it small.

A third boy, aged 8, was extremely blue, and walking 20 yards left him exhausted. At first it was difficult to say

how much his operation had helped, as he had such poor muscular development that he could not do much. Each year he has improved, so that now, after three years, he can run 50 yards or walk five miles and is regular at school. He has grown 6 in. (15 cm.) and put on 21 lb. (9.5 kg.) in weight (Case 17).

These three compare well with the best results in Fallot's tetralogy and have maintained their improvement for two or three years without much increase in heart size. The other two have done well but the heart has increased rather more in the first year, so longer time is needed to know if they will continue as good.

The difference between the successes and the two deaths may be related to the hearts being larger in the latter, although in one who did well it was nearly as large. The heart size seems the best guide to whether a patient with tricuspid atresia is likely to maintain the improvement after operation: if the c.t.r. is under 54% the good result may last at any rate for several years, but if it is 60% or more it is less certain, though there is not yet enough evidence to decide that operation is not worth doing.

The results of Taussig *et al.* (1951) show a mortality of 26% within six months of the operation. Our results are similar and not as good as in Fallot's tetralogy. The natural prognosis of tricuspid atresia is, however, much worse than that of Fallot's tetralogy. There have been six deaths in the 31 cases of tricuspid atresia among 1,124 cases of congenital heart disease seen in 1947-51. This is a higher mortality than in any other group, except perhaps in pulmonary atresia and transposition of the aorta and pulmonary trunk.

Dextrocardia and Isolated Laevocardia

There were six cases in this group—two with dextrocardia and complete situs inversus, one with isolated dextrocardia, and three with laevocardia but with the abdominal viscera transposed. In cases such as the last four the congenital defects are generally very complex. The mortality in this group was very heavy and half the patients died. These three have been described in the section on deaths after operation (Cases 12, 13, and 14).

Three patients survived, two doing extremely well. One (Case 18) had dextrocardia and situs inversus, probably with Fallot's tetralogy: after operation she could walk three miles instead of a few hundred yards. Her heart increased in size soon after operation, but became smaller during the next two years (c.t.r. 58 to 67% to 63%). Another, who had a continuous murmur that was thought to indicate bronchial artery blood supply to his lungs, probably with complete situs inversus, was able to lead a normal life without much increase in the size of the heart (Case 19). The third, with laevocardia and transposed viscera, was only slightly improved.

Very good results may therefore be obtained but cannot be expected with confidence in dextrocardia and isolated laevocardia. The results of Taussig *et al.* (1951) are better than these, but agree in showing a rather heavy mortality of 17% directly, and another 12% during the ensuing six months.

Pulmonary Atresia

Cases of pulmonary atresia are more difficult. The difference in the surgical treatment of this group and of Fallot's tetralogy is one reason for their separation (Allanby *et al.*, 1950), but the distinction is often difficult, and some cases of atresia are probably left undiagnosed among the cases of Fallot's tetralogy. This will give an unduly pessimistic view of the results of operation.

In a patient with the general picture of Fallot's tetralogy but with a loud and single second sound in the pulmonary area and without a systolic murmur the diagnosis of pulmonary atresia is likely. If the cardiac outline shows a very sharply defined pulmonary bay with an absence of a pulmonary trunk the diagnosis becomes more certain, and is further supported if there are also the special features

that indicate a bronchial artery blood supply to the lungs—isolated nodular shadows in the hila and heavy vascular markings in the right upper quadrant caused by bronchial arteries passing from the arch of the aorta (Campbell and Gardner, 1950). There may be a continuous murmur that is indicative of pulmonary atresia (or sometimes truncus arteriosus) with a collateral blood supply through a persistent ductus or bronchial arteries.

Generally, angiocardiology should be used to confirm the presence of adequate pulmonary arteries beyond the atresia, but in patients with recurrent attacks of unconsciousness we have sometimes thought that thoracotomy is the lesser risk. It should never be dispensed with in this group on other grounds, even though there seem to be pulmonary arteries on radiology.

(a) *With a Continuous Murmur.*—There were nine of these cases (including the two considered in the dextrocardia group). Two died soon after operation (Case 14 and another); in a third no artery adequate for an anastomosis could be found. In the other six the surgeon succeeded in carrying out a subclavian-pulmonary anastomosis, though in three this had to be end-to-end: all these patients were improved. The first, instead of being an invalid who could walk 200 yards, could soon lead a normal life and walk four miles, including many Devonshire hills; her cyanosis was much less and her haemoglobin percentage returned to normal. Her heart, which had been small, increased soon after operation (c.t.r. 43 to 53%) but no further in the next three years, and her improvement is maintained. Case 19, with an equally good result after two years, has been described. The other four have not been followed for so long; all are improved, including two who had end-to-end anastomoses (one very good, two good, and one somewhat improved). All were thought to have patent pulmonary arteries beyond the atresia, one with a persistent ductus and the other three with a bronchial artery blood supply to the lungs.

(b) *Without a Continuous Murmur.*—There were 12 cases: five of these died, two before the special problems of this group had been fully appreciated, and three later, when we were well aware of these. In four more no operation was possible as no artery suitable for an anastomosis was found: two of these were early cases, but the two recent ones, in which the mistake should have been avoided, were accepted as having adequate pulmonary arteries—one after radiology and one even after angiocardiology.

These results are so bad that pulmonary atresia might seem unsuitable for operation, but two of the three good results were outstanding, and it seems unlikely that those without a continuous murmur are worse subjects for operation than those with such a murmur. As an example, one boy was deeply cyanosed and could hardly walk at all; now, two years later, he goes to an ordinary school and is ready to spend his time fighting with the other boys, and hardly shows any change in colour. There is no undue increase in the size of his heart. The clinical diagnosis of pulmonary atresia with a bronchial artery blood supply seems almost certain. In the third the improvement was only moderate.

Comparison of Fallot's Tetralogy with other Groups

Discarding the 32 cases of the special groups described and three cases with transposition (one with the addition of pulmonary stenosis) wrongly put forward for operation, there remain 165 cases in which the diagnosis was simple Fallot's tetralogy. We know that, in fact, two of these had a single ventricle and another an aorta that arose entirely from the right ventricle, but these are points that cannot be diagnosed with certainty on clinical grounds, so we have left them with the group of Fallot's tetralogy. Even so, the results for Fallot's tetralogy are very much better than for the other groups, and the operative mortality is 8% and the expectation of a good result 75%. In the more complicated groups, on the other hand, the mortality so far has been nearly 30%, and the good results only about 35%. Unless this result can be improved with further experience, operation should be advised in these cases only when they seem favourable and only in special centres where every facility for investigation and surgical treatment is available.

Summary and Conclusions

The results of 200 anastomotic operations in patients with morbus caeruleus are described, nearly all of them having been followed for more than a year and several for four years. Most had Fallot's tetralogy, and here the results were excellent. Many were seriously ill, but only 8% died and 75% benefited greatly, so that they can walk a mile or more and lead lives that are almost normal without too much physical activity. In the smaller number of more complex lesions, such as tricuspid atresia, dextrocardia, and pulmonary atresia, the results were much less good. The total mortality was nearly 30%, and only 35% obtained the good results. More experience is needed to decide which of these patients can hope to benefit from operation, but some tentative suggestions are made.

Most patients have an increased capacity and lose much of their cyanosis, clubbing, and polycythaemia. Some cyanosis, at least on exercise, and some clubbing generally remain unless they were very slight. The haemoglobin usually falls from between 120 and 160% to between 90 and 120%. In nearly all the successful cases a continuous murmur can be heard at the site of the anastomosis, and the presence of this soon after the operation is often one of the best indications of success. The pulse pressure may be a little wider as the result of the anastomosis, but not often much wider.

Generally the improvement gained in the first few months after operation is a good guide to the future and is maintained. The annual mortality rate is not much above 1%, and this includes the risks to which these patients are inevitably exposed whether they have an operation or not.

Special attention has been paid to the increase in the size of the heart because this has been thought to be the great drawback to the operation. Generally the increase is not great, and is not progressive after the first few months. The cardiothoracic ratio may increase quickly from 48 to 52% and then remain constant during the period of observation. A few patients in whom the increase is great or even progressive make us anxious lest they may develop congestive heart failure, but except for three with complex lesions in whom this happened within the first six to nine months no others have yet done so.

It is a pleasure to express our thanks to the surgeons who have made this work possible: Mr. R. C. Brock, who has operated on the largest number, Mr. T. Holmes Sellors, and Mr. Ian Hill. Mr. Holmes Sellors has added to our indebtedness by the great trouble he and his surgical staff have taken in keeping us so fully informed about patients operated on in another hospital. We should also like to thank the staff of the cardiac department, who during the last four years have helped with the follow-up at different stages, the doctors who have sent us reports on their patients, and Miss M. Waldron, of the department of illustration, Guy's Hospital, for the charts.

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RADIOACTIVE PHOSPHORUS (P^{32}) IN
TREATMENT OF MENORRHAGIA*

BY

H. C. McLAREN, F.R.C.O.G.

J. C. HEATH, B.Sc.

AND

A. QUINTON, M.Sc.

(From the Department of Obstetrics and Gynaecology,
Queen Elizabeth Hospital, Birmingham)

If menorrhagia persists after curettage in the over-40 age group a decision on radical treatment either by induction of the menopause or by surgery may be necessary to avoid anaemia and increasing general debility. Both methods have disadvantages, however; radium or deep x rays practically castrate the patient, so that flushings and premature age-effects such as senile "spotting" of the vagina or introital fissuring may develop (McLaren, 1950). Surgery with ovarian conservation may avoid these sequelae, but it carries a small but definite mortality and morbidity.

The idea of avoiding radical treatment by destroying the endometrium is not new; ten Berge (1936) in Holland, for instance, has described a method of uterine thermocautery which had some success. Our present experiments of irradiating the uterus with beta particles were conducted on the suggestion of Dr. A. G. Glucksmann. As beta particles from a source such as radioactive phosphorus are stopped by the surface layers of tissue it seemed that surface endometrial cautery and uterine haemostasis might be achieved without destroying ovarian function.

The difficulty in constructing an applicator which would pass the human cervix yet allow irradiation of the whole of the cavity of the uterus led us to use a balloon on the lines described by Simon (1949) and by Douglas and his colleagues (1950, 1951). The human uterus, however, is not distended without a high pressure of air or fluid, and this led to difficulty in containing the balloon *in utero*. In the end a simple rod-shaped applicator designed by one of us (J. C. H.) was used, and proved to be easy and safe to handle. Despite the shape of the normal uterine cavity a wide area of endometrium was burned by P^{32} .

The Applicator

In the preliminary experiments three layers of filter paper were wound tightly around an acrylic resin rod 4 cm. long and 1 cm. diameter (Fig. 1). An aqueous solution of sodium phosphate containing the radioactive phosphorus isotope P^{32} was distributed evenly over the filter paper and evaporated. The completely dry filter paper was coated with a solution of acrylic resin.

In later experiments moist filter paper was moulded over the whole surface of a cylindrical "perspex" former with a hemispherical upper end. An aqueous solution of sodium hydrogen phosphate in which the phosphorus is radioactive was allowed to evaporate to produce a dry surface evenly covered with P^{32} . A thin sheath of perspex (0.25 mm. thick) was slipped over the filter paper and a seal made with perspex solution in chloroform at the lower end. This applicator has two advantages: (1) it is easier to assemble, more robust, and less likely to contaminate the patient; and (2)

thinner filter paper may be used, and there is therefore less error due to self-absorption; the absorption in the perspex cover can be allowed for in the calculation. A "winged" applicator was also used which, when in position, formed a letter Y (Cases 10 and 14). The amount of P^{32} used per unit area was the same as for the rod applicator. The two upper short rods were 2.5 cm. long and the single rod 3.5 cm. long; the diameter of all three was 0.8 cm.

Care was taken not to damage the plastic shell containing the P^{32} at insertion into the uterus. For sterilization, 1 in 20 "dettol" was used.

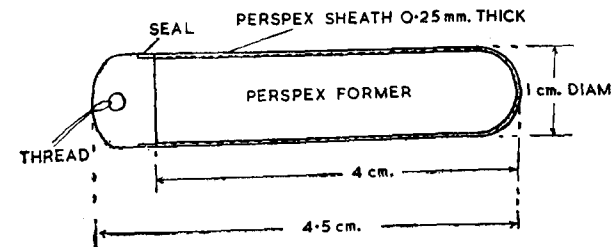


FIG. 1.—The applicator consists of a rod with a covering of P^{32} impregnated blotting-paper ensheathed in perspex.

Animal Experiments

To test the efficacy of the applicator and to prove its ability to contain the P^{32} , tests were made on the vagina of the rabbit. With the animals anaesthetized, P^{32} applicators were inserted into the lower vagina and held in position by vulval sutures of thread. Dummy applicators were used in control animals. With the loaded applicator in position the animals remained healthy, although the vulva became oedematous. Micturition, however, was undisturbed. After the removal of the applicators the vulval oedema rapidly disappeared, although even 14 days later there was a definite cuff of perivaginal thickening at the site of the P^{32} burn (Table I).

Histological Changes after P^{32} Irradiation

The beta-radiation from P^{32} caused a complete necrosis and loss of surface epithelium. Deep to this, the damage to stromal cells was difficult to interpret—that is, it was difficult to say if some of the stromal cells with granular cytoplasm and indistinct nuclei might recover. There was pronounced inflammatory reaction of the deeper tissue due to the surface burn and to those beta particles which penetrated beyond the necrotic surface layers. Leucocytes crowded the stroma, which was oedematous and showed many free erythrocytes. In this partly inflamed, partly damaged area at the periphery of the damaged vagina it was difficult to define exactly the limit of cauterization by P^{32} . Admitting these difficulties, however, it is safe to say that a cuff of vagina was destroyed to a depth of 2 mm. Deeper to that, of course, the tissues were inflamed and oedematous, but not necrotic.

TABLE I.—Effect of P^{32} on the Vagina of a Rabbit: Severe Tissue Damage was Caused to a Depth of About 2 mm.

No.	Details of Applicator				Surface Dose r.e.p.	Depth Dose in Röntgens Equivalent Physical					When Killed	Gross Effects	Histology
	Quantity	Time Hours	Length cm.	Diam. cm.		1 mm.	2 mm.	3 mm.	4 mm.	5 mm.			
1	4.75	120	4	1	190,000	59,000	21,000 10,000	7,000 r.e.p. at 2.8 mm.	2,500	900	Immediately	Vulvar oedema; perivaginal oedema with slough of mucosa	Severe burn, but not complete destruction of tissues down 2 mm.; marked vascularity
2	4.75	120	4	1	190,000	59,000	21,000 10,000	7,000 r.e.p. at 2.8 mm.	2,500	900	After 8 days	Vulvar oedema and marked perivaginal thickening	Slough of lining mucosa and submucosa to a depth of 2 to 3 mm. Deeper to the burn, marked oedema and capillary dilatation
3	4.75	120	4	1	190,000	59,000	21,000 10,000	7,000 r.e.p. at 2.8 mm.	2,500	900	After 14 days	Thickening of perivaginal tissue	Slough separating; lumen packed with inflammatory cells and necrotic tissue; marked submucosal fibrosis and capillary thrombosis, especially in cavernous tissue of clitoris

*Read before the Birmingham and Midland Obstetrical and Gynaecological Society on March 26, 1952.

Clinical Experiments

First of all a dummy applicator was inserted into the uterus of a patient due to have a hysterectomy for menorrhagia. Transcervical sutures of thread were found to hold the applicator safely in the uterus. With this normal (parous) uterus most of the endometrium was found at hysterectomy to be in contact with the applicator. The tissue subjected to histological study served as a control for the irradiated cases.

Four patients—three of whom had uterine fibroids—were then treated with the rod-shaped applicator carrying P^{32} . Total hysterectomy and bilateral salpingo-oophorectomy was carried out within 21 days. After histological studies a further 11 patients were treated with P^{32} , and to judge its curative effect on menorrhagia three months were allowed to pass before hysterectomy.

Prior to insertion of the applicator a bimanual examination of the uterus and appendages was made; curettage of the uterus was also carried out in most cases. On three occasions, however, despite careful bimanual examination and uterine exploration by curette, we failed to diagnose fibroids which were obvious in the uterine muscle on section after hysterectomy. Our failure to make the diagnosis is perhaps excusable because of the intramural position of the fibroids.

After hysterectomy the uterus was opened, photographed, and sectioned to show the depth of burn produced by P^{32} , the degree of endometrial regeneration, and the state of the tubes and ovaries.

Clinical Observation with P^{32} in Utero

As we gained confidence in the technique the patients were allowed up in the ward with the applicator *in utero*. They felt no discomfort or "radium-sickness," although mild flushes of the face affected two patients (out of 15). One patient (Case 6) complained of a pink discharge during the three months between treatment and hysterectomy. She proved to have a mild endometritis with mild endosalpingitis. At operation she had the first "menstrual" loss for three months, and the resulting congestion of the abdominal wall and pelvis made haemostasis difficult. Although the degree of endometrial inflammation was slight, no doubt it added to the physiological congestion of ovarian-pituitary origin. This "menstrual" congestion caused difficulty with haemostasis in another patient (Case 16), although there was no warning uterine bleeding. These two cases are of special interest, since the menstrual congestion of ovarian origin no doubt affected all other patients, whether they menstruated or not.

The need to remove the lower uterus and cervix in another patient led to an unusually difficult dissection of old-standing tough scar between rectum and posterior cervix. A small puncture of rectum followed, but it was easily sutured and caused no trouble during convalescence.

Lastly, our 15-year-old patient, who was bedridden with gross rheumatic heart disease, caused anxiety at hysterectomy.

This girl had been almost exsanguinated with menorrhagia on several occasions; she had repeated transfusions and repeated curettage, and had resisted all efforts to cure her with hormones. After 12 months of bleeding it was thought that hysterectomy might extend the short life

TABLE II.—Control of Menorrhagia by P^{32}

Case	Age	Curettage	1st Menses	2nd Menses	3rd Menses
5	49	Metropathia	Normal	Normal	Normal
6	49	No curettage obtained	Nil	Nil	Began at operation
7	44	Normal proliferative phase	Trace	Normal	Normal
8	15	Metropathia (undiagnosed fibroid)	Loss slightly less	Loss slightly less	Relapse: flooding
9	48	Metropathia (undiagnosed fibroid)	Flooding	Flooding	Emergency hysterectomy
10	43	No curettage	Trace	Nil	Nil
11	36	Patchy metropathia	Nil	"	Normal loss
12	45	Premenstrual (undiagnosed small fibroid)	Heavy	Trace	Normal (4th period flooding)
13	45	Proliferative	Flood	Nil	Normal
14	45	Metropathia	Nil	"	Nil
16	47	No curettage	"	Trace	"

Of 11 patients, 7 were successfully treated; 1 relapsed after 3 months; another was improved for only 2 months; while 2 (with unsuspected fibroids) were failures.

prognosticated by her physician. P^{32} produced only temporary benefit, and hysterectomy with ovarian conservation was undertaken. She collapsed at operation, but a blood transfusion brought a remarkable improvement, and the operation was concluded without difficulty. Convalescence was satisfactory.

Control of Menorrhagia by P^{32}

Of 16 patients treated with P^{32} , 11 were given a three-months trial before hysterectomy. The period of three months was laid down by the Medical Research Council, who advised us in these experiments. It is, of course, not sufficient time to assess the value of P^{32} as a haemostatic agent. Nevertheless, improvement as judged by the onset of amenorrhoea or normal menstruation was achieved in eight of eleven patients; one patient was improved for two periods and then relapsed, while the following two patients with unsuspected fibroids of the myometrium were failures.

Case 9.—A 6-para aged 38. At curettage the uterus measured 3 in. (7.6 cm.) by sound; it was uniformly bulky, but it was not thought to contain a fibroid. Curetting showed metropathia. After P^{32} she had 45 days of amenorrhoea followed by a severe uterine loss over 10 days. She was admitted to a neighbouring hospital as an emergency and after three pints (1.7 litres) of blood

TABLE III.— P^{32} Histology.

Case	Age	Curettage	Hysterectomy	Details of P^{32} Applicator				Surface Dose r.e.p.	Estimated Depth of Burning mm.	Clinical Results	Pathology
				Type	Quantity mc.	Time Hours	Length cm.				
701	53	No curettage obtained	17th day	Rod	3.82	71	4.0	1.1	150,000	2.5	Insufficient time
702	36	No curettage	18th "	"	3.14	68	4.0	1.1	118,500	2.3	" "
703	42	Normal proliferative	15th "	"	2.72	101	4.0	1.1	147,000	2.5	" "
15	45	Metropathia	7th "	"	3.40	123	3.5	0.8	187,000	2.75	" "
5	49	"	3 months	"	4.75	120	4.0	1.0	250,000	3.0	Normal menses
6	49	No curettage obtained	3 "	"	4.75	120	4.0	1.0	250,000	3.0	Amenorrhoea
7	44	"	3 "	"	3.50	152	4.0	1.0	240,000	2.9	3 improved periods then relapse
8	15	Normal proliferative	3 "	"	4.75	128	4.0	1.0	265,000	3.1	Amenorrhoea, 6 weeks, 1 normal period then relapse
9	48	Metropathia	2 "	"	4.6	57	4.5	1.0	110,000	2.25	Flooding
10	43	No curettage	3 "	3-piece	7.25	100	3.5 (2.5)	0.8	194,000	2.65	Amenorrhoea
11	36	Metropathia	3 "	Rod	4.75	100	4.5	1.0	200,000	2.8	Amenorrhoea 8 weeks, then normal period
12	45	Normal premenstrual	3 "	"	4.35	84	4.0	1.0	176,000	2.65	Normal menses
13	45	Proliferative normal	3 "	"	4.75	123	4.0	1.0	252,000	3.0	" "
14	45	Metropathia	3 "	3-piece	7.6	123	3.5 (2.5)	0.8	190,000	2.8	Amenorrhoea
16	47	No curettage obtained	3 "	Rod	4.75	124	4.0	1.0	255,000	3.05	"

Although a superficial endometrial burn was caused by P^{32} , recovery with endometrial regeneration followed. Nevertheless, haemostasis was obtained in 9 out of 12 cases.

hysterectomy was necessary. The anterior wall of the uterus was found to contain a fibromyoma the size of a hen's egg (see also Tables II and III).

Case 12.—A 3-para aged 45. At preliminary curettage the uterus was carefully palpated and fibroids were sought in the uterine cavity with the curette. The uterus was bulky, the cavity $3\frac{1}{2}$ in. (8.9 cm.). A small cervical polyp was removed. The curettings accorded with her menstrual cycle (secretory phase). After P^{32} , menstruation followed at about monthly intervals—namely, heavy loss for seven days, then two normal periods, then a relapse with severe bleeding. At operation a cluster of fibroids some 2 cm. in diameter occupied the upper myometrium.

Two further cases were only partially relieved by treatment with P^{32} :

Case 7.—This patient, aged 44, had three normal periods—that is, an improvement for 103 days—then a recurrence of heavy bleeding. The uterus was bulky, with a myometrium $3\frac{1}{2}$ in. (8.3 cm.) thick but without fibroids. No histological evidence of P^{32} burning persisted.

Case 8.—A girl aged 15 had severe cardiac disease; she had been treated by repeated curettage and blood transfusions. P^{32} led to some improvement for eight weeks, but her third period was heavy. Hysterectomy with ovarian conservation was performed, but there was no uterine abnormality, apart from a hyaline "burn" necrosis of the endometrial stroma.

Effects of P^{32} on the Uterus

Gross Pathology.—Apart from the presence of fibroids or thick myometrium (see Table III), there was little of note to record in the specimens removed at hysterectomy. The ovaries, of course (which would have been severely damaged

by radium), showed obvious signs of activity such as follicles or corpora lutea. In the endometrium the site of burning by P^{32} was obvious—for example, in Case 15, subjected to hysterectomy seven days after P^{32} , the endometrium was burned and congested at the site of irradiation, while as long as three months after irradiation the site of burning was still definable in some specimens.

Histology (Table III).—No specimen was obtained earlier than seven days after irradiation, so that, although the surface dose of beta-irradiation amounted to about 200,000 r.e.p. in both animal and human experiments, we have no human tissue obtained on the conclusion of irradiation. From Cases 15 (seven days after P^{32}) and 702 (18 days after P^{32}) it appeared, however, that the depth of endometrial burn was no more than 1.5 to 2 mm. in the human uterus (Figs. 2 and 3). As in the rabbit's vagina, the surface epithelium and endometrium was necrotic, while the deeper layers were severely damaged and inflamed, with capillary dilatation and clotting, oedema of the stroma, leucocytic infiltration, and so on. As in the rabbit histology, it was difficult to draw an exact outer limit to the depth of cautery achieved by P^{32} . With previous curettage of the uterus, of course, a surface burn and inflammatory reaction affect the deeper part of the endometrium. Nevertheless, the deeper glands and stroma nearest to the myometrium or embedded in the surface muscle appeared to escape irradiation injury, and as recovery proceeded regeneration of endometrium followed. After three months the surface epithelium occasionally showed marked irradiation distur-

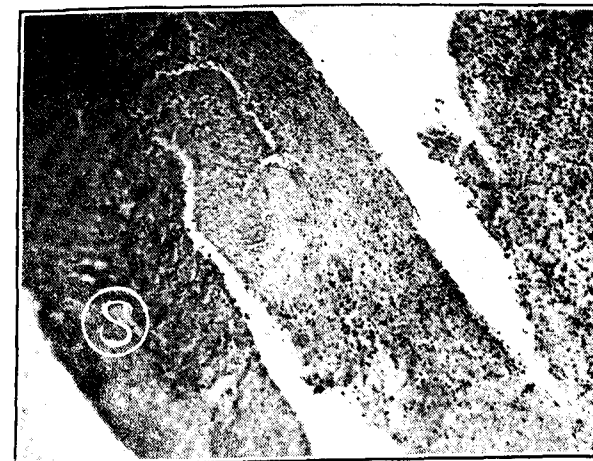
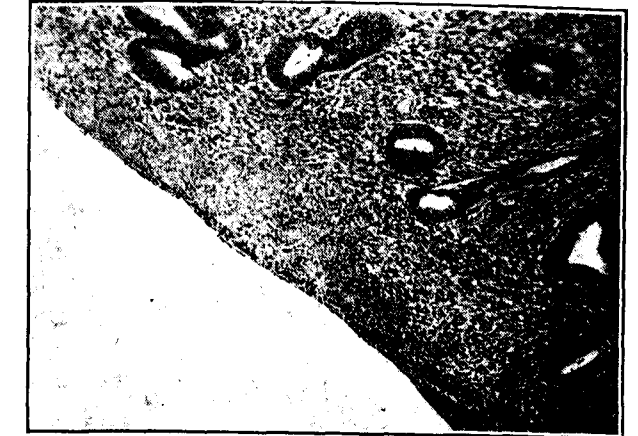
FIG. 2.—Case 15. P^{32} caused a surface slough (S), seen separating from tissue which is infiltrated with inflammatory cells.

FIG. 3.—Case 702. Irradiation necrosis of the surface endometrium has not penetrated far enough to destroy deeper glands and stroma.

FIG. 4.—Case 10. After three months. Although some specimens showed apparent recovery from P^{32} , others showed areas of surface epithelium with the irradiation distortion depicted here.

FIG. 5.—Case 11. Three months after 200,000 r.e.p. a type of hyaline or waxy necrosis of stroma developed beneath the lining epithelium (M). In this specimen the "burn membrane" extended down to the upper part of the cervical canal.

tion, while below the surface a waxy or hyaline appearance of the stroma was observed. This we have called a "burn membrane," and it was obvious in four specimens (Figs. 4 and 5). Finally, the ovaries were sectioned in all specimens for evidence of irradiation effects, but, apart from simple follicular cysts, the ovaries were normal.

Intra-epithelial Cancer.—It was an extraordinary coincidence that the first patient to be treated with P^{32} should prove to have what Dr. A. G. Glucksmann calls "near or pre-cancer" of the cervix. The patient was used as a "carrier" of P^{32} , and, of course, surgery was planned when she had recovered from her anaemia. Dr. C. W. Taylor writes: "At the squamo-columnar junction of the cervix there is considerable epidermization of the mucous glands with areas of atypical epithelial proliferation. One section shows apparent pre-cancerous changes with a suggestion of early carcinomatous infiltration, but serial sections taken from the block show, in fact, no more than an indirect cut of a 'cleft' with atypical proliferation of the basal epithelium. The lesion found, therefore, is no more than a tiny fragment of pre-cancer without true carcinomatous infiltration."

The area of cervix in question was well outside the range of beta particles emanating from the applicator, so that the pre-cancerous changes were coincidental.

Discussion

P^{32} produced a surface burn of the endometrium some 2 mm. in depth without ovarian damage. The resulting slough with inflammatory reaction and vascular thrombosis was healed in about 90 days with endometrial regeneration. A recurrence of menorrhagia, however, did not follow in all cases, and, although only 11 out of 16 cases were subjected to a three-months trial, we can report a cure in seven and an improvement in two. Menstruation usually reappeared, suggesting that no more than temporary haemostasis can be expected of the method. Nevertheless, even temporary haemostasis, if it could be guaranteed, would be valuable—for example, in younger women who declined radical treatment or who wished to have children. Not only would the patient be freed from serious haemorrhage, but menstruation when re-established might be normal. The same possibility of normal menstruation after P^{32} exists in the older age group studied in this series, although, of course, the achievement of the amenorrhoea of the menopause without ovarian destruction is the aim of treatment.

The carcinogenic action of x rays or repeated small doses of gamma rays on the skin raises the possibility of endometrial cancer as a sequela of beta-irradiation of the uterus. If, however, the endometrium heals after a surface burn, as happened in most of our cases, and, secondly, if menstruation and shedding of the endometrium follow, it seems unlikely that cancer will develop. Nevertheless, cells which have been irradiated by sublethal doses of beta rays must undergo proliferation, and it is not known if these cells have a tendency to become carcinomatous. The problem must therefore be held *sub judice*, and certainly all patients treated with P^{32} (without hysterectomy) will require a prolonged follow-up so that in time we may have the answer to the question of the risk of carcinogenesis.

The possibility of foetal abnormality is another theoretical objection to the irradiation of the uterus without castration, in that the ovum, by embedding itself in damaged tissue, might in some way grow abnormally. By the time the endometrium has been shed at menstruation, however, and by the time it has recovered sufficiently to develop premenstrual endometrium, it seems a very remote possibility that a healthy ovum would suffer any damage as it developed *in utero*. The ovaries, of course, are not subjected to beta-irradiation, and there is therefore no question of fertilization of a damaged ovum.

Finally, with the idea of achieving a deeper endometrial burn we are now experimenting with cerium¹⁴⁴. Beta particles from this have a maximum energy of 3.1 meV., and in theory the radiation should burn endometrium to a

depth of 5 to 7 mm. If this calculated depth is in fact achieved we may obtain better clinical results. A further improvement may also follow the development of an applicator which will irradiate all of the endometrium.

APPENDIX A

Calculation of Dose in Equivalent Röntgens at Various Depths

Absorption experiments in tissue-like materials (alkathene wax) show that the beta rays from the P^{32} emerging from the applicator had a half-value layer of 0.075 cm. and an absorption coefficient of 9.23 cm.⁻¹ in tissue. The blackening of photographic film was used to confirm the even distribution of the P^{32} along the applicator and also the calculated dose rates.

Let l = length of filter paper in cm.
 $2a$ = diameter of filter paper in cm.
 t = thickness of perspex sheath in cm.
 q_0 = strength of P^{32} in mc. when applicator inserted.
 q = " " " " " " removed.
 Decrease in strength = $(q_0 - q)$ mc.
 Number of beta particles emitted during treatment =
 $(q_0 - q) 6.57 \times 10^{13} = N$.

Consider the number of particles crossing the boundary of an elementary cylinder diameter $2r$.

Half the particles emitted will be ejected outwards from the filter paper, and allowing for the absorption of the rays:

$$\text{No. of particles crossing the boundary} = \frac{N e^{-9.23(r-a)}}{2}$$

$$\text{No. of particles absorbed in the elementary volume } 2\pi r l dr =$$

$$= \frac{N}{2} \times 9.23 \times e^{-9.23(r-a)} \times dr.$$

$$\text{No. of particles absorbed per unit volume} = \frac{N \times 9.23 \times e^{-9.23(r-a)}}{4\pi r l}$$

Assuming that the beta particles have an average energy 1.12×10^{-6} erg.

$$\text{Energy absorbed} = \frac{N \times 9.23 \times e^{-9.23(r-a)}}{4\pi r l} \times 1.12 \times 10^{-6} \text{ erg. g.}$$

$$\text{Depth dose} = \frac{N \times 9.23 \times e^{-9.23(r-a)} \times 1.12 \times 10^{-6} \text{ r.e.p.}}{4\pi r l \times 85}$$

If we put $r = a + t$,

$$\text{Surface dose } S = \frac{N \times 9.23 \times e^{-9.23.t} \times 1.12 \times 10^{-6} \text{ r.e.p.}}{4\pi r l \times 85}$$

$$= \frac{(q_0 - q) 6.57 \times 10^{13} \times e^{-9.23.t} \times 1.12 \times 10^{-6}}{4\pi (a+t) l \times 85}$$

$$\text{Surface dose } S = \frac{(q_0 - q) e^{-9.23.t} \times 6.36 \times 10^5}{(a+t) l} \dots (1)$$

$$\text{Tissue dose} = S \times \frac{(e^{-9.23(r-a)})}{(e^{-9.23.t})} \times \frac{a+t}{r} \dots (2)$$

$$= S e^{-9.23(r-a)} \times \frac{a+t}{r} \text{ r.e.p.}$$

For the standard applicator $l = 4$ cm., $a = 0.475$ cm., $t = 0.025$ cm. The value of $q_0 - q$ varies, but is approximately 1 mc. If we substitute these values,

$$S = \frac{e^{-9.23 \times 0.025} \times 6.36 \times 10^5}{2} = 252,000 \text{ r.e.p.}$$

$$\text{Percentage depth dose} = 100 \times e^{-9.23(r-0.5)} \times \frac{0.5}{r} = 50 e^{-9.23(r-0.5)}$$

$$\text{If } d = \text{depth in cm. \% D.D.} = \frac{50}{0.5+d} e^{-9.23.d}$$

Table Showing How Dose Varies With Depth

Depth in mm.:	Surface	1	2	3	4	5
% D.D.	100	37	11.3	3.9	1.39	0.5
Tissue dose in rep	252,000	80,600	28,500	9,800	3,500	1,260

The minimal lethal dose of radiation on endometrium is not known, but if 10,000 r.e.p. is accepted as a lethal dose then the "cautery" effect of 5 mc. of P^{32} in the uterus for five days is about 3 mm.

Summary

A method is described for producing uterine haemostasis by P^{32} without damaging the ovaries.

A surface burn by P^{32} is quickly healed and regeneration of endometrium follows.

Preliminary animal experiments were followed by a clinical trial on 16 patients, 11 of whom were allowed three months between irradiation and hysterectomy. Seven cases were cured, two were somewhat improved, and two, with unsuspected fibroids, were failures.

We wish to thank Dr. A. G. Glucksmann, of the Strangeways Laboratories, Cambridge, who initiated and took part in this study, and Dr. C. W. Taylor, Director of Pathology at the Birmingham and Midland Hospital for Women, who advised us on the histology. We are also grateful to our colleagues Miss M. Neville and Mr. L. M. Park, Selly Oak Hospital, who operated on one of the patients and sent us the clinical notes and pathological material to complete this report. Finally, we wish to thank Miss M. E. Attwood and Mr. D. H. S. Boyd for technical assistance.

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VARIATION IN TECHNIQUE OF INTRACUTANEOUS B.C.G. VACCINATION

BY

CARROLL E. PALMER, M.D.

Director, Tuberculosis Research Office, World Health
Organization, Copenhagen

AND

PHYLLIS Q. EDWARDS, M.D.

Medical Officer, Tuberculosis Research Office, World Health
Organization, Copenhagen

The technique for giving an intracutaneous injection is ordinarily set forth very clearly: 0.1 ml. of fluid is to be injected as superficially as possible into the skin. Yet when even such a simple procedure becomes a commonplace in the everyday work of a great number of persons, as is the case in the large public health programmes of to-day, individually insignificant errors and deviations from the prescribed technique may, when taken collectively, amount to considerable variations, and thereby create problems of unexpected magnitude. The full impact of this situation—and its possible consequences—was probably not really felt until intracutaneous injections of B.C.G. vaccine were being given to literally millions of persons in the international mass vaccination campaigns. The present paper gives the results of several studies designed to provide preliminary information on the immediate measurable results of B.C.G. vaccination in schoolchildren when the technique of intracutaneous injection of vaccine was deliberately varied within the limits likely to occur under ordinary field conditions.

There are two principal ways in which an intracutaneous injection may deviate from the recommended technique. First, more or less than the specified volume of 0.1 ml. may be given; and, secondly, the fluid may not be injected superficially into the skin. Theoretically, these two kinds of deviation ought not to be correlated: variation in volume should be independent of variation in depth.

So long as B.C.G. vaccination remained mostly in the hands of a few interested people, the technique of injection was probably more of an art than a science. Each worker undoubtedly developed his own method of gauging the volume and depth of his injections. With the start of mass vaccination, however, hundreds of new workers had to be instructed in the technique, which could no longer be left to the whim of each worker; some uniformity and standardization was essential. In mass vaccination campaigns it would be difficult, or even impossible, to enforce a standard procedure for measuring the volume from the graduated marking on the syringe, because most syringes—even new syringes—soon begin to leak badly. Experience had already shown, however, that the size of the wheal—the white, rounded elevation of the skin caused by the injection—corresponded at least roughly with the volume of fluid injected; and this method was adopted for gauging the dose. There seems, however, to be little agreement on the size of the wheal representing the standard (0.1 ml.) dose of vaccine.

The first edition of *B.C.G. Vaccination against Tuberculosis* (Holm, 1948), issued by the International Tuberculosis Campaign, contained the following instructions for making intracutaneous B.C.G. vaccination: "By the intracutaneous vaccination, 1/10 c.cm. of the vaccine is injected as superficially as possible into the skin. . . . If the injection is given correctly, a wheal will appear, in which the follicles of the hair are easily visible. The wheal must have a diameter of about 10 mm." Two years later, in the *Second Annual Report of the International Tuberculosis Campaign* (1949–50) the instructions for vaccination were revised to read: "(a) The injection should be made as superficially as possible, and very slowly. (b) The dose should be as accurate as possible—0.1 c.cm. If judged by the size of the wheal, the diameter of the wheal must be 8 mm." An account of the B.C.G. vaccination programme in Finland (Savonen, 1949) did not specify the volume of vaccine or depth of injection, but simply stated that "so much vaccine is used that the anaemic wheal appearing on the skin has a diameter of 10–12 mm."

The British Ministry of Health (1950) issued the following instructions for B.C.G. vaccination programmes: "0.1 c.cm. (ml.) of the vaccine is then injected *strictly* intradermally without loss due to leakage from the needle track. A satisfactory vaccination should produce a white wheal 5 mm. in diameter." A brochure from the Bureau of Tuberculosis Control (1952), Commonwealth of Pennsylvania and the Henry Phipps Institute in the United States, does not mention the size of the wheal but merely states: ". . . 0.1 c.cm. is injected intracutaneously as superficially as possible into the skin."

A volume of 0.1 ml. is almost always specified, yet the wheal expected to result from this volume varies in diameter from 5 to 12 mm. There must therefore be considerable variation in interpreting what is meant by a very superficial injection, for about the only way the size of the wheal could differ and still represent a constant volume of vaccine would be by variation in the depth of injection.

Thus one may be justified in thinking that intracutaneous injections of B.C.G. vaccine, and of tuberculin as well, must have varied widely in mass campaigns.

Many vaccinators began working in the campaigns after only the most cursory instruction and little

practice in giving injections. Often lacking critical supervision, they naturally developed their own habits for estimating the size of the wheal and the depth of the injections. A consistent error of only a few millimetres in estimating the size of the wheal from a deep intracutaneous technique could, as we shall show, result in their giving much more than the recommended dose. Moreover, large doses could easily pass unnoticed, because a leaking syringe makes it difficult for anyone to estimate the volume injected. On the other hand, it can be assumed that no vaccinator (even with a badly leaking syringe) would refill her syringe before completing at least one vaccination, so the maximum volume injected is not likely to have exceeded 0.6 or 0.7 ml.

Independently of technique, the volume of vaccine given has probably also been influenced by the attitude of the vaccinator (and the supervisor) towards the work: a strong conviction that a larger dose assures greater protection, coupled with an equally strong belief in the harmlessness of B.C.G., is known to have accounted for many conscientious vaccinators routinely and deliberately giving each person "a good vaccination." On the other hand, some vaccinators, fearing complications from too much vaccine, especially in younger children, have undoubtedly overestimated the size of the wheal and given only a fraction of 0.1 ml. Precise information on this subject is unobtainable; but from what is known of variations between vaccinators, both in their technical performance and in their attitude to the work, it is reasonable to conclude that the average volume of vaccine routinely given by some vaccinators has been at least four or five times that given by others. Furthermore, taking into account the range of variation for each individual vaccinator, it is quite possible that some vaccinated persons received eight or ten times as much vaccine as others.

Material

The data in this paper are derived from an extensive series of field studies on B.C.G. vaccine and vaccination, carried out during the past three years by the Tuberculosis Research Office of the World Health Organization, Copenhagen, in co-operation with the Danish Statens Seruminstitut and the International Tuberculosis Campaign. In general, the work was done among Danish schoolchildren, in groups large enough to provide reliable results. Each study was carefully planned and supervised to ensure that the observations were, so far as possible, objective and free of personal bias. Children were selected for vaccination on the basis

of their reactions to a Mantoux test with 10 units of purified protein derivative (P.P.D.*); those in whom the indurated area was less than 6 mm. in diameter were vaccinated. Post-vaccination tests were made with the same dose and batch of tuberculin, and all observations were made according to a standard procedure by the same team of highly trained field personnel.

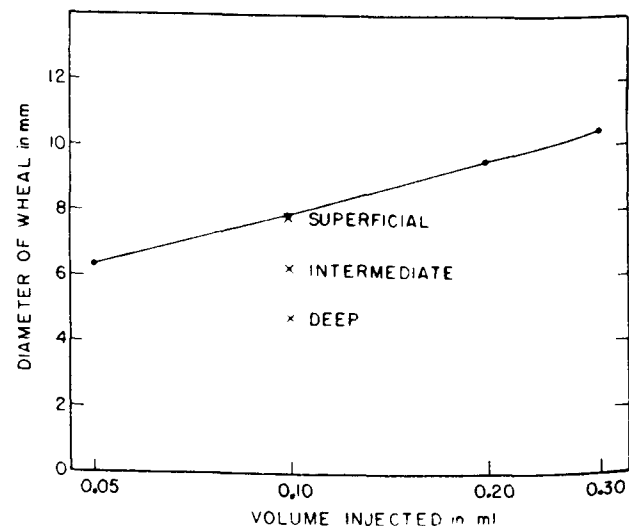


FIG. 2.—Mean diameter of wheals according to (a) volume of B.C.G. vaccine injected very superficially, and (b) depth of injection of 0.1 ml. of B.C.G. vaccine.

Results

Wheal Size with Variation in Volume and Depth of Injection

Before investigating the relation between the size of wheal and the volume and depth of vaccine injected the personnel chosen for this work had to be specially trained. Varying the volume presented no problem: with carefully selected non-leaking syringes, different volumes could be measured quite accurately by reading from the graduations on the barrel of the syringe. But after having become skilled in giving injections very superficially for other studies the vaccinators needed practice in order to become proficient in varying the depth of their injections. For this purpose members of the office staff volunteered as subjects on whom one of the vaccinators practised with saline until she could inject, at will, into different layers of the skin and could classify her injections according to depth.

Two studies were then made in groups of Danish schoolchildren totalling nearly 1,400. In the first study only volume, not depth, was varied: each child was given 0.05, 0.1, 0.2, or 0.3 ml. of vaccine, always injected very superficially. In the second study depth was varied but volume kept constant: 0.1 ml. was given at one of four different skin levels, graded as superficial, intermediate, and deep intracutaneous, and just below the subcutaneous tissue. A regular sequence was followed in both studies: the different volumes

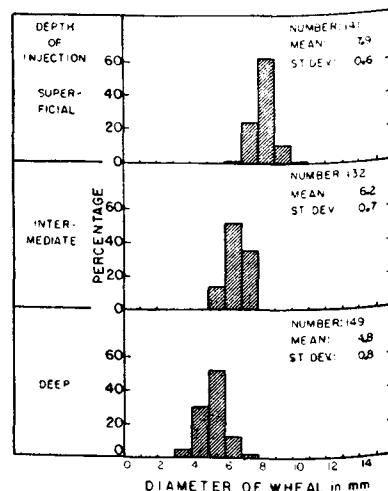


FIG. 3.—Frequency distributions of diameter of wheals according to depth of injection of 0.1 ml. of B.C.G. vaccine.

or depths were given in rotation as children came in line for vaccination. In this work, the vaccinator herself measured the diameter of the wheal immediately after each injection; the measurements therefore may not be entirely free of bias. The vaccinator also classified each injection according to its actual rather than intended depth, since she did not always strike the depth aimed for. Her classification of depth was used for analysing the material. (Wheals produced by subcutaneous injections are not included in the results, because often no wheal appeared, and when it did it was very small with indistinct margins, and it rapidly disappeared.)

The histograms in Fig. 1 show that the usual amount of 0.1 ml. of vaccine, given superficially, very often produced a wheal 8 mm. in diameter; and almost all of the wheals which were not 8 mm. in diameter measured either 7 or 9 mm. Larger and smaller volumes caused a corresponding change in the size of wheals, associated with slightly greater variations in the distribution around the central value. The average size had a linear relation to the logarithm of the volume injected, as shown by the line in Fig. 2. Doubling or halving the dose made a difference of about 1.5 mm. in the average size of the wheals; a sixfold increase (from 0.05 to 0.3 ml.) made a difference of about 4 mm.

The mean size of the wheals resulting from injection of 0.1 ml. at different depths is also shown in Fig. 2, and the corresponding histograms in Fig. 3. The size of the wheal clearly decreased with increasing depth of injection: the difference in average size between wheals produced by superficial and by deep intracutaneous injection was 3.1 mm., a difference as great as that produced by a fourfold difference in volume of vaccine given superficially.

Analysis of the influence of age and sex on the size of the wheal showed that older children had slightly larger wheals than younger ones, but the difference was too small to be important. These studies were carried out in healthy, well-nourished white children. We believe, from what field workers from different parts of the world have told us, that skin qualities may differ appreciably in different races and perhaps also with different nutritional conditions. These factors may influence the size of the wheal, although we have no definite data on this subject.

Unfortunately we have no information about the variation in size of wheal for volumes other than 0.1 ml. given by intermediate and deep intracutaneous injection. But if we assume that the size of wheal and volume of vaccine injected have the same linear relation (and slope) for the deeper as for the superficial injections, then small differences in size of wheal may represent very large differences in volume. For example, it appears that a wheal of 5 mm. may be produced by hardly more than one-quarter of the usual (0.1 ml.) dose given very superficially, whereas a wheal of 6 mm.—only 1 mm. larger—could result from a dose nearly twice the regular dose if injected deeply into

the cutaneous tissue. If, in addition, the vaccinator underestimates the size of the wheal, the dose may be three or four times the recommended 0.1 ml.

Effect of Variations in Volume of Vaccine on Post-vaccination Response

Many workers favour the intracutaneous method of giving B.C.G. vaccine primarily because they assume that with it the amount of vaccine injected can be measured. But, as we have already explained, in practice the amount given is probably far from constant. It is important to know whether, and how much, the observable consequences of vaccination are affected by failure to give a constant dose of B.C.G. Information on post-vaccination allergy and size of local lesions is available from the studies in which volume and depth were deliberately varied. One restriction on this work was that the total amount of B.C.G. given to any child could not exceed the Danish standard dose (0.075 mg. of organisms), so dilutions of a regular batch of vaccine were prepared and used in various volumes.

TABLE I.—Mean Diameter of Mantoux Reactions to 10 T.U. and of Vaccination Lesions According to Strength and Volume of Vaccine Injected

10½ Weeks after Vaccination										
Strength of Vaccine as Fraction of Standard	Mean Diameter of Induration of Mantoux Reactions to 10 T.U. (mm.)				mg. B.C.G. Injected	Mean Diameter of Induration of Vaccination Lesions (mm.)				mg. B.C.G. Injected
	Volume Injected (ml.)					Volume Injected (ml.)				
	0.05	0.1	0.2	0.3		0.05	0.1	0.2	0.3	
1/2	17.8	17.6				7.1	8.6			
1/4	16.9	17.8	17.6			6.5	7.3	8.1		
1/8		16.8	17.3		0.0375		5.3	6.7		0.0375
1/12				16.5	0.0188				5.5	0.0188
					0.0094					0.0094

One Year After Vaccination										
Strength of Vaccine as Fraction of Standard	Mean Diameter of Induration of Mantoux Reactions to 10 T.U. (mm.)				mg. B.C.G. Injected	Mean Diameter of Vaccination Scar (mm.)				mg. B.C.G. Injected
	Volume Injected (ml.)					Volume Injected (ml.)				
	0.05	0.1	0.2	0.3		0.05	0.1	0.2	0.3	
1/2	18.2	19.3				5.8	6.6			
1/4	18.2	18.8	19.6			5.2	5.8	6.6		
1/8		18.0	18.3		0.0375		4.5	5.5		0.0375
1/12				17.6	0.0188				4.6	0.0188
					0.0094					0.0094

*RT XIX-XX-XXI from Statens Seruminstitut, Copenhagen.

The results (Table I) are from the study designed to determine the effect of varying the volume alone and both volume and strength of vaccine simultaneously. Altogether 951 children were vaccinated. They were divided into eight subgroups, each receiving one of the various volume-dose combinations. The horizontal rows in Table I show the average size of the tuberculin reactions (left) and local lesions (right) for the groups given different volumes (0.05 to 0.3 ml.) of the same dilution of vaccine (1/2 to 1/12 standard strength). The vertical columns furnish similar data for groups given different dilutions but the same volume. From the diagonal rows one can compare the results when different volumes and dilutions were combined so that the groups got the same total milligram dose of B.C.G. organisms.

The figures in the left-hand section of the table may surprise many B.C.G. workers: over quite a broad range neither volume nor strength of vaccine had much, if any, effect on the average size of the tuberculin reactions either 10½ weeks or one year after vaccination. For example, 0.05 ml. of 1/4 strength vaccine (0.0094 mg. B.C.G.) gave reactions whose diameter averaged 16.9 mm. at 10½ weeks, compared with 17.6 mm. from 0.2 ml. of the same dilution (0.0375 mg. B.C.G.): a fourfold difference in volume (and in milligram dose of B.C.G.) made a difference of less than 1 mm. in the size of the tuberculin reactions.

By contrast, the figures on the right of Table I show that varying the volume or varying the strength of vaccine has a slight but consistent effect on the average size of the local lesions at 10½ weeks, and of the resulting scars at one year. An increase in dose (either by increasing the volume or the strength of the vaccine) is associated with larger lesions. This observation is confirmed by an earlier study (Edwards and Gelting, 1950), in which 0.1-ml. volumes of standard strength and of four-times standard strength vaccines were compared. The average size of post-vaccination tuberculin reactions differed by only 1 mm., but with the stronger vaccine the local lesions were on average 2.3 mm. larger.

An additional point, perhaps of more theoretical than practical interest, is shown by the diagonal rows in Table I. Apparently increasing the quantity of diluent for a constant dose of B.C.G. is associated with a very slight tendency for the post-vaccination tuberculin reactions to decrease in size. This may reflect a true relation between dose and volume, or it may depend on some systematic error associated with the injection of different volumes. (Vaccine may tend to ooze from the larger wheals resulting from the superficial injection of large volumes; or possibly the vaccinator tended to inject a little more than she should when giving small volumes and a little less when giving large ones.)

Effect of Variations in Depth of Injection on Post-vaccination Response

Studies of the effect of varying the depth at which vaccine was injected gave striking results, shown in Tables II and III. In the first study 188 children were alternately given a superficial and a deep injection of 0.1 ml. of vaccine; and each injection was classified by the vaccinator as superficial, intermediate, or deep intracutaneous, or subcutaneous. The same procedure was followed in the second study, on about 500 children; but here both standard strength and 1/100 standard strength vaccine were used. As the children came in line to the vaccinator, the first was given a superficial, the second an intermediate, and the third a deep intracutaneous injection. When this sequence had been completed three times the next child was given an injection just below the skin into the subcutaneous tissues. Thus, 1 out of every 10 injections was subcutaneous (given only to boys). The same rotation system was followed for both strengths of vaccine.

It is evident from both studies that the average sizes of the tuberculin reactions were not appreciably affected by the depth at which standard strength vaccine had been injected. For the 1/100 strength vaccine, however, the dia-

TABLE II.—Mean Diameter of Mantoux Reactions to 10 T.U. and of Vaccination Lesions According to Depth of Vaccine Injection

10½ Weeks after Vaccination				
Strength of Vaccine	Depth of Injection	Mean Diameter of Induration of Mantoux Reactions to 10 T.U. (mm.)	Mean Diameter of Induration (mm.)	% with Local Abscess
Standard (0.75 mg. per ml.)	Intracutaneous superficial	18.8	8.1	1.2
	Intracutaneous intermediate	17.6	9.0	0.0
	Intracutaneous deep	18.2	13.5	11.7
	Subcutaneous	18.5	15.1	28.6

One Year after Vaccination				
Strength of Vaccine	Depth of Injection	Mean Diameter of Induration of Mantoux Reactions to 10 T.U. (mm.)	Mean Diameter of Superficial Scar (mm.)	% with Abnormal Scarring*
Standard (0.75 mg. per ml.)	Intracutaneous superficial	22.1	7.3	0.0
	Intracutaneous intermediate	21.6	7.1	4.3
	Intracutaneous deep	21.9	8.1	30.2
	Subcutaneous	21.8	6.8	40.0

* Scar surrounded by zone of discoloration, irregular and often retracted, adherent to underlying tissues.

TABLE III.—Mean Diameter of Mantoux Reactions to 10 T.U. and of Vaccination Lesions According to Depth of Vaccine Injection

10½ Weeks after Vaccination				
Strength of Vaccine	Depth of Injection	Mean Diameter of Induration of Mantoux Reactions to 10 T.U. (mm.)	Mean Diameter of Induration (mm.)	% with Local Abscess
Standard (0.75 mg. per ml.)	Intracutaneous superficial	19.9	8.2	0.0
	Intracutaneous intermediate	20.0	10.7	4.7
	Intracutaneous deep	19.3	13.7	13.4
	Subcutaneous	19.3	16.6	30.4
1/100 standard (0.0075 mg. per ml.)	Intracutaneous superficial	14.6	2.7	0.0
	Intracutaneous intermediate	13.3	4.0	0.0
	Intracutaneous deep	13.2	4.1	0.0
	Subcutaneous	12.9	3.8	0.0

One Year after Vaccination				
Strength of Vaccine	Depth of Injection	Mean Diameter of Induration of Mantoux Reactions to 10 T.U. (mm.)	Mean Diameter of Superficial Scar (mm.)	% with Abnormal Scarring*
Standard (0.75 mg. per ml.)	Intracutaneous superficial	21.2	7.5	3.2
	Intracutaneous intermediate	20.4	7.5	5.5
	Intracutaneous deep	20.5	8.0	32.3
	Subcutaneous	20.2	9.1	52.0
1/100 standard (0.0075 mg. per ml.)	Intracutaneous superficial	14.0	1.2	0.0
	Intracutaneous intermediate	13.1	1.4	0.0
	Intracutaneous deep	12.2	1.3	0.0
	Subcutaneous	11.7	0.8	3.8

* Scar surrounded by zone of discoloration, irregular and often retracted, adherent to underlying tissues.

more superficial injections gave a higher level of allergy: the most superficial gave an average at 10½ weeks of 14.6 mm., compared with 12.9 mm. for the subcutaneous, while at one year the averages were 14.0 and 11.7 mm. respectively.

The average size of local lesions 10½ weeks after vaccination showed a systematic and pronounced difference with the depth of injection. In both studies the lesions averaged about 8 mm. for the superficial technique and increased with depth of injection to become twice as large (15–16 mm.) for subcutaneous injections. Of even more practical importance, the frequency of local subcutaneous abscesses also increased with deeper injection technique.* Superficial injection of standard strength vaccine led to an abscess in less than 1% of cases, but the frequency of abscesses increased substantially with increasing depth, and nearly one-third of the children given vaccine subcutaneously developed a local abscess. (The subcutaneous injections, it may be recalled, were given not deeply into the subcutaneous tissues, but just under the skin.)

A further interesting point is brought out by Table III. With the 1/100 strength vaccine the depth of injection had much less, though probably still some, effect on the size of the local lesions, and there were no local abscesses. It is also noteworthy that the measured size of superficial scars at one year for the standard vaccines in both studies (Tables II and III) increased only slightly with increasing depth of injection. There was, however, a pronounced difference in the scars after deep injection: they were commonly surrounded by a zone of discoloration; they were irregular in shape, and often retracted and adherent to the underlying tissues.

Fig. 4 gives histograms of the local lesions at 10½ weeks and resulting scars at one year for the four different depths of injection for the two studies combined; the frequency of local abscesses and abnormal scars is shown by the darker shading. With increasing depth the whole distribution moved towards the right on the scale and local abscesses became more frequent with increase in the proportion of lesions over 14 mm. in diameter. None of the smaller lesions were associated with an abscess; but an abscess was associated with 30% of the lesions over 14 mm. in diameter, and with more than half of the lesions over 20 mm. in diameter.

Discussion

The widespread adoption of the intracutaneous method of giving B.C.G. vaccine in mass campaigns has been explained in several ways: (a) it is regarded as more exact than other methods because a measured amount of vaccine can be injected; (b) the technique is believed to be fairly easy to learn and to apply rapidly in mass vaccinations; and (c) results, in terms of post-vaccination tuberculin sensitivity, are thought to be better than with other methods.

Practical problems have, however, arisen. At least one problem can be inferred from the inconsistencies, almost amounting to contradictions, in the instructions for making intracutaneous injections. Nearly all of these instructions

*The term "abscess" is used to denote a collection of fluid beneath the corium, as opposed to the normal ulceration in the corium, which, when covered, is covered by epidermis and crust only.

specify that 0.1 ml. of vaccine should be injected very superficially. But the size of the resulting wheal is usually also specified, testifying to the fact that the volume of vaccine is not expected to be measured by the graduations on the barrel of the syringe. The reason for this cannot be doubted: the syringes often leak so badly that some other way had to be found to gauge the volume injected. Even if syringes did not leak it would be questionable whether the graduated markings could be used for vaccinations done at the speed expected in mass campaigns. In practice, therefore, volume is commonly gauged by the size of the wheal, and this is usually estimated rather than measured. Some vaccinators are told to try to make wheals 5 mm. in diameter, and others wheals 10–12 mm. in diameter, but at the same time all are told to inject 0.1 ml. very superficially.

Quantitative data from the studies described in this paper show that the diameter of the wheal is directly related to the volume as well as to the depth of the injection; the largest wheals are produced by the largest volumes given most superficially; the smallest wheals by the smallest volumes given most deeply. A wheal 8 mm. in diameter, for example, was usually found to represent 0.1 ml. of vaccine injected superficially, but a wheal of this size could probably represent 0.4 ml. or more given in the deeper layers of the skin. On the other hand, only one-quarter of the recommended dose, given very superficially, can give rise to a wheal 5 mm. in diameter. The results indicate that there must be enormous differences in the volume of B.C.G. given in mass campaigns—the differences between vaccinators alone amounting to four or five times, and probably still greater variations in the amount given to individual persons.

This investigation has shown that tuberculin allergy, measured by the size of tuberculin reactions at different intervals after vaccination, is practically unaffected by variations of technique within the likely range in mass campaigns. The size of the local responses at the vaccination site, on the other hand, depends to a large extent on the depth of injection and to a less extent on the volume of vaccine injected. A given volume injected subcutaneously produces lesions twice as large as those resulting from the same

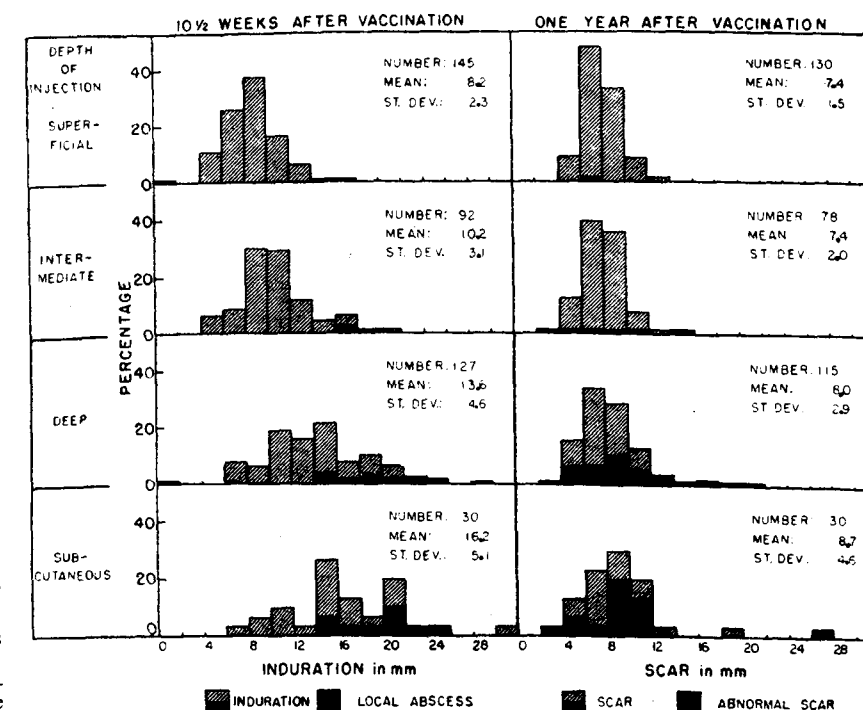


FIG. 4.—Frequency distributions of diameter of local vaccination lesions, and frequency of local abscesses and abnormal scars, according to depth of injection of 0.1 ml. of B.C.G. vaccine.

volume injected superficially. Moreover, abscesses at the site of the local lesion are rare after superficial injections, but increase progressively in frequency with increasing depth of injection; and in this investigation nearly one-third of the children had associated subcutaneous abscesses when the vaccine was injected just below the skin into the subcutaneous tissues.

These findings bear directly on the question whether laymen should be employed as vaccinators for mass B.C.G. campaigns in countries with few professional personnel. So far as post-vaccination allergy is concerned, variations in the technique of giving intradermal injections apparently make so little difference that lay vaccinators could probably be employed with impunity. If, however, the success of a campaign depends on keeping to a minimum the frequency of large vaccination lesions and of complications, then all vaccinators must be intensively trained to inject the vaccine into the most superficial layers of the skin.

What bearing do these findings have on the search for more fundamental knowledge on the problem of tuberculosis immunization? We cannot answer this question, yet it may be permissible to speculate on certain possibilities. To regard a large, ugly vaccination lesion as a promise of strong and long-lasting immunity is, if not an obvious inference, at least a tempting idea to the vaccinator, and a consoling idea to the person vaccinated. But our findings provide little support for such an inference. Certainly a weak vaccine (such as the 1/100 dilution of standard strength used here) gave rise to extremely small lesions and rather weak allergy; but when standard strength vaccine was injected at different depths in the skin very considerable differences in the size of the lesions were not associated with differences in allergy. The inconstant correlation between the local reaction and the allergic response to B.C.G. does not justify the belief that both can be used as a true guide to immunity. A strong or a weak local reaction—a good or fair “take”—may reflect properties associated with immunization we do not know; yet from these studies it seems to depend to such an extent on the way the vaccinator did her work that size of the local lesion may well reflect factors that have nothing whatever to do with immunity.

Summary

An intracutaneous injection of B.C.G. vaccine may deviate from the recommended technique in two principal ways: more or less than 0.1 ml. may be given, and the vaccine may not be injected superficially into the skin. This paper reports the results of several studies, altogether comprising about 1,400 schoolchildren, in which volume and depth of injection of B.C.G. vaccine were deliberately varied within the limits likely to occur in ordinary mass vaccination campaigns, and the effect of such variations on the resulting post-vaccination tuberculin allergy and the local reactions at the site of vaccination.

Because of the fact that most syringes leak, the volume of vaccine injected is commonly gauged by estimating the size of the wheal formed on the skin rather than by reading from the graduated markings on the barrel of the syringe. In a study of about 950 children when different volumes of B.C.G. vaccine were injected very superficially into the skin, 0.1 ml. of vaccine produced wheals averaging 8 mm. in diameter. Doubling or halving the volume caused a difference averaging 1.5 mm.; a sixfold increase (from 0.05 to 0.3 ml.) caused a 4 mm. increase in the diameter. In a second study of over 400 children, depth of injection was varied but volume was kept constant: deep intracutaneous injection of 0.1 ml. gave wheals averaging 3.1 mm. smaller than the same volume injected superficially—a decrease as great as that from a fourfold reduction in volume given superficially.

Tuberculin allergy in schoolchildren, measured by the tuberculin reaction at intervals after vaccination, was practically unaffected by variations in intracutaneous technique likely to occur in the field. Volumes of 0.05–0.3 ml. of vaccine injected at depths ranging from very superficial in the skin to subcutaneous all gave about the same mean level of post-vaccination allergy.

A given volume of vaccine injected just beneath the skin into the subcutaneous tissue produced local lesions twice as large as those from the same volume injected superficially. The frequency of local subcutaneous abscesses increased with increasing depth of injection.

These studies show that the size of the reaction at the site of vaccination is influenced by the depth of injection of vaccine, but the level of B.C.G.-induced tuberculin allergy is not. If, therefore, post-vaccination allergy is to be taken as an index of immunity, the local vaccination reaction does not necessarily measure the same thing.

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MEASUREMENT OF LEAKAGE OF TUBERCULIN SYRINGES

BY

JOHANNES GULD, M.D.

AND

CHRISTIAN RUD, M.D.

(From the Tuberculosis Research Office, World Health Organization, Copenhagen)

Many of the syringes used for intracutaneous injections tend to leak between plunger and barrel, often to such an extent that reading from the graduated scale may be grossly misleading. In practice the quantity of liquid actually injected is therefore usually estimated by measuring the size of the wheal produced at the site of injection. For scientific work, however, where accurately measured dosage is required, unsatisfactory syringes must be detected and eliminated before use.

A simple and easily constructed apparatus for accurate and quantitative measurement of leakage in syringes is

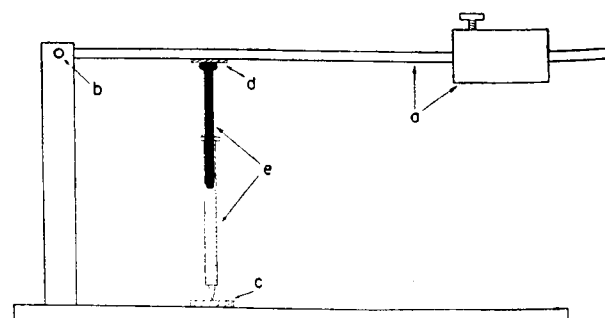


FIG. 1.—Diagram of apparatus for measuring leakage in syringes. a=lever with adjustable weight; b=joint for vertical rotation of lever; c and d=rubber disks; e=tuberculin syringe.

illustrated in Fig. 1. The syringe, when filled with distilled water, is placed vertically in the apparatus. The tip, with no needle attached, is pressed against the soft smooth rubber disk (c) and the lever with a certain weight (a) is brought down upon the plunger. This lever, while holding the syringe steady, subjects the plunger and consequently the contents of the syringe to a constant pressure. As the tip is embedded in the rubber disk, the contents can escape only by leaking out between plunger and barrel, and the rate of decrease of the contents thus becomes a measure of the rate of leakage. The pressure is correct only if the lever is nearly horizontal, so when testing short or partly filled syringes the distance between rubber disk and lever must be correspondingly reduced by placing the rubber disk on a box of appropriate height.

If the diameter of the plunger is about 4.5 mm. (as in most all-glass tuberculin syringes) an external pressure of about 1 kg. is used, corresponding to a pressure inside the syringe of 5 to 6 kg. per cm.² or approximately 70 lb. per sq. in. (This pressure corresponds roughly to what was found in the following experiment. Several experienced testers were asked to exert pressure, by hand, on a tight air-filled syringe, corresponding to the estimated pressure used for an ordinary Mantoux test. By this procedure the air volume was reduced to between one-fifth and one-eighth, corresponding to an internal pressure of five to eight atmospheres.)

If the diameter of the plunger exceeds 4.5 mm. (as in most Record syringes) the external pressure must be correspondingly increased in order to keep the internal pressure per cm.² constant.

Experiments

A series of experiments designed to provide data on the leakage rate of syringes—as measured by the apparatus—have been carried out. Twelve new all-glass 1-ml. tuberculin syringes of the type used for field studies by the Tuberculosis Research Office were filled with distilled water to a certain level and subjected to constant pressure in the apparatus.

Each syringe was tested for leakage at five different levels of filling—namely, filled to the 1, 0.8, 0.6, 0.4, and 0.2-ml. marks. Starting from each of these levels, the decrease in the contents of the syringe was measured by reading the scale every minute for a period of five minutes. All tests were repeated once, and then the syringes were boiled in distilled water for 30 minutes and tested again at two different levels of filling—1 ml. and 0.4 ml. When the tests were repeated the person reading the scale had no knowledge of previous results. The results were plotted on a graph, the time during which the fluid in the syringe was kept under pressure being indicated on the horizontal scale and the contents of the syringe during the testing period on the vertical scale. The slope of each curve thus gives the leakage rate, illustrated in Fig. 2 for four of the twelve syringes tested.

The leakage rate varied to a surprising extent from syringe to syringe, ranging from 0.06 to more than 0.4 ml. in five minutes. In some instances the leakage rate showed great variations from level to level in the

same syringe. There was good agreement between the results of the first and the second series of tests; and boiling in distilled water for 30 minutes did not appear to alter the leakage rate.

Practical Application

Syringes to be used for research by our field teams are now pre-tested for a period of six minutes (not five) with an internal pressure of 5–6 kg. per cm.² (70 lb. per sq. in.). As leakage may be different in different parts of the syringe, each syringe is tested for two different degrees of filling—namely, completely and two-fifths filled. The results are expressed in units of 0.01 ml. per six minutes (0.1 ml. per hour). When a syringe is said to have a leakage of 15, for example, it means that the leakage in six minutes (average of the two trials) amounts to 0.15 ml.

From such information it is also possible to estimate the percentage of fluid lost in injecting 0.1 ml. If it is assumed that the injection is made in five seconds, and that the internal pressure in the syringe is 5–8 atmospheres, a leakage rate of 10 corresponds with a loss of 2% or less of the 0.1-ml. dose. A leakage rate of 20 corresponds with a 3–4% loss, and a rate of 30 with a loss of 5–6%.

Fig. 3 summarizes the results of testing 387 new syringes of the particular brand we have found to be most satisfactory. The rate of leakage is plotted on the horizontal scale, percentage of syringes on the vertical scale, and each point on the line indicates the percentage of the total number of syringes which have a leakage rate below a specified value.

It may be seen from the figure that while the leakage rate ranged from 4 to 70 the syringes were not equally distributed over this range. About half of the total sample had

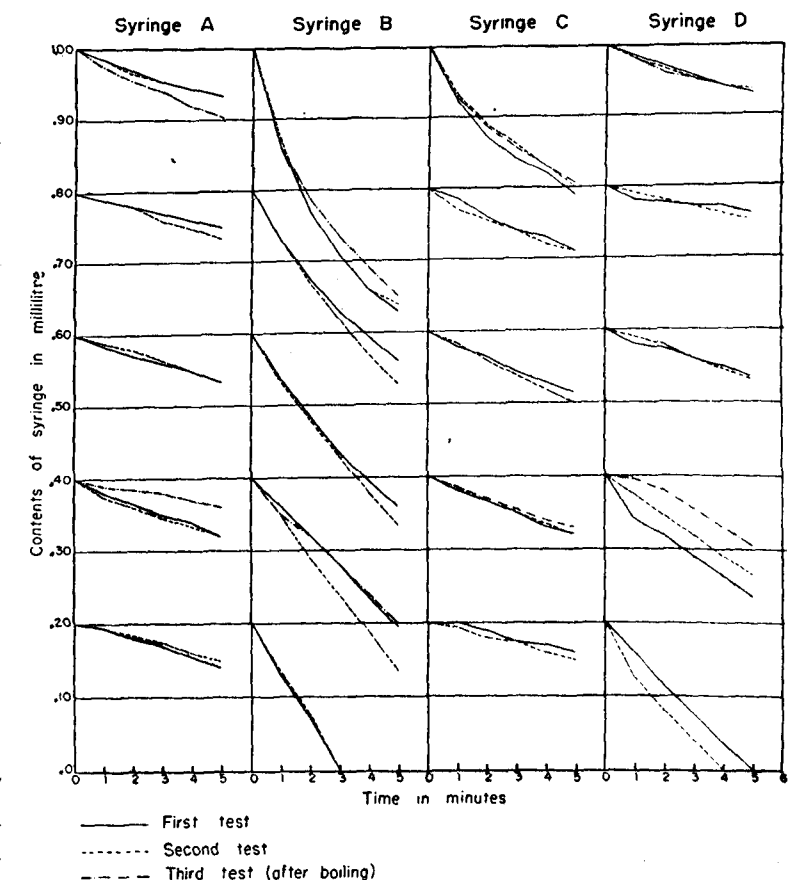


FIG. 2.—Results of experiments with four tuberculin syringes (A, B, C, and D). Each curve shows decrease in contents under pressure by time.

rates of between 4 and 15, while the other half were scattered between 15 and 70. Of incidental interest is the fact that if the arithmetic value of the leakage rate is replaced by its logarithm, the distribution is very nearly normal. It may also be seen from the figure that the maximum leakage may be lowered from 70 to 25 by rejecting 15% of the syringes. To have a maximum leakage of 20 means rejecting 25% of the syringes, and a maximum leakage of 15

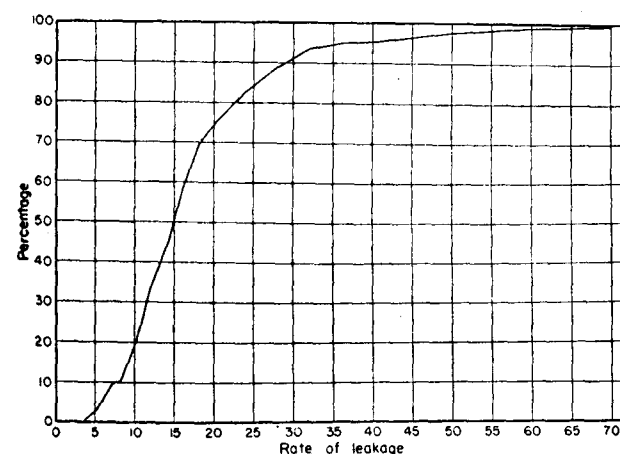


FIG. 3.—The cumulative distribution of the leakage in 387 new syringes. Leakage is measured in units of 0.01 ml. per six minutes under a pressure of approximately 5 kg. per cm.², and these units are marked on the horizontal scale of the figure. The vertical scale gives percentages of the 387 syringes tested, and each point on the curve indicates the percentage of the total sample which have a leakage rate below the specified value.

means rejecting half of the syringes. Information from a curve of this kind is thus a good guide when a compromise is sought between economy and low maximum leakage.

It should be understood, of course, that the particular curve shown here applies to a rather expensive brand of syringes selected as one of the best from a number of different products available in large quantities. As an example of the results obtained with other brands, we found leakage rates ranging from 19 to 144 with one sample of 24 new Record syringes of the type selected for a mass programme as having comparatively low leakage. Half of this sample of syringes had rates above 52.

New syringes with a leakage rate below 20 are seldom found to show any apparent leakage when first used in the field. Only the sides of the plunger become moist, evaporation evidently keeping pace with minimal leakage. After 1,000 to 1,500 injections, however, syringes usually begin to leak, one or two drops for every 10 to 20 injections. Both the syringe and the tester's hand then begin to get wet, and further increase in leakage (or leakage from between the needle and the tip of the syringe) can no longer be detected. Thus it is not difficult in the field to know when a syringe is leaking, but it is difficult to estimate how much fluid is lost.

In the Tuberculosis Research Office we have adopted the plan of testing all new syringes before they are sent to the field, rejecting those with leakage rates above 20. The moment a syringe begins to leak steadily in the field we ask that it be returned for retesting in the apparatus (to control gross error in the tester's judgment). Leakage rates between 20 and 30 are usually found; if above 20 they are rejected for further field use.

The cost of such strict criteria may seem prohibitive even for research work, but the cost of leakage cannot be disregarded. For example, the leakage rates for a sample of 55 syringes, discarded because of leakage in a mass B.C.G. campaign where "some" leakage was tolerated, was found to vary from 20 to 540, with half of the sample we tested having a rate above 90. A rate of 90 probably corresponds to a loss of 15 or perhaps 20% of the amount of fluid actu-

ally injected—a net loss of 15 ml. of tuberculin or vaccine for 1,000 injections, at a cost which cannot be considered negligible when compared with the cost of a new syringe. Workers from some of the mass campaigns maintain that occasionally they have used 1-ml. syringes yielding only one or two vaccinations for each refilling—a very costly procedure indeed, in terms of both time and money.

Summary

A home-made apparatus is described for measuring leakage between the plunger and barrel of tuberculin syringes. Even with the brand of syringe which we have found the most satisfactory, about one out of every four new syringes leaks to a greater extent than is compatible with accurate work. After being used for 1,000 to 1,500 intradermal injections, many syringes begin to show obvious signs of leakage, and, when retested, fail to meet the criteria we have adopted for acceptability. Unless new syringes are first tested before use and a plan for periodic retesting is followed, it is unreasonable to expect field workers to be able to measure accurately the amount of fluid given in intradermal injections or to avoid wasting rather large amounts of tuberculin and vaccine.

A NEW DIPHTHERIA PROPHYLACTIC (N.A.F.T.)

BY

D. C. LAHIRI, M.B., D.T.M.&H., Dip.Bact.
(From the Haffkine Institute, Bombay, India)

It has been known for some time that culture filtrates of toxigenic *Corynebacterium diphtheriae* may vary greatly in their antigenicity per Lf when tested in guinea-pigs and in horses (Barr and Glenn, 1949). Hartley (1935) suspected an undetermined factor in the original culture medium as a possible reason for these variations, but failed to isolate any substance having an adjuvant effect on a poorly antigenic sample of toxoid.

Experiments

During the past few years we have experienced the same phenomenon of marked variation of antigenicity of different samples of crude toxoid per Lf injected, particularly in respect of the hyperimmunization of horses. This was particularly clear-cut when the results from three types of culture medium were examined. The three media were: (a) veal-infusion-proteose-peptone, (b) pig-stomach autolysate, and (c) casein hydrolysate. The toxoid derived from the veal-infusion-proteose-peptone gave by far the best antitoxin responses. This observation was confirmed by carefully controlled experiments in guinea-pigs. Since the responses to the veal-infusion-proteose-peptone medium toxoid were so much better our attention was directed to a possible non-toxoid component of the crude toxoid possessing adjuvant properties. That the veal-infusion-proteose-peptone toxoid did contain such an adjuvant substance was revealed by the results from the following experiment.

The toxoid contents from each of the three culture media toxoids were removed by the addition of the optimal amounts of highly purified horse antitoxin. The T.A.F. floccules were centrifuged and the supernatants separated. Then a fixed amount of freeze-dried toxoid purified by the method of Levine *et al.* (1949) was added

to equal volumes of each of the three supernatants, using physiological saline as the control. Potency tests in guinea-pigs, tested four weeks after one dose of 1 Lf, showed that the veal-infusion-proteose-peptone toxoid supernatant greatly increased the antigenicity of the added toxoid, the casein hydrolysate supernatant decreased it, and the pig-stomach hydrolysate had no apparent effect compared with the controls.

Subsequent research in the veal-infusion-proteose-peptone crude toxoids showed that the adjuvant factor—previously described as the synergic factor (Lahiri, 1951)—was diffusible through "cellophane" (grade 600), then could be adsorbed on to activated charcoal and be eluted with N/50 sodium hydroxide. The method now adopted is to dialyse the crude toxoid, adsorb the adjuvant factor on to activated charcoal, and elute with diluted sodium hydroxide. The eluate is then neutralized and evaporated to dryness. Technical details of the method have already been described (Lahiri, 1952), and further details will be published later. The following experiment illustrates the adjuvant effect of the material obtained.

Freeze-dried purified toxoid was dissolved in (a) detoxified crude toxoid, (b) the parent broth, (c) the neutralized charcoal eluate, (d) the residual fluid of the diffusate

TABLE I.—Survival of Guinea-pigs Challenged with 20 C.L.D.* of Test Toxin, Administered Four Weeks After Immunization with 1 Lf of the Purified Diphtheria Toxoid, Dissolved in Different Fractions of Crude Veal-infusion-proteose-peptone Toxoid: Control in Saline

Fraction into which the Purified Toxoid was Dissolved	Survival Rates in Three Animal Assays			
	1	2	3	Total
Detoxified crude veal-infusion-proteose-peptone diphtheria toxoid ..	7/7	7/8	6/7	20/22
Neutralized charcoal eluate ..	8/8	7/8	14/15	29/31
Parent broth ..	1/8	0/8	2/8	3/24
Residue of toxoid diffusate after treatment with charcoal ..	2/8	1/8	3/16	6/32
Detoxified crude <i>tetanus</i> -veal-infusion-bacto-peptone toxoid ..	2/8	1/7	2/8	5/23
Saline control ..	3/16	3/15	5/24	11/55

* 1 C.L.D. equals the smallest quantity of the test-toxin which kills all of four normal guinea-pigs within four days of injection.

TABLE II.—Survival of Mice Challenged with 20 C.L.D. of Tetanus Test Toxin, Administered Four Weeks After Immunization with (a) 1 Lf, and (b) 2.5 Lf of Purified Tetanus Toxoid, each Dissolved in Different Toxoid Fractions

Solvent for the Purified Tetanus Toxoids	Purified Tetanus Toxoids			
	Batch 1 Dose		Batch 2 Dose	
	1 Lf	2.5 Lf	1 Lf	2.5 Lf
Solution of diphtheria N.A.F. ..	4/30	10/28	7/30	12/29
Analogous material, derived from veal-infusion-bacto-peptone tetanus toxoid ..	6/30	9/30	5/30	10/30
Saline ..	5/29	14/30	7/28	10/29

TABLE III.—Reaction and Results of Schick Test in Children Immunized with Different Diphtheria Prophylactics. (The Figures Indicate the Number of Children of the Stated Category)

Group	Total No. of Children	Immunized With	Results of Schick Test					Reactions		
			Before Immunization		After Immunization		Not Tested	Mild	Moderate	Severe
			Negative	Positive	Negative	Positive				
1	151	25 Lf/1 ml. N.A.F.T. batch 1 ..	Not tested		149	0	2	0	0	0
2	89	36 Lf/0.5 ml. A.P.T. of British manufacture ..	7	82	79	7	3	17	7	1
3	78	28 Lf/0.5 ml. A.P.T. of Haffkine Institute ..	9	69	69	8	1	18	5	2
4	115	25 Lf/0.5 ml. N.A.F.T. batch 2	17	98	102	13	0	0	0	0

after treatment with charcoal, and (e) saline—the control. The immunity-response results, using guinea-pigs, are recorded in Table I.

Subsequent experiments, using the same culture medium, failed to reveal the presence of the adjuvant factor in tetanus culture filtrates, and, conversely, the diphtheria toxoid adjuvant factor failed to augment the antigenicity of purified tetanus toxoid. This is illustrated by the following experiments: purified tetanus toxoid was dissolved in (a) a solution of the partially purified diphtheria toxoid adjuvant factor, (b) analogous material derived from tetanus toxoid diffusate, and (c) physiological saline. The results are recorded in Tables I and II.

Field Trials

These results were so promising, as judged by laboratory tests, that a series of field trials were carried out, employing 433 young children and 80 adults. Each of our groups of children (aged 1–8 years) were immunized with a different prophylactic: (1) with our purified diphtheria toxoid augmented with the charcoal eluate adjuvant factor Batch No. 1; (2) with a duplicated preparation, Batch No. 2; (3) with an A.P.T. of British manufacture; and (4) with A.P.T. made in the Haffkine Institute. The children were Schick-tested before their single dose of diphtheria prophylactic and post-Schick-tested four to eight weeks after inoculation; careful note was also made of the number and severity of the reactions encountered. The results obtained are summarized in Table III, and show (a) that the new prophylactic, termed N.A.F.T. (natural adjuvant factor toxoid) is as good an antigen as the A.P.T. of British manufacture or as that made in our Institute; and (b) that N.A.F.T. is much less prone to cause reactions than the two kinds of A.P.T.

In our experiments with 80 adults (aged 25–50), none of whom had previously received anti-diphtheria prophylactic, each of the subjects was bled before inoculation and again four weeks after inoculation. They were subdivided into six groups, each group receiving a different form of prophylactic. The results are analysed in Tables IV, V, and VI. The value of this experiment, however, was seriously diminished by the quite unexpected finding that nearly

TABLE IV.—Pre-immunization Titre of Adult Volunteers Never Artificially Immunized Before. Titre Expressed in International Units of Antitoxin per ml. of Volunteers' Sera. The Figures Indicate the Number of Volunteers Whose Sera Showed a Titre Within the Stated Range

Group	Ranges of Titre at which the Sera of the Volunteers were Tested							Total No. of Volunteers	Geometric Mean Titre (International Units) Approx.
	<0.01	0.01–0.025	0.025–0.05	0.05–0.2	0.2–0.5	0.5–1	1–2		
1	1	0	4	6	4	1	1	17	0.07
2	1	2	1	5	4	2	2	17	0.09
3	2	0	2	5	5	1	1	16	0.08
4	2	0	3	4	1	0	2	12	0.06
5	2	2	1	4	1	1	0	11	0.04
6	0	1	2	2	0	1	1	7	0.07

TABLE V.—Response of Adult Volunteers to Injection of Different Kinds of Diphtheria Prophylactic. Response is Shown by Approximate Titre of Antitoxin Developed per ml. of the Volunteers' Sera Four Weeks After Immunization. The Figures Indicate the Number of Volunteers Whose Sera Showed a Titre Within the Stated Range. Titre Expressed in International Units. Pre-immunization Titres of these Groups of Volunteers are Shown in Table IV

Group	Immunized With	Ranges of Titre at which Sera of Volunteers were Tested (I.U.)												Total Number of Volunteers	Geometric Mean Titre (International Units) Approximate
		0.01–0.025	0.2–0.5	0.5–1.0	5–10	10–25	25–50	50–75	75–100	100–150	150–200	200–250	250–300		
1	5 Lf of native toxoid precipitated with 0.2 mg./Lf alum.	0	0	0	0	1	4	9	2	0	1	0	0	17	43
2	5 Lf of native toxoid mixed with 0.2 mg./Lf N.A.F.	0	0	0	1	0	1	3	2	8	2	0	0	17	68
3	5 Lf of native toxoid alone	1	0	1	0	3	5	4	1	1	0	0	0	16	14
4	5 Lf of international ref. std. toxoid mixed with 0.2 mg./Lf N.A.F.	0	0	0	0	1	1	4	0	4	0	1	1	12	67
5	1 Lf of international ref. std. toxoid mixed with 0.2 mg./Lf N.A.F.	0	1	1	1	0	1	2	0	3	0	2	0	11	24
6	5 Lf of international ref. std. toxoid alone	0	0	1	0	2	2	1	1	0	0	0	0	7	14

TABLE VI.—Reaction of Adult Volunteers to Injection of Different Kinds of Diphtheria Prophylactic. The Figures Indicate the Number of Volunteers who Showed the Stated Variety of Reaction

Group	Total No. of Volunteers	Immunized With	Nature of Reactions Caused by the Prophylactic in the Volunteers			
			Immediate Allergic or Inflammatory			Delayed Allergic
			Mild	Moderate	Severe	
1	17	5 Lf of native toxoid precipitated with 0.2 mg./Lf alum.	5	3	1	0
2	17	5 Lf of native toxoid mixed with 0.2 mg./Lf N.A.F.	0	0	0	0
3	16	5 Lf of native toxoid alone	1	0	0	4
4	12	5 Lf of foreign toxoid mixed with 0.2 mg./Lf N.A.F.	1	0	0	0
5	11	1 Lf of foreign toxoid mixed with 0.2 mg./Lf N.A.F.	0	0	0	0
6	7	5 Lf of foreign toxoid alone	1	0	0	0

every adult tested gave evidence of having been in contact with toxigenic *C. diphtheriae*, as 90% possessed very significant amounts of antitoxin before receiving the toxoid. Even so, as a consequence of this experiment, it will be seen that purified toxoid augmented with our N.A.F. gave the best antitoxin response. It is realized that the antigenicity of a diphtheria prophylactic cannot reliably be assessed by its performance as a secondary stimulus. A factor of considerable importance, arising from this experiment using adults, is the almost complete absence of reactions in subjects receiving N.A.F. in the prophylactic used, and this confirmed our observations made in children. It must be recorded, however, that the crude veal-infusion-proteose-peptone diphtheria toxoid itself proved quite unsuited for human prophylaxis owing to the severity of the reactions produced. This is remarkable in view of the observation that the N.A.F. is derived from this very material.

Summary

As a consequence of an examination of the antigenicity of toxoids derived from three different types of culture media, it was found that those derived from our veal-infusion-proteose-peptone medium were outstandingly greater than the other two per Lf.

Research into the reason for the valuable difference showed that the adjuvant factor is diffusible through cellophane, and can be adsorbed on to activated charcoal and eluted by dilute sodium hydroxide. The addition of

this neutralized partially purified natural adjuvant factor—N.A.F.—to purified formol-toxoid greatly augmented its antigenicity when tested in guinea-pigs.

This factor did not augment the antigenicity of purified tetanus toxoid, and, conversely, an analogous preparation derived from crude tetanus toxoid made in the same medium failed to augment the antigenicity of purified diphtheria toxoid.

Field trials made in children showed that purified toxoid augmented with this natural adjuvant increased its antigenicity to a level at least equal to British-manufactured and our own make of A.P.T. Furthermore, the reactions encountered were nil, compared with a high incidence from control materials.

A detailed trial in adults revealed the unexpected fact that diphtheria is endemic in the region of Bombay, since 90% of the subjects tested possessed highly significant amounts of circulating antitoxin before inoculation. This fact considerably diminished the value of the experiment from the point of view of assessing the comparative antigenicity of the prophylactics under test, although the highest titres were obtained from those subjects receiving toxoid together with the purified natural adjuvant factor. A valuable observation, however, was the almost complete absence of reaction in those subjects receiving N.A.F. with the prophylactic, whereas without it the incidence was high.

This new prophylactic is a perfectly clear solution that can be sterilized by filtration and freeze-dried without damage to its antigenicity.

I wish to express my grateful thanks to Dr. L. B. Holt, of the Wright-Fleming Institute of Microbiology, for help in the arrangement of this paper.

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The verbatim proceedings of the Third Commonwealth Health and Tuberculosis Conference, held in London in July, 1952, are now available in book form. This publication, price 21s., is obtainable from the National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C.1. Every speaker has revised his or her contribution, and the book contains, in addition to a full account of the proceedings, photographs of some of the speakers and overseas delegates at the conference.

THE PANCREATIC SIDE-EFFECTS OF MORPHINE

BY

H. WAPSHAW, M.D., F.R.C.Sed., F.R.F.P.S.
 Assistant Surgeon, Western Infirmary, Glasgow

Prior to the publication of Lagerlöf's studies (1945, 1947), information regarding the influence of morphine on the pancreas was very fragmentary. In 1907 Bickel and Pincussohn observed in two dogs with pancreatic fistulae that it first decreased and later increased the output of the external secretion. Cohnheim and Modrakowski (1911), using dogs each with a duodenal and an ileal fistula, found that morphine depressed the natural response to food. Babkin (1928) also noted a diminution in the duodenal content after its administration to animals. A more remote effect, which has been reported in rabbits, is an increase in the diastatic index of the urine (Sato, 1940).

The first recorded studies in humans are by Lagerlöf. Primarily interested in the fat-splitting enzymes in the blood, particularly those elaborated by the pancreas, he conceived that morphine might serve as a safe means of deranging the function of the gland. He compared the effect produced by the intravenous administration of purified secretin on the content of digestive ferments in the blood and duodenum with the effect of secretin given along with morphine. For the recovery of the duodenal juice he made use of the gastro-duodenal tube, thus minimizing the amount of gastric juice entering the duodenum. Secretin alone produced an abundant flow of pancreatic juice of high bicarbonate content unassociated with any appreciable change in the lipase levels in the blood. When it was given along with morphine there resulted a reduction in the volume of the duodenal fluid and a concomitant lowering of the secretory rates of amylase, trypsin, and, to a less extent, the bicarbonate of the pancreatic secretion: the amount of bilirubin in the duodenal contents was also diminished. These changes were maximal approximately 30 minutes after morphine. Soon afterwards there appeared in the blood a lipase that had not previously been present. Lagerlöf interpreted these findings as being due to overaction of the sphincter of Oddi interfering with the delivery to the duodenum of the bile and pancreatic secretion, and leading to absorption of a portion of the latter into the blood stream. He could not, however, exclude altogether the possibility that morphine depresses the function of the pancreas. The procedure just outlined has come to be known as the morphine-secretin test, the focus of attention having shifted to the response on the part of the serum-enzymes (see below). Lagerlöf has also made the arresting suggestion that the nausea and abdominal discomfort, sometimes amounting to pain, which not infrequently follow the administration of morphine, may be symptomatic of a drug-induced pancreatitis.

This paper is principally concerned with the serum-enzyme effects of morphine on healthy humans. Some were investigated in the fasting state, others were given a substantial meal before morphine, and in a third group an attempt was made to exalt the so-called vagus response of the pancreas to food by giving a parasympathetic stimulant before the morphine. Carbachol (carbachol B.P.) was chosen, since it has been shown to exert a vagus-like action on the pancreatic secretion (Wapshaw, 1952).

Biochemical Studies

Methods.—In most of the experiments both the amylase and lipase estimations were carried out with the same sample of venous blood. For the former the Somogyi iodometric test was employed, for which the normal range of values is 70–200 units per ml. of serum, although for each individual the value varies very little. The lipase activity was determined by the Cherry and Crandall (1932) test. By this method it is unusual for normal values to exceed 1.5 ml. N/20 sodium hydroxide per ml. of serum. A rise in the serum amylase of 50% over the premedication reading was regarded as significant. It was more difficult to decide what constituted a positive lipase response; but in view of results in the literature and after considerable experience an increase of at least 100% over the premedication control reading was taken as a positive result.

Effects of Carbachol.—This was a control study. Twenty-eight normal volunteers were investigated. These were divided into two equal groups. The first group fasted during the experimental period. The second received a meal consisting of soup, a meat dish with potatoes and vegetable, and a milk pudding 45 minutes before the injection of carbachol. Each subject received 0.5 mg. of carbachol intramuscularly, which is twice the upper therapeutic dose. Only lipase estimations were carried out in this series. (a) *Fasting Group*: Three out of 14 subjects showed a slight but apparently significant increase in the lipase concentration two to five hours after carbachol. The most pronounced increase was a rise from 0.7 ml. to 1.7 ml. N/20 NaOH per ml. serum. (b) *Fed Group*: Only 1 of the 14 subjects had altered readings. The control reading in this case was 0.6 ml., and four hours after carbachol the reading was 1.2 ml.

Effects of Morphine Hydrochloride.—The 84 individuals investigated were divided into three groups, each comprising 28 subjects; all received a subcutaneous injection of ½ gr. (16 mg.) of morphine hydrochloride. The first group fasted throughout the experimental period. The second group had a meal (see above) 60 minutes before the administration of morphine. The third group received a similar meal and 45 minutes later an intramuscular injection of 0.5 mg. of carbachol; after a further 15 minutes the morphine was injected. Thus it was arranged that the morphine was given at a time when the pancreas was likely to be in a state of active secretion. (a) *Fasting Group*: An increase in the amylase and lipase levels was observed in 5 of the 28 subjects (18%). The highest rise for amylase was three times the premedication reading in that subject and the highest for lipase 20 times (see Table I). (b) *Fed Group*: Raised levels were noted in 9 of the 28 investigated (32%). The highest rise for amylase was 9.1 times the premedication reading, and the highest for lipase 14.7 times (see Table II). (c) *Food plus Carbachol*: Raised levels were observed in 19 subjects (68%). The maximum responses were observed in the same case (No. 15, Table III) and amounted to 22 times and 17 times the premedication values for amylase and lipase respectively. In several the changes were marked within the first hour, but maximum augmentation more usually occurred two to four hours after the morphine injection. A comparison of the two sets of readings indicated that the lipase concentration was more readily affected than the amylase concentration.

TABLE I.—Effects of ½ gr. (16 mg.) of Morphine Hydrochloride on Serum Enzymes in 28 Fasting Subjects (only the 5 instances of positive responses are shown)

No.	Amylase (units/ml.)					Lipase (ml. N/20 NaOH/ml.)						
	Fasting Reading	Hours after Morphine					Fasting Reading	Hours after Morphine				
		1	2	3	4	5		1	2	3	4	5
1	100			180	460		0.5				1.8	
2	180						0.3			4.6		
3	177			530		1.8			3.2			
4	220			260								
5	160			320		0.1			2.0			

TABLE II.—Effects of Food and $\frac{1}{4}$ gr. (16 mg.) of Morphine Hydrochloride on Serum Enzymes in 28 Subjects (only the 9 instances of positive responses are shown)

No.	Amylase (units/ml.)							Lipase (ml. N/20 NaOH/ml.)						
	Fasting Reading	Hours						Fasting Reading	Hours					
		1	2	3	4	5	6		1	2	3	4	5	6
1	177				200			0.2				2.6		
2	84							0.1					2.6	
3	114					188		0.4					1.2	
4	100	400		914	640			0.4	6.4		7.6	5.9		
5	100			640				0.8			5.3			
6	123			530				1.1			3.1			
7	139			800				1.3			3.4			
8	160			800				0.5						

TABLE III.—Effects of Food, 0.5 mg. of Carbachol, and $\frac{1}{4}$ gr. (16 mg.) of Morphine Hydrochloride on Serum Enzymes in 28 Subjects (only the 19 instances of positive responses are shown)

No.	Amylase (units/ml.)											Lipase (ml. N/20 NaOH/ml.)										
	Fasting Reading	Hours										Fasting Reading	Hours									
		1	2	3	4	5	6	7	8	9	10		1	2	3	4	5	6	7	8	9	10
1	100	94	213									1.2	1.3	4.6								
2	80	85			220							0.7	0.7			3.9						
3	40	44			53							0.7	1.4			2.4						
4	50					88						1.1			2.5							
5	66			177						106		Zero										0.9
6	46				145							"				1.6						
7	55					114						"				0.6						
8	66	118		172								0.6	4.0		2.7							
9	80	340		420								0.4	5.2		5.1							
10	100	710	1,600									0.8	8.0	9.6								
11	60	760	940									0.7	3.5	6.6								
12	168	530		650								1.1	7.0	6.5								
13	94	200		578								1.6	4.5		6.0							
14	123	640		1920								0.9	7.4		10.1							
15	70				1600							0.6			10.2					4.3		
16	55	96		320					800			1.2	7.5		10.7							
17	160	400			580							0.9	5.0			1.6						
18	73				920							0.9				8.5						
19	80				580							1.3				5.8						

Bodily Reactions

Carbachol.—The somatic effects varied from case to case. Some subjects were apparently unaffected. Others complained of flushing of the face and neck, diaphoresis, salivation, a desire to void urine or go to stool, and one suffered from fairly severe precordial distress.

Morphine Hydrochloride.—One-fifth of all the subjects complained of nausea and about half of those affected vomited. The detailed incidence of sickness in the three groups was as follows: fasting, 21%; fed, 18%; fed and received carbachol, 25%. In some the feeling of sickness, often with giddiness, came on soon after the injection of morphine; in others it did not come on for one to two hours. It passed off after about two hours.

There was no correlation between the occurrence of sickness and the enzyme findings in the blood.

Pain developed in the epigastrium in three subjects. One belonged to the fasting group and the other two to the group which received food and carbachol. One of the latter was in great distress when examined, not only with pain that radiated in the lumbo-dorsal region but also with vomiting and retching. None of the three, however, showed signs of intra-abdominal irritation, and all the unpleasant effects had passed off within a few hours.

The serum enzymes were slightly raised in two of the three affected with pain. The one with the severe pain was No. 4 in Table III, and the other No. 2 in Table I.

Discussion

It is generally accepted that the amylase concentration in the blood remains constant irrespective of the state of nutrition or the relative abundance of carbohydrate in the diet (Carlson and Luckhardt, 1908; Cohen, 1925; Somogyi, 1934). Opinions differ, however, whether or not the blood

is normally endowed with the capacity to split the glyceryl esters of the more complex fatty acids, and there is no agreement on what effects the ingestion of fat may have on this property. Crandall (1935) and Lagerlöf (1945) hold that the olive-oil-splitting esterase or lipase is normally confined to the pancreatic secretion and that it finds its way into the general circulation only when the gland becomes the seat of disease. Others believe that its presence in the blood is consistent with sound health (Comfort and Osterberg, 1940; Johnson and Bockus, 1940; Wapshaw, 1948).

There is evidence that certain parasympathetic-mimetic drugs modify the digestive activity of the blood. Thus, the beta-methyl derivative of acetylcholine (methacholine B.P., "mecholy") was administered intramuscularly to dogs by Antopol, Schiffrin, and Tuchman (1934), and by Friedman and Thompson (1936), and observed to cause a rise in the amylase titre, which attained maximal levels within a few hours. Friedman and Thompson tied off the pancreatic ducts in dogs and found that the subsequent response on the part of the serum amylase to methacholine diminished *pari passu* with the degree of acinar atrophy which resulted from that procedure. In similar experiments Popper, Olson, and Necheles (1943) were likewise able to correlate their serum-lipase findings with the amount of parenchymatous loss. Indeed, the latter authors went so far as to suggest that the serum-enzyme response to methacholine, especially when administered together with secretin, might serve as a means of detecting pancreatic insufficiency.

Myhre, Nesbitt, and Hurly (1949) performed the methacholine-secretin test on a group of 24 healthy subjects. Only 70% of them yielded positive responses in the blood, which is obviously too low a normal register for a test that is intended to discover faulty function. The impression gained from the present investigation was that carbachol would also be unsuitable for this purpose.

As regards the effects of morphine, the serum-enzyme levels were raised in 33 of the 84 subjects examined—that is, 39%. Taking each group separately, positive responses occurred in 18% of the fasting group, in 32% of those furnished with a meal, and in 68% of those who received carbachol in addition to food. Peak levels were reached between the second and the fourth hours, and by the tenth hour the readings approached normal. Some very remarkable findings were recorded; in fact, judging from previous experience (Wapshaw, 1948) the increments in certain instances were of such a high level as to justify a biochemical diagnosis of acute pancreatitis; but the lack of supporting clinical evidence allayed any misgivings on that score. Lagerlöf expressed the view that although a certain parallelism exists between the lipase and amylase responses the former is the more pronounced. The present findings agree with this.

The increased incidence of positive findings in the third group of the morphinized series—that is to say, those on whom presumably the most testing conditions were imposed—corresponds with that reported by others. Thus, Myhre *et al.* (1949) found that morphine and secretin modified the amylase levels in 70% of 30 normal subjects. It would appear that Burke, Plummer, and Bradford (1950) subjected the pancreas to a still greater stress by giving concurrently morphine, methacholine, and secretin, since, according to their results, 79% of the 68 individuals so treated exhibited raised enzyme readings. In the present series the disparity between the results in the three groups of subjects, all of whom had morphine, leads to the view that the mobilization of the serum enzymes is conditioned by (1) the potent action of the drug on the sphincter of Oddi and the surrounding duodenal musculature, and (2) the functional state of the pancreas at the time when the morphine takes effect. The proportionately higher readings in the carbachol group was also regarded as evidence that this drug enhances the natural secretory response to food. Whether or not carbachol, itself a powerful excitant of visceral muscle, reinforces the action of morphine on unstriated muscle, thereby increasing the compression of the *pars intestinalis* of the pancreatic ducts, is a matter for further study. The findings with carbachol alone suggest that it does not seriously hamper the flow of the pancreatic secretion, which it stimulates, though, judging from the data, methacholine may conceivably have such a dual effect.

The nausea that so often affects those under the influence of morphine has been ascribed variously to one or several of the following actions—excitation of the vomiting centre in the medulla (Goodman and Gilman, 1941), pyloric spasm (Schroeder, 1933), a more general effect on the motility of the intestinal tract (Plant and Miller, 1926; Carlson, 1933; etc.), and biliary side-effects (Lueth, 1931; McGowan, Butsch, and Walters, 1936). Clinical support for Lagerlöf's assumption that the nausea may be of pancreatic origin is lacking. None of the subjects in the investigations of Myhre *et al.* showed symptoms which were referable to the pancreas. Burke *et al.* cited one instance of epigastric pain following morphine, but it is noted that this particular subject had previously undergone cholecystectomy and the pain could well have been due to a rise in the intrabiliary pressure. The overall incidence of nausea in the present series was 21% and did not bear any obvious relation to the functional state of the pancreas at the time when the morphine was given. There were three instances of associated epigastric pain—one in the fasting group, and the other two in the carbachol group; in two the enzyme levels showed a rise, but only of slight degree. All three were completely free of pain and nausea within a few hours, and enjoyed their evening meal.

It would be premature to conclude that these findings have any direct bearing on the aetiology of acute pancreatitis. They do infer, however, that morphine may cause the pancreas a considerable degree of embarrassment, although these short-term experiments indicate that the disturbance was largely functional.

Summary

The influence of morphine on the pancreas was investigated in 84 normal subjects. The observations included a study of (1) the ensuing changes in the amylase and lipase levels in the blood, and (2) the somatic effects of the drug.

The serum-enzyme concentrations were significantly raised in 39% of the series. These changes appear to be due mainly to a state of secretion-retention within the pancreas, for which the excitant action of morphine on the sphincter of Oddi and contiguous muscularis, with consequent absorption of the ferments into the general circulation, is responsible. The present findings suggest that this effect is conditioned also by the functional state of the pancreas.

Carbachol alone does not materially affect the enzyme concentration of the blood, though it would appear to intensify the effect of morphine in this respect.

The incidence of nausea among the morphinized group was 21%. Three instances of transient epigastric pain are recorded. It is questionable if these bodily reactions, though attributable to morphine, have a pancreatic basis.

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The rapidity with which exchange of information on influenza has taken place since the first signs of the present epidemic has made it possible to determine with certainty that the virus concerned in 1953 is the A-prime virus. This, in turn, has made possible the immediate use of vaccines prepared from it and the carrying-out of large-scale vaccination, whose results may prove of great value in the prevention of the disease. Thus, in Holland, workers and employees in large works and factories have been vaccinated. In the United States, Canada, and Great Britain mass vaccination has been carried out, mainly in barracks and hospitals, ideal places for the transmission of the infection. World Health Organization experts now hope that when they meet in Geneva in 1954 they will be able to announce that they have mastered this disease, thanks to the work carried out by the network of W.H.O. laboratories established throughout the world, and thanks also to the fact that for the first time it has been possible to use in good time a vaccine prepared in advance.

GASTRO-ENTERITIS IN GENERAL
PRACTICE

A STUDY OF 90 UNSELECTED CASES

BY

W. J. SMITHER, M.D., D.P.H.

The *British Medical Journal* (1951) notes a real as well as an apparent increase in the amount of gastro-intestinal infection. There has also been a steady annual increase in the number of cases of food-poisoning notified. The *Monthly Bulletin of the Ministry of Health* (1951) states, "That better reporting accounts for the whole of the increase is unlikely, and it appears that food-poisoning is still increasing."

It is often said that earlier bacteriological investigation would reveal an increased proportion of specific infections. The Chief Medical Officer to the Ministry of Health says in his report for the year ending March 31, 1950: "The fact that no causal agent could be found in a large number of sporadic cases [of food-poisoning] was because many of these cases were not reported until it was too late for investigation." In the United States Felsen (1945) concluded, *inter alia*, that "when the unclassified infectious diarrhoeas are studied the majority appear to be bacillary dysentery. . . . The reported incidence of bacillary dysentery far exceeds that of any other specific infectious diarrhoea."

That statement holds true for this country, where the picture of bacillary dysentery is acknowledged to be very different from that seen abroad. The number of corrected notifications rose to the record figure of 17,223 in 1950. Of these, 14,085 were investigated bacteriologically, and 96% of this number were due to *Shigella sonnei*. When these figures are compared with the total number of "incidents" of food-poisoning for the same period—that is, 3,979—it would appear that *Sh. sonnei* is the commonest cause of acute diarrhoea. Particularly would this be expected in general practice, where the mild type of diarrhoea is so commonly seen.

For the year ending March 31, 1950, when there were 2,431 incidents of food-poisoning, the Chief Medical Officer reported that "there was evidence that at least 11,000 persons were affected." Even if we allow that the increase in the number of incidents in 1950 was entirely a real increase and in no way due to the new method of reporting, the proportionate number of estimated as opposed to reported persons affected should not rise above the total reported cases of dysentery. Thus the general practitioner should still expect to find that Sonne dysentery is the commonest cause of diarrhoea.

It was decided to test the truth of these assumptions and the value of the statements that early bacteriological investigation would reveal more specific causal agents. A study of unselected cases of acute diarrhoea, with or without vomiting, was felt to be of value.

The Investigation

The method chosen was to investigate bacteriologically by means of rectal swabs every case of acute diarrhoea, with or without vomiting, seeking treatment. From June to November, 1951, inclusive, 74 cases occurred in a general practice in an industrial area near London. A

second group of 16 cases were investigated from mid-December, 1951, to mid-February, 1952, with a slightly different technique. The number considered to be at risk—that is, likely to seek advice—was approximately 7,000. No attempt at selection was made and all acute cases were investigated. Cases of chronic or recurrent diarrhoea were excluded. Rectal swabs were sent to the local laboratory without a provisional diagnosis, and the bacteriological diagnosis quoted is the one arrived at by this laboratory.

Because of criticism of rectal swab efficiency in general practice, the technique was changed for the second group of 16 cases. In these the rectal swab was used to inoculate immediately a bottle of selenite medium, and both swab and inoculum were sent to the laboratory.

The results obtained are shown in the Tables. Following the terminology of the Ministry of Health, a "family outbreak" means two or more related cases in the same family, and a "sporadic case" means a case which had no ascertainable relation to another case. Each family outbreak and sporadic case has been treated as one unit and described as an "incident." The Ministry of Health defines an "outbreak" as the occurrence of two or more related cases in persons of different families. No relationship was observed between any of the sporadic cases reported, so the term outbreak is not used.

Table I shows the incidence by the presumed cause. In the largest group no pathogenic organisms were isolated. All the second series of cases came into this group, making

TABLE I

Presumed Cause	Sporadic Cases	Family Outbreaks	Total Incidents	Total Cases
No pathogens	68	1	69	71
<i>Sh. sonnei</i>	3	4	7	14
<i>Pr. vulgaris</i>	1	1	2	3
<i>Salm. typhi-murium</i>	1	—	1	1
Food-poisoning (toxin type)	1	—	1	1
	74	6	80	90

a total of 69 incidents. *Sh. sonnei* was the most frequently isolated specific causal agent—7 incidents comprising 14 cases. *Proteus vulgaris* was the next most frequent—two incidents comprising three cases. *Salmonella typhi-murium* was isolated in only one case.

One family outbreak occurred in the group from which no pathogenic organisms were isolated. There was one family outbreak in the proteus group. This contrasts with the comparatively large number of four family outbreaks of Sonne infection.

Only one case required admission to hospital. This patient was a young woman with high fever whose failure to respond to treatment led to her admission on the third day of the illness. The hospital diagnosis was food-poisoning (toxin type). She recovered in eight days. All the other cases responded rapidly to treatment and yielded negative swabs on the second attempt, except the case from which *Salm. typhi-murium* was isolated. This gave a positive rectal swab one week later. One case, subsequently diagnosed as acute appendicitis, presented as acute diarrhoea.

Table II shows the incidence by age and presumed causal agent. The youngest patient was 4 months and the oldest 74 years. No pathogenic organisms were isolated in the majority of incidents at all ages, but the smallest number of these negative swabs occurred in the group under 1 year. Most cases of Sonne dysentery occurred in the 5–14 years group. Half as many occurred in the 1–4 group, and there was one case in each of the groups of under 1 year and over 14 years. There was one case of proteus infection in the under-1-year group, and a family outbreak comprising

TABLE II

Presumed Cause	Age in Years			
	Under 1	1 to 4	5 to 14	Over 14
No pathogens	6	23	16	26
<i>Sh. sonnei</i>	1	4	8	1
<i>Pr. vulgaris</i>	1	2	—	—
<i>Salm. typhi-murium</i>	—	—	—	1
Food-poisoning (toxin type)	—	—	—	1
	8	29	24	29

two cases in the 1–4 years group. The individual case of salmonella infection and that of food-poisoning (toxin type) occurred in adults.

Table III shows the incidence by weekly intervals. Those incidents in which no pathogenic organisms were isolated were fairly evenly distributed throughout the whole period. Incidents of Sonne dysentery were evenly spaced until the beginning of November, after which no further cases occurred. This is not in keeping with the comment of the

TABLE III

Week Ending	No Pathogens	<i>Sh. sonnei</i>	<i>Pr. vulgaris</i>	<i>Salm. typhi-murium</i>	Food-poisoning (Toxin Type)
2/6/51	2	1			
9/6/51	3				
16/6/51	1				
23/6/51	4				
30/6/51	2	1			
7/7/51	4			1	
14/7/51	1				
21/7/51	1				
28/7/51	1	1			
4/8/51	2				
11/8/51	1				
18/8/51	5	1			
25/8/51	1				
1/9/51	—				
8/9/51	3		1		
15/9/51	2				
22/9/51	3				
29/9/51	3	1			
6/10/51	—				
13/10/51	1				
20/10/51	—				
27/10/51	3				
3/11/51	4	1			
10/11/51	2	1			
17/11/51	3				
24/11/51	1				
22/12/51	2				
29/12/51	5				
5/1/52	—				
12/1/52	2				
19/1/52	1				
26/1/52	1				
2/2/52	2				
9/2/52	1				
16/2/52	2				

British Medical Journal (1951) that "in this country dysentery, as opposed to food-poisoning, is now almost a winter disease." The incidents of proteus infection occurred together in mid-September, and those of salmonella infection and of food-poisoning (toxin type) in early July.

Discussion

It may be said that there is no justification for regarding those mild cases of gastro-enteritis in which no pathogenic organisms were isolated from rectal swabs as food-poisoning. However, the clinical course, the rapid response to treatment, and the absence of parenteral infection lend support to such a clinical diagnosis. The Chief Medical Officer (1951), noting the increased incidence of food-poisoning, gives three main reasons for that increase. The first is the retention overnight and reheating of meat dishes cooked the previous day for reasons of economy. The second is the great increase in communal feeding in schools, mines, and factory canteens, where such cooking practices are common. The third cause is the lack of personal hygiene. These conditions are so widespread in this area, where domestic refrigerators are rare and food is commonly kept in the

larder or kitchen, that a history of any of the predisposing factors is of little value. Histories are unreliable in isolated cases of food-poisoning.

Only one case, that infected with *Salm. typhi-murium*, gave an unequivocal history. This patient was a woman of 43 who was quite sure that her symptoms followed the eating of a boiled duck egg. The *Lancet* (1951) casts doubt on the role of duck eggs in salmonella infections. It is difficult, however, to get bacteriological proof in the case of a boiled duck egg. There is rarely any of the egg left, and these eggs are not common articles of diet eaten as such in this area. Large numbers are used in cookery, particularly in catering establishments, where they fetch a high price. It seems interesting that in this series the only person who volunteered information concerning the ingestion of suspected food was the sole case of salmonella infection.

The cases of Sonne dysentery reported here were so mild and their response to treatment so rapid that, but for the interest engendered by this study, they might never have been investigated and reported. There were more family outbreaks of this infection than of any other. The group of cases in which specific organisms were isolated was dominated by Sonne infections—14 cases out of a total of 18. This suggests that infection with *Sh. sonnei* is even more common than the numbers of reported cases would indicate.

The presence in this series of one isolated case and one family outbreak of gastro-enteritis in which *Pr. vulgaris* was isolated may or may not be of significance. However, it seems fair to comment that this organism was found more often than *Salm. typhi-murium*, believed by many to be the commonest cause of food-poisoning. The one case of the latter infection noted was so mild that it might easily have passed unnoticed.

There were six infants under 1 year with diarrhoea from whom no pathogenic organisms were isolated. Since no special bacteriological techniques were employed, there is no means of determining whether these were due to a specific strain of *Bact. coli*. No parenteral infection was noted. The numbers compare with two sporadic cases of specific infection under the age of 1 year. In one of these *Sh. sonnei* was isolated and in the other *Pr. vulgaris*.

It is submitted that any of the cases from which no pathogenic organisms were isolated could be due to the heat-resistant enterotoxin produced by certain strains of staphylococci. These organisms may be extinct in the food, and even more probably extinct in the rectal swab, and yet cause symptoms. The ubiquitous distribution of such organisms, and the ideal conditions for toxin production in the common cooking practices mentioned previously, support this view. The one case in which food-poisoning (toxin type) was the final diagnosis presented clinically as a severe gastro-enteritis with marked vomiting and high fever. There was some abdominal tenderness but no other physical sign. The patient was mentally alert throughout to a degree unusual in such a pyrexia. Her failure to respond to home treatment led to early admission to hospital. No pathogens were isolated from the rectal swab, and bacterial investigation in hospital was quite negative. The final diagnosis was therefore a clinical one. This would seem to be an isolated case of unusually severe enterotoxic food-poisoning due to individual hypersusceptibility.

Any of the cases from which no pathogenic organisms were isolated could have been due to a great variety of causes. So far as was possible, many of these causes were eliminated clinically. Most of these other conditions are comparatively rare. One case subsequently diagnosed as appendicitis presented as acute diarrhoea, and one case of adenomatosis of the colon was picked up. Neither of these has been included.

It is realized that more argument than evidence has been adduced to support the belief that most of the cases in which no pathogenic organisms were isolated were due to staphylo-

coccal food-poisoning; what evidence we found is negative rather than positive. Nevertheless it would seem that staphylococcal food-poisoning is the commonest cause of the frequent mild cases of diarrhoea, with or without vomiting, met with in general practice.

Summary

Ninety unselected cases of acute gastro-enteritis, occurring over a period of nine months in an urban practice, were investigated. In by far the greatest number of these no pathogenic organisms were found. The commonest specific organism isolated was *Sh. sonnei*. *Pr. vulgaris* was the next most common. Only one case of infection with *Salmonella typhi-murium* was found. One case was subsequently diagnosed in hospital as food-poisoning (toxin type).

Arguments are advanced for the belief that staphylococcal food-poisoning is the commonest cause of mild cases of gastro-enteritis.

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Medical Memoranda

Intra-partum Uterine Rupture

Mr. Hodgkinson's article in the *British Medical Journal* of February 9, 1952 (p. 308), on this subject prompts me to record my experiences at the Government Hospital, Gatooma, with similar cases during the past two years. This hospital contains some 250 beds for Africans and about 150 to 200 deliveries take place in it every year. Caesarean section is often carried out, since contracted pelvis, and especially pelvis with contracted outlets, are common. I have averaged about 25 such operations a year during the past five years. Uterine rupture has not occurred in any case in which caesarean section has been carried out, although nearly all these operations have been of the "classical" variety. I attribute this immunity to following the advice of Mr. Victor Bonney to use a layer of non-absorbable sutures in the uterine wall. Our present practice is to use a deep layer of catgut and a superficial layer of nylon. No irritation seems to be set up by the latter, and in a case on which I operated for the second time recently it was extremely difficult to trace the previous scar in the uterus. The following four cases of uterine rupture have been met with.

CASE REPORTS

Case 1.—An African woman aged about 35 was admitted to hospital on January 14, 1950. She had had five previous pregnancies; the first three were normal full-term deliveries of live children, the fourth was a full-term delivery of a stillborn child, and the fifth a four-months abortion. She stated that labour began late in the evening of January 13, and she did not think that the membranes were ruptured. On examination she was shocked and collapsed, and had just come about 40 miles by ambulance over rough roads. No foetal parts could be distinguished through the tense abdomen, and the foetal heart was not heard. Per vaginam there was a foul-smelling discharge, and a shoulder was presenting. The cervix was fully dilated. In spite of all the usual restorative measures the woman died two hours after admission without recovering sufficiently to warrant

active treatment. At necropsy it was found that the uterus had ruptured into the left broad ligament, and that the child was still *in utero*. The patient had lost only about a pint (570 ml.) of blood. Death was obviously due to shock and toxæmia.

Case 2.—This patient, an African woman aged about 25, was admitted to hospital on February 1, 1950. She had had two previous pregnancies, both of which terminated normally in live children. The present labour began the evening before admission. The uterus was tonically contracted, no foetal parts were felt through the abdomen, and the foetal heart could not be heard. Vaginal examination revealed that the cervix was three-quarters dilated and a head could be felt high up at the pelvic brim. There was a large caput and the cervix was hanging loosely below it. The patient was profoundly collapsed and pains had ceased some hours before admission. After the usual shock treatment a laparotomy was performed. A full-term dead foetus was found loose in the abdomen. The uterus had ruptured through its left side behind the broad ligament and the peritoneum contained about 3 pints (1.7 litres) of blood and clots. Subtotal hysterectomy was performed. Convalescence was stormy, but the patient eventually made a complete recovery.

Case 3.—An African woman of about 30 was admitted on May 22, 1951. She had had five previous full-term pregnancies, all of which terminated in easy and normal labours. On examination the child was lying in the L.O.A. position and seemed very large. The maternal pulse rate was 80 and the foetal 96. The foetal head was fixed at the pelvic brim, and a large caput reached nearly to the vulva. A catheter drew off 2 pints (1.1 litres) of very blood-stained urine. It was decided that caesarean section was indicated, and a laparotomy was performed in order to do this. To our surprise the uterus was extensively ruptured through the anterior part of the lower segment. The child was still *in situ*. It was removed by enlarging the uterine hole, and a subtotal hysterectomy was carried out in view of the extensive laceration of the lower segment. The child was dead, but the mother made a good recovery after a stormy convalescence.

Case 4.—This woman, who appeared to be about 40 years old, was admitted on September 30, 1951. She had had ten previous full-term pregnancies with easy labours. She was very collapsed. The foetal parts could be felt with difficulty and the head was palpated in the right iliac fossa. Vaginal examination revealed severe bleeding, and the case was thought to be one of placenta praevia. On laparotomy the peritoneal cavity was found to contain about 2 pints (1.1 litres) of blood and clots.

The child was free amongst the intestinal coils, and the uterus was found to have a large rent through its posterior lower segment. The child was removed, dead, and a subtotal hysterectomy was performed. Apart from some trouble with atony of the bladder—a common difficulty in post-partum African cases—the woman made an un interrupted recovery.

COMMENT

In none of these cases had a caesarean section been performed previously, nor had there been any interference in the present labour so far as is known. All the cases occurred in multiparae, and it is suggested that the cause of the obstructed labour in each case was progressive enlargement of children with each pregnancy. It is felt that a lesson to be learnt is that a good previous obstetrical history should not be allowed to warp one's judgment into expecting that all will necessarily be well with subsequent labours even with a child in a good obstetric position.

My thanks are due to Dr. R. M. Morris, the Secretary for Health, for permission to publish this article.

H. J. KNIGHT, M.B., B.S., D.Obst.R.C.O.G.,
Medical Superintendent, Government Hospital, Gatooma,
Southern Rhodesia.

"Lethane" Poisoning: Report of a Fatal Case

Insecticides containing "lethane" are in common use for the treatment of pediculosis. Harrison (1947) reported a fatal case of poisoning due to this type of preparation, which he believed to be the first recorded example of its kind. A further non-fatal case was recorded by Guy (1951).

CASE REPORT

A male child aged 1 year and 11 months had recently been treated for milary tuberculosis for about a year. While in his own home he drank a small quantity (the exact amount being unknown) of a liquid insecticide, believing it to be lemonade. He rapidly became unconscious, and was admitted to hospital in this condition.

On examination the child was deeply comatose. The limbs were flaccid; the colour was good, and the breathing regular. There was a smell of paraffin in the breath. The pupils were equal, were dilated, and did not react to light. There were no other clinical abnormalities. Gastric lavage was carried out and nikethamide given, both intramuscularly and intravenously. Later the breathing became stertorous and cyanosis was noted. Generalized clonic convulsions then developed, and these were controlled only by sodium phenobarbitone and lumbar puncture. Respiratory failure then set in, with prolonged periods of apnoea, and the child died two and a quarter hours after admission.

Necropsy showed milary tuberculosis of lungs, liver, spleen, and kidneys, the milary lesions being in varying stages of development and healing. The stomach was moderately dilated, but was otherwise normal. The lungs showed hypostatic congestion. There was no abnormality of the central nervous system. Analysis of the gastric contents showed the presence of a thiocyanate.

COMMENT

The composition of the preparation, as stated on the label, was as follows: lethane 384 special, 49%; oil of petrolol alb., 49%; and oil of citronel., 2%. "Lethane 384 special" has the following composition: β -butoxy- β -thiocyanodiethyl ether, 12.5%; β -thiocyanoethyl laurate, 37.5%; and refined paraffin, 50%.

The clinical features of the present case were those of rapid coma, convulsions, and respiratory depression and failure. These findings are in agreement with those of Cameron *et al.* (1939), who investigated the toxic effects of several thiocyanates on rats, rabbits, and guinea-pigs. They concluded that β -butoxy- β -thiocyanodiethyl ether was highly toxic to these animals, and that death was due to respiratory failure, probably of medullary origin. Harrison, in his report of a fatal case of lethane poisoning, suggested that death was due to respiratory failure.

Guy (1951) reported the case of a child of 20 months who took 1 to 2 dr. (3.5 to 7 ml.) of a lethane hair-oil. Some of this was apparently inhaled, as a bronchopneumonia developed. The child remained ill for about two weeks and showed slight neck rigidity, drowsiness, and irritability. There was no evidence of hepatic or renal dysfunction. It is possible that the bronchopneumonia may have been due, in part at any rate, to the paraffin base. The neurological features probably represented a toxic effect from the thiocyanates; on the other hand it is possible that these findings could have been complications of the pneumonia *per se*.

Absorption of the poison seems to be rapid, and there appears to be no effective antidote. Glaister (1945) suggested a trial of methylene blue (50 ml. of 1% solution intravenously) or sodium thiosulphate (10–50 ml. of 20% solution intravenously). Apart from these measures, treatment must be symptomatic, and should include early and energetic gastric lavage.

The present case is reported in order to re-emphasize the dangerous nature of these preparations, which, as Harrison has pointed out, can be readily bought at any chemist's shop

and which are not labelled "poison." As the contained thiocyanates have a toxic action similar to that of hydrocyanic acid, it is suggested that the future sale of such preparations should be brought within the scope of the poisons regulations.

Our thanks are due to Dr. A. M. Tripathy for the necropsy report; to Mr. H. K. Lawton for the analysis of the gastric contents; and to Dr. R. W. M. Strain for permission to publish the details of this case.

ELIZABETH COULTER, M.B., Ch.B.

R. D. G. CREERY, M.D., M.R.C.P., D.C.H.
Ulster Hospital for Children and Women, Belfast.

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Death After Intravenous Iron

More or less severe reactions to the intravenous injection of saccharated iron oxide have occurred on several occasions during the last few years, but none of those previously reported have ended fatally. Nissim (1947) suggested gradually increasing dosage, and Nissim and Robson (1949) reported that "several patients received repeated doses of as much as 300 mg. of iron by intravenous injection without the slightest toxic reaction." In mice they said that "death is presumably due to multiple capillary embolism in internal organs." Davidson and Girdwood (1948) reported a case treated by repeated intravenous injections of saccharated iron oxide, in which sickness and rigors occurred with the last three injections of 100 mg. Severe reactions also occurred in several other cases. Slack and Wilkinson (1949) used 25 mg. on the first day, increasing to 50 mg. on the second, 100 mg. on the third, and 200 mg. subsequently. One of 60 patients developed a mild reaction at the 200-mg. level. In 60 other cases more than 800 mg. had been given intravenously. Mitchell (1949), Sinclair and Duthie (1949), and Govan and Scott (1949) have also described reactions, while Ramsey (1950) gave initial doses of 300 to 900 mg. of "ferrivenin" in 11 cases, in all but one of which there were severe reactions (weakness, sweating, sickness, and collapse for a few hours). Mooney (1950) reported one case treated with an initial dose of 100 mg., which three hours later developed a temperature of 103° F. (39.4° C.) with intense headache, shivering, and copious vomiting lasting some six hours. The manufacturers suggest the use of graded doses.

Below we record a case in which an initial intravenous dose of 100 mg. led to severe reactions and death.

CASE REPORT

A man aged 69 was admitted to hospital for treatment of anaemia. His blood count was haemoglobin, 61% (9 g. %); red cells, 3,890,000; C.I., 0.79; white cells, 6,500. Red cells showed marked anisocytosis, moderate poikilocytosis, anisochromia, and polychromasia. A few target cells were seen. Reticulocytes were less than 1%.

A slow injection of 5 ml. (100 mg.) of saccharated iron oxide ("ferrivenin") was given intravenously, and three minutes later the patient became hot and flushed. After a further two minutes he became cold and drowsy. Ten minutes after the completion of the injection he became dyspnoeic and cyanosed, and then collapsed. He was pulseless, and no apex beat could be felt or heard. Gasping respirations continued. Intracardiac injections of nikethamide and adrenaline, as well as intravenous injections of nikethamide and lobeline, were given. Artificial respiration and oxygen were given from the time of the collapse. Weak heart beats were noted shortly after the intracardiac injections, but the patient died 30 minutes after the original injection.

At necropsy 18 hours later the only evidence of disease was in the coronary arteries, both of which were calcified, and the right artery was completely occluded. There was no evidence of multiple emboli.

The LD 50 of the batch of ferrivenin when originally tested was approximately 300 mg. of iron per kg. of body weight in mice, and a recent toxicity test on the same batch showed no significant departure from this original figure.

COMMENT

Trivial and severe reactions to the use of intravenous ferrivenin have previously been reported. This case in which sudden death followed the first injection emphasizes the necessity for care: the initial dose should not exceed 25 mg. and the possibility of severe reactions even in patients who have had repeated injections should be kept constantly in mind.

We are indebted to Dr. R. A. Hickling for permission to publish details of this case.

D. W. BARRITT, M.B., M.R.C.P.
G. C. SWAIN, M.B., M.R.C.S.

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Long-delayed Rupture of Spleen: Report of Two Cases

Delayed bleeding occurs in about 15% of all splenic injuries, the latent period varying between a few hours and many days. According to Zabinski and Harkins (1943) this latent period is less than seven days in 50% of the cases and less than 14 days in a further 25%. They could find only eight reported cases in which the delay was longer than 19 days, one of these being as long as two years. The following cases are of interest mainly on account of their long latent period—22 and 26 days respectively.

CASE REPORTS

Case 1.—A soldier aged 22 was admitted to a military hospital in 1942 with gunshot wounds of his feet and hands, sustained when he was blown up by a landmine. He had apparently no other injuries. These wounds healed, and on the 22nd day after injury he reported to the commanding officer's office for discharge from hospital. Here he collapsed with sudden severe abdominal pain and considerable shock. After resuscitation a laparotomy was performed and a ruptured spleen removed.

Case 2.—A married woman aged 29 was brought to hospital in November, 1950, having collapsed in the street with sudden severe upper abdominal pain, radiating to the tip of the left shoulder. She gave a history of a fall from a chair 26 days before, when she had "bruised" her left side. After this injury she had been confined to bed for five days with severe pain in her left side and shoulder. She had then returned to her work as a school teacher, which included "keep-fit exercises." She had experienced a dull ache in her side but no severe pain until her sudden collapse. On examination she was shocked and very pale. There was great tenderness in the upper abdomen, with rigidity in the left hypochondrium and loin. At operation, after resuscitation, the peritoneal cavity contained a fair amount of liquid blood. Examination of the spleen showed a small tear on the costal surface with a large amount of surrounding clot. Splenectomy was performed, and the patient made an uneventful recovery.

COMMENT

Numerous theories have been advanced to account for the latent period. The formation and later rupture of a subcapsular haematoma probably account for some cases, and McIndoe (1932) points out that the severity of the tear as found at operation may be much greater than the original injury suggests, and that it is possible that the haematoma ruptures with almost explosive violence, causing the very sudden collapse of the patient.

The theory of the perisplenic haematoma as advanced by McIndoe and later by Delannoy (1939) seems to fit in with the symptoms in many cases and with the findings at operation of large amounts of clotted blood in the region of the spleen. Other theories are: intrasplenic bleeding controlled by pressure of the haematoma on the pulp; temporary haemostasis due to shock; tamponade by omentum, colon, stomach, etc. McIndoe places these injuries in three categories: (1) minor capsular rupture or parenchymal injury; (2) subcapsular haematoma; and (3) capsular haemorrhage with perisplenic haematoma. Of these, Nos. 2 and 3 are the most important.

Delannoy associated these pathological lesions with the symptomatology, and suggested two clinical types. (1) Splenic rupture with delayed haemorrhage. This corresponds with McIndoe's subcapsular haematoma and usually with a symptom-free latent period. (2) Rupture with retarded symptoms, corresponding with the perisplenic haematoma. Here the latent period may be marked by pain of varying severity occurring in the left hypochondrium and shoulder or sometimes by generalized abdominal discomfort.

Examination at this stage will reveal persistent tenderness and rigidity in the left upper quadrant, and x-ray films may show a paralysed diaphragm on this side. Other symptoms are pallor, weakness, dizziness, and fainting attacks, though these latter are probably more common with a slow continuous leak than with true delayed rupture. A number of such cases have been recorded, and one reported by Coyle, Kleiman, and Smith (1950) presented with gradual abdominal distension and anaemia.

The cases reported here fit well into these clinical categories. Case 1 had no symptoms referable to the abdomen between the time of his injury and his collapse 22 days later. Case 2 experienced intermittent pain in the left hypochondrium, and at operation a large clot was found around the splenic region, with liquid blood in the rest of the peritoneal cavity.

The pain in these cases is usually sudden and severe, and most commonly felt in the splenic region. Zabinski and Harkins reported the frequency of associated fractures of the ribs—a fact previously recognized by McIndoe, who stressed the importance of keeping under observation for at least 14 days any patient with an injury to the left side, particularly if complicated by fractured ribs. It must, however, be remembered that delayed rupture of the spleen can occur after quite a trivial and sometimes forgotten injury, and it is probable that many, if not all, the cases reported as "spontaneous rupture of a normal spleen" fall into this category.

My thanks are due to Mr. Stanley O. Aylett for his helpful advice and for permission to publish these cases, which were treated under his care.

C. G. ATTENBOROUGH, M.B., F.R.C.S.,
Registrar, Accident and Orthopaedic Department,
The London Hospital.

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Reviews

• CANCER IN GENERAL PRACTICE

Cancer in General Practice. By Ronald W. Raven, O.B.E., F.R.C.S., and P. E. Thompson Hancock, F.R.C.P. (Pp. 265; 71 figures. £1 10s.) London: Butterworth and Co. 1952.

The authors of this book give a condensed but systematic account of malignant disease in the various organs of the body. The word "cancer" in the title is used colloquially and includes such diseases as the leukaemias and lymphadenoma as well as the sarcomata, which are given a modern and no doubt highly scientific nomenclature. The early and when generally accepted, the pre-cancerous stages of tumours are clearly and concisely described, with the common modes of spread. The authors emphasize early diagnosis, and give a brief account of the treatments available and their results.

Mr. Raven's vigorous ideas on the education of the public about cancer are well known. It is natural that he should also be interested in the education of the general practitioner. In so far as the descriptions prove the value of good history-taking and thorough examination in order to make an accurate diagnosis, the general practitioner will be stimulated and encouraged to be on his mettle. It is rather the result of treatment which is so discouraging. To take, for example, one of the commonest cancers of the human body, he learns that 5 out of 10 patients with stage 1 carcinoma of the breast die within five years in spite of all forms of treatment. He wonders how many of the survivors will be subjected to more and more treatment at ever lessening intervals. There is much to be said for one radical operation or one radical course of radiotherapy which either cures or kills, but the mutilation of mind as well as of body which results from repeated operations or therapy is one of the most distressing sights in general practice to-day. The general practitioner will learn much from this book, but the knowledge may make him sick at heart.

C. W. WALKER.

ARTHRODESIS

Architectural Principles in Arthrodesis. By H. A. Brittain, O.B.E., M.A., M.Ch., F.R.C.S. With foreword by Sir Harry Platt, M.D., M.S., F.R.C.S. Second edition. (Pp. 208; 257 illustrations. £2 2s.) Edinburgh and London: E. and S. Livingstone. 1952.

It is eleven years since Mr. H. A. Brittain published his monograph on arthrodesis, and the outstanding feature of it was his operation for fusion of the hip. Since then what everyone now calls Brittain's arthrodesis has been practised by surgeons the world over with results far superior to those obtained by any other method, especially in tuberculous disease. This is the test of a good operation—that it succeeds in the hands of many surgeons of reasonable competence and does not depend on some legerdmain of the originator. Brittain's distinction is therefore derived from his conception of ischio-femoral arthrodesis, and when he talks about architectural principles in arthrodesis he knows what he is about and is not merely a clever craftsman. Thus there is every justification for a second edition of this valuable monograph, and he now speaks with a certainty and authority that would have been premature in 1941. Some of his other operations are coming along well, too. The posterior arthrodesis of the shoulder is in the same class as his operation on the hip, and his encouraging experience of it has been powerfully reinforced by Professor Mercer's. The V-arthrodesis for osteoarthritis of the hip is still, I think, rather personal to Mr. Brittain, but we may all come round to it in time as we have done to ischio-femoral arthrodesis for tuberculosis.

Although our ultimate aim must always be to restore the function of a damaged joint, it must be confessed that even in favourable circumstances arthroplasty is still an unpredictable procedure. Too often conditions are against us, and then a painless ankylosis is often the best that we can offer a patient crippled by a painful or unstable joint. Brittain, more than any other surgeon in this country, has set himself the task of devising methods of arthrodesis that really work, and his success has been such that no orthopaedic surgeon can afford not to read his *Architectural Principles*.
H. J. SEDDON.

ELECTROLYTES AND THE HEART

Gli Elettroliti nella Funzione Contrattile del Miocardio e nella Genesi dell'Elettrocardiogramma. By F. Lenzi and A. Caniggia. Monografie Cardiologiche I. Preface by Professor L. Condorelli. (Pp. 355. No price.) Siena: La Poligrafica.

This book on the electrolytes in the contractile function of the heart muscle and in the causation of the cardiogram is an account of extensive experimental work done on the hearts of tortoises. The authors have investigated the effect of various ions, taking them in the groups of the Mendeleff table. They point out how the important ionic reactions which occur round the muscle cell depend mainly upon the movements of the sodium and potassium ions. The cardiogram indicates what they call the cationic gradient between the high concentrations of potassium inside the cell and the low concentrations outside, and also the difference between the various concentrations of sodium inside and outside the cell. They explain how, by altering the levels on either side of the membrane, the activation process can be changed—that is, an increase of sodium in the blood will accelerate it, but slow down repolarization. In the same way, with increase of potassium outside the cell, activation is slowed but recovery is promoted. This process will cause a prolongation of the QRS and a shortening of the ST intervals. For the clinician these are perhaps the most important points of interest, but the authors have also investigated very fully the effects of lithium and calcium, rubidium, and caesium. These little-known elements play no appreciable part as yet in clinical medicine, but possibly calcium may be important, for QRS is prolonged by an increase in the calcium, strontium, and barium group. They have also considered some of the heavy metals as well, including mercury. The records of the cardiograms are clear and easy to follow.

No doubt this work is more of interest to the physiologist or the pharmacologist at present, but these matters will probably take their place in clinical medicine in due course. The book is comprehensive; over 1,000 references are given; there is no index, but the table of contents is a good guide. The clinician may not find time to read the book very closely, but it contains many interesting facts worth studying.

TERENCE EAST.

RESPONSE TO AIR BOMBARDMENT

Angst und Schreck. By Professor Friedrich Panse. (Pp. 189. M. 12.60.) Stuttgart: Georg Thieme. 1952.

Although extensive clinical observations on air-raid casualties were made during the second world war, we have, perhaps mercifully, been spared a voluminous post-war literature on war psychiatry. Here, exceptionally, is a substantial brochure on anxiety, fear, terror, panic, etc., based on a study of 95 patients who experienced severe air bombardment, mostly in Western Germany. The subjective reactions of 20 of these are recorded in some detail. And on the strength of these data, together with his own clinical observations, Professor Panse gives a detailed classification of the various types of anxiety reaction observed, including, for example, the vegetative components of anxiety discharge, interference with the field of consciousness and with emotional expression, influence

of suggestion, disturbance of time sense, the development respectively of sensitization and of immunity, "conditioned" reactions, and the like.

As the book is written throughout from a neuro-psychiatric point of view, and as the psychological categories used are borrowed almost exclusively from a general psychology in which unconscious factors have no place, it is not surprising that the author's findings do not add to what was current psychiatric knowledge in Britain at the end of the Blitz. Nevertheless, the excerpts from case histories are interesting, the clinical observations apposite, and the bibliography, with the exception indicated above, adequate. On the whole, therefore, the brochure constitutes a useful descriptive introduction to the subject, suitable for students of general psychiatry. It would have been still more useful had the author provided an index.

EDWARD GLOVER.

CONQUEST OF FEAR

The Conquest of Fear. By Harley Williams. (Pp. 240. 16s.) London: Jonathan Cape. 1952.

Dr. Harley Williams continues to delight and instruct us with his biographical studies of famous men and women. Members of his own profession form the majority of his subjects, but his facile and erudite pen probes at times into the lives of statesmen like Woodrow Wilson and Roosevelt and of captains of industry like Carnegie and the first Lord Leverhulme. He has the gift of describing the personality and character of the individual he presents in a few expressive sentences. This appears effortless, but one has only to read on to find that it is based on careful and prolonged study of the life and times of the subject of his essay.

In the present volume Dr. Williams treats of the lives of thirteen men who have helped in "The Conquest of Fear"—that is, humanity's fear of illness. He begins with Edward Jenner. Often as his life and work have been recounted—especially recently in W. R. Le Fanu's admirable *Bibliography of Edward Jenner*—we can enjoy this sympathetic study of the man who first scientifically explored the possibility of preventing a disease due to a virus. In telling of the romance of tropical disease investigation the author chooses Father Damien, Patrick Manson, Ronald Ross, David Bruce, Gorgas, Noguchi, and Adrian Stokes. Then come two scientists, Crookes and von Röntgen. Two medical peers, Lord Moynihan and Lord Dawson, follow. The influence and strength of these two men lay chiefly in the success of the one at the operating table and of the other at the bedside. They were both medical statesmen, as is clearly brought out in this book. Finally, the author concludes with a study of Franklin Roosevelt, to illustrate how a patient can triumph over the handicap of a crippling disease and rise to the highest office in his country.

In recording certain of these illustrious lives, Dr. Williams performs a most useful service to posterity. For when the present generation, who knew many of these men and women, has passed on, these studies will retain a freshness and value which only the work of a contemporary could achieve.

ARTHUR S. MACNALT.

LEUCOTOMY STUDIES

Psychosurgical Problems. Edited by Fred A. Mettler, M.D., Ph.D. By the Columbia Greystone Associates Second Group. (Pp. 357. £2 2s.) London: Routledge and Kegan Paul. 1952.

Workers in the field of leucotomy have been awaiting with interest this further report from the Columbia Greystone workers. Criticism of their first well-controlled investigation was directed mainly at the rather routine character of the testing procedures, and this time there can be no doubt that imagination and initiative have played an important part in the selection of the tests. It is depressing, therefore, that, in the words of the editor, "careful planning, high motiva-

tion, ample funds, sincere co-operation, a real problem and an energetic attack cannot produce positive data." It is not, however, likely that "the correct data are of a negative character," and it is of great interest to examine the causes for the comparative failure of this investigation.

The main difficulty with co-operative research projects, as with any large-scale organization, is that the planning is essentially that acceptable to the majority of the group. Thus in this instance the two main faults—which are gross enough to impair the whole project—bear the imprint of group intelligence at its most mediocre. First, the emphasis on "statistical methodology" has involved a demand for a uniformity of case material which, admirable as an ideal, has in the event led to the selection of a very small number (23) of the least suitable patients—deteriorated schizophrenics. (The exclusion of those with a positive family history means only that the diagnosis is less well substantiated.) Secondly, the need for radical changes in procedure revealed by the results of the first project has caused unnecessary and fatal alterations to the operative techniques. The admirably balanced and interrelated topectomies have been replaced mainly by two series of: (1) cerebral venous ligation, and (2) orbital "ice pick" leucotomy. Both these techniques are essentially inexact, uncontrollable, and unlikely to be effective in the treatment of the present material. The first survey of these workers showed that topectomy was justifiable and almost certainly effective in some cases. It should have been followed by an improved investigation on better case material. The ample funds would then have provided a rich return.

The title of the book is as pretentious as the literary style: it is not an analysis of psychosurgical problems interesting to the clinical psychiatrist or neurosurgeon, but a collection of observational papers of value primarily to specialized research workers. To those interested in the development of tests of frontal-lobe function the relevant chapters will provide both information and stimulation.

ALICK ELITHORN.

MEDICAL DICTIONARY

Blakiston's Illustrated Pocket Medical Dictionary. Edited by Normand L. Hoerr, M.D., and Arthur Osol, Ph.D. (Pp. 1,005; 60 illustrations on 24 plates. £1; thumb-indexed £1 3s.) New York and Toronto: The Blakiston Company. London: H. K. Lewis and Co. 1952.

This is a new book, produced under the supervision of the editors of the larger *Blakiston's New Gould Medical Dictionary*. It is not an abridgment of this, but was prepared by the same method as the *Oxford English Dictionary*. Over 100 contributors searched all new textbooks and about 50 medical journals for words in action. The words chosen were defined by specialists. The result is an authoritative work defining over 33,000 words. One-fifth of the book is an appendix containing much miscellaneous information on such topics as anatomy, blood constituents, diets, the elements, hormones, prescription writing, and weights and measures. The plates include illustrations of parts of the body, types of suture, bandages, fractures, and operative positions.

The book is meant for all concerned with medicine other than doctors, especially nurses, dentists, pharmacists, and laboratory workers. It is also considered suitable for laymen, including lawyers and physical education teachers. Many of the words are part of the doctor's vocabulary, and a doctor rarely needs a medical dictionary; when he does, it is a large standard dictionary, which is also desirable for all who have to write many medical terms, especially medical laboratory technicians and medical typists.

The dictionary includes many ordinary words that needlessly increase its bulk—for example, *gasometer*, *sigh*, *cough*, *yawn*, *bedpan*, *steam*, *giant*, *cosmetic*. People who do not know what these words mean may reasonably be expected to look them up in an ordinary dictionary. A *dwarf* is defined as "a diminutive human being"; apt enough, but if a definition is really necessary Walt Disney has lived in vain.

RAYMOND WHITEHEAD.

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SURGERY OF THE HEART

On another page Drs. M. Campbell and D. Deuchar discuss the results of treating 200 patients suffering from congenital heart disease by means of anastomotic operations as described by Blalock and Taussig in 1945. They use the term *morbus caeruleus*, for, except in patients who die, an exact anatomical diagnosis may be impossible. Probably over four-fifths had Fallot's tetralogy, and the best results were obtained in these. In this condition there is stenosis of the outflow tract of the right ventricle, sometimes of the pulmonary valve, more often below it in the infundibulum; the interventricular septum is patent, the opening lying in the upper part; the aorta is dextroposed, so that it receives blood from the right ventricle as well as from the left; and the right ventricle is enlarged. As a result of the pulmonary stenosis, not enough blood reaches the lungs. The aim of the operation is to increase the pulmonary blood flow by making an anastomosis between a systemic artery and one of the pulmonary arteries.

The patients treated were mostly children, rather more boys than girls; three-quarters of them were between 5 and 14 years old. The principal symptoms are cyanosis and breathlessness on exertion, resulting in a disability that may be severe, so that the child may not be able to walk more than a few yards. Three-quarters of the patients were severely disabled in this way.

The diagnosis was ordinarily made by clinical examination combined with electrocardiography, radiology, and blood counts. Sometimes special investigations were used; they all subject the patient to discomfort and some risk. Angiocardiography may confirm dextroposition when the diagnosis is in doubt by showing early filling of the aorta, and it may help in deciding on operation by demonstrating the presence of pulmonary arteries and the anatomy of systemic branches. Levels of arterial oxygen saturation may be determined on blood obtained by puncturing the femoral or brachial artery, before and after breathing oxygen, but the information obtained does little more than confirm the clinical finding of

cyanosis. A catheter may be passed through a superficial arm vein into the various chambers of the heart, and it can usually be made to enter the pulmonary artery. The position of the catheter can be seen with fluoroscopy; sometimes the presence of a patent septum or a pulmonary stenosis can be deduced; blood samples can be withdrawn for estimations of oxygen saturation; and the most valuable information to be obtained is from the pressure readings in the various chambers and vessels. In patients with Fallot's tetralogy there is always evidence of a shunt from the right to the left side of the heart.

The operation performed on Campbell and Deuchar's patients was, when possible, end-to-side anastomosis of the left subclavian artery to the left pulmonary artery. Occasionally it was necessary to do an end-to-end anastomosis, but this is less beneficial because the systemic blood then reaches only one lung. Nearly all the patients have been followed up for over one year, some of them for five years. Good or very good results were seen in 136 (68%); 17 were improved; 6 were improved but later died, 2 from causes probably unrelated; 17 have not changed; and 24 (12%) died from the operation. Many of the patients now lead normal or practically normal lives, earning their living or attending ordinary school. In 11 patients it was found that anastomosis could not be done, usually because there was no suitable pulmonary artery. Of the 24 patients who died from the operation, 13 had a lesion other than an uncomplicated Fallot's tetralogy, and 5 of the remainder were aged 19 or older. Nearly all those who died caused anxiety during the operation, and all except one died within 72 hours of its completion. The figures may be compared with those of Belcher and Sellors,¹ who reported 70 cases with 8 operative deaths, and very obvious benefit in 42, and with the large series of Taussig's²—1,000 cases with a 16% mortality and good results in 78%.

After an anastomosis is established a murmur can be heard resembling that in patent ductus arteriosus; it is continuous, with systolic accentuation, best heard below the inner half of the clavicle but widely conducted. A thrill is unusual. Clubbing of the fingers regresses, but seldom disappears. Cyanosis becomes less; but it is nearly always still present after exercise, and usually just visible at rest. The pulse pressure is sometimes increased. The raised haemoglobin falls, approaching normal; there is a wide range of readings both before and after operation, the average final value in the patients with good results being 102%. The presence of an anastomosis increases the work that the heart must do; it therefore enlarges. In most cases the heart enlarges fairly rapidly in the

¹ *Lancet*, 1950, 2, 887.

² Taussig, H. B., et al., *Trans. Ass. Amer. Phys.*, 1951, 64, 67.

first month or so; the size then remains stationary. On the whole patients with large hearts before operation do not do so well; and too large an anastomosis is suspected in patients whose hearts continue to enlarge after the initial increase: the onset of congestive failure is then a serious possibility. Symptoms improve immediately after operation, and the main changes are usually established within a few months. Subsequent deterioration, or evidence that the anastomosis is becoming smaller, have been very rare. All patients have lost their radial pulse on the side of operation, and no blood pressure can be registered in this arm, but there have been no more serious effects of devascularization. Horner's syndrome and minor cerebral thromboses have been the only post-operative complications, both uncommon. No patient has developed bacterial endocarditis, another complication that was expected, but five have had cerebral abscesses—a common event in the untreated disease.

Campbell and Deuchar do not report any results of direct operations for pulmonary stenosis—division of a stenosed valve by a valvulotome or resection of an infundibular stenosis. These operations are now accepted as useful in treating isolated pulmonary stenosis, but they can also be applied to many cases of Fallot's tetralogy, the commoner condition. They have the attraction of reducing the abnormalities to three instead of increasing them to five, as does an anastomosis, but these direct operations are still in the experimental stage. The gratifying results of the anastomotic operation, as reported by Campbell and Deuchar in the longest series yet published in this country, confirm the reputation of this procedure.

MODERN YAWS CONTROL

The First International Symposium on Yaws Control was held in March, 1952, at Bangkok under the auspices of the World Health Organization with the assistance of the United Nations International Children's Emergency Fund and the Government of Thailand. Over 30 papers were presented, and collected summaries of these papers and the related discussions have been made available in duplicated form by the W.H.O. This symposium marks the coming of age of yaws and the passing of its control from the enthusiastic amateur to the professional slayer of dragons. With this evolution the technique of control has changed from one of individual fancy to one based on scientific principles, though there are still some aspects of yaws that remain to be carefully studied.

Great changes have come about since the discovery of penicillin, and especially since the development of

long-acting penicillin preparations such as procaine penicillin in aluminium monostearate (P.A.M.). In the past anti-yaws campaigns by mass treatment have often been made ineffective by the failure of the patients to attend long enough to receive adequate treatment, though in some areas the incidence of yaws has been greatly reduced after several years of free, rather haphazard bismuth injections. The optimal dose of P.A.M. that will render non-infectious the largest number of patients with infectious yaws lesions is not yet known for certain, but it is probably not more than 2.4 million units in one or two injections.

The modern effective anti-yaws campaign is no beginner's exercise. It must be initiated by a census and survey of the whole population, and six to twelve months after the campaign there must be another survey to assess the results. This may sound academic to the "practical" man, but there have unfortunately been recent anti-yaws campaigns whose effectiveness no one has been able to assess, and only good results, properly confirmed, can justify the expenditure of effort and money. In modern anti-yaws campaigns much, if not all, the work of surveying, diagnosis, and treatment is being done by selected local lay people after a short period of practical training. General supervision is by a doctor trained in public health and familiar with the problems of yaws control.

An important problem is to decide who is to receive treatment. An effective campaign is a public health measure and is not concerned only with the treatment of patients with yaws, though for practical reasons a certain amount of this may be necessary. There is no doubt that in an anti-yaws campaign previously uninfected contacts of patients with infectious lesions should be treated, perhaps with a smaller dose. But more important numerically and from other points of view are those patients who, having had an attack of early, secondary, or infectious yaws, have no clinical manifestation of yaws at the time they are examined. If untreated, many are certain to relapse during the following year or so and thus infect the uninfected and cured members of the population. At present there is no infallible way of detecting these latent secondary cases, which potentially, at least, cease to be a danger only when they develop late or tertiary destructive lesions or undergo spontaneous cure with serological reversal. The most practical way of reducing this menace is to treat all persons who give a history of having had yaws during the previous five years.

Two other important aspects of yaws control, originally found by Harding,¹ were emphasized at the Bangkok conference. One is that mass treatment

alone is not adequate to control a disease so closely related to the social and hygienic conditions of the population. Mass treatment must be associated with the construction of simple treatment centres, sited so that they are readily available to the population they serve. And from these centres itinerant medical auxiliaries, who are selected and suitably trained local people, must make frequent visits to the villages or homes in the area to seek and treat any infectious relapses or new cases which may have originated locally or come in from an outside area.

Harding's anti-yaws campaign followed his anti-trypanosomiasis campaign, since he found his team had to remain in the field to treat the few cases of the latter disease that are certain to follow any mass-treatment campaign. When his anti-yaws campaign was completed he started campaigns against other diseases that were important to the community, that could be diagnosed by the staff of the rural centres, and for which effective chemotherapeutic agents that could be administered by the staff were available. He was thus putting into practice what was probably the most important principle discussed at the conference—namely, that an anti-yaws campaign is not an end in itself but must pave the way to a gradually improved rural health service. Each step as it is taken is consolidated, and no further commitment is entered into unless the financial resources to carry it out successfully are assured. The effectiveness of modern yaws therapy is such that the most undeveloped people can appreciate it. And it is on this appreciation, as Harding emphasized, that the further improvement in rural health must be made. Towards this improvement the teaching of healthy living that should come from the rural treatment centres must be regarded as of utmost importance.

HORMONES AND ENZYMES

Almost twenty years ago Sir Frederick Gowland Hopkins remarked¹: "Only the end-results of the profound influence which minute amounts of substances with adjusted structure exert upon living cells or tissues can be observed in the intact bodies of man or animals"; and biochemistry "must learn to describe in objective chemical terms precisely how and where such molecules as those of hormones and vitamins intrude into the chemical events of metabolism." Perhaps in another twenty years our knowledge of how hormones influence metabolic processes will be sufficiently advanced to find useful applications in medicine. But at present experimental study of the influence of hormones on enzymes has given few clear-cut results. Moreover, our knowledge of enzymic changes in pathological states is limited to some isolated examples, such as the increase of urinary diastase in acute pancreatitis

and the rise in plasma acid-phosphatase in carcinoma of the prostate. It would be of particular interest to know whether metabolic diseases with an endocrine basis are associated with changes in tissue enzymes.

Workers engaged on the study of enzymes in relation to hormones are seeking to put their own house in order, as shown by the collection of papers entitled "The Influence of Hormones on Enzymes."² This publication indicates that encouraging progress has been made in some limited fields, despite the difficulty in devising experiments which can yield unequivocal results.

Steroid hormones have been studied particularly. As reported by W. H. Fishman and S. L. Cohen, quantitative changes of the enzyme β -glucuronidase may occur, on the one hand, in association with mammary cancer, and, on the other, under the influence of steroid hormones, particularly oestrogens. But, since the function of this enzyme is debatable, the theoretical implications of the findings are obscure. This is also true of the discovery that in certain tissues cortisone can enhance the oxidation of the "unnatural" D-amino-acids. Cortisone can also enhance the oxidation of proline, an amino-acid in which collagen is particularly rich. In reporting this effect, W. W. Umbreit points out that there are indications of "some vague relationship between collagen and the action of cortisone," but also remarks: "We do not at this stage know whether the basis of the action of cortisone lies in the failure . . . of a particular enzyme system, or of a group of enzyme systems or, in fact, whether its basis is enzymatic at all."

Umbreit studied tissues incubated after removal from animals to which cortisone had previously been administered. Effects of hormones *in vitro*—that is, added to the incubation medium—are more amenable to analysis, although less easy to demonstrate. Such effects, when cautiously interpreted, may help to clarify our knowledge of physiological processes, as notably illustrated by the hormonal effects which S. J. Folley and collaborators^{3,4} have demonstrated with isolated mammary gland tissue. But much evidence will be needed to support the suggestion of G. S. Gordan and his colleagues² that the decreased cerebral respiration in certain pathological states, such as hypopituitarism and adult eunuchism, may be related to effects exerted on brain tissue *in vitro* by certain steroids such as desoxycorticosterone and androgens.

Carbohydrate metabolism is known to be under complex hormonal control, and the mechanisms are being unravelled in a number of laboratories, notably that of C. F. Cori. Thus it appears from the work of E. W. Sutherland² that the glycogenolytic action of adrenaline, and also that of the hyperglycaemic factor of the pancreas, is associated with an increase in the effective concentration of the enzyme phosphorylase within liver

¹ Rep. Brit. Ass., 1933, p. 1.

² Ann. N.Y. Acad. Sci., 1951, 54, art. 4 (pp. 531-728).

³ Balmain, J. H., and Folley, S. J., Biochem. J., 1951, 49, 663.

⁴ Arch. Biochem. Biophys., 1952, 39, 188.

⁵ Fels, J. M., Chaikoff, I. L., and Osborn, M. J., J. biol. Chem., 1951, 191, 683.

⁶ Ottaway, J. H., Nature, Lond., 1951, 167, 1064.

⁷ Askonas, B. A., ibid., 1951, 167, 933.

⁸ Lardy, H. A., abstract of paper read to 2nd International Congress of Biochemistry, 1952.

cells. Insulin has been shown by W. C. Stadie and other workers to facilitate the entry of glucose into muscle tissue such as a preparation of the isolated diaphragm. Whether or not M. E. Krahl is correct in suggesting that it is the enzyme hexokinase that is influenced by insulin, it is clear that the increased glucose "utilization" which insulin produces in intact animals can be attributed, at least in part, to a direct action of insulin on tissue cells. It is not clear, however, if an action of insulin on a single metabolic process—a process by which glucose is metabolized—could account for such diverse effects of insulin as inhibition of amino-acid oxidation² and stimulation of lipogenesis³ in liver tissue.

Studies such as these may eventually throw light on the metabolic derangements occurring in diabetes. Pituitary and adrenal hormones can scarcely be left out of account, particularly since diabetes can be induced in certain test animals by administration of growth hormone, A.C.T.H., or 11-oxy-corticosteroids. Here again the isolated diaphragm has proved a useful tool. Its glucose uptake can be reduced, or the enhancing action of insulin prevented, by pretreating the animal with growth hormone, provided that there is no deficiency of adrenal cortical hormones. But, in view of recent findings by Krahl² and Ottaway⁶ that growth hormone may have an insulin-like action under different experimental conditions, no simple theory can be advanced at present.

As to how thyroxine works, H. A. Lardy has suggested² that an enhancement in metabolic rate, as found with tissues removed from thyroxine-treated animals, may be achieved at the expense of a lowering of the efficiency of "oxidative phosphorylation"—the process by which energy derived from tissue oxidations is stored in the form of phosphate compounds such as adenosine triphosphate. Recent findings by Askonas⁷ are in agreement with the view that the latter process may actually be impaired by thyroxine. But Lardy has yet to produce evidence in support of his recent suggestion⁸ that certain other hormones act by a similar mechanism.

The clinical investigator will pardonably be bewildered rather than enlightened by present-day literature on the influence of hormones on enzymes. In view of the vigour with which this field is being studied, we may hope soon to see unifying concepts with a sound experimental basis.

INTRADERMAL INJECTIONS

In many reports the phrase "0.1 ml. intradermally" is used to describe the quantity and technique of injecting a test or therapeutic material, and in general both author and reader believe that an accurate description of the facts has been recorded. We publish this week two papers from the Tuberculosis Research Office of the World Health Organization which show that quite a wide range of quantities and depths of injection is probably covered by this description. Drs. J. Guld and C. Rud (p. 368) describe their technique for estimating leakage in new syringes, and even among those of the make they regard as most satisfactory 25% of syringes leak

to an extent which calls for their rejection; with other makes of syringes tested this percentage is even higher. Boiling did not affect the leakage rate, but after the syringes had been used for 1,000–1,500 injections the tendency to leak increased. Leakage is of greater importance in intradermal than in subcutaneous or intravascular injections because of the much greater pressure required to press down the plunger. The ordinary subcutaneous injection requires negligible pressure, but Guld and Rud estimate that a pressure 5–8 times that of the atmosphere is normally required for intradermal injection. It must be the experience of all who have made many intradermal injections that when the needle is too deep practically no pressure is required on the plunger.

This possibility of leakage has long been recognized, and experienced workers have tended to adopt the practice of checking the quantity injected by the diameter of the wheal raised by the injection. Drs. Carroll Palmer and Phyllis Edwards (p. 363) report that the diameter recommended in various publications varies from 5 mm. to 12 mm. From their own experiments they find that a very superficial injection of 0.1 ml. from a satisfactory syringe gives a wheal 8 mm. in diameter. But they also show that wheal diameter is an unsatisfactory index of volume, for with very superficial injections a six-fold increase of quantity increased the mean diameter of the wheal only from 6.3 mm. to 10.5 mm. Further, variation in size of wheal is related to the depth of injection, the most superficial injections giving the largest wheals for a given volume injected, while subcutaneous injections give no clearly defined wheal. From their experiments it is clear that a technique described as 0.1 ml. intradermally may even under closely regulated conditions with properly tested syringes lead to quite surprising differences: the range of variations with indifferent syringes in the hands of workers not using the greatest care must be very wide indeed.

In an attempt to find out how these variations might affect the results of B.C.G. vaccinations, Palmer and Edwards then carried out experiments in which the depth of injection and the strength of vaccine were deliberately varied. The mean diameter of Mantoux reactions ten and a half weeks and one year after vaccination showed no great variation with the depth of injection. The diameter of the area of induration round vaccination lesions at ten and a half weeks increased with the depth of injection, though there was little difference in the size of the scars at one year. The proportion of children with local abscess at ten and a half weeks increased with the depth of injection, and there was a tendency for abnormal scarring also to be associated with the deeper injections. The experiments show that a superficial injection is just as effective as a deep one in bringing about Mantoux conversion, but carries a very much lower rate of undesirable complications.

These papers are concerned particularly with the field use of B.C.G. on a large scale, but the lessons to be drawn from the experiments on syringe leakage and variation of wheal size with depth of injection are equally applicable to the injection of test materials,

notably tuberculin. The intradermal tuberculin test (Mantoux) has become the standard in this country largely because the quantity of material and the exact site of injection are supposed to be accurately known. In view of the variations shown by these papers it may be that the apparently less standardized methods based on a scratch in contact with old tuberculin (Von Pirquet test) or tuberculin jelly covered with adhesive plaster (patch test) are no more variable in results. If this is so, the main advantage of the Mantoux technique would be the greater opportunity it offers for intentional variation in the strength of the solution injected, and for detecting the less sensitive individuals by a final intradermal injection of 100 tuberculin units.

IMMUNIZATION AGAINST BACTERIAL TOXINS

Three distinct methods are known whereby a sample of diphtheria toxoid may have its potency as an antigen increased: by the removal of substances which depress the antitoxin response,^{1,2} by the admixture of a vaccine with the toxoid,^{3,4} and by the adsorption of the antigen on to an insoluble carrier, such as hydrated aluminium hydroxide or phosphate^{5,6} (A.P.T. comes into this category). Elsewhere in this issue Dr. D. C. Lahiri claims that crude diphtheria toxoid prepared in a veal-infusion-proteose-peptone medium contains a substance which not only enhances the antigenicity of purified toxoid—without precipitate formation—but reduces or abolishes the incidence of allergic responses when the mixture is inoculated into human subjects. The substance, termed natural adjuvant factor (N.A.F.), appears to be absent in toxoids derived from pig-stomach or casein hydrolysate media. If Lahiri's claim is confirmed—and it certainly needs confirmation—this will be the first demonstration of the enhancement of the antigenicity of purified diphtheria toxoid by the addition of a soluble substance which does not precipitate the antigen. The method used by Lahiri for preparing his N.A.F. almost certainly excludes the possibility that it is a protein or polysaccharide. His claim that it abolishes the allergic reaction needs confirmation by some direct and certain method, such as the simultaneous inoculation of subjects known to be allergic with purified toxoid and with the same toxoid in which has been dissolved Lahiri's N.A.F.

Recently it has been reported that one form of purified diphtheria toxoid administered in a simple solution is as potent as A.P.T. when tested in guinea-pigs by the two-dose method of assay.⁷ This is indeed remarkable, and it would be interesting to know the antigenicity of a prophylactic made with this purified toxoid adsorbed on to aluminium phosphate gel, and correspondingly whether Lahiri's N.A.F. would increase the potency of

alum-precipitated toxoid (A.P.T.) and purified toxoid, aluminium phosphate-precipitated (P.T.A.P.).

These recent observations, and other quantitative studies in diphtheria prophylaxis, show that the antitoxin response in animals (and humans) can be increased by two very different procedures. The first is to disperse the injected toxoid over a very large area of relatively inert mineral carrier; this greatly increases the efficiency of response per unit of toxoid injected.⁸ The second is to modify, by the addition of another reagent, the activity, or perhaps the susceptibility, of the antitoxin-producing cells to the injected toxoid in simple solution. The road seems still open to great advances in active immunization against bacterial toxins.

COMMONWEALTH CO-OPERATION

When Mr. Menzies opened the Proceedings of the British Commonwealth Scientific Conference in Canberra a year ago he referred to one of the perpetual dilemmas of science—"every time a scientist solves a problem he creates at least one more"—and he chose as an example the extension of human life which medical science has helped to bring about. This is creating, in Mr. Menzies's words, "one of the greatest social problems in history." The conference report,¹ which has just been published, contains a recommendation of its medical committee on the most important aspect of this problem—world food supplies and population trends. It stands to reason that the possibilities of agricultural development should be clearly known when efforts are made to eradicate a killing disease from an under-developed and perhaps over-populated territory. With this in mind the committee recommended that Governments concerned should take joint action with the Food and Agriculture and World Health Organizations to secure examination "of the relation between population, world food supplies, agricultural systems, and the results of medical research." If gloomy prophecies about the inadequacy of food supplies are to remain unfulfilled, co-operation between medical and agricultural research will have to be not only close but also prompt, and it is to be hoped that all Commonwealth Governments will act vigorously on this recommendation.

The medical committee, which was under the chairmanship of Dr. F. H. K. Green, of the Medical Research Council, considered a number of other subjects which seemed particularly suited for collaboration within the Commonwealth, among them environmental physiology and geographical anthropometry. The committee recorded its appreciation of the work of the laboratories of the Public Health Laboratory Service in the United Kingdom, some of which already serve as reference laboratories for the identification of a number of pathogenic organisms on a Commonwealth or international basis. These arrangements might well be copied elsewhere. The committee also called particular attention to the great value of the work of

¹ Levine, L., Wyman, L., and Edsall, G., *J. Immunol.*, 1949, 63, 219.

² Kurokawa, M., Murata, R., Nakano, T., Yamada, T., and Kubata, K., *Jap. med. J.*, 1951, 44, 55 and 233.

³ Farago, F., and Pusztai, G., *Brit. J. exp. Path.*, 1949, 30, 572.

⁴ Ungar, J., *Irish J. med. Sci.*, 1952, April, 145.

⁵ Scheibel, I. F., *Acta path. microbiol. scand.*, 1944, 21, 130.

⁶ Holt, L. B., *Developments in Diphtheria Prophylaxis*, 1950, London.

⁷ Barr, M., Glenny, A. T., Hignett, S., Randall, K. J., and Thomson, A., *Lancet*, 1952, 2, 803.

⁸ British Commonwealth Scientific Conference, Australia, February–March 1952, Report of Proceedings. H.M.S.O., London.

develop because of the spread of the pulmonary infection to the pleura. Pulmonary suppuration and also consolidation in relation to bronchiectasis may be associated with a similar spread of infection. In many cases of this kind there is no great difficulty in recognizing the cause. There may be definite evidence of the pulmonary disease—for instance, the expectoration of purulent sputum. The specimen of pleural fluid may contain numerous polymorphonuclear leucocytes or may, indeed, be frankly purulent, and the infecting organisms—for example, pneumococci, streptococci, or a mixture of pyogenic organisms—may be recovered from it. However, with the early use of chemotherapy in pneumonia many of these effusions remain sterile, and it is with these that difficulties arise. Thus, a young person who develops pleuritic pain, fever, and, because of the pain, shallow breathing may be thought, reasonably enough, to have pneumonia. After treatment with penicillin and a sulphonamide he is found to have a clear sterile effusion, and the question arises whether this results from an abortive pneumonia or whether it is tuberculous.

I think two features may help: if the initial fever responded promptly to the chemotherapy and if the effusion remains small in amount and is absorbed quickly, usually within two to three weeks, then a pneumonic cause is likely. Tuberculous effusions tend to be associated with a longer febrile course, not responsive to penicillin, and with slow absorption of the fluid. When there is real doubt it is best in young people to regard the effusion as being tuberculous and treat the patient accordingly. Sometimes this course will be supported later by the growth of tubercle bacilli from the fluid, but even when this does not occur, if the features of the illness suggest tuberculosis, the long course of treatment outlined later is in the best interests of the patient.

Effusions with Pulmonary Tuberculosis

Tuberculous pleural effusions, although commonest in young people, do occur at all ages. Besides the sort already mentioned, which is not usually associated with detectable pulmonary disease, patients with established pulmonary tuberculosis may develop effusions. These effusions also occur at any age, but are relatively commoner in the middle-aged and elderly. It is usually possible from the history, or from clinical or radiological evidence of pulmonary tuberculosis, to establish the cause of this type of effusion.

Effusions with New Growths

While the causes of pleural effusion referred to above all occur in the middle-aged and elderly as well as in young people, it is wise to suspect the presence of a bronchial carcinoma when a man aged 40 or more develops fluid in his pleural cavity. The effusion may be caused by extension of the growth to the pleura or the presence of secondary deposits there; or by involvement of the mediastinum and the production of venous or lymphatic obstruction; or by inflammation of the pleura in relation to infected atelectatic lung beyond a blocked bronchus. The third of these causes may produce an illness with a febrile onset and most of the features described as occurring in post-pneumonic effusions. Effusions produced in the other ways are usually not associated with fever, and, while the onset may be painful, it is quite often insidious and not productive of pleural pain.

In most cases the diagnosis is not difficult. There may be features of the illness, such as loss of weight, the development of cough or the increase of an already existing smoker's cough, the expectoration of blood, or the discovery of secondary deposits outside the chest, which suggest the diagnosis. When the sample of fluid is taken it may be found to be uniformly blood-stained, or malignant cells may be found on examination of specially prepared specimens from it. All such patients must have postero-anterior and lateral chest radiographs taken, and in some cases these may confirm the presence of the neo-

plasm by demonstrating massive shadows in the lung or mediastinum; others may demonstrate segmental or lobar atelectasis, suggesting bronchial occlusion. It may be possible in some cases to obtain final confirmation of the diagnosis by bronchoscopy.

Difficulty in diagnosis arises in the following circumstances, which although not common are not altogether rare. A middle-aged or elderly man complains of some breathlessness of recent onset. He is otherwise well and has had no increase in his usual slight cough. He is found to have an effusion in his chest, and a specimen is taken which is not blood-stained. The chest radiographs do not show anything suggesting pulmonary or mediastinal new growth. This may still be true after aspiration of the liquid and its replacement with air, although this sometimes reveals the presence of a neoplasm which had been obscured in the radiograph by the opacity caused by the fluid. Careful examination of the patient for new growths elsewhere which may be responsible for metastases to the pleura may be negative, and bronchoscopy may show a normal bronchial tree. Although the onset is not characteristic, some effusions of this type may be tuberculous, and this is eventually shown in some by the growth of tubercle bacilli on culture.

So far as the immediate situation is concerned, it is usually best to treat the patient in the way described below for the treatment of tuberculous effusions. Most of those which are in fact tuberculous will subside over a few weeks. On the other hand, those due to neoplasms will increase, requiring repeated aspiration and frequently becoming blood-stained. They are usually caused by secondary pleural deposits from a bronchial carcinoma which may remain inconspicuous for some time. Although the wait of a few weeks will usually make the diagnosis clear, in some patients in whom this does not occur, or in whom it is necessary to come to a more exact diagnosis as early as possible, the remaining diagnostic procedure is thoracoscopy and pleural biopsy after replacing the effusion with air.

In women carcinoma of the breast is an important cause of pleural effusion. The effusion may sometimes be the only evidence of intrathoracic metastasis, and sometimes it occurs a long time—occasionally a few years—after apparently successful treatment of the primary growth. A rare cause in women, which is worth mentioning because of the possibility of curing it, is the condition known as Meigs's syndrome. In these cases persistent clear pleural effusion and usually ascites also are associated with benign fibroma of the ovary, disappearing after removal of the neoplasm.

Other Causes of Effusion

It sometimes happens that in pulmonary infarction pleural effusion is the most striking feature of the illness. The fluid is often but not always blood-stained. In most cases, by bearing in mind the circumstances in which pulmonary embolism and infarction occur, it will be possible to make the diagnosis. Occasionally, real difficulty arises in middle-aged and elderly men in whom blood-stained pleural effusion, especially if associated with haemoptysis, must suggest the presence of a bronchial carcinoma. However, effusions associated with infarction do not persist, increase, and recur after aspiration as malignant effusions do, and the condition usually resolves after a few weeks.

An effusion frequently develops in the pleural cavity in relation to a subphrenic abscess. This is usually small, being detectable in the posterior costophrenic angle of chest radiographs, and is often helpful in diagnosing subdiaphragmatic disease. When a subphrenic abscess is present the diaphragm on the affected side is high in position, and from clinical examination it may be thought that a basal pleural effusion is present. In most cases there will be a previous history of abdominal disease which will lead to further investigation, including radiographs to show the position of the diaphragm. Occasionally, a larger pleural effusion may be present, but, if the recent history of the patient is carefully considered, there is rarely much difficulty in perceiving that the cause is in the abdomen.

Treatment

The treatment of many pleural effusions is part of the treatment of the causative condition. Thus effusions occurring with established pulmonary tuberculosis and those complicating bronchial carcinoma often affect the course of treatment adopted for the primary disease and frequently do not require separate consideration. Here I shall refer briefly to the treatment of three varieties of pleural effusion.

Malignant and Post-pneumonic Effusions

Some patients in whom an accumulating effusion is the main manifestation of a bronchial carcinoma may be kept comfortable by repeated aspiration, sometimes for several months. This also applies to women with large effusions caused by metastasis from breast cancer. In both cases additional methods of treatment must be considered, such as, for example, the use of testosterone in metastatic breast carcinoma. These procedures will usually need to be controlled by experts, but the mechanical distress of a large effusion can often be well dealt with in the patient's home.

In patients who are confidently diagnosed as having post-pneumonic effusions no special treatment is needed if the fluid is sterile and quickly disappears. Larger sterile effusions may be aspirated and usually do not re-form. If organisms are found in the fluid the treatment should be conducted with special care. If the fluid is still clear and the patient is febrile and ill it is probably best for him to be treated in hospital. If this is not possible at once the fluid should be aspirated and at the end of aspiration one million units of penicillin should be left in the pleural cavity. This should be done each day, combined with the administration of parenteral penicillin in large doses—that is, two million units each day. If the organism recovered from the fluid is not sensitive to penicillin, then some other suitable antibiotic should be given systemically, and, because of the special dangers of this sort of infection, the patient should certainly be treated in hospital. In any case, if the patient does not promptly become well and his fluid sterile in a day or two the further treatment is best carried out in hospital. If the fluid is or becomes purulent treatment in hospital is imperative.

Tuberculous Effusions

The management of patients with tuberculous effusions is a long process. Moreover, those effusions which occur in young adults in the absence of demonstrable pulmonary tuberculosis are common, and general practitioners are often concerned in their treatment. It may therefore be helpful to describe the main principles of treatment. Those patients who are ill or who have a large effusion are best treated in hospital. However, there are many whose illness is relatively slight and in whom the effusion remains small, and some of these, if their home conditions are good, may be treated there quite satisfactorily. It should be pointed out that these patients have active tuberculosis and should be notified as such so that a search may be made for the person who is the source of the infection, and so that the general practitioner may co-operate with the chest physician in the treatment of the patient.

Rest in Bed.—This is the first essential of treatment, and many patients are most comfortable if they are propped up with pillows. The period of rest in bed is in practice best related to the patient's temperature. This usually settles to normal levels in three weeks, but is sometimes raised for six weeks or even longer. It is a good working rule to keep the patient in bed for three to six weeks after the fever has settled; the more severely ill he has been, the longer the period of extra rest. He may then begin to get out of bed, provided the fluid is diminishing in amount and he feels well, as he probably will.

Management of the Fluid.—In patients with small effusions the management of the fluid usually presents no difficulty. After the diagnostic aspiration it should be left alone, and nearly always is absorbed almost completely in

a few weeks. Patients with larger effusions should be treated in hospital, if possible, and in some of them it will be necessary to carry out further aspiration. The cardinal indication for this is dyspnoea. The usual practice is to aspirate without air replacement, and because large aspirations produce pulmonary oedema not more than 20 to 30 oz. (570 to 850 ml.) are removed at a time. When it is necessary to remove more the aspirations are repeated daily. Aspiration is also carried out when the fluid persists an unduly long time and for persistent fever.

Chemotherapy.—Although these methods are adequate for the treatment of most tuberculous effusions, it should be mentioned that some physicians consider it wise to use streptomycin and *p*-aminosalicylic acid (P.A.S.) in addition. It is, of course, too early to assess the benefit of chemotherapy in a condition in which the immediate results are in any case good. However, the argument is that effusions develop soon after the primary tuberculous infection, when there is an active pulmonary or glandular lesion and perhaps widespread dissemination of tubercle bacilli. In these circumstances they think it reasonable to use antibacterial treatment. Certainly in very ill patients and in those with prolonged fever the administration of these drugs seems to be a valuable addition to treatment.

Further Management of the Patient.—When the patient begins to get up his activity should be gradually increased until after about two to three months he is up almost all day. Walking exercise may then be begun and increased gradually until he is walking two to three miles by the end of a further month. In most patients it will have taken about six months to reach this point in their treatment. The majority will then be able to return to work, but should do no more than half-time for the first two to three months. The period of increasing activity is undoubtedly best undertaken at a sanatorium. When this is not possible, with care it can often be managed quite successfully at home.

Radiography.—Radiographs of the patient's chest should be taken throughout the period of treatment, and the frequency with which this is done will depend on the course of the illness. If there is no anxiety, weekly films for the first four to six weeks and monthly ones afterwards should suffice. Radiographs will usually show the steady diminution of the amount of effusion, and will also reveal complications, such as the presence of pulmonary tuberculosis and increase or recrudescence of the effusion.

Aftercare.—Although the immediate prognosis is good so far as restoration to health and disappearance of the effusion are concerned, about 25% of these patients are found to have pulmonary tuberculosis within five years. In addition to the long period of treatment it is therefore necessary to continue the period of observation for at least five years. A satisfactory scheme is to see the patient and have a chest radiograph every three months for three years, and then every six months to the end of five years.

Because of the age at which this illness so often occurs many of the patients will ask whether it is wise for them to marry and have children. In general, provided the patient understands that he or she is passing through a particularly dangerous period, there can be no objection to marriage. So far as child-bearing is concerned, it is impossible to be dogmatic. There is no evidence that pregnancy alters the outlook for patients with established pulmonary tuberculosis and none that patients who have had pleural effusions are more likely to develop pulmonary tuberculosis if they become pregnant. Nevertheless, I think it not unwise to suggest a delay of two years, or longer for very young women, in order to avoid the period in which pulmonary lesions are most likely to appear. It may be added that a patient who has been treated on these lines and who is being kept under regular observation is not likely to be a source of tuberculous infection.

Next Refresher Course Article.—"Miscarriage," by Mr. John Beattie.

attitude to illness and accident—these alone are the healing factors that unify the often bizarre and complex pathology of the allergic neurosis from which this child and her family had suffered.

Another child arrived at this family school with a description of how cold air would precipitate a severe attack of asthma. This same child, sleeping in an unheated bedroom, endured the severe frost of 1947 and played daily with uproarious enjoyment in the snow, and was never in better health.

The above are examples only of a consistent pattern of progress observed by me in the group of allergic children that have passed through this community. Without drugs, without nursing, without doctoring for their allergy, their problems have largely ceased to exist so long as there has been no introduction from without, or from within, of stress, anxiety, or insecurity. Bronchial asthma and associated sinus infections vanish; and other even more violent allergic explosive phenomena cannot be produced, as formerly, by the offending antigenic proteins.

As an example of this, one boy was on arrival unable to eat even cakes made with eggs, and on this account was having a special diet. Incontrovertible medical testimony arrived with him that he became ill, "swelling up," if he ate eggs in any form; yet with no drugs, no nursing, no fads, and no doctoring this same boy was eating boiled eggs with relish and no ill effects within three days of arrival, and remained well and free from this trouble thereafter.

No useful purpose would be served by quoting further examples, especially as every observer with wide knowledge of such types of illness can match these illustrative cases with many others in which, though the circumstances are different, the pattern of experience is identical. Objective reading of the advertising material dealing with the treatment of allergy forces a realization that, though activated by a sincere desire to heal, much therapy in this and allied fields is at present widely divorced from reality.

An Explanation Suggested

I have already outlined a theory by which some of these apparent contradictions can be explained. To use again the sense of smell as a schematic example, it is as if there persists a "morbid echo" of what was in the past evolutionary history of man an important defence reflex. In its original physiologically efficient state such a reflex would, in an appropriate physical emergency, readjust the vascular supply to the nasal mucosa, thus alerting the olfactory apparatus. To-day the obsolete paths seem to be used to relieve the pressure of morbid nervous tension. One of the most striking clinical findings in children of the type I have described above has been the cessation, without treatment, of constant nasal discharges, the clearing of the sinuses, often draining for the first time in months, and a return to normal of the upper respiratory tract, once the children have settled down in the relatively stress-free atmosphere of this family school. To those better versed in comparative physiology the idea will be less novel than it must appear to the clinician. Man is full of structures relating him to his more distant ancestors of which the significance is still obscure. Under the tension caused by unfavourable conditions a frequent, and useless, reflex discharge to the olfactory mucous membranes might be expected to cause engorgement and ultimate structural hypertrophy, with a resulting interference with the normal drainage of the paranasal sinuses and their consequent enhanced vulnerability to infection.

The phenomenon of morbid tension, so familiar to all workers in the psychiatric field, yet still obscure in its nature, seems to have its own clear relation to an earlier physiological defence mechanism. The sudden increase in the dynamic potential of the brain to ensure a maximum efficiency in the complicated reflex responses to danger was surely a universal attribute of survivors under the laws of natural selection. Pavlov (1941) has described qualities of brain type in dogs where "high mobility" in the cerebral cortex was not matched by adequate powers of "inhibi-

tion." At human level we describe as "worry" the constant morbid reaction to psychological equivalents of danger. People who worry often have brains that, except for this relative weakness of "inhibition," seem most efficient, and are frequently highly successful social types. Under conditions of stress over a prolonged period they quickly produce the high degree of morbid tension so apparent in their manner and their typically violent reflex responses on clinical examination. It is suggested that during such times vestigial autonomic and other reflex defence patterns not now in normal use can become reactivated along anatomical lines appropriate to the genetic inheritance of the susceptible individual.

It is, I think, probable that, as in the case of the upper respiratory tract, analogous "morbid echoes" of obsolete defence mechanisms may also prove to be a factor in other stress-conditioned diseases—for instance, certain of those affecting the heart, the stomach, the colon, the lungs, and the skin, to name but a few. To take the last two named: at amphibian level the skin is closely integrated through the autonomic system with the lungs and the pharyngeal exchange area as organs of blood-oxygen exchange. Watch any amphibian partly immersed in water, partly still in the air. It is apparent that in such an animal danger may call for a vasomotor response of maximal degree in the skin and lung, with the object of obtaining optimum oxygen exchange with which to face the emergency. The theory of a long-lost but once vital defence reflex helps us to understand why, at human level, there should be the close liaison between organs of such widely differing origins and with such diverse functions. Every experienced physician has seen the asthmatic person exchange this neurosis for a neurodermatitis, and later again change the neurodermatitis for an attack of rhinitis or asthma. Such a hypothesis would give us a possible physiological explanation of a number of debilitating and frustrating illnesses of obscure origin. For example, it might even help to sort out from the acute coryzas the many "stress-colds" that must confuse the issue in contemporary research on this subject.

The Adult Patient

As I have constantly seen, in the security of the family school described a child can be relieved of all these symptoms; but what of the adult, often burdened by irreversible structural changes in the affected organs; how can he get similar relief?

Here we must face the problem that at present no such effective relief is possible as that available to the child, whose environment is so easily modified and whose morbid habit of life is not yet so deeply ingrained. Benefit in neurotic illness seems to follow the most diverse measures, including an immense range of medicines and treatments. The explanation here presented might, however, reveal why so many are benefited through the powerful suggestion of security induced by the heterodox disciplines of many cults of healing, often based on contradictory foundations.

The adult patient will, I believe, be greatly helped by a better understanding of why he is ill. Too frequently the nervous patient is discouraged and depressed by an acute sense of personal failure. Should the theory we have considered be true, it would relieve the patient of much of the burden of social disapproval that, however well concealed, is a constant reality for the sufferer from neurotic illness. In the wider field of therapeutics a true appreciation of the underlying physiology may lead ultimately to more successful treatment.

It is not possible to discuss here the successful surgical treatment of certain types of nervous illness. The reduction of tension by lobotomy would again seem to depend upon the apparently paradoxical yet fundamental anatomical linking of the phylogenetically modern prefrontal areas with the very old thalamic and autonomic mechanisms.

At an earlier stage of evolution the fundamental reflex patterns would be excited mainly by danger, climate, sexual

Reports of Societies

HYPNOTISM

On January 8 a largely attended conference of the B.M.A.'s Psychological Medicine Group, with Dr. H. B. CRAIGIE in the chair, discussed the profession's attitude to hypnotism. The Group Committee had drawn up a statement on hypnotism, as follows:

(a) Hypnotism may be defined as follows: the use of suggestion with the intention of bringing about an altered state of consciousness involving a surrender by the patient of his normal powers of control.

(b) The hypnotic state should be induced only for therapeutic purposes. Its value as a therapeutic agent is, however, extremely limited, since its results are indefinite, and, although it may apparently induce relief of certain symptoms, this relief does not appear to be permanent. It tends to increase the subject's degree of suggestibility, and for this reason its use has been largely given up by the medical profession. When, however, it is used the hypnotic state should be induced only by a registered medical practitioner or under his direction and in his presence.

The words in italics were subsequently deleted at the suggestion of the Central Ethical Committee, and the statement so amended has been approved by the Council and reported to the Representative Body.

A Method of Approach to the Unconscious

Dr. E. A. BENNET, who opened the discussion, said that it was surprising to learn that the Group Committee's statement on hypnotism in 1952 was to all intents and purposes identical with the pronouncement made in 1892 by a special investigating committee of the British Medical Association and even with a report made to the medical section of the French Royal Academy of Sciences as far back as 1831 on the subject of animal magnetism. Was it to be concluded that no more was known on the subject than 60 or even 120 years ago? Surely not. Hypnosis was a method of reaching the unconscious, and the unconscious—whatever connotation be given to the term—was a main interest in psychotherapy. The unconscious contained the energy they sought to release for therapeutic purposes. There were other roads to the unconscious—for example, free association or active imagination, and hypnotism was by no means the best method.

Dr. Bennet criticized the definition which stated that hypnotism involved a surrender by the subject of his normal powers of control. The patient came for treatment because he felt he had already surrendered, and wished to regain, his powers of control. The balance between the conscious and the unconscious had been disturbed and the aim was to restore this. A patient was not treated by hypnotism; rather hypnosis permitted something to be done, just as an anaesthetist facilitates a surgical operation. Hypnosis required rapport, collaboration, between patient and doctor. This was not the same thing as transference. Before employing hypnosis the therapist should know his patient well and explain the procedure fully. Under special circumstances it could be employed with benefit in the removal of certain symptoms, of which amnesia, psychogenic loss of muscular power, impotence, and vaginismus were examples, but such treatment must be followed by abbreviated analysis. Many patients, thus treated, got well and remained well, and they did not develop a dependence upon the therapist.

There were certain real dangers in applying hypnosis. For example, the potentially psychotic patient, under hypnosis, might be seriously harmed by the release of more energy from the unconscious than he (or the therapist) could control. A further danger—and this might happen with non-psychotic patients—was that the restriction of consciousness

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For patients who are faced with a long stay in hospital or prolonged convalescence following a serious illness, the Preparatory Training Bureau run by the British Council for Rehabilitation will assist towards a return to normal work. In some cases patients may be unable to go back to their previous employment, or illness may have interrupted a university or technical training course, but whatever the situation the Bureau assesses each case on its individual merits and needs, taking into consideration such factors as personal preference and educational background. The main medium for instruction is correspondence, although it is sometimes possible to arrange direct tuition from a visiting instructor. Subjects taught range over a wide variety of subjects from agriculture to criminal psychology. The Bureau works in close co-operation with medical officers, welfare workers, and especially with local education authorities, who have powers to reimburse tuition fees, although wherever possible students are encouraged to contribute towards the cost of their training. Further details may be obtained from the Registrar, Preparatory Training Bureau, Tavistock House (South), Tavistock Square, W.C.1.

which occurs in hypnosis might give an outlet to tendencies at variance with the patient's conscious moral standards. Hypnotism should be practised only by those whose training and experience enabled them to make a psychiatric diagnosis and whose judgment in selecting suitable patients for this treatment was sound.

Lack of a General Theory

Professor ALEXANDER KENNEDY said that he spoke neither as an expert nor as an enthusiast, but simply as a psychiatrist who felt that some knowledge of the subject should be part of the background of every psychiatrist. Mr. Somerville Hastings's Bill was not by any means the first legislation on the subject. There had been laws and decrees concerning hypnotism in many countries during the nineteenth century.

There had been many attempts to explain the phenomena of hypnosis, and hypnotism seemed often to attract explanations in terms of current theory. Just as it was magnetism in Mesmer's time, so at the present time extra-sensory perception was being invoked. One view which was of great interest was that pointed out by Charcot and later by William Brown—hypnotism had a great deal in common with hysteria. It was known that in certain conditions of the nervous system in which hysteria was a common complication the patients exhibited a state at times which was not unlike hypnosis. To the popular view hypnotism was an example of the power of one person over another, or of mind over matter. To the layman the whole thing was so striking that it was impossible for anyone to feel neutral towards it. Historically, hypnosis was the first abreactive technique.

As to the medical attitude towards hypnotism, if medical men were to take the responsibility of doing what lay hypnotists were doing they must acquire competence at it, or if they thought it a wrong thing they must give sound reasons for their view. It had been suggested in some quarters that the therapeutic use of hypnosis should be regarded as a special branch of medicine. He himself did not hold that view. Hypnotism could not rank as a specialty and could never be a very high-grade occupation. If people were going to use hypnotism in the course of psychiatric treatment they should use it against the general background of psychiatry, and it was in psychiatry itself that they should be specialists.

Lay Hypnotists

Dr. J. R. REES said that it would be interesting to learn Dr. Kennedy's objections to lay hypnotists. He understood the objection to be not only to stage performances but to the little clinics afterwards which might be formed around the lay hypnotist.

Professor KENNEDY replied that he thought it would be wise to suppress such demonstrations, but largely on the grounds of good taste. It was possibly more of a public matter than specifically a psychiatric one. There were, however, dangers arising from what might be called the side activities of the mesmerists, and these might be greater than those arising from their public performances. One of the difficulties was that the public was apt to say, "These people can do it; can you?" If doctors combined to suppress something which apparently they could not make use of themselves they looked rather feeble in the eyes of the public. Braid, Elliotson, and Esdaile had been persecuted by their colleagues because they investigated hypnosis.

Discussion

In the subsequent discussion Dr. M. N. PAI gave a short talk on suggestibility, especially that form prevalent during social upheavals, such as war. Dr. W. G. MASFIELD, replying to questions about the Committee's definition, observed that the statement that hypnotism should be used

only by a medical practitioner was another way of saying that its *raison d'être* was therapeutic. Whereupon one or two speakers expressed concern lest legislation brought in to stop lay hypnotism might have an unfortunate effect on activities such as spiritual healing.

Dr. CULVER BARKER said that hypnotism was helpful in selected cases, but he would hesitate very much before sending a patient to a hypnotist unless the latter had a very good background of psychiatric experience. Dr. DORIS ODLUM hoped that the point would be fully emphasized that they were speaking of hypnosis in the interests of the patient. Danger arose when such a method as this came into the hands of those who used it apart from this dominating consideration.

Professor FERGUSON RODGER said that what the Committee had framed was something like a legal definition so that hypnotism could be recognized when it was seen; it was not done with the intention of describing the therapeutic means used by a particular practitioner. A number of psychiatrists who at one time used hypnotism now used it no longer or only very rarely, because they did not like the "feel" of it. There were very few occasions, he thought, when they needed to use it; they could nearly always use some other method. Dr. SYBIL TREMELLEN mentioned that hypnotism was used extensively in dental clinics in America.

MINISTER AT MENTAL HEALTH CONFERENCE

The annual conference of the National Association for Mental Health was held in London on February 5 and 6 under the chairmanship of Professor C. FRASER BROCKINGTON, Professor of Social and Preventive Medicine, University of Manchester. The conference took the form of a symposium on the practical applications of research and experiment in the mental health field, and one session was devoted to mental deficiency and another to research into the causes of mental illness. Delegates were present from W.H.O. and Unesco, and from health services in the United States, Australia, Canada, France, Denmark, Holland, Switzerland, Egypt, and Argentina.

A Dual Social Problem

The Conference was opened by the Minister of Health, Mr. IAIN MACLEOD, who said that in coping with mental illness and deficiency great shortages were encountered on many sides. In the mental-deficiency field alone there was a waiting-list of some 8,000, and with mentally defective children this constituted a dual social problem, for not only was it better for the child himself that he should have the trained care which could be given to him in hospital, but it could make all the difference to the mother and the family if what was potentially a disruptive element was removed from the home environment. He regarded this as the biggest problem which faced him as Minister of Health.

It was true that they were all to some extent prisoners within the difficulties with which the country was faced, but it was a great tragedy that in the more carefree days of the Health Service, before a ceiling was imposed by the late Sir Stafford Cripps, more money had not been devoted to the mental health field. Surely the first thing they should do was to seek to instil into the people of this country a different and more wholesome attitude towards mental illness. In the future they must associate the problem of mental health more closely with the problem of the general health. When the time arrived the claims of mental health should have first call on the capital resources available in the hospital field, and side by side with the provision of buildings must go the training of more nursing staff. He

assured the delegates that he would look forward to receiving the conclusions of the conference and would give them every consideration.

Professor L. S. PENROSE, Galton Professor of Eugenics, University College, London, then addressed the conference on recent research in mental deficiency. Thirty or forty years ago the hereditary factor was thought to be the only one worth investigating. But now environmental causes, such as maternal infection during pregnancy, had come to the fore, and both aspects must be continually remembered and balanced against each other. In discussing the possibility of a decline in intelligence of the whole population, Professor Penrose said there was no evidence of this, but there was a related problem to consider—namely, the increase in the number of low-grade defectives. Dr. L. T. HILLIARD, physician-superintendent, Fountain Hospital, described some modern institutional developments. He pleaded for a quicker turnover of patients to reduce the waiting-list, and if a certain amount of risk were taken it was surprising what could be done.

Other discussions at the conference were on the subject of child care and on the influence of recent advances in the prevention and treatment of mental illness.

HOSPITAL OUT-PATIENT DEPARTMENTS

On January 27 the Sections of Medicine and General Practice of the Royal Society of Medicine held a discussion on "The Function of the Hospital Out-patient Department."

Sir JAMES SPENCE, introducing the subject, said that it all depended on whether you looked at the question as a patient, who might be a *habitué* or a new-comer; as a general practitioner, who might be either genuinely requiring a consultation or just decanting patients from an over-busy surgery; or as a consultant, a hospital administrator, or busy surgeon; or as a student, a hospital administrator, or busy surgeon. Each had a different point of view, and the "time-and-motion" experts also had their point of view. Then there were different kinds of departments, some arranged primarily for true consultation, others trying to combine this with clinical displays to students, others arranged for technical examinations or treatments by specialists. Behind all this lay the casualty departments with their daily load of work. The picture therefore required clear analysis.

The true consultation department reached its highest level when practitioner and consultant were friends, or when the consultant dealt with the patients as if they were friends. The purpose of consultation was to give appropriate explanation and advice both to patients and to practitioners. The manner in which this was done was in itself a valuable method of teaching students. This concept of true consultation had been rather lost sight of in teaching hospitals, where it was made difficult, if not impossible, by the presence of nurses or students in the room. By simple arrangements they could be kept in the background. He preferred to have only two students in his room, and no nurse. Then it became true out-patient teaching. The other method of clinical displays in out-patient departments to a large number of students was something different. While legitimate for its own purposes, it was not out-patient teaching. When offered the choice of consultation with or without students present, 90% of patients accepted the presence of students if there were no more than one or two. The introduction of a patient to a consultant whom he had never seen before required thought. For this he used a voluntary social history writer. Apart from this a letter from a doctor was required; a telephone conversation was better still; but best of all was to have the general practitioner accompany the patient. A study of the history and origin of out-patient departments revealed the cause of their weaknesses. Most of them had evolved out of underground casualty departments in buildings designed primarily for in-patients.

A General Practitioner's View

Dr. R. J. F. H. PINSENT, speaking as a general practitioner who had referred his patients widely to both general and special hospitals, said that the general practitioner must look to the out-patient department for services which he himself could not give his patients, either because their problems were beyond his skill or because some special investigation was required. He had come to regard the hospitals around him as fulfilling the purpose of an extension of himself. Hospital care was but one phase in the course of an illness, and it might be very short in relation to the duration of the disease or the lifetime of the patient. In one year he had seen in his practice 2,176 patients (first attendances), and of these he referred 413 (19%) to hospital for opinion or advice. The greatest demand was made on the casualty department, to which 19% of the patients who went to hospital were referred; this was a reflection of the general practitioner's lack of facilities rather than his lack of skill.

After referring briefly to an example of delay in dealing with a patient, Dr. Pinsent went on to discuss the form of a consultant's report. It need not be long, but it should be clear and answer all the questions if possible. It would help if hospitals used a standard size of notepaper which would fit unfolded into the N.H.S. record envelope. He urged that the general practitioner should be encouraged to go to hospital as a clinical visitor, with or without the care of patients. On the other side, for some time he had been privileged to have visitors from the hospital world (registrars) come to share an evening surgery with him. This gave them an opportunity of seeing illness as it presented itself in the home and in the surgery, and he had learned much and had been stimulated by the contact.

Appointments

Brigadier G. P. HARDY-ROBERTS spoke from the point of view of a lay administrator. General practitioners could help in the smooth running of an out-patient department if, when making appointments for their patients, they would indicate more clearly the kind of specialist required, and if they would refrain from asking for an urgent appointment except in cases of real need. No appointments system could work satisfactorily unless consultants and their assistants began their sessions punctually, but it was important that out-patients should understand that good treatment was incompatible with a "conveyor-belt" system. Unnecessary delays should be avoided, but patients themselves were not always blameless. There were frequent instances of unpunctuality on their part, and of failure to attend clinics, especially after their initial visit.

Discussion

Dr. W. A. BOURNE said that during the last 13 months he had seen at hospital 2,634 out-patients, but he had been able to make a diagnosis which really satisfied him in only 60%. He was impressed by the number of elderly people making vague complaints who came to the out-patient department. Apparently they used the hospital as a social centre, and therefore he decided to arrange that they should go to the hospital without necessarily having to see a medical man at all. Two or three out-patients' clubs had been formed, and these had proved beneficial as well as exceedingly popular.

Dr. L. W. BATTEN spoke of his failure to induce hospitals to play the good consultant. Sometimes he had to write not to an individual but to a department, and it was then that trouble arose. Apart from the notorious delay in getting an answer, his persuasive letters often evoked merely a list of findings as if the patient were a box of tricks, not a person. Often the patient sent only for an opinion was presented with a bottle of medicine and invited to come again—in fact taken over by the hospital.

In private practice he tried always to accompany his patients to consultations. He would most gladly do the same in hospital if, first, he was made to feel he would be welcome; secondly, he could hope the consultation would be reasonably punctual; and, thirdly, if he did not fear it would be semi-public—as Sir James Spence had said, not a real consultation at all.

Dr. ALEXANDER BROWN said that the out-patient department was being run for different purposes, including the training of registrars to become consultants and of students to become doctors. It was time that people got down to the planning of the out-patient departments so that the important cases which came from the general practitioner for the opinion of a particular consultant could really have a consultation. In his own district (Cambridgeshire) the general practitioner had free access to the pathological and radiological facilities, and if this were arranged generally out-patient attendances would be appreciably cut down.

Nova et Vetera

Sir FREDERICK TREVES

Sir Frederick Treves, the centenary of whose birth falls on February 15, was born at Dorchester and educated at Merchant Taylors School. He qualified from the London Hospital in 1874, and by the 'nineties had become the best-known and most successful surgeon in London. In another coronation year—1902—his name was on every tongue as the surgeon who operated on King Edward VII. Since June 13 the King had been suffering from abdominal pain but was anxious not to postpone the coronation, despite the advice of Sir Francis Laking and Sir Thomas Barlow, who recognized that the appendix was involved. After further consultation with Treves and Lord Lister they persuaded the King to submit to an operation, which was carried out by Treves at 12.30 in the afternoon of June 24, two days before the date fixed for the coronation. Treves found a deep-seated abscess round the appendix, necessitating two large drainage tubes in the abscess cavity. Convalescence was uninterrupted, and the postponed coronation took place on August 9. It is said that Treves did not go to bed for seven nights after the operation.

By a strange chance Treves's Cavendish Lecture "On Some Phases of Inflammation of the Appendix" was delivered on June 20 and published in this *Journal* on June 28. He was one of the first surgeons to devote special attention to diseases of the appendix, and opened a discussion on the surgical treatment of "typhlitis" at the B.M.A. annual meeting at Leeds in 1889. In a subsequent paper contributed to *Albutt's System of Medicine* (1897) he used the term "perityphlitis," regarding the term "appendicitis" as uncouth.

Treves was a man of many interests and travelled extensively, recording his impressions and experiences in a number of books. His last work was *The Elephant Man and Other Reminiscences* (1923). The story of John Merrick "the elephant man" was first told by Treves in this *Journal* (1886, 2, 1188; 1890, 1, 916). The man had been victimized by showmen for some time. He suffered from congenital hypertrophy of certain bones, with pachydermatocele and papilloma of the skin, and his countenance was so hideous that he wore a mask. His death in 1890 followed continued growth of the skull, which became so heavy that it fell backward while he was asleep and dislocated his neck.

Treves retired in 1908, and in that year became one of the founders of the British Red Cross Society. At the beginning of the first world war he offered his services and became president of the headquarters medical board at the War Office. He died in Lausanne on December 3, 1923.

Preparations and Appliances

EXTRADURAL SPACE INDICATOR

Professor R. R. MACINTOSH, Nuffield Department of Anaesthetics, University of Oxford, writes: Extradural analgesia would be more popular if the anaesthetist knew for certain when the point of his needle had passed the ligamentum flavum (L.F.) and reached the extradural space. Any device to indicate this must work decisively, for the advancing needle might otherwise penetrate the dura (D). Mr. R. Salt, technician to the Nuffield Department of Anaesthetics, has designed a spring-loaded stylet for this purpose, and in practice it has proved robust and effective. The distal end of the stylet is blunt, and the proximal end is housed in a small metal case (S.H.) containing a spring.

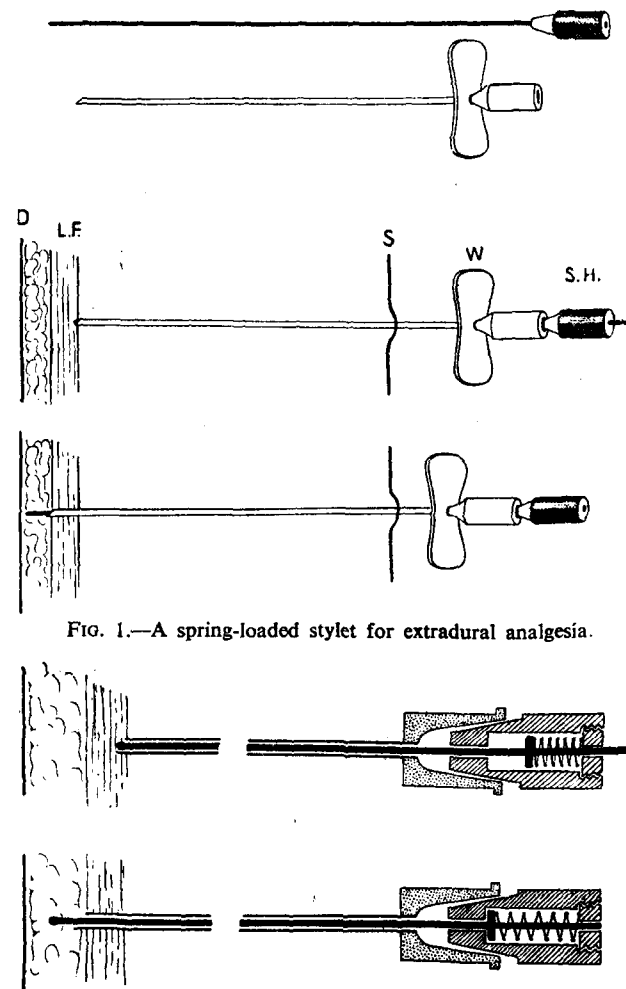


FIG. 1.—A spring-loaded stylet for extradural analgesia.

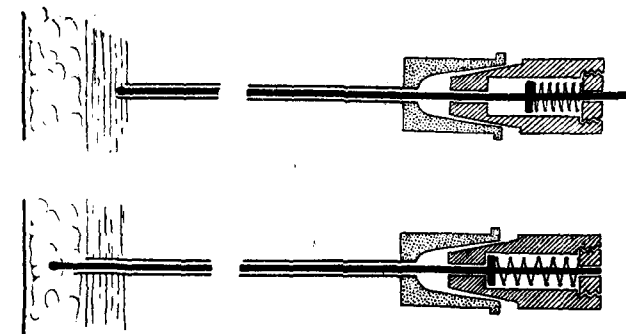


FIG. 2.—Section of the stylet.

An 18-gauge needle is inserted until the point lies in the ligamentum flavum. The stylet is inserted through the needle, but the distal blunt end is held up by the tough ligament, compressing the spring and keeping the proximal end $\frac{1}{2}$ in. (8.5 mm.) out of the casing. The needle is held by its two flanges (W) and advanced slowly. As soon as the bevel is clear of the ligamentum flavum the stylet is propelled forward by the spring. That the point of the needle has reached the extradural space is shown by the sudden disappearance of the proximal end of the stylet into the casing.

The needle is manufactured by Vann Bros., Ltd., of 63, Weymouth Street, London, W.1.

Correspondence

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

Assistance for Doctors in Flood Areas

SIR,—Through the appropriate divisions of the Association and local medical committees information has been sought about the forms of assistance needed by the doctors in the areas affected by the recent disastrous floods. It is known that numbers of our colleagues have sustained grievous losses. There are some whose houses and cars are under water. Others may suffer through the evacuation of large numbers of patients who may not be able to return to their former homes. One of our divisions is raising a local emergency fund, but I am sure that our members in all parts of the country will welcome an opportunity of assisting. Indeed, we have friends farther afield who are anxious to help, as is shown by a most kind offer received from the Canadian Medical Association.

We have in the Association a small fund known as the Sir Charles Hastings Fund, the object of which is to give prompt assistance to doctors who, through misfortune of one kind or another, find themselves in temporary difficulties. The fund is administered by three trustees—the Chairmen of Council, the Chairman of the Representative Body, and the Secretary of the Association—who are in a position to deal expeditiously with all cases of need brought to their notice. I invite readers of the *Journal* to send contributions necessary relief in the present emergency. Will contributors please make their cheques or postal orders payable to the Sir Charles Hastings Fund, and send them to the Secretary of the Fund at B.M.A. House, Tavistock Square, London, W.C.1, marking the envelope "Flood Relief."—I am, etc.,

E. A. GREGG,
Chairman of Council.

Smoking and Lung Cancer

SIR,—In view of the present interest in the relationship of smoking to lung cancer there is undoubtedly a large body of opinion, both professional and lay, which accepts, as though it had been proved, that smoking is the main cause of the recorded increase in lung cancer; and no doubt there is considerable distress in the community on this account. In the present state of our knowledge, is this anxiety really justified?

What do we really know? What do we not know? It is agreed that (1) the Registrar-General's recorded figures of deaths from lung cancer have been mounting with startling rapidity since the early 'twenties of this century, and are still rising; (2) the national habit of cigarette-smoking has increased in corresponding measure—indeed, there is an intriguing correlation between the increase in cigarette-smoking and the recorded increase in deaths from lung cancer; (3) there is an immeasurably greater ability to diagnose this condition to-day, as compared with the first decade of this century. There is probably as close a correlation between the increase in lung cancer as there is between the increase in cigarette-smoking and the increase in lung cancer; and (4) it has yet to be shown that there is a carcinogenic agent in tobacco smoke, and, even if there be such an agent, it will be necessary to show that it is capable of inducing cancer in the bronchial epithelium.

In judging the relative importance of (2) and (3) we must admit that we do not know how much of the rise in the death rate can be explained by our greater ability to recognize the disease. At the same time, we cannot assume that,

because there is a correlation between the increase in smoking and the increase in lung cancer, there is necessarily a connexion between the two. It is easy to call to mind other close statistical correlations. What catches the popular fancy is the way the rise in the habit of cigarette-smoking goes hand in hand with the rise in lung cancer mortality. But in the long history of our profession's attempts to elucidate the causes of cancer it has found many correlations of a comparable nature which have in the end proved false. In the early days of the present century it was taught, and it was in the students' textbooks, that breast cancer might be related to the bone and metal supports of the corsets of the Edwardian days; but in the intervening 45 years the incidence of mammary cancer has not fallen. It is as high to-day as it was then. The high frequency of liver cancer in the East was long considered to be associated with liver parasites—a belief now rapidly dying out. There have been other such false assumptions. If the reported increase in lung cancer is due to tobacco smoke, how does it come about that there is no increase in the incidence of cancer in other parts of the respiratory tract, such as mouth, tongue, and pharynx, which suffer a greater exposure to the smoke and for a longer time? In point of fact, there is some slight decrease in these sites.

With regard to the statistical approach of Dr. Richard Doll and Professor A. Bradford Hill (December 13, 1952, p. 1271), I feel unhappy about results obtained from analysis of male figures when it would appear that over 95% of their men smoked, and when there are no controls who have not smoked. They record that out of 108 cases of lung cancer in women 40 had never smoked. This is a formidable proportion. We do not know how many of their 68 women who had smoked, and who died of lung cancer, would have developed lung cancer had they not smoked. With regard to their men, the same difficulty arises: how many would have developed lung cancer had they not smoked. Why not as many as the women? This aspect is not given its proper weight by these authors. Their whole emphasis is on smoking.

It is clear, and this is sometimes, perhaps, better than being statistically clear, that lung cancer takes a certain toll of women whether they smoke or not. The same must be true of men. From what we know of cancer in other sites it is not unreasonable to suppose that the incidence will be higher, perhaps much higher, than in women. It may, indeed, be this natural incidence, not the smoking, which is, at least in part, responsible for the higher male figures. The only satisfactory solution of the problem would be the study of a large group of smokers in comparison with an equally large group of non-smokers.

In the early 'thirties it was the fashion to ascribe lung cancer to the tarring of the roads and to the exhaust fumes of motor vehicles, but the failure to demonstrate any higher incidence in those specially exposed to such hazards resulted in the abandonment of the hypothesis. Then the traces of arsenic in British tobaccos received the blame, but that belief, too, has been discredited. The industrial pollution of the air we breathe has been considered as a factor, in spite of the fact that, while lung cancer figures are rising, the aerial pollution is definitely decreasing. When doctors disagree it is bad for the patient.

It may be that a proportion of lung cancers in man are induced by tobacco smoke: at the moment we do not know, but let us be sure of our evidence before we scare our public. As a profession we have that responsibility.—I am, etc.,

Leeds.

R. D. PASSEY.

Damages Against Casualty Officer

SIR,—We have read with dismay your account (January 17, p. 166) of the action and judgment in the case of *Payne v. St. Helier Group Hospital Management Committee and Another*. The opinion of the learned judge cannot fail to cause disquiet among medical practitioners, who are as jealous of the traditions and good repute of British justice

as they are of their own inheritance. From your account of the case it appears that the findings of the casualty officer were borne out by the evidence of the general practitioner, for he and his locum remained satisfied with the patient's progress for a fortnight after the injury. This seems to have been completely ignored by the judge in his summing up. Furthermore, why should Mr. Justice Donovan reject in its entirety the evidence of Professor Ian Aird? Professor Aird's teaching and writings are a guide to surgeons all over the world. His opinion in this case supported the defendant in every particular. Most of us would rest content with such support.

Even more disquieting is the judge's reference to the casualty officer failing to observe signs which "must have been present." There are no "musts" in medicine, especially where such fickle things as physical signs are concerned. Moreover, the casualty officer is held to be negligent, not for what he failed to do, but for what he failed to observe. This surely introduces a new precedent into the law regarding negligence and malpractice. Mr. Justice Donovan further remarks that the patient in this case should have been seen by a consultant. It seems that to satisfy the courts an ordinary medical qualification is of negligible value. Hospital management committees had better begin staffing their casualty departments with consultant surgeons.

May we conclude by expressing sympathy with the defendant and the vehement hope that an appeal will be made against the judgment? If this decision is allowed to stand, it will be impossible to practise medicine without constant fear of litigation. "Who then shall be saved?"—We are, etc.,

BERNARD O. DOWDELL.
P. D. DRINKWATER.
J. BRYAN EAGLES.
J. MILLER AITKEN.
BETTY EAGLES.
FRANCES M. FOUNTAIN.
KENNETH E. MARSH.

Huddersfield.

A. D. CHARNLEY.
JOHN M. REID.
E. GLEDHILL.
W. E. THOMPSON.
C. F. J. CARRUTHERS.
W. S. DICKSON.

lows certain abdominal operations. If early clearance of the blocked bronchus does not occur some infection and inflammation of the collapsed segment probably nearly always results and the patient develops a segmental aspiration pneumonia of the type described in these papers. (This point is, indeed, mentioned in the earlier paper.) If, then, the conclusion of the second paper—that segmental aspiration pneumonia may occasionally result in an established bronchiectasis—is correct we should expect to find that post-operative segmental collapse may also, sometimes, lead to bronchiectasis. It would be interesting to know if this is the case. Do physicians or surgeons seeing large numbers of cases of bronchiectasis feel that in some of their cases the beginning of the disease can be traced to an abdominal operation? Does the frequency of a history of a previous abdominal operation in any large series of cases of established bronchiectasis suggest that the former is sometimes an indirect cause of the latter?

These papers should emphasize, once again, the importance of the prevention, early diagnosis, and effective treatment of post-operative segmental collapse. Unlike the more dramatic, but much rarer, massive pulmonary or lobar collapse, the symptoms of this condition may be slight and clinical signs scanty, so that it may be easily overlooked if not expected. The papers also stress again that correct treatment is essentially the mechanical drainage of the blocked bronchus with antibiotics playing only a secondary role. This is certainly true of the post-operative condition. Brock's classical paper¹ on "Post-operative Chest Complications" gives a very good account of the treatment of post-operative pulmonary collapse. His method is essentially postural coughing adapted for the surgical patient. If carefully carried out at an early stage the blocked bronchus can nearly always be cleared. The development of an aspiration pneumonia with the remote possibility of bronchiectasis may thus be prevented. Bronchoscopy or tracheo-bronchial suction is rarely necessary or desirable.—I am, etc.,

Omagh, Co. Tyrone.

W. S. DAVIS.

REFERENCE

¹ *Guy's Hosp. Rep.*, 1936, 86, 191.

SIR,—The Council of the Medical Defence Union, like yourself, has been made aware of the disappointment with which many practitioners have read the judgment in the case of *Payne v. St. Helier Group Hospital Management Committee and Another* reported in your medico-legal columns (January 17, p. 166). A similar reaction was experienced by individual members of the Council when they learned the substance and framework of that judgment. Steps were immediately taken to instruct the solicitors who act for the Union to examine jointly with leading and junior counsel the question of entering an appeal forthwith. Two conferences were held with learned counsel, who eventually advised that there was a total absence of any promising ground whereon to base an appeal, and that, indeed, an appeal if entered would not carry any hope of success. In these circumstances the Council had no alternative but to follow the advice of its chosen legal experts, much though they regretted their inability to seek a reversal of the unfavourable judgment.

The profession can rest assured that the probable repercussions of each case sponsored by the Union and heard in court are carefully considered in the light of any additional available legal procedure that can be undertaken to protect directly the interests of a member and indirectly those of his colleagues.—I am, etc.,

London, W.C.1.

ROBERT FORBES,
Secretary,
The Medical Defence Union.

Segmental Aspiration Pneumonia and Bronchiectasis

SIR,—The papers by Dr. K. D. Forgan Morle and Squadron Leader Philip W. Robertson in the *British Medical Journal* of October 27, 1951 (p. 994), and January 17 (p. 130) should be of interest to all those concerned with the care of patients after surgery. It has long been recognized that broncho-pulmonary segmental collapse not uncommonly fol-

One observation made by the authors possibly provides a useful clue to the nature of the infective element either as primary or secondary invaders. "The bronchial secretions have been found to be so thick and tenacious as to block the suction tube" (during bronchoscopy). In our

experience (Allison *et al.*)¹ this appearance of bronchial aspirations is rather characteristic of muco-pus due to the presence of *Haemophilus influenzae*, so much so that we are usually able to forecast the culture result by the appearance of the bronchial secretion. We are not alone in regarding *H. influenzae* as an important agent in bronchiectasis. Elkeles² first drew attention to the prevalence of this organism in bronchiectasis. This was confirmed in a large number of cases by Mulder³ and again later in a smaller series by Benstead.⁴ Admittedly these reports deal with fully established cases of bronchiectasis, but for precisely this reason it is of importance to determine whether *H. influenzae*, or any other organism, is predominantly present in what is so plausibly described by Drs. Morle and Robertson as the early stage. Hegglin and Grumbach⁵ described lung conditions in Swiss Servicemen similar to those seen by Drs. Morle and Robertson. Pure cultures of *H. influenzae* were a constant finding in this Swiss series. It is of some interest in this context to recall that it was suggested as long ago as 1911 by Chedini and Breccia⁶ that metabolic products of *H. influenzae* lessen to a marked degree the tone of unstriated muscle. If confirmed this would go some way towards explaining at least part of the mechanism played by the infective element in the pathogenesis of bronchiectasis.

Morle and Robertson's therapeutic suggestions must be accepted as an important part of rehabilitation, or, probably, even of prophylaxis, but a rational therapy must take all pathogenic factors into consideration. When the infective component has been more fully elucidated and appropriate antibacterial drugs will most likely come to be considered as essential as the removal of the bronchial obstruction in every single case of incipient bronchiectasis.—I am, etc.,

K. ZINNEBANN.

Leeds.

REFERENCES

- ¹ *J. Path. Bact.*, 1943, 55, 465.
- ² *Schweiz. med. Wschr.*, 1931, 61, 677.
- ³ *Ibid.*, 1937, 67, 356.
- ⁴ *Acta med. scand.*, 1938, 94, 98.
- ⁵ *J. Path. Bact.*, 1940, 50, 317.
- ⁶ *Lancet*, 1950, 1, 206.
- ⁷ *Schweiz. med. Wschr.*, 1941, 71, 578.
- ⁸ *Zbl. Bakt.*, 1. Abt. Orig., 1911, 57, 567.

School Dental Service

SIR,—With reference to your annotation (January 10, p. 87), the future of the school dental service should not lightly be linked with the treatment of verminous heads. Its future development is important, and merits similar consideration to that devoted to the future of child medical care.

Like medical services, dental services for children are duplicated in the National Health Service and the local authority health service. As in medical practice, arguments are being put forward which, if carried to their logical conclusion, would result in the extinction of the family dentist. The Chief Medical Officer of the Ministry of Education (*Report for 1950-1 of the Chief Medical Officer, Ministry of Education*; H.M.S.O.) argues against "a transfer of a substantial part of the school population from the school dental service to the general dental service for treatment. . . ." He favours an expanded school service, using dental auxiliaries to fill and extract teeth.

In considering the relative effectiveness of treatment by the school service and the general dental service, one must remember the state of mind created towards having teeth filled. Many children who have been given fillings by the school service grow up to lose their teeth. In trying to find the reason for this undesirable result, one discovers other flaws in the school dental service besides that of shortage of dentists. The report recognizes a difference between the two services, saying that the "private dentist" deals with "those individuals who are sufficiently enlightened to seek his services. . . ." This explanation, however, misses an essential point. Many of those who seek the private dentist's aid are not enlightened, they are merely in pain. It is with this class of patient that the private dentist can compete with the school dental officer in winning new patients for fillings. It would be invidious for a general dental practitioner to claim more

success than a colleague in the school service, but one must record that many of to-day's extraction patients were yesterday's school service filling patients. One must conclude, having questioned hundreds of such patients, their parents, school dental officers, and school teachers, that the school service is relatively inefficient in putting over the idea of fillings.

The future role of the family dentist in winning patients for the filling of teeth must not be underestimated: plans for expansion of the school dental service which ignore the general dental practitioner should be resisted in the national interest. The refusal of the British Dental Association's offer of help for the school service is a tragic mistake. The Minister of Education's arguments are unsound. She should think again, not merely for short-term advantage, but in the long-term interests of the health of the schoolchild.—I am, etc.,

Birmingham.

C. N. JEFFRIES.

SIR,—The opposition to Brigadier R. A. Broderick's proposal (January 3, p. 43) to experiment with the training of dental nurses, contained in the letters of Dr. E. Davies-Thomas and Mr. C. N. Jeffries (January 17, pp. 162-3) must arise from a mistaken idea of the proposed function of these nurses. The proposal is to train dental nurses to do some of the more simple procedures in children's dentistry under the direction of dentists in school clinics. Much of this work is now neglected, owing to the difficulty in obtaining dentists to do it. A similar scheme has been working in New Zealand for about 30 years.

The British Dental Association has raised several objections to this scheme. First, it has been suggested that these nurses will "dilute" the dental profession. Doctors have the assistance of the nursing profession in the treatment of their patients. State-registered nurses have a three-year training which equips them to treat patients by difficult and potentially dangerous procedures. No one would suggest that they dilute the medical profession, or that their use is in any way harmful to the patient's or the doctor's interests. It is hard to see why dental nurses should be considered a menace. The second objection raised is the lack of trained teachers for the dental nurses. At the outset of the scheme, when the numbers to be trained would be small, this difficulty could be overcome. After that time sister tutors could be trained in teaching duties as is done in the nursing profession. Thirdly, the British Dental Association is concerned that the practising life of dental nurses would be short, owing to domestic wastage. This objection surely applies to any training for women who do not take vows of celibacy before starting their careers.

As an alternative to this scheme the British Dental Association suggests that more dentists be trained for this work. At the present time this is impracticable, but in any case it is uneconomical to employ a person with five years' training when the work can be equally well done by personnel whose training has been limited to more simple tasks. The practising dentist would benefit from this scheme in that it would increase the demand for comprehensive treatment in the adult. If children have the opportunity to receive regular treatment and education in dental hygiene at school, they are encouraged to try to keep their mouths sound and clean throughout their lives. This early training is possibly better done by an enthusiastic dental nurse than a dentist, conscious in many cases that the work he is doing does not match his capabilities.—I am, etc.,

Abbot's Langley, Herts.

F. G. HARDMAN.

REFERENCE

¹ *Brit. dent. J.*, 1947, 82, 259.

Medical Care of the Schoolchild

SIR,—The picture which you draw in an annotation (January 10, p. 87) is so different from that known to myself that I wonder what is your conception of this service. I would be interested to know what provision you would make in your proposals, to mention only a few

claim only slight experience, is a procedure which removes the obstruction at one operation and thus provides adequate drainage for an obstructed and infected urinary tract.—I am, etc.,

Glasgow.

JAMES H. LEVACK.

Intestinal Microflora

SIR,—My letter (December 6, 1952, p. 1257) regarding kwashiorkor was necessarily brief and to the point, so much so that it was too subtle for some and misread by others. I wanted to put forward the idea of the role of intestinal microflora as a dynamic part of the nutrition of the human body and that it was not only the biosynthesis of the B group of vitamins, but also other metabolic activities, that took place in the gut.

Laboratory studies of bacterial metabolism show that growth factors are the main or side products, and aerobic organisms can be used in submerged culture processes to produce many organic substances by fermentation. Commercial work on streptomycin has shown that when its manufacture is stepped up large amounts of vitamin B₁₂ are produced in the substrate. Clinically it has been shown that aureomycin will produce vitamin-B deficiencies by the killing of the intestinal microflora; and in the treatment of some of the vitamin-B lesions with large doses of multiple vitamin-B concentrate the lesions may not all disappear, but some will be further activated or unmasked (vitamin-B shift). It is not only the B group of vitamins that share in the biosynthesis in the gut, but other factors may enter into the picture for the true origin and maintenance of a suitable intestinal microflora. It was because of this that I pointed out that, in the absence of a suitable diet *ab initio*, the failure to take in meat and meat products meant the failure of a suitable type of intestinal microflora to flourish in the first place. The ingestion of large amounts of vegetable protein in a gut not properly conditioned would eventually work out right, but could work better under more suitable circumstances—i.e., a more receptive intestinal microflora.

It is suggested that many conditions relating to nutritional pathology may be explained on the basis of an aberration of the intestinal microflora, so that the various types of pernicious anaemia could be explained on this basis. The differential absorption of iron, with complete failure of absorption in some people, may also be explained on this basis, and so on.—I am, etc.,

Watford.

CHARLES ROTMAN.

In Remembrance of Mr. Philip Mitchiner

SIR,—In view of Mr. Philip Mitchiner's known dislike of funeral flowers, and his great interest in the Royal Medical Benevolent Fund, it was suggested that donations to this charity would have pleased him. The Committee of the Fund would like it to be known that the sum of £163 was contributed, and many letters expressing affection and respect were received. The Committee desires to thank all his friends who joined in this remembrance of a well-loved and honoured man.—I am, etc.,

London, S.W.15.

E. C. PENNEFATHER,
Secretary, Royal Medical
Benevolent Fund.

POINTS FROM LETTERS

The Catheter and the Prostate

Mr. WALTER McC. SCOTT (London, W.2) writes: Having read the correspondence on this subject (January 24, p. 216), I would like to suggest that perhaps the best view is to fit the treatment and operation to the patient rather than the patient to them; and that "the art" lies in selecting the right one for each.

Collection of Blood

Dr. P. M. VICARY (Littlestone, Kent) writes: May I add yet one more point in the correspondence on collection of blood? Before inflating the already applied cuff of the sphygmomanometer, ask the patient to put the arm down as near the floor as possible. Inflate the cuff after a minute in this position and then elevate the arm to the position for venepuncture. One word of warning: Hold on to your sphygmomanometer.

Obituary

G. D. HALE CARPENTER, M.B.E., D.M.

Professor G. D. Hale Carpenter, professor emeritus of zoology (entomology) in the University of Oxford, died at the Radcliffe Infirmary on January 30 at the age of 70 after a long illness.

Geoffrey Douglas Hale Carpenter was born on October 26, 1882, and came of a distinguished academic family; both his father and his grandfather were doctors of science and Fellows of the Royal Society. He had the rare privilege of being born in Eton College, where his father was an assistant master and his mother the daughter of another. He was educated at the Dragon School (Lynam's), Bradfield College, and St. Catherine's, Oxford, graduating B.A., with a second-class in his final examination, in 1904, and then passing with a University Entrance Scholarship to St. George's Hospital. He qualified M.R.C.S., L.R.C.P. in 1908, taking the degrees of B.M., B.Ch. in the same year, and he proceeded to the D.M. five years later. After qualification he held the appointments of house-surgeon and house-physician at St. George's Hospital.

From his earliest preparatory-school days Hale Carpenter displayed a keen interest in natural history, and he came to know the plants, birds, snails, and insects of the Oxford district exceedingly well. The ground was thus well prepared for his future activities, and when as a young student he attended his first lecture on insect-borne diseases the effect was profound. He decided forthwith that that was the field for him, and in 1910 he entered the Colonial Medical Service.

At the close of the nineteenth century sleeping sickness, which had hitherto been confined to the west coast of Africa, appeared in Uganda and spread with such terrible rapidity around the shores of the great lake, Victoria Nyanza, and among the dense population of the islands in the lake that over 200,000 natives died within a few years. To study the disease the Royal Society appointed a commission, which came to the conclusion that the control of sleeping sickness demanded a greater knowledge of the bionomics of the tsetse fly, *Glossina palpalis*, and Hale Carpenter was engaged for the work, taking up his residence in the Sesse Islands, in the north-west part of the lake, in February, 1911. The results of his investigations appeared in the *Reports of the Sleeping Sickness Commission of the Royal Society* (1912, 1913, and 1919), and were presented in another form as a dissertation for his degree of doctor of medicine at Oxford.

The war of 1914-18 caused him to be withdrawn from tsetse research, and he served as a captain with the Uganda Medical Service, being constantly moved about from post to post waiting for the casualties that never came. As he said in the preface to his book, *A Naturalist in East Africa* (1925), which dealt with the war years, "Many long periods of what would otherwise have been 'excessive boredom' were relieved by the pursuits of a naturalist, and, indeed, it was only the interest of these pursuits that made life possible." So it was he studied and collected insects of all kinds, paying special attention to the phenomena of mimicry, polymorphism, and matters of evolutionary interest and keeping up a correspondence about his work with the late Sir Edward Poulton, of Oxford. For his services

in the war he was appointed M.B.E. in 1918. After the war he was specialist officer for the control of sleeping sickness in Uganda until he retired from the Colonial Medical Service in 1930, but he undertook a special investigation into tsetse fly in Ngamiland at the request of the Secretary of State for the Colonies in 1930-1.

On returning to England, Hale Carpenter built a house on Cumnor Hill, within easy cycling distance of the Oxford University Museum, which housed in the Hope Department of Entomology so many of his African specimens. For a year or two he visited the department daily, studying and identifying his collections and assisting Sir Edward Poulton, whose disciple he had been for so long. When Sir Edward retired in 1933 Hale Carpenter succeeded him as Hope professor, occupying the chair until 1948, when he retired on reaching the conage limit. The title of emeritus professor was then conferred upon him. During the period he was professor he continued his studies on mimicry, geographical distribution, and evolution, and he did all he could to make his department more useful, finally appealing to the University for a new building and for a greatly increased staff.

During the last war Hale Carpenter lectured on tropical medicine and camouflage to the troops in training near Oxford, and he prepared special booklets for the African campaigns, besides serving as head warden of the air-raid precautions service for the Cumnor district. He was keenly interested in the Linnean, Zoological, and Royal Societies, and was a frequent attendee and speaker at their meetings in London, serving as vice-president of the Linnean in 1935-6 and as president of the Royal Entomological Society in 1945-6. His monumental study of *Euploea*, a genus of butterflies ranging widely across the Pacific, was completed shortly before his death, and is to appear in the *Transactions of the Zoological Society of London*. His other writings included *A Naturalist on Lake Victoria* (1920) and *Mimicry* (1933), as well as numerous technical publications.

Hale Carpenter was a tall, good-looking man, with white hair, easy of address, and with a keen sense of humour. His recreations included boating on the Cher-humour. His recreations included boating on the Cher-humour. He took a prominent part in the well and gardening. He took a prominent part in the church life of Cumnor. The funeral service was held in the chapel of Jesus College, Oxford, where he was a Fellow from 1933 to 1948. He married in 1919 Amy Frances Thomas-Peter, of Treviles, Cornwall, who survives him. There were no children.—B. M. H.

JOSIAH OLDFIELD, D.C.L., M.R.C.S.

Dr. Josiah Oldfield, who died on February 2 at the age of 89, was a reformer of the old school, vigorous in the advocacy of the many causes he had at heart.

Josiah Oldfield was born at Shrewsbury on February 28, 1863. From Newport (Salop) Grammar School he went on to Oxford, where he gained second-class honours in theology and civil law. After being called to the Bar by Lincoln's Inn, he practised for a time on the Oxford circuit. He then decided to study medicine at St. Bartholomew's Hospital Medical School, qualifying in 1897. He never lost his interest in the law, however, and in 1901 Oxford awarded him a doctorate in civil law for his thesis on capital punishment. In the same year he founded the Society for the Abolition of Capital Punishment, and also went out to India to see for himself how the people of India lived and what substance there was in their grievances.

While a student at Oxford Oldfield came to the conclusion that meat-eating was unnecessary, and after qualifying as a doctor he became warden and senior physician to the Lady Margaret Fruitarian Hospital, Sittingbourne. His views as a medical man undoubtedly added weight to those of other advocates of dietary reform, G. B. Shaw included. During the first world war Oldfield held a commission as a Territorial in the R.A.M.C. and commanded a field ambulance. He was mentioned in dispatches and awarded the Territorial Decoration. After the war he returned to his hospital and private practice, describing himself in a book of reference as a consultant in diseases of digestion and resulting neuroses. He wrote numerous books, mainly on dietetics, for the instruction of the lay public, and he also addressed meetings up and down the country. He died after a short illness; increasing age did not prevent him from continuing the work he considered so important. He leaves a daughter, Dr. Josie M. Oldfield.

The death at a comparatively early age of Dr. HARRIET E. ACHESON, formerly professor of obstetrics and gynaecology at the Lady Hardinge Medical College, New Delhi, at Glenavy, County Antrim, on January 21, will be a matter of regret to the many who knew her in India. Harriet Elizabeth Acheson was born in Ulster, the daughter of the late John Acheson, of Portadown, and studied medicine at the Royal Free Hospital School of Medicine for Women, qualifying M.R.C.S., L.R.C.P. in 1924. She graduated M.B., B.S. at the University of London in the following year and proceeded M.D. in 1931. Dr. Acheson went to India in 1926 to join the Women's Medical Service there, and served in several of the smaller hospitals. Her professional ability and her kindly disposition stood her in good stead, and her last appointment of a general nature was at the Aitchison Hospital, Lahore, one of the biggest hospitals staffed by the Women's Medical Service. In 1938 she was appointed professor of obstetrics and gynaecology at the Lady Hardinge Medical College. She hesitated before accepting that onerous position because, although she wished to specialize, she did not really care to give up the freedom which being in sole charge allowed. However, specialization won the day, and Dr. Acheson was very successful in the College. Many students, house-surgeons, and assistants owe her much for her careful and patient teaching and for her personal interest in their welfare. She remained at the College until the partition of India in 1947, and her retirement then was much regretted. For her services she was appointed O.B.E. in 1948. Dr. Acheson had an artistic side which she developed in the latter years of her service in India and after retirement. Sketching in water colours was not a mere hobby but a matter of self-expression which gave her great satisfaction.—R. Y.

Dr. A. S. WHITEHEAD, consultant radiologist to hospitals in the Liverpool and District Eastern Hospital Group, died at his home on February 2, at the early age of 36. Alan Stuart Whitehead was born on October 11, 1916, and was educated at King George V School, Southport, and at the University of Liverpool, where he graduated M.B., Ch.B. in 1941, being awarded the clinical exhibition in medicine. He had proceeded M.D. only last year. After graduation, Dr. Whitehead acted as house-surgeon and house-physician at the Emergency Hospital, Southport, and then entered the R.A.M.C. Owing to ill-health he was obliged to relinquish his commission in 1944. He then spent a short time in general practice until in 1947-8 he took the postgraduate course in radiology at the University of Liverpool, obtaining the degree of M.Rad. as well as the diploma of D.M.R.D. of the Royal Colleges in 1949. He served as registrar in the Royal Liverpool United Hospitals in 1948-9.

and later became senior registrar at Broadgreen Hospital and Mill Road Maternity Hospital. In 1951 he was appointed assistant radiologist to the Liverpool and District Eastern Hospital Group, and finally, in October, 1952, consultant radiologist to Mill Road Maternity Hospital, Newsham General Hospital, and Bootle General Hospital. He leaves a widow and two children.

We are indebted to Dr. P. H. WHITAKER for the following appreciation: Whitehead was an exceptionally able student who did very well in his final examination, as was shown by the award of the clinical exhibition in medicine. During the war he acquitted himself well, and later, when he took up radiology, he was one of the outstanding students of his year, proving that radiology was, in fact, the specialty for which he was most suited. His rapid promotion to consultant status was further evidence of his considerable ability, particularly as during that time he had published papers on congenital toxoplasmosis, radiological double contour effect, and placentography. At the recent annual meeting of the British Institute of Radiology he took part in the discussion on placentography. His advice was continually sought by his colleagues on all matters pertaining to radiology, and they thought very highly of his opinion, which was most willingly given. Since his work was of such a specialized nature we invited him to help us with the postgraduate course in radiology. He gave freely of his time to the teaching of the students, and we could always rely on him to help with additional work. He will be greatly missed by all his colleagues in hospital and by the students. It is tragic that so young a life should be cut short at the commencement of what must have been a very promising career.

Medical Notes in Parliament

WELFARE OF FLOOD VICTIMS

The disaster which storm and flood inflicted on the east and south-east coasts on January 31 has been a major pre-occupation of Ministers and Members since the Prime Minister first promised the House on February 2 that everything in human power would be done to repair the sea defences and alleviate distress. The progress on health and welfare provisions is recorded in the following statements.

On February 3 the Home Secretary, as chairman of the committee of Ministers set up to control operations, stated that some 30,000 people were believed to have left their homes, of whom some 6,000 were in rest centres. Except in a few cases such essential services as gas, electricity, water, and fuel were working, and food supplies were adequate.

The next day he had to say that the breaches in the sea defences were so extensive that it would not be possible to complete the repair work before the next high tides on February 14. Although everything possible would be done, the country must be prepared for the possibility of further flooding in some areas. To prevent further loss of life, and to minimize the risk of disease, residents who had had to leave their homes should satisfy themselves by local inquiries that it would be safe for them to return before they did so.

Requisitioning

Discussion was inflamed by controversy over a proposal to requisition 20 houses in Erith.

Mr. H. MACMILLAN, Minister of Housing and Local Government, made a statement on welfare in which he sought to settle the dispute over requisitioning. He pointed out that the responsibility for welfare and first-aid relief rested with the county and county borough councils, under the general direction of the Ministry of Health. The Minister had no hesitation in permitting those authorities to requisition such property as they felt most convenient to perform their task.

After first aid came the stage of convalescence and rehabilitation. The Minister of Health and he were already considering the dispersal of those in the rest centres. If for this purpose he felt it necessary to authorize the requisitioning of empty houses he would do so, but in that case the authority concerned would be the housing authority—county boroughs and district councils—who were responsible for long-term housing as distinct from the short-term welfare problem.

Health Good

Sir DAVID MAXWELL FYFE had more to say about dispersal from rest centres on February 5. As rehousing became possible furniture would be required, and arrangements had been made to store in a Government depot at Royston any gifts of furniture made by the public. He assured the House, on the authority of the Minister of Health, that the state of public health in the flooded areas gave them no cause for anxiety, although it was being closely watched.

Mr. N. W. DODDS returned to the question of requisitioning, and said that the Kent county medical officer of health was pressing the Ministry of Housing and Local Government to grant the request of the Erith Borough Council to requisition houses. The HOME SECRETARY replied that it was a health matter and the Minister of Health would do what he considered necessary. He had been in touch with the county medical officer, who had advised him that he was satisfied that for the time being arrangements were adequate, and he would not press the local authority on health grounds to clear the rest centres. The clearance of rest centres, the Home Secretary added, must be considered with the greatest urgency.

Mr. T. C. PANNELL referred to experience in the blitz that after 48 hours people wanted to get home again, and that public morale fell if they could not. The idea in Erith that the rest centres should be kept open for a fortnight or three weeks, with 70 people sleeping in a room, was not the sort of situation that the local people envisaged. He pressed again that the county medical officer's request should be considered on welfare grounds. To this the HOME SECRETARY replied that there were less than 3,000 people in rest centres. But he agreed that that, while reassuring, was no reason for stopping the urgent consideration he had promised.

Lodging Allowance

The first decision on billeting was announced by Mr. MACMILLAN on February 6. It was that the Government had decided as an immediate short-term measure to pay a lodging allowance, without applying any form of means test, to householders affording shelter to victims of the flood.

Specialists on Tribunals

Mr. J. T. PRICE asked the Minister of National Insurance on February 2 if in cases of industrial dermatitis referred to medical appeal tribunals adjudicators were in all cases qualified dermatologists. Mr. R. H. TURTON, the Parliamentary Secretary, said they were not, and he could not accept the suggestion that tribunals should always include specialists in the particular condition from which an appellant might be suffering. In a case of dermatitis the evidence before the tribunal always included a report by a dermatologist. There was general satisfaction with the decisions of the tribunals, which consisted of physicians of great eminence. To adopt the suggestion of Mr. Price would involve great delay.

Female Mortality in Scotland

Mr. HECTOR HUGHES on February 3 asked the Secretary of State for Scotland if he was aware that in Scotland the death rate for young women was higher than the death rate for young men; that Scotland was the only country in Europe where this was so; if he would state the reason for this disparity; and what he would do to reduce the high mortality among young women.

Commander W. W. GALBRAITH said he was aware that for the 15 to 35 age group in Scotland, contrary to the usual experience elsewhere in Europe, the female death rate was higher than the male death rate in the years 1948-50. This was due to an excess of female deaths from respiratory tuberculosis. With the greatly reduced tuberculosis mortality in 1951, the latest year for which detailed figures were available, the female death rate fell below the male rate.

Mr. H. HUGHES and Major W. J. ANSTRUTHER-GRAY questioned the Under-Secretary about the disparity between the tuberculosis death rate among women in this age group in England and Scotland.

Commander GALBRAITH informed them that the death rate from respiratory tuberculosis among women between 15 and 35 years of age in Scotland had fallen from 149 per 100,000 in 1948 to 56 in 1951. The corresponding rates for England and Wales were 68 and 28. The precise reasons for the continuing disparity between the two countries were not known, but he saw no reason why the measures taken in recent years to combat the disease should not result in this disparity being further reduced in the near future.

Tuberculosis and Housing

Mrs. JEAN MANN asked for information about the living accommodation density in England and Scotland, and Commander W. W. GALBRAITH stated that according to the 1% sample tables of the 1951 census the number of persons per room in Scotland was 1.04 (compared with 1.27 in 1931) and in England and Wales 0.73 (compared with 0.83 in 1931). Mrs. MANN asked if this was related to the disparity in the tuberculosis rate, and Commander GALBRAITH agreed that it might be.

Flour for Bread

Major G. LLOYD-GEORGE, Minister of Food, rejected a request by Dr. BARNET STROSS on February 4 that the addition of chalk to flour used for bread should be discontinued.

Vaccination of Troops

Mr. N. BIRCH, Parliamentary Secretary to the Ministry of Defence, assured Mr. C. R. HOBSON on February 4 that of British soldiers, sailors, and airmen to refuse the right of vaccination had been maintained in respect of troops in Korea serving under United Nations command.

Dogs and Disease

Sir WILLIAM DARLING asked on February 5 whether domestic dogs were known to be carriers of disease. Miss PAT HORNSBY-SMITH told him that the Minister of Health was advised there was little evidence that domestic dogs were commonly responsible for any human disease in this country.

Vital Statistics

Poliomyelitis and the Weather

Drs. W. H. Bradley and A. E. Richmond have explored the hypotheses that meteorological conditions govern the rise and fall of the incidence of poliomyelitis, that fluctuations in weather affect the trend of the incidence during an outbreak, and that the total weather conditions affect the size of the epidemic. The criteria used for the meteorological conditions were dry-bulb temperature and vapour pressure. Since the incidence begins to rise in early June it seems that a certain minimum temperature and humidity are necessary for the spread of infection, but "beyond this it has not been possible to correlate the incidence with any specific meteorological factor." The beginning of the seasonal fall does not appear to be related to temperature and humidity. Variations in temperature and humidity during an outbreak do not seem to have any effect on

¹ Monthly Bull. Minist. Hlth (Lond.), January, 1953.

the course of the epidemic. There is a very slight suggestion that the years with below-average temperature and humidity are associated with the lowest incidence of poliomyelitis.

Decennial Supplement, 1931

Statistics of births, deaths, marriages, and population in the period 1921-30 are given in Part III of the *Decennial Supplement* for 1931 just issued by the Registrar-General for England and Wales. Since the events recorded happened more than 20 years ago, the Registrar-General has understandably omitted the customary commentary on them: the volume is issued "to complete the historical record and for the more efficient study of long-term demographic events in England and Wales."

Influenza

In the week ending January 31 there were 313 deaths from influenza in the great towns of England and Wales, compared with 132 in the preceding week. In London and the south-eastern region there were 219 deaths, while in Greater London as a whole there were 170. Elsewhere, only in East Anglia has there been any considerable relative increase in deaths—from 3 to 25. Other regions of England and Wales continue to remain free from any widespread outbreak of the disease. The number of deaths in the great towns since the first week of the year is 568, as compared with 157 in the corresponding period of 1952 and 4,959 in 1951.

In the past week it is on the older members of the population that the illness has fallen most heavily. Of the total deaths, 283 have been in those aged 55 and over, 133 being in those over 74. Most cases are due to the "Scandinavian" strain of virus A-prime, though there have been reports of the presence of virus B in certain areas.

Week Ending January 31

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,850, whooping-cough 2,799, diphtheria 24, measles 26,460, acute poliomyelitis 29, dysentery 435, paratyphoid fever 7, and typhoid fever 1.

Infectious Diseases

Infectious diseases were more prevalent in England and Wales during the week ending January 24. The rises in the number of notifications included 632 for whooping-cough, from 2,160 to 2,792; 499 for measles, from 21,383 to 21,882; 243 for scarlet fever, from 1,589 to 1,832; 145 for acute pneumonia, from 1,204 to 1,349; and 107 for dysentery, from 312 to 419.

The largest rises in the number of notifications of measles were Derbyshire 255, from 464 to 719; Southampton County 201, from 1,767 to 1,968; Surrey 134, from 551 to 685; and the largest falls were London 356, from 1,777 to 1,421; Essex 349, from 1,810 to 1,461; and Yorkshire West Riding 338, from 1,520 to 1,182. Small increases in the incidence of whooping-cough were recorded throughout the country; the largest were Lancashire 133, from 483 to 616, and London 44, from 99 to 143. The only rise of any size in the number of notifications of scarlet fever was 38 in London, from 65 to 103. 19 cases of diphtheria were notified, 7 more than in the preceding week. The chief feature of the returns of diphtheria was a rise from 2 to 6 in Warwickshire, where all the cases were notified in Birmingham C.B.

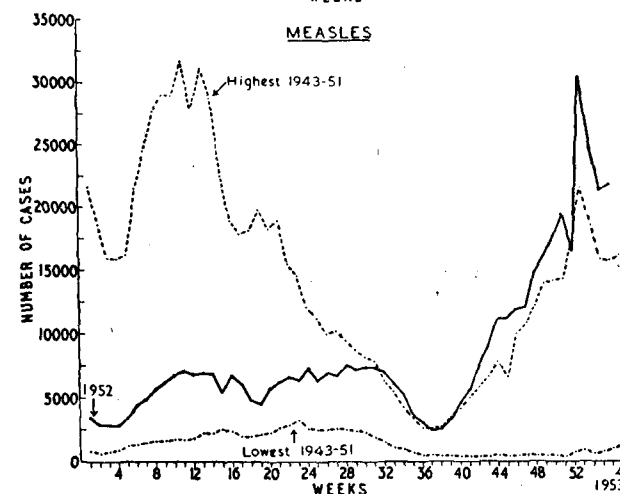
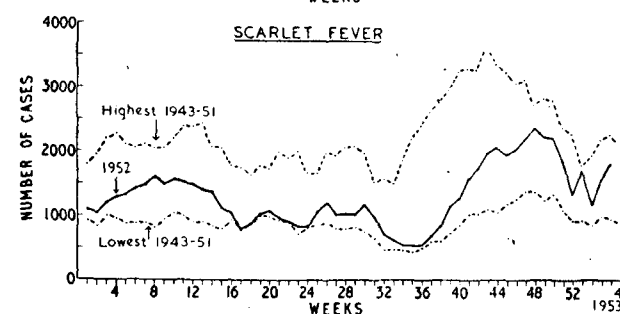
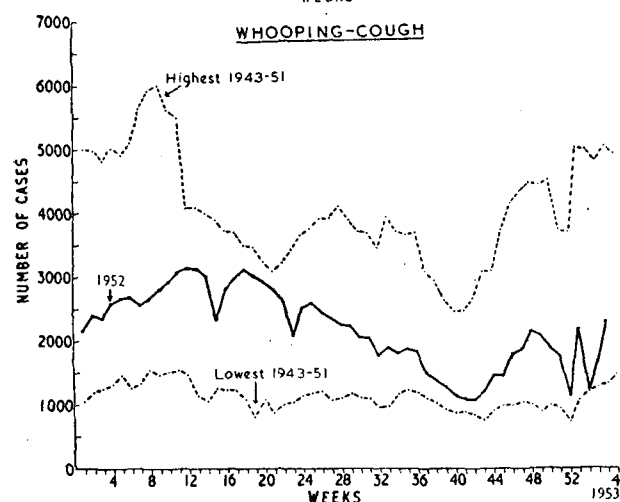
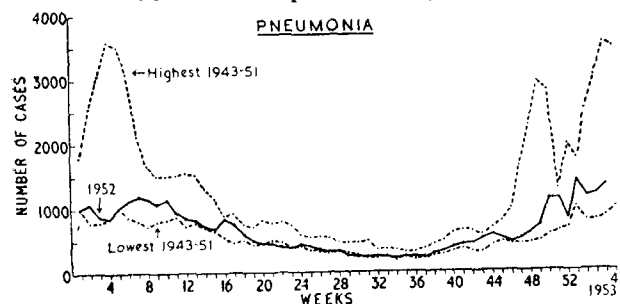
During the week 38 cases of acute poliomyelitis were notified; these were 10 fewer for paralytic and 3 more for non-paralytic than in the preceding week. The largest returns were 3 in Surrey and in Yorkshire West Riding.

The chief centres of infection for dysentery were Essex 86 (East Ham C.B. 79), Lancashire 69 (Liverpool C.B. 18, Preston R.D. 13), Lincolnshire 44 (Grimsby C.B. 44), London 33 (St. Pancras 14), Kent 33 (Penge U.D. 9), Yorkshire East Riding 28 (Kingston-upon-Hull C.B. 27), and Yorkshire West Riding 25 (Barnsley C.B. 8).

132 deaths were attributed to influenza in the great towns, 60 more than in the preceding week; 94 of these deaths were registered in London and the South.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1943-51 are shown thus -----, the figures for 1952-3 thus ———. Except for the curves showing notifications in 1952-3, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 24 (No. 3) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	19	2	9	0		22	3	11	0	0
Dysentery ..	419	33	128			434	56	58	6	
Encephalitis, acute ..	7	1	0	0		3	0	0	0	
Enteric fever: Typhoid ..	3	0	1	0		4	0	0	1	1
Paratyphoid ..	8	1	2(B)	0		6	0	1(B)	0	
Food-poisoning ..	62	5		0		123	19		0	
Infective enteritis or diarrhoea under 2 years ..				5	11				15	22
Measles* ..	21,882	1349	232	75		2,828	44	349	145	70
Meningococcal infection ..	38	2	18	3	2	35	1	8	1	2
Ophthalmia neonatorum ..	28	0	5	1		36	6	4	2	
Pneumonia† ..	1,349	95	242	26	3	869	43	257	10	
Poliomyelitis, acute: Paralytic ..	15	2		2	0	25	2		3	2
Non-paralytic ..	9	0				10	1			
Puerperal fever‡ ..	265	50	14	2	0	232	34	7	4	1
Scarlet fever ..	1,832	103	297	50	55	1,211	76	229	26	34
Tuberculosis: Respiratory ..			145	32				96	30	
Non-respiratory ..			24	3				17	0	
Whooping-cough ..	2,792	143	200	28	139	2,349	82	346	144	68

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..	0	0		0		0	0		0	
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	7	1	3	1	1	18	2	0	1	
Influenza ..	132	25	2	0	1	45	6		0	1
Measles ..		1	1	0	0		0		1	0
Meningococcal infection ..		1	1				0			
Pneumonia ..	548	116	23	11	12	279	49		7	11
Poliomyelitis, acute ..	4	0			1	7	1			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis: Respiratory ..			29	20	1			18	21	2
Non-respiratory ..			1	2	0			2	2	0
Whooping-cough ..		1	0	1	1		2		0	0
Deaths 0-1 year ..	280	32	40	12	10	283	24	29	14	30
Deaths (excluding stillbirths) ..	7,878	1433	699	129	191	6,026	866	658	143	195
LIVE BIRTHS ..	7,508	1110	919	183	345	7,477	1213	913	212	438
STILLBIRTHS ..	192	28	24			222	29	26		

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

Medical News

Hospital Endowments (Scotland) Bill.—A Bill providing for the establishment of a Scottish Hospital Endowments Research Trust was introduced in the House of Lords last week. The Trust is to "receive and administer part of the endowments of former voluntary hospitals on trust for the purpose of assisting the conduct of medical research." The Trust will also have power to accept new gifts or legacies. The arguments in favour of this move are given in a memorandum by the Hospital Endowments Commission which was published last July as a White Paper (Cmd. 8615). From this it appears that the annual income of the Trust will be about £120,000.

Beit Centenary.—Alfred Beit, financier and philanthropist, was born at Hamburg on February 15, 1853. As a young man he went to Kimberley, where he set up on his own as a diamond merchant. He had success and became the intimate friend of Cecil Rhodes and Starr Jameson. By the time of his death in 1906 Beit had amassed a fortune. Although much of this was left to members of his family, his public benefactions amounted to £2,000,000. King Edward's Hospital Fund and Guy's Hospital were each left £20,000. A scheme for an institute of medical sciences, for which Beit had bequeathed £50,000, was abandoned, but in December, 1909, his brother Otto increased the amount to £215,000 and founded the Alfred Beit memorial fund for medical research. The first list of awards, made in March, 1910, included the names of Thomas Lewis, F. W. Edridge-Green, Sidney Russ, and Edward Mellanby.

How Children Develop.—An ambitious study of the physical and mental development of normal children, from birth until the end of adolescence, is being carried out by the Child Study Research, a joint organization of the Institutes of Child Health and Education of London University. After a pilot study of 23 infants the main project began in the summer of 1951. Now there are about 100 infants being regularly examined in their homes as well as at the Child Study Centre (Coram's Garden, Brunswick Square, London, W.C.1). It is hoped gradually to increase the number to a total of 250. Each time a mother visits the centre she reports on her child's progress, her own training methods, and the first appearance of signs of temperament and personality in her offspring. Her report is checked by tests and observations on the child, who also has a full physical examination including anthropometric measurements, a radiograph of the wrist, etc. Later on these records and observations will be correlated with school progress.

Walkie-Talkie Ambulances.—The Health Department of Kingston-upon-Hull has equipped some of its ambulances with radio-telephones. The ambulances are deployed at various points in the City away from their station, so that local calls can be dealt with more promptly. The points selected for deployment are not necessarily the same on each occasion. Account is taken of peak traffic periods or other circumstances which may warrant special coverage. It is also found that some parts of the city are particularly favourable for radio transmission and reception. The scheme is working well and has eliminated delays caused by traffic congestion.

A.C.T.H. Factory.—Armour Laboratories, whose American laboratories played such a prominent part in the development of A.C.T.H., are to build a laboratory in this country for the production of their long-acting brand of A.C.T.H. "acthar gel." On February 6 the Mayor of Eastbourne laid the foundation of the new laboratory at Hampton Park, Eastbourne. Large-scale production of the hormone is expected to start early next year.

Westminster Abbey Appeal.—The Dean and Chapter of Westminster are appealing for a million pounds to restore the Abbey. Many famous men of medicine and science are commemorated there, and it is felt that doctors will wish to support the appeal generously. Contributions should be sent to the Dean of Westminster, c/o Barclay's Bank Ltd., Abbey House, London, S.W.1.

B.M.J.s for Korea.—Korean doctors have expressed a keen desire to read about modern British medicine, and would be grateful to receive used copies of the *B.M.J.* or the Association's special quarterly journals. Readers who have finished with their journals, and would like them to go to Korea, should send them to Chungchong Namdo Medical Association, c/o Dr. L. N. Yhap, U.N.K.R.A., Pusan, Korea, B.A.P.O. 3. After circulation in Korea the journals will be placed in the library of the Union Medical College, which comprises the Seoul Medical, the Seoul Women's Medical, and the Ewha Medical Colleges.

Nursing on Television.—A television documentary programme entitled "Under Her Skilled Hand" was transmitted on February 4. The story, by Dr. Cormac Swan, assistant editor of *Family Doctor*, told of the preliminary interview of a prospective nurse, her classroom training, introduction to ward work in a general hospital, and her final emergence as a fully qualified nurse. The authentic scenes and dialogue and the excellent acting must have had a good effect on anyone considering taking up nursing as a profession.

The Horder Club was formed about six years ago to honour Lord Horder and his work in connexion with the rheumatic diseases. It is composed of a group representing many of the facets of the study of rheumatic diseases. The Club met on January 29 and discussed a film shown by Dr. Campbell Golding on radiography in rheumatoid arthritis.

Dr. E. C. Ellis and Mr. Hugh Owen Jones have received letters of commendation from the Minister of Fuel and Power, Mr. Geoffrey Lloyd, for their part in the successful treatment of 20 miners burnt in an explosion at Bedwas Colliery, Monmouthshire, last October. After expressing admiration for their work, Mr. Lloyd goes on to say that "the saving of the lives of so many casualties from such extensive burning injuries is quite unprecedented in the mining world."

Dr. Cyril Darlington, F.R.S., director of the John Innes Horticultural Institution, has been appointed Sherardian Professor of Botany at Oxford.

Dr. W. G. Penfield, O.M., professor of neurosurgery at McGill University, will receive the honorary degree of doctor of civil law at the Rhodes centenary celebrations at Oxford next July. Dr. Penfield was himself a Rhodes Scholar.

Dr. P. D. White, the well-known Boston cardiologist, has gained a Lasker award for "distinguished achievement in the field of cardiovascular diseases." He was given a golden statuette of the Winged Victory of Samothrace and \$1,000.

Dr. William Pickles is leaving England on February 26 for South Africa, where he will give a series of lectures at the invitation of Dr. T. B. Davie, Principal and Vice-Chancellor of the University of Capetown.

Emergency Bed Service: Applications and Admissions.—During the seven days ending February 9 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 1,992, of whom 79.58% were admitted. A yellow warning indicating that the percentage of admissions fell below 80 was issued on February 10.

COMING EVENTS

Medical Librarianship.—The First International Congress on Medical Librarianship is to be held in London in July under the presidency of Sir Cecil Wakeley. There will be symposia on the education and training of medical librarians, the organization of new medical libraries, and international co-operation. A full programme of visits to medical libraries and institutions has also been arranged. Further information may be obtained from the honorary secretaries of the Congress, London School of Hygiene, Keppel Street, London, W.C.1.

British Association of Sport and Medicine.—The first annual general meeting of the British Association of Sport and Medicine will be held in the Meyerstein Theatre of the Westminster Hospital Medical School, London, S.W.1, at 5 p.m. on Friday, February 27. Sir Adolphe Abrahams will speak on the policy of the association, and all registered medical practitioners who are interested in the medical aspects of sport will be welcome. Further information may be obtained from the Hon. Secretary, c/o The British Olympic Association, 95, Mount Street, London, W.1.

Postgraduate Symposium on Dermatology.—The next of the monthly symposia for general practitioners arranged by the Cambridge University Medical School is to be held at Addenbrooke's Hospital, Cambridge, on Saturday, February 28, the subject for discussion being dermatology. The symposium is open, without fee, to medical practitioners whose names are on the National Health Service list, and those wishing to attend are asked to notify the Secretary, Cambridge University Medical School, The Naval Hut, Downing College, Cambridge, not later than February 21.

NEW ISSUES

Journal of Clinical Pathology.—The next issue (Vol. 6, No. 1) will be available in a week's time. The contents include:

- A THROMBIN GENERATION TEST. R. G. Macfarlane and Rosemary Biggs.
- A SIMPLE METHOD OF STUDYING THE GENERATION OF THROMBIN IN RECALCIFIED PLASMA. W. R. Pitney and J. V. Dacie.
- THE MEASUREMENT OF PROTHROMBIN IN PLASMA. Rosemary Biggs and A. S. Douglas.
- THE THROMBOPLASTIN GENERATION TEST. Rosemary Biggs and A. S. Douglas.
- PSEUDO-HAEMOPHILIA: AN ACQUIRED HAEMORRHAGIC DIATHESIS DUE TO A CIRCULATING ANTICOAGULANT. C. Houglic.
- A MODIFICATION FOR ROUTINE LABORATORY USE OF STEFANINI'S METHOD OF ESTIMATING FACTOR V ACTIVITY IN HUMAN OXALATED PLASMA. Peter Wolf.
- THE ESTIMATION OF HEPARIN IN BLOOD. M. Bassiouni.
- TRANSFUSIONS OF SUSPENSIONS OF BLOOD PLATELETS IN THROMBOCYTOPENIA AND THROMBOPATHIA. S. van Grevel, M. M. P. Paulsen, H. L. J. M. Bartels, and R. Vonk.
- LABORATORY TESTS FOR IMPICIENT THROMBOSIS. G. I. C. Ingram, Rosemary Biggs, and P. Amlidge.
- A THIRD EXAMPLE OF THE BLOOD GROUP ANTIBODY ANTI-K. Hal Crawford.
- VITAMIN B₁₂ CONCENTRATIONS OF SERUM AND URINE IN THE FIRST 72 HOURS AFTER INTRAMUSCULAR INJECTIONS OF THE VITAMIN. D. L. Mollin and G. I. M. Ross.
- ANTIBODY FORMATION IN MYELOMATOSIS. J. Marks.
- THE MIDDLEBROOK-DUBOS HAEMAGGLUTINATION TEST AND ITS HAEMOLYTIC MODIFICATION IN THE DIAGNOSIS OF TUBERCULOSIS. J. C. Sherris.
- AN INVESTIGATION INTO THE DETERMINATION OF CORTICOSTEROIDS IN URINE. S. L. Tompsett.
- A STUDY OF BARBITURATE INTOXICATION BY AN ULTRA-VIOLET SPECTROPHOTOMETRIC TECHNIQUE. J. T. Wright and R. G. S. Johns.
- LUNG BIOPSY IN MITRAL STENOSIS. J. B. Ericknap.
- TECHNICAL METHODS:
 - A SIMPLE METHOD FOR THE DETECTION OF L.E. CELLS. R. H. Marten and E. K. Blackburn.
 - AN ELECTRICAL COLONY COUNTER. W. D. Linsell.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

Details in this column are necessarily brief. Further information and tickets where required (marked ●) should be obtained from the institution concerned.

Monday, February 16

UNIVERSITY COLLEGE.—At Physiology Theatre, 5.30 p.m., Dr. T. S. Work: Biosynthesis of Proteins.

Tuesday, February 17

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. J. C. White: Human Haemoglobins and Derived Pigments.

CAERNARVONSHIRE AND ANGLESEY PEDIATRIC CLUB.—At Clinic, Sackville Road, Bangor, 4.30 p.m., Mr. A. Sutcliffe Kerr: Neurosurgery in Childhood.

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. W. J. O'Donovan: Hysteria Cutis.

MIDDLESEX COUNTY MEDICAL SOCIETY.—At North Middlesex Hospital, 3 p.m., clinical meeting.

●SOCIETY FOR THE STUDY OF ADDICTION.—At Meyerstein Lecture Theatre, Westminster Hospital Medical School, 5 p.m., Fifth Kelyack Memorial Lecture by Professor E. M. Jellinek: International Aspects of Alcoholism.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Dr. D. Gordon: Neuro-radiological demonstration.

Wednesday, February 18

EUGENICS SOCIETY.—At 26, Portland Place, W., 5 p.m., Galton Lecture by Professor T. H. Marshall, M.A.: Social Selection in the Welfare State.

HARVEIAN SOCIETY OF LONDON.—At St. Mary's Hospital, Paddington, W., 5.30 p.m., clinical meeting.

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Virus Diseases.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, W.C., 4.30 for 5 p.m., Mr. D. I. Williams: Spina Bifida and Incontinence.

MIDLAND MEDICAL SOCIETY.—At Queen Elizabeth Hospital, Birmingham, 8.15 p.m., clinical meeting.

OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Professor Dugald Baird: Some Epidemiological Aspects of Obstetrics.

SCHOOL OF PHARMACY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Charter Lecture by Sir Henry Dale, O.M., F.R.S.: Future of Pharmacy and Pharmacology.

Thursday, February 19

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Professor R. McWhirter: Radiotherapeutic Technique in Breast Carcinoma.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Sir Alan Drury, F.R.S.: Uses and Applications of Human Blood Plasma Fractions.

EDINBURGH CLINICAL CLUB.—At B.M.A. Scottish House, 8 p.m., Dr. W. F. T. Haultain: Some Problems in the Conduct of Abnormal Midwifery in General Practice.

GLASGOW UNIVERSITY MEDICO-SURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Dr. A. Sessor: Experimental Salt Depletion.

●INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. D. V. Hubble: The Thin Child.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Dr. J. Berkson: Oxygen, the Premature Baby and Retrolental Fibroplasia; Mr. A. S. Kerr: Unilateral Proptosis.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At 11, Chandos Street, W., 8.30 p.m., Mr. S. M. Cohen: Place of Sympathectomy Procedures.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor J. E. Richardson: Early Renal Symptoms of Parathyroid Tumour.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., Dr. M. A. C. Dowling: Malaria Eradication Experiment in Mauritius.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor J. Crighton Bramwell: Normal Heart.

UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., public lecture by Professor V. B. Wigglesworth, F.R.S.: Chemical Aspects of Insect Physiology.

Friday, February 20

BIRKENHEAD MEDICAL SOCIETY.—At Borough General Hospital, 8.30 p.m., Dr. S. G. James: Some Aspects of Mental Disorder and Crime.

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members: 6.30 p.m., Mr. A. Nemet, M.I.E.E., F.Inst.P., and Mr. W. B. Cox, B.Sc.: Contrast Problem in High Kilovoltage Radiography.

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 4 p.m., Radiotherapy Section meeting. Professor B. W. Windeyer: Radiotherapist's Impressions of a Visit to Canada.

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. T. Brain: Common Skin Diseases in Children.

KENT AND CANTERBURY HOSPITAL.—8 p.m., clinical meeting.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—5.30 p.m., Dr. D. P. Cuthbertson: Problems of Quality and Quantity of Protein.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Liverpool Medical Institution, 5 p.m., discussion: Tuberculosis and Pregnancy.

ROYAL INSTITUTE OF PHILOSOPHY.—At University Hall, 14, Gordon Square, W.C., 5.15 p.m., The Reverend Vincent Turner: Theologians and Logicians.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Mr. W. N. Morley: National Health Service.

UNIVERSITY COLLEGE.—At Physiology Theatre, 5.30 p.m., Dr. T. S. Work: Biosynthesis of Proteins.

Saturday, February 21

BIOCHEMICAL SOCIETY.—At London School of Hygiene and Tropical Medicine, 11 a.m., Symposium: Biological Transformation of Starch and Cellulose.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Alexander.—On February 6, 1953, at Ellersburn, Nunburnholme Avenue, North Ferryby, East Yorks, to June Alexander, M.B., Ch.B. (formerly Tyson), wife of Gordon Alexander, M.B., B.S., D.Path., a son.

Davies.—On January 11, 1953, at the Royal Infirmary, Cardiff, to Marie, wife of Dr. D. M. Davies, a son—John Stuart.

MARRIAGES

Cooling—Bentley.—On December 27, 1952, at St. Peter's Church, Shaldon, Devon, Edwin Nicholas George Cooling, B.Sc., Colonial Forest Service, Northern Rhodesia, to Rosalind Mary Bentley, M.B., Ch.B., of Shaldon, Devon.

DEATHS

Bean.—On January 25, 1953, at Worthing, Sussex, Algernon Carter Bean, M.R.C.S., L.R.C.P., Surgeon Captain, R.N., retired.

Wood.—On January 29, 1953, in a nursing-home, Brighton, Walter Robert Wood, M.R.C.S., L.R.C.P., L.D.S., of Trechills, Hassocks, Sussex, aged 80.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Morphine in Acute Ventricular Failure

Q.—How long does morphine take to act when given for acute left ventricular failure from coronary occlusion? Is there any danger in giving it intravenously?

A.—Subcutaneous morphine begins to act within 5 to 10 minutes in acute left ventricular failure. Intravenous morphine acts at once and is certainly preferable if given extremely slowly and in a relatively small dose, certainly not exceeding $\frac{1}{4}$ gr. (16 mg.). The chief danger of intravenous morphine is depression of the respiratory centre, but this can be avoided if due care is taken.

Aminophylline acts more quickly than subcutaneous morphine, and is a drug of great value in acute left ventricular failure from any cause. The usual dose is 0.24 g. intravenously, but this dose may be doubled if necessary. It is an effective venous-pressure-lowering agent, and may also have some direct stimulating effect on the heart itself.

Lipotropic Factors in Atherosclerosis

Q.—Of what use are lecithin and other choline-containing substances in the treatment of coronary artery disease and atheroma?

A.—There is good evidence that the lipotropic factors, such as choline, have no influence whatever in protecting animals from experimental atherosclerosis, or in diminishing established atherosclerosis; nor has any well-controlled study proved that such lipotropic agents benefit human atherosclerosis. At the present time it is clear that treatment with such agents is not justified.

Goitre Prophylaxis in Backward Communities

Q.—What is the best way of preventing endemic goitre in a primitive community where the introduction of iodized salt is impracticable? I have seen a reference to work by Marine, who is said to have prevented endemic goitre in schoolchildren in Ohio by the twice-yearly administration of 2 g. sodium iodide. Is this method successful, and could it be applied to a primitive community? Such a method would certainly have administrative advantages.

A.—The work referred to was by Drs. David Marine and O. P. Kimball in 1917-19; the best account is in the *Journal of the American Medical Association* (1921, 77, 1068). Girls aged 5 to 12 years were given 2 g. of sodium iodide, divided into 10 daily doses of 0.2 g., each spring and autumn. Of 2,190 girls so treated for 30 months, only five developed goitre; whereas of 2,305 untreated girls, 495 developed goitre. Marine and Kimball later considered this dose unnecessary high. In goitre areas, 0.1 mg. of iodine (=0.13 mg. of potassium iodide) is probably an adequate daily prophylactic dose. These results speak for themselves, but the method has never, so far as is known, been repeated, as shortly afterwards the use of iodized salt was introduced and has proved equally effective and more convenient in most countries of Europe and North and South America. This latter method is now universally recognized as the method of choice, but if it is impracticable for the population in question, that of Marine and Kimball, possibly using half the dosage, would almost certainly be effective. Other measures that might be considered include adding iodine to the water supplies, administration of iodized sweets or tablets, and importation of sea-food—for

example, dried sea-fish. Attempts have also been made to increase the iodine content of vegetable foods by the application of iodine-rich fertilizers.

Risk of Explosion or Toxic Effects during Repeated Ether Abreaction

Q.—I use open ether for abreaction treatment. (1) Are there any risks of explosion in the presence of a closed anthracite stove? If so, what precautions should be observed? (2) Are there any dangers to patients (or psychiatrist) from administering ether in this way several times a week for several months?

A.—(1) There is certainly a risk of explosion in these circumstances. The likelihood, however, of explosions occurring with ether and air, as distinct from ether and oxygen, seems to be small. The risk of fire, however, is a very grave one, since the anthracite stove is at floor level where the ether vapour is certain to collect.

(2) Many patients in the past have had open ether several times a week for a period of weeks or months without apparent damage. However, the possibility cannot be ruled out that in certain individuals such repeated administrations might in time produce degenerative changes in various organs, notably the liver and kidneys.

A.C.T.H. in Status Asthmaticus

Q.—What is the place of A.C.T.H. and cortisone in the prevention and treatment of status asthmaticus?

A.—A.C.T.H. and cortisone undoubtedly have a place in the treatment of status asthmaticus. Although in a small proportion of cases they are ineffective, the large majority are markedly benefited, often dramatically so. One must remember the recognized contraindications, and that A.C.T.H. and cortisone have a temporary suppressive action only. The attacks will recur after the A.C.T.H. or cortisone is stopped, perhaps within a few days, although just occasionally not for a few months. It is just as well to keep patients so relieved under observation for a few weeks, for the writer has found severe asthma recurring within that time. It has also been recorded that two cases relieved by A.C.T.H. died of status asthmaticus 20 and 29 days later (*Acta allerg.*, 1952, 5, 75).

If there is a dominant infective factor in a case of status asthmaticus, antibiotics should be used. At the present time it may be that we should reserve A.C.T.H. and cortisone for those cases of status asthmaticus in which adrenaline and intravenous aminophylline have failed. The prevention of status asthmaticus is best done by specific diagnosis and therapy and not with A.C.T.H. or cortisone.

Troublesome Cough in a Child

Q.—Can you please tell me how to stop the unproductive cough which usually follows even a slight cold in a child of 5? The child does not cough much during the day, and her general health is unimpaired, but she is awake several times every night, and from about 5 a.m. onwards. There are no prolonged bouts of coughing—I am certain there is no question of pertussis—but the child and her mother are losing hours of sleep every day. The tonsils are not enlarged and the adenoids were removed last year.

A.—A satisfying answer to this question cannot be given as it presents a really difficult problem.

Some children develop a high fever and a severe cough with every cold and some a cough which persists for weeks after the cold, and in either case it is difficult to treat satisfactorily. The statement that the cough is unproductive does not mean very much in childhood, because sputum or discharge from the posterior pharynx is in any case swallowed. The posterior wall of the pharynx should always be examined, and a post-nasal muco-purulent discharge may then be seen or the pharyngeal wall may be noted to be reddened and granular. In that case nasal

drops—1% ephedrine in normal or half-normal saline—may be helpful if the child allows them to be given. They should be given three times a day for not more than a month, with the child lying on her back, with her head bent back over the edge of her bed, so that the drops pass down the nose and do not simply trickle out again.

Chloramphenicol may be extremely effective in cutting short a cough of the nature described, but it is not desirable to use it for a comparatively minor disorder in view of the possibility of toxic effects. These are of course very rare, but of such gravity that this drug should not be used lightly, especially for conditions which may frequently recur. The writer has had no experience of the use of topical chloramphenicol.

Oral Vaccines

Q.—Where can I find an authoritative opinion on the value of oral vaccines?

A.—On p. 74 of the Second Book of *Any Questions?* The book is obtainable for 7s. 6d. (postage 6d.) from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Relationship between Clinical and Biochemical Findings in Diabetes

Q.—How close is the relationship between the presence and severity of diabetic symptoms and the level of the blood-sugar curve? During a glucose-tolerance test one of my patients had a fasting level of 260 mg., rising to 337 mg. per 100 ml., yet he has almost complete freedom from symptoms. Is this common, and what is the explanation?

A.—It is difficult to assess the severity of diabetes from the sole consideration of the blood-sugar curve, although it is safe to say that if the curve shows only a slight degree of carbohydrate intolerance the diabetes is mild and symptoms slight or absent. When there is a high fasting level, as in the case in question, a steep rise, and slow return it is impossible, without knowledge of the clinical condition, the presence or absence of ketosis, etc., to say with any degree of certainty whether the diabetes is severe or not or whether symptoms are likely to be severe. One of the reasons for this lack of relationship between symptomatology and glucose tolerance is the duration of the disease. If the patient is young and the onset of diabetes relatively rapid, there will almost certainly be such symptoms as loss of weight. But if the patient is middle-aged or old, and especially if the patient is an obese woman with the relatively mild type of diabetes, symptoms are often absent, even when the blood sugar is considerably raised. It seems possible that in these cases the patient has become gradually acclimatized to a higher level of blood sugar and is able to tolerate it without marked loss of fluids—the factor responsible for many of the classical symptoms of diabetes. Pruritus vulvae is a marked exception and is frequently the only symptom present in such cases.

Essential Hyperidrosis

Q.—A healthy young engineer finds that excessive sweating of his hands corrodes the delicate metal parts with which he works. Can you suggest a remedy? Wearing gloves, by impairing the sensitivity of his hands, would be a disadvantage.

A.—It may be that treatment of the metal parts with protective or rust-proof oils should be considered here.

The treatment of what may be called an essential hyperidrosis of the hands is difficult. Local measures, including fractional doses of x rays and astringents, such as 10% solution of sodium hexametaphosphate or aluminium salts, are of limited value. Atropine or sedatives internally are similarly seldom helpful and are not desirable in an other-

wise healthy subject. The channel through which the physiological dysfunction acts is nervous, and theoretically ganglion-blocking agents, such as hexamethonium bromide or tartrate, should prove useful. Often, however, the effective dosage is near the toxic dosage and may be dangerous, but this measure should receive a trial. If the position is serious the question of surgical cervical sympathectomy might be considered. A preliminary nerve block would indicate its value.

Arthrogryposis Multiplex Congenita

Q.—What is known about the aetiology, course, and treatment of arthrogryposis multiplex congenita?

A.—This disease—also known as amyoplasia congenita—is rare. It is certainly a congenital abnormality, but whether it is hereditary or due to some interference during pregnancy is unknown—the latter is more likely.

The primary condition is now known to be an absence or marked hypoplasia of muscles, particularly in the forearms and below the knees. The skin changes and the stiffness of the joints are thought to be secondary to this. The main effect of the lack of muscle development is the formation of deformities such as club foot, club hand, flexion of knees or elbows, and dislocations of the hip. The treatment is largely confined to the correction of these deformities, and it always proves difficult, long continued, and finally often incomplete. However, as time goes on, the child learns to become more active, and there is a general improvement in function. Treatment, therefore, may be said to be that of the deformities existing in any particular patient, along fairly orthodox lines. The extent of the disease is very variable from child to child.

NOTES AND COMMENTS

Night Starts.—A DOCTOR writes: With reference to your expert's reply to this question ("Any Questions?" December 13, 1952, p. 1319) I have considerable personal acquaintance with "night starts." I get them in my legs as a result of organic mischief, an old paralysis of both legs from transverse myelitis. These jerks have steadily diminished during the last 22 years. I seldom have a night quite free. They do not worry me much. Either by change of position or other simple means I can get to sleep. But sometimes I may have a poor night with them, and even get jerks in my arms. The exciting cause is a late night, often with too much food and some alcohol and a smoky atmosphere. Whether that is indigestion or a temporary plethora I am not sure. As one of my friends of rather more than my age (71) gets similar troublesome nights on rare occasions, I wondered whether you might have added to your answer that the evening habits of food and drink may need revision.

OUR EXPERT writes: The observations of your correspondent are interesting; and so little is known about this subject that the possible effect of evening habits in food and drink is well worth bearing in mind. Flexor spasms are well known in disease of the spinal cord—e.g., from disseminated sclerosis—though their causation is unknown. It is possible that what your correspondent has to put up with after a transverse myelitis is an abortive form of the flexor spasm.

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THE HEALING SUN-GOD

In Egypt, five thousand years ago, the Eye of Horus symbolised the Sun, recognised in the most ancient of days as the source of life and health. The Children of the Sun penetrated to the furthest parts of the earth, and left behind them evidence of sun-worship that remains to this day in Stonehenge and the ancient ruins of Mexico. Strangest of all, the Eye of Horus persists in every modern physician's prescription, as the "R" with the crossed tail.

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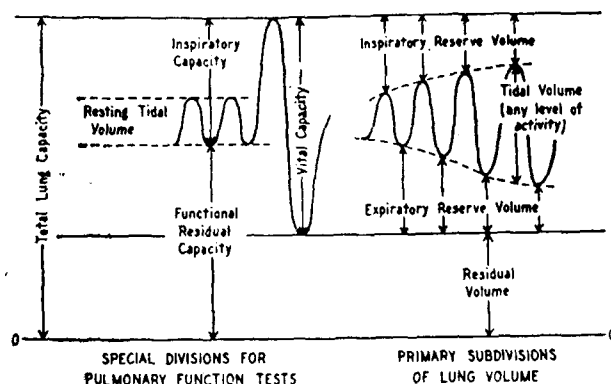
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is no doubt that undue emphasis has been laid upon this aspect. The study of lung volumes alone in various lung diseases can be particularly misleading if the observers assume that changes in the lung volumes are closely correlated with total lung function or the severity of a particular disease.

The terminology employed in the study of lung volumes has been so diverse that unnecessary confusion has arisen. Christie (1932) made excellent suggestions to standardize the nomenclature, and his terminology has been almost universally accepted. Recently, however, a further standardization has been put forward by a large group of interested workers (Pappenheimer *et al.*, 1950), and their suggestions are a further advance (see Diagram). The primary subdivisions of lung volume are



Subdivisions of the lung volume (after Pappenheimer *et al.*, 1950). All gas volumes corrected to body temperature, pressure, and saturated with water vapour (B.T.P.S.).

shown on the right, and apply to all levels of respiratory effort and contain no overlapping volumes. On the left are the terms used when the patient is studied at rest. It will be noted that the expression "air" to denote a volume is carefully avoided. All gas volumes should be corrected and stated at body temperature, pressure, and saturated with water vapour (B.T.P.S.), as the vital phenomena occur within the chest and not within the spirometer.

The vital capacity is, by Hutchinson's (1846) original definition, the volume of gas that can be expelled by a maximal expiration following a maximal inspiration. It can be measured by expiring into any gas-volume-measuring apparatus that affords no appreciable resistance and is of sufficient accuracy. In the closed circuits usually employed, when a tracing is obtained, high percentages of oxygen are used. Accurate volumetric tracings while breathing air or any other mixtures of gases can be obtained by the box-bag technique (Donald and Christie, 1949). In a series of observations on four normal subjects by this method I could find no significant change in vital capacity when breathing oxygen, air, 12% oxygen and nitrogen, or 5% carbon dioxide in air. When determining the vital capacity several trials are carried out. If successive measurements show a large increase, owing to better understanding and effort, then the procedure should be continued until nearly constant values are obtained. According to definition, the maximal value observed is recorded as the vital capacity.

If a respiratory tracing is taken over a period the two components of the vital capacity, the inspiratory capacity (O.T. complementary air) and the expiratory reserve volume (O.T. reserve air) can also be determined. This subdivision affords some difficulty even in normal subjects. There is a tendency to alter and vary the "respiratory level" (which can be precisely described by the volume of air in the chest at the end of quiet expiration) during such breathing gymnastics. Further, subjects with respiratory disability are even

more prone to such alterations. The temporary increase of oxygen uptake resulting from a deep inspiration (Armitage and Arnott, 1949) also makes the analysis of the record more difficult.

The vital capacity alone is not of great value in assessing respiratory disability. A patient with greatly reduced vital capacities may have remarkably good ventilatory function, and vice versa. The two subdivisions of vital capacity have also been overinterpreted.

It was thought that the determination of the residual volume (that volume of gas remaining in the lungs after a maximal expiration) by various indirect methods would give far more meaning to lung-volume measurements, particularly as this would allow the total lung capacity to be studied. Thus the residual volume and the total capacity would give the minimal and maximal lung volumes. The residual volume could be considered not only absolutely but also as a percentage of the total lung volume. Christie (1932) has reviewed 47 methods of determining the residual volume.

Open-circuit Method.—The so-called "open-circuit" of Darling *et al.* (1940) is used extensively in America. When a subject breathes oxygen the total amount of nitrogen in the expired gas will be a simple function of the volume of gas in the lungs and the change in the lung nitrogen concentration. The expired gas is collected in a large spirometer (Tissot) for seven minutes. The patient is then switched out of the oxygen circuit and told to exhale maximally, an alveolar sample being taken with an evacuated gas-sampling tube. There are many valid criticisms of this method: poor washing-out of under-ventilated areas of lung, no tracing is available, and direct alveolar samples (end of maximal expiration) are unreliable in many lung diseases.

Closed-circuit Method.—This method of determining the residual volumes, which is used extensively in this country and Europe, employs a closed circuit and a physiologically inactive gas. Its principle is that the degree of dilution of a known quantity of inert gas is a simple function of the combined volumes of the lungs and the spirometer circuit. In 1800 Humphry Davy used hydrogen for this purpose. Van Slyke and Binger (1923) measured the residual volume by first determining the functional residual capacity during quiet normal breathing. Christie (1932) improved this technique and used the nitrogen present in the lungs at the time of turning the patient into the circuit as his indicator gas. Herrald and McMichael (1939) introduced the important modification of running oxygen into the circuit so as to keep the spirometer tracing level. This procedure ensured a constant spirometric and circuit volume despite oxygen uptake. They also employed a katharometer, which, by measuring the changing thermal conductivity of the gas, indicated the completion of mixing in the circuit and lungs. McMichael (1939), by reintroducing hydrogen as the indicator gas, with its high thermal conductivity, was able to use the katharometer not only to determine the rate and completion of mixing, but also the final concentration of hydrogen. Meneely and Kaltreider (1941) introduced the use of helium as the indicator gas. It has all the advantages of hydrogen without the risk of explosion, and it has been almost universally adopted for this purpose. These workers also pointed out that the rate of mixing of helium in the lungs, while measuring the residual air, was greatly retarded in emphysema.

The present methods of determining lung volumes are undoubtedly satisfactory, and the results obtained are certainly not far from the actual volumes being measured. Lung-volume studies of the same patients by the open- and closed-circuit methods have shown a remarkable agreement despite the faults of the simpler method (Gilson and Hugh-Jones, 1949). Many excellent studies of the lung volumes in various types of pulmonary disease are available. The stage has now been reached where it is more important to consider the value and meaning of lung-volume determinations than to attempt to improve their accuracy. It is also important that the values and ranges of variation of the lung volumes in normal persons at various ages should be more carefully determined.

The upper "normal" limit of the residual volume of the lungs, when expressed as a percentage of the total capacity, is usually considered to be from 20 to 30%, increasing slightly with age. However, in recent years more and more instances have been reported of healthy persons, particularly those over 50 years of age without any history of lung

disease or dyspnoea, with a residual volume of well over 40% of their total lung capacity (Greifstein *et al.*, 1952). This is in no way surprising to anyone who has attempted to measure biological phenomena, but it has not deterred an appreciable number of workers from assessing the degree of severity of such diseases as pulmonary emphysema by this figure alone.

Pulmonary Emphysema

The old clinical observations that the lungs cannot empty adequately and that the respiratory level is much raised in this disease are in general confirmed. Stating this in terms of lung volumes, the residual volume and functional residual capacity are increased. However, the relationship of this increase to the degree of disability is very variable indeed. Baldwin *et al.* (1949b), in their extensive study of emphysema, divided the patients into four different groups, the severity of the disease being judged by the degree of arterial blood desaturation at rest and with exercise, by the presence or absence of carbon dioxide retention, and, finally, by the development of right heart failure. Although they found that most of these patients had a pronounced increase of total capacity was in the region of 50 in all groups, despite the fact that these groups represented from moderate to very severe emphysema. Further, some of the most disabled patients had almost normal residual-volume/total-capacity ratios, and some patients in the earliest group, who did not even show arterial blood desaturation on brisk exercise, had some of the highest residual volumes. It has been my own experience and that of many other workers that, although the residual volume is usually greatly raised in emphysema, the relation of this rise to respiratory function, as judged by exercise tolerance and other tests, is most variable and unreliable.

Baldwin *et al.* also found, as many others have reported since, that there was very poor correlation between the vital capacity and ventilatory capacity (as measured by voluntary hyperventilation). Further, although the total capacity is increased in some cases of emphysema, this is by no means invariable, and most patients with this disease have a total capacity within the normal range. It follows, speaking generally, that if the total capacity, which is the combined residual volume and vital capacity, is not greatly altered in this disease then the size of the residual volume cannot be expected to correlate any better with function than the vital capacity.

Pulmonary Fibrosis

In diseases in which there is generalized pulmonary fibrosis the interpretation of lung volume data becomes even more difficult. Pulmonary fibrosis can occur without any significant degree of emphysema. In most of these patients all the various subdivisions of the total capacity and the residual volume are abnormally small.

However, if the vital capacity is reduced but the residual volume is still normal then the latter will represent an abnormally large percentage of total capacity. In the absence of knowledge of how pulmonary fibrosis may affect the filling and emptying of the lungs it is difficult, if not impossible, to assess the degree of emphysema in such patients on this evidence alone. The diagnosis of emphysema in pulmonary fibrosis is of great importance, as it is most desirable to be able to assess in what ways pulmonary fibrosis causes respiratory disability, apart from concomitant secondary emphysema. Increase of the absolute residual volume over the normal range is usually thought to be good evidence of emphysema, but the assessment of emphysema in the presence of lung fibrosis is exceedingly difficult.

If the disease process is unilateral or different in each lung—that is, collapse or fibrosis with contralateral lung distension—the lung-volume measurements, as obtained by external spirometry, are impossible to interpret. Even if

the lung volumes of the separate lungs are obtained by bronchial catheterization, one cannot be certain whether the changes demonstrated are due to actual emphysema or fibrosis or to mechanical events in the chest such as mediastinal shift and collapse. Again, it should be emphasized that it is unwise to regard the various subdivisions of lung volume as a permanent expression of morphological or pathological changes. There can be great changes in the respiratory level (as measured by the functional residual capacity) and the residual volume in the same patient in relatively short periods of time. Exacerbations of bronchospasm and bronchitis will cause considerable but reversible increase of the functional residual capacity and residual volume.

Finally, it can be stated that, although the lung volumes are useful data and represent one of the first attempts to measure disturbances of lung function, they are of very limited value alone, and in our present state of knowledge they can be grossly overinterpreted.

Ventilatory Capacity (Maximum Breathing Capacity)

The lung-volume measurements are entirely spatial and have no relation to time. Thus the vital capacity is a measure of the maximum filling and emptying of lungs, but provides no information whatsoever concerning the speed and efficiency of this filling and emptying during increased ventilation. The ventilatory capacity depends more upon this speed and efficiency than upon the absolute size of the range of movements. The voluntary maximum breathing capacity first introduced by Hermannsen (1933) is of great value in the assessment of ventilatory function. The maximum breathing capacity (M.B.C.) is defined as the maximum volume of air that can be breathed in unit time. It is usually measured for 15 seconds and then converted to litres a minute. It should be emphasized that the ventilatory volumes obtained by maximum voluntary hyperventilation, although a most useful measure of the efficiency of the bellows action of the lungs, far exceed those obtained during the heaviest possible exercise or by maximum respiratory stimulation by increased tensions of carbon dioxide. If the true ventilatory capacity were defined as the maximum volume that can be ventilated in unit time without undue discomfort, then it is usually about half the maximum breathing capacity. The maintenance of a high ventilatory capacity requires good neuromuscular co-ordination (which is rarely affected), even and adequate application of negative pressure to the lung surfaces, a normally patent tracheo-bronchial tree, normal elasticity and rebound of the lung tissue, and movable components of the chest wall. It is manifest that a large number of important factors are being assessed simultaneously. The prediction formulae of the maximum breathing capacity employ the age and body size (Baldwin *et al.*, 1948) or age alone (Wright *et al.*, 1949). There is a large reduction of maximum breathing capacity as the age increases.

There are two commonly used methods of determining the maximum breathing capacity. In the first and more informative method an ordinary Benedict type spirometer is employed. It is important that the resistance is kept to a minimum, and wide non-corrugated tubing should be employed: 1½-in. (3.8-cm.) tubing is adequate; the use of very wide tubing introduces new errors. The inertia and natural frequency of the system will cause inaccuracies, but if the bell is reasonably light it has been shown (D'Silva and Mendel, 1950) that reliable results can be obtained up to respiratory frequencies of 110 a minute. Other workers measure the maximum breathing capacity with non-return valves each side of the mouthpiece and collect the expired air in a Douglas bag or a Tissot spirometer. It is important that the valves used should have a reasonably low resistance even at very high rates of air flow. This method is particularly useful when dealing with a "mixed" population of tuberculous and non-tuberculous patients. Only the mouthpiece and valves need be cleaned and sterilized, as there is no rebreathing.

In this test the subject is usually told to breathe as deeply and as rapidly as possible. These instructions are self-contradictory, but many authors state that the compromise reached by the patient is his best ventilatory state. There is as yet no proof

of this, and there is in fact good evidence (Bernstein *et al.*, 1952) that unless a respiratory rate of 70 a minute or over is reached low values will be obtained. Emphasis on speed and dictating the rhythm imparts a sense of urgency and need for maximum effort. The personality and power of exhortation of the observer is important, and this factor is another cause of the varying figures obtained in different laboratories. It would be more satisfactory if a standard apparatus and technique could be agreed upon by all workers in the field, but at present this does not seem to be possible. There may be some risk in pulmonary tuberculosis and other chronic infections, such as bronchiectasis, that this highly unnatural and relatively violent respiration will cause aspiration of actively infected material into healthy lung tissue. Although several workers have mentioned this hazard, only to dismiss it, common sense would suggest that the procedure is not without danger. In such instances I have satisfied myself with asking the patient to take a few rapid and forced respirations, using a high-velocity tracing. The ventilatory rate for each breath is measured in litres a minute, and the highest recorded is noted. The comparison of such results with the maximum breathing capacity measured by the usual method in less ill patients has been most satisfactory.

Gaubatz (1938), Tiffeneau and Pinelli (1948), Gaensler (1951), and Kennedy and Stock (1952) have measured the volume of gas expired in standard time during a single forced expiration after filling the lungs. Gaensler employs a spirometer with an automatic timing device so that the volume expired in a fixed time can be measured without a tracing. This is a great advantage in routine clinical work. He has shown an excellent correlation between this "timed capacity" ($\frac{1}{4}$ second) and the maximum breathing capacity.

How is the maximum breathing capacity affected in pulmonary emphysema? It is in this disease, in which the ventilatory capacity is most impaired, that the test is most valuable. It is much more simple than those used to determine the residual volume, and assesses the disability which is the main cause of the patient's dyspnoea and discomfort. One important disadvantage of this method should be mentioned. Bronchospasm, including bronchiolar obstruction due to oedema or secretion, will greatly reduce the maximum breathing capacity, and thus its value as a measure of true emphysema and permanent lung damage is greatly reduced in just those cases in which emphysema threatens and needs to be assessed.

A study of the ventilatory capacity before and after the inhalation of such "antispasmodics" as adrenaline can be carried out in order to assess the separate effect of bronchospasm. However, this is only a crude method, as such a procedure never raises the figure to that obtained if and when the bronchospasm remits naturally.

In patients with generalized pulmonary fibrosis and without emphysema, as judged clinically, radiologically, and by normal or reduced residual volumes, the ventilatory capacity is not greatly impaired. The mean of the maximum breathing capacity in a series of 39 such patients was 78% of the mean of a large group of normal subjects (Baldwin *et al.*, 1949a). Yet the vital capacity of many of these patients was greatly diminished. The decrease of the range of the lung bellows seemed to be compensated by increased efficiency and speed of movement. However, despite their relatively unimpaired ventilatory capacity, many of these patients were dyspnoeic on moderate exertion.

Ventilatory Capacity and Dyspnoea

Cournand and Richards (1941), in order to study the relationships between ventilatory demands and ventilatory capacity, employed a standard step-test of thirty 20-cm. steps in one minute and measured the minute-ventilation during this time and for five consecutive minutes afterwards during recovery. This gave the minute-ventilation during a standard exercise and also allowed the study of the various ventilatory volumes associated with various degrees of dyspnoea. They studied a large group of patients suffering from pulmonary tuberculosis with varying degrees of disease, fibrosis, and collapse. After the step-test 68 patients experienced dyspnoea. During the last minute of dyspnoea the mean minute-ventilatory volume, when expressed as a percentage of the

patient's maximum breathing capacity, was 37%. In the minute following relief from dyspnoea the mean ventilation was 29% of the maximum breathing capacity. They emphasized that there was considerable variation in different individuals.

In a later study of patients with generalized pulmonary fibrosis (Baldwin *et al.*, 1949a) a remarkably similar relationship was found. They also reported that the mean minute-ventilation of those with moderate dyspnoea was 49% of the maximum breathing capacity, and with very severe dyspnoea 69%. It was clearly shown that the cause of the dyspnoea in these patients with pulmonary fibrosis was partly the loss of ventilatory capacity and partly the abnormally large volumes ventilated on exercise.

When patients with severe emphysema and very limited ventilatory capacity, as measured by the maximum breathing capacity, were studied many signalled that they were relieved of dyspnoea when the minute-volume fell to 50-60% of the maximum breathing capacity (Baldwin *et al.*, 1949). It has been suggested that the emphysematous patient is grateful for small mercies and regards what, to him, is only moderate ventilatory discomfort as tolerable and not constituting shortness of breath. In any case there is no doubt that these relationships are no longer valid in patients with extremely impaired ventilatory capacities.

Cournand and Richards (1941) termed the unused percentage of the maximum breathing capacity the "breathing reserve" and related this figure to the various degrees of dyspnoea. This term can be criticized, as a large amount of this so-called reserve can never be used. Even a normal subject ventilating 50-60% of his maximum breathing capacity after very violent exertion is uncomfortably dyspnoeic. It cannot be overemphasized that the maximum breathing capacity is only an arbitrary measure of the bellows action of the lungs and does not represent the maximum volume that can be ventilated by that person in response to natural physiological stimuli.

Other workers state the ventilation in any given state as a fraction of the maximum breathing capacity, and call this the "dyspnoea index" (Wright, 1944). It is simpler to state the actual ventilation under any given condition as a percentage of the maximum breathing capacity. This is self-explanatory and avoids the false inference of infallibility associated with the word "index." The term "dyspnoeic index" has been employed (Hugh-Jones and Lambert, 1952) to describe the percentage of the maximum breathing capacity ventilated during a step-test when standard work is performed. The height or the number of steps in unit time are adjusted to standardize the work done with different body weights. The standardization of the amount of work done is of value when studying the ventilatory responses in patients whose weights vary greatly or in the study of ventilatory behaviour in different groups of patients. However, it is undesirable to convert this well-established method of measuring ventilatory discomfort in various degrees of activity into a rigid "index of dyspnoea." The careful elimination of the effect of body weight in assessing dyspnoea in real people with different body weights is also unfortunate. These variable body weights will cause varying ventilation and resultant dyspnoea during any standard activity (walking, stair-climbing, etc.).

It is still not known why a person should be extremely uncomfortable when his physiological demands—for example, exercise—cause him to ventilate about half of the air he can shift at rest, and without distress, by voluntary hyperventilation. There is great need for a more precise study of the ventilatory mechanisms during exercise causing dyspnoea in normal subjects and in those with various lung diseases. The level at which these patients breathe, the range and speed of their respiration, and the movement of the diaphragm and ribs during shortness of breath would not only be of fundamental interest but would bring important knowledge that could be applied to the various collapse and surgical procedures causing reduction of the ventilatory capacity.

Ventilatory Volumes

These can easily be determined by collecting the expired air during various activities. A Douglas bag can be carried by the observer if the patient is walking or going upstairs, and the volume of gas expired during a fixed period be measured by passing the gas collected through a flowmeter or into a Tissot spirometer. Walking on a treadmill or a simple step-test will allow the expired gases to be collected and measured with greater ease, and a gas-meter type of recorder can be used. The disadvantage of the step-test is that the patient is usually not in a stable state, nor can the data be easily related to everyday activities. Many workers take the opportunity of carrying out arterial blood studies during these exercise tests.

Remarkably different ventilatory volumes are obtained in different patients. Many will ventilate only 10 litres a minute while walking at moderate speed, whereas patients are encountered who ventilate as much as 50 litres a minute. The demands on the ventilatory capacity will obviously be very different in two such patients, and, although they may have the same ventilatory capacity, the latter patient will obviously become dyspnoeic with a far less degree of exertion.

Passing from these empirical determinations of ventilatory volumes, let us briefly consider some of the factors that influence the amount of ventilation in various diseases.

In the normal subject about one-quarter to one-third of the inspired air does not pass beyond the passages lined by mucosa (the so-called anatomical dead space) where no significant gas exchange with blood takes place. In many lung diseases this "dead space effect" is greatly increased by the ventilation of unperfused lung tissue, and thus an abnormally large proportion of inspired air takes no part in the removal of carbon dioxide and the oxygenation of blood. This will render larger ventilatory volumes necessary for a fixed task, and this added demand can be ill afforded in the face of reduced ventilatory capacity. In certain lung diseases the changes in the elasticity and physical properties of the lung tissue in certain areas of lung may result in overventilation of the more healthy areas, and this overventilation is also wasteful and will have the same effect as increased dead space.

Secondly, there is the influence of changes in the partial pressure of carbon dioxide in the alveoli and body fluids, which are compensated and perpetuated by similar changes in body base. If the partial pressure of carbon dioxide is lowered by intermittent but repeated hyperventilation on exercise the respiratory centre will become more sensitive to a fixed amount of carbon dioxide produced on exercise, as the resulting increase in H-ion concentration will be greater than normal owing to the decreased buffering effect. These increased ventilatory volumes are necessary to remove a standard amount of carbon dioxide, as the alveolar gas is now relatively poorer in carbon dioxide content. In a number of cases of pulmonary fibrosis, pathological infiltration of lung, and heart failure, the carbon dioxide in the alveoli and blood is much reduced and there is little doubt that this factor is partly responsible for the hyperventilation encountered in these diseases.

If, as in severe emphysema, there is a lag of carbon dioxide excretion on each occasion when the patient exercises, owing to ventilatory disability, there will be a tendency for the partial pressure of carbon dioxide to rise, and if this is increasingly buffered then carbon dioxide retention (compensated gaseous acidosis) occurs. It must be emphasized that the gradient of this gas across the alveolar membrane between blood and alveolar air is unaltered, the partial pressure of carbon dioxide being raised throughout the lungs and body. In such cases the respiratory stimulation by a fixed amount of carbon dioxide is diminished, as the increased buffering will cause less increase in H-ion concentration. It can be shown that there is significantly less ventilation on exercise in this group of emphysematous patients as compared with those without high blood and

alveolar carbon dioxide tensions. It has also been suggested that the respiratory centre becomes less sensitive to carbon dioxide and H-ion changes in these cases.

Thirdly, the added anoxic stimulus to respiration is important in certain diseases. Although it is generally known and taught that anoxaemia at rest causes a definite but not very pronounced increase of ventilation, it is less often appreciated that anoxaemia associated with exercise causes a most dramatic increase of ventilation. The increased ventilation caused by anoxaemia at rest washes out carbon dioxide and also reduces the H-ion concentration in the body. Thus two of the normal stimuli to respiration are reduced and the effect of anoxic stimulation is mainly counteracted. If, however, the patient is exercising, and the body carbon dioxide and H-ion concentrations are maintained or increased despite the increased ventilation, then the anoxaemic stimulus becomes more fully apparent (Gray, 1950). This mechanism is particularly important in diseases in which oxygen transfer is inadequate but the ventilatory capacity is but little impaired, as such patients are capable of marked temporary activity, causing abrupt anoxaemia. Good examples of this are certain types of pulmonary infiltration causing difficulty in oxygen transfer across the alveolar membrane (Austrian *et al.*, 1951; Donald *et al.*, 1952). Such patients become anoxaemic and dyspnoeic despite a relatively unimpaired ventilatory capacity. Their dyspnoea is due to the enormous ventilatory volumes that occur with exercise.

Another instructive example is seen in patients with large intracardiac shunts and pulmonary stenosis. On exercising these patients are unable to increase the pulmonary blood flow and oxygen uptake to any appreciable extent, and extreme anoxaemia ensues. Despite their relatively normal lungs and ventilatory capacity they become extremely dyspnoeic owing to their enormous ventilatory volumes—that is, 50-60 litres a minute walking slowly. The low carbon dioxide tension in the body will also contribute to this extreme hyperpnoea.

It is often stated that the Hering-Brauer reflex, causing inspiratory inhibition with a certain degree of lung distension, is increased in activity in many pulmonary diseases, particularly in pulmonary fibrosis. If overactive this reflex causes more frequent and shallow respiration. It is not yet proved that overactivity of this reflex can cause increased total ventilation. There is good evidence that the inhibition of inspiration occurs earlier than normally in the pulmonary congestion of cardiac origin, causing more frequent and shallow respirations, although it is still doubtful whether this is the cause of increased ventilation (Christie, 1932). With regard to the Hering-Brauer reflex being increased by pathological processes or fibrosis in lung disease, this is still only a hypothesis, and no good definitive evidence has yet been forwarded to substantiate it.

Intrapulmonary Gas-mixing

Efficient gas exchange is to a large extent dependent upon the efficient distribution of inspired air to all alveolar spaces. Overventilation of one part of the lung cannot compensate for poor oxygenation in underventilated lung. The haemoglobin is saturated to all intents and purposes by adequate ventilation, and further ventilation will add but little oxygen to the blood perfusing that area. If the tidal air that passes the relatively rigid anatomical dead space is almost equally distributed to all alveoli, as we have good reason to believe is the case in the healthy lung, then it is certain that normal lung will be a remarkably efficient mixer of inhaled gases. Further, if the rate of mixing of inhaled gases is studied, then this will be a useful measure of the efficiency of gas distribution in the lungs. A number of factors that will influence the speed at which an inhaled foreign gas will be mixed throughout the lung spaces can be predicted on first principles—for example, the tidal volume, the size of the rigid anatomical dead space, the functional residual volume, and the rate of respiration (Darling *et al.*, 1944; Birath, 1944).

Cournand *et al.* (1941) measured the alveolar nitrogen after seven minutes' quiet oxygen breathing during the determination

of the residual volume. They showed that this was abnormally high in emphysema and attributed this to the inefficient ventilation of many alveoli and air spaces.

Birath (1944) compared the actual mixing curves obtained by serial sampling while breathing a hydrogen mixture with theoretical curves calculated with all the known variables, and assuming mixing to be perfect. Any retardation of mixing, no matter what the cause, was expressed as being due to a certain-sized rigid space between the mouth and properly ventilated lung. If this figure was greater than the accepted size of the normal anatomical dead space, then the excess figure expressed the mixing deficiencies of the lung. This method is unsatisfactory, as the anatomical dead space cannot be accurately measured or foretold even in normal subjects. Other workers (Boothby *et al.*, 1948; Carlson *et al.*, 1948; Fowler and Comroe, 1948) have carried out continuous recordings of the nitrogen washed out and alveolar nitrogen concentration (end of tidal air samples), while breathing oxygen, by means of the Lilly-Hervey nitrogen meter.

As previously mentioned, Meneely and Kaltreider (1941) showed that the rate of helium mixing in emphysema during lung-volume determinations is much reduced. Bates and Christie (1950) studied this phenomenon with greater thoroughness. They determined and corrected the effect of delayed mixing in the circuit and katharometer lag as well as allowing for the known variables already mentioned. No attempt was made to correct for the anatomical dead-space effect. Gross impairment in mixing was demonstrated in a group of emphysematous subjects. They also showed that there was considerable impairment of mixing, even in normal subjects, with increasing age. One asthmatic subject was studied while in severe bronchospasm and on two occasions during his recovery. The mixing efficiency rose remarkably as his bronchospasm abated. It is apparent that, like lung-volume and ventilatory studies, this test is also at the mercy of bronchospasm and bronchial obstruction, and is therefore not a reliable index of permanent lung damage.

All these methods show that the mixing capacity and inspired gas distribution in various lung diseases are impaired and abnormal. However, this disturbance is only assessed as if the lungs were dry unperfused organs. Such an assessment gives no information concerning the relationship of the alveolar underventilation, which is being indirectly demonstrated, to the blood flowing through the lungs. Fowler and Bateman (1950), who have contributed greatly to the study of mixing deficiencies, now feel that the study of the gases encountered in the lungs while breathing air and the correlation of such studies with arterial blood-gas tensions will yield far more valuable data on the real effects of alveolar underventilation. Although hydrogen and helium are excellent gases to demonstrate mixing deficiencies they are light and highly diffusible gases which behave very differently from the gases present in the lungs during ordinary air-breathing. Rauwerda (1946) has produced a valuable monograph on the subject of intrapulmonary gas-mixing.

Respiratory Velocities

The physician of the last century who asked a patient with respiratory disease to whistle or blow a candle out was crudely assessing the maximum respiratory velocities. Sensitive and accurate instruments have been evolved to record instantaneous air-flow velocity (Silverman, 1945). The rate of flow is stated in litres a minute, as the actual velocity recorded is a function of the cross-section of the apparatus where the air flow is being measured. The velocity of flow in the air passages and finer bronchioles, under different conditions and in various diseases, is yet to be determined. Although many workers have obtained records in a number of normal and abnormal subjects under different conditions, little of real significance has emerged from its use. However, this approach is relatively new and may yet yield important findings. It is possible that a simple whistle-like instrument to measure the maximum expiratory velocity will become a standard clinical tool.

Breathing Exercises

Most of us are inclined to believe that breathing exercises are a convenient placebo, and an indirect form of psychotherapy in respiratory conditions where little else can be offered. I would make an exception of post-operative

breathing exercises, where the principle of encouraging an early return to full function, in what is usually normal lung, is sound. It must be remembered that these physiotherapy sessions are expensive in personnel, time, and money. It is my belief, although I have no proof, that breathing exercises have no effect whatsoever on emphysema and bronchospasm. Recent studies have shown that physiotherapists and singing teachers have no more control over their diaphragmatic movement than those whom they instruct (Wade, 1951). It is high time that more precise studies of the effect of these procedures on respiratory function were carried out to determine in what type of case, if any, physiotherapy is of value.

Summary

Summarizing this rapid and imperfect survey of spirometric methods relating to the efficiency of ventilation, I would like to repeat that in the past too much emphasis has been laid on the static aspects of the lung volumes. It is more important to determine the ventilatory capacity of the lungs by such simple tests as those described and then to determine what ventilatory demands will be encountered in conditions that simulate normal activities as closely as possible. The factors that increase these ventilatory demands in various diseases have not been adequately studied. Finally, I would state that if I could have only one figure in a case of emphysema, although I should like many more, I would ask for the maximum breathing capacity.

THE PULMONARY CIRCULATION

Let us next consider the haemodynamics of the pulmonary circulation, particularly the flow and pressure relationships. The important aspects of the relationships of alveolar circulation to ventilation will be considered separately. It has long been a matter of debate whether the pressure and volume variations in the pulmonary circulation are the passive result of conditions imposed upon it by respiration and the systemic circulation or whether there is active vasomotricity of pulmonary vessels. Except for transient differences, the blood flow through the lungs is equal to that through the whole systemic circulation. However, despite this, the pressures in the lesser circulation are of a far lower order than those in the systemic circulation. The short, distensible, and capacious pulmonary arteries, arterioles, and pre-capillaries, and the enormous network of large pulmonary capillaries surrounded by air, allow the whole cardiac output to flow through the pulmonary vascular bed with a pressure head of only one-sixth of that in the systemic circulation.

The introduction of the technique of cardiac catheterization has made it possible to study the pulmonary circulation in both normal and abnormal subjects without any great disturbance of physiological status. Many normal subjects have now been investigated under near basal conditions, and the upper limit of normal pulmonary artery systolic pressure is believed to be 30 mm., of mean pressure 15 mm., and of diastolic pressure 10 mm. Hg. These pressures are measured from the level of the right atrium, and are the mean of the values throughout a full respiratory cycle.

Riley *et al.* (1948) studied the effect of exercise on the pulmonary artery pressures in three normal subjects. Resting studies were carried out with the subjects lying supine and exercise studies while riding a bicycle ergometer in the upright position. It was shown that, even though the oxygen consumption increased sixfold and the cardiac output more than doubled, the pulmonary artery pressure did not alter significantly. The resistance of the pulmonary vascular bed to this increased flow was greatly diminished on exercise, being only a third of the resistance at rest. As a result of this, the work of the right ventricle against pressure was only doubled; whereas that of the left ventricle was trebled. Hickam and Cargill (1947) obtained similar results, although their subjects did not increase their oxygen uptake and cardiac output to the extent of Riley's subjects. Both these groups of workers pointed out that the decrease of pulmonary resistance could not be explained by the passive

dilatation of the vascular bed, but that there must be independent and active widening of the vessels, or the opening up of new channels. Dexter *et al.* (1951) have shown that if normal subjects are exercised in the supine position so that the oxygen consumption exceeds 400 ml. per m.² of body surface, per minute, then a slight but significant rise of the pulmonary artery pressure occurs. They found that under these conditions the pulmonary resistance showed little alteration during exercise. These different findings may have been due to errors of pressure-recording in the erect position or as yet undemonstrated differences in intrapleural pressures while exercising in the supine and erect positions.

This demonstration that the pulmonary vascular bed is a low-resistance low-pressure system both at rest and with exercise is important. Not only is it advantageous from a purely mechanical aspect, but these properties of the lung vessels will allow considerable restriction of the vascular bed by resection or disease without marked pulmonary hypertension or right ventricular embarrassment.

Motley *et al.* (1947) have convincingly demonstrated that a rise in the pulmonary artery pressure is rapidly induced in normal subjects by breathing 10% oxygen for a short period of time (ten minutes). The average rise in mean pulmonary artery pressure in five subjects was from 13 to 22 mm. Hg. This increased pressure could not be attributed to increase in flow, as the cardiac output was but little altered. More recent experiments (Cournand, 1950) show that there is, in fact, some increase of cardiac output under these conditions, but that this increase is of such an order that it could have little effect on the pulmonary artery pressure. The work of Dexter *et al.* makes it necessary to review the accuracy of this statement, but it would seem to be still valid. Drinker (1945) has demonstrated that anoxia can cause altered capillary permeability, oedema, stasis, and per-haps increased resistance. However, the almost immediate reversibility of the rise in pulmonary artery pressure due to anoxia makes this hypothesis unlikely. There is no good evidence of left ventricular failure with back pressure. Wade, Cumming, and I (1951, unpublished observations) have measured the pulmonary "capillary" pressure, a crude transpulmonary measurement of pulmonary venous pressure obtained by occluding a branch of the pulmonary artery with the tip of the cardiac catheter, in several subjects with normal cardio-respiratory systems, while breathing air and 10% oxygen, and no significant change in this pressure was recorded. The only feasible explanation of the rise in pulmonary artery pressure when breathing low tensions of oxygen is that there is active constriction of pulmonary vessels.

Liljestrand and von Euler (1946) demonstrated that moderate anoxia caused pulmonary hypertension in intact cats. They produced good evidence that this rise in pressure was due to the direct action of low oxygen tension upon the tone of the arterioles or pre-capillaries. They did not believe that it was due to nervous influences, increased flow, or increased back pressure. It was suggested that this local anoxic action would result in an exquisite control of alveolar ventilation and normal oxygen tensions were present.

Pulmonary Circulation in Lung Disease

As the only reliable method of studying the haemodynamics of the pulmonary circulation in lung disease is by cardiac catheterization, the present knowledge (Riley *et al.*, 1948) is scanty. In one of the earliest studies (Riley *et al.*, 1948) a very heterogeneous collection of lung diseases was investigated. The diagnosis included pulmonary fibrosis, bronchiectasis, emphysema, and silicosis with tuberculosis. Most of these patients were unable to exercise vigorously. Even in these severe, chronic, and disabling respiratory diseases the pulmonary artery pressures were normal or but little raised while at rest, and showed only a moderate rise above normal when the patients exercised. Those who suffered the greatest rise of mean pulmonary artery pressure—that is, 13 to 42, 23 to 42 mm. Hg.—on exercise also showed a significant degree of arterial blood desaturation. However, even those

who did not develop arterial hypoxaemia showed some abnormal rise of pressure, and it seemed that the pulmonary vascular bed was no longer capable of accommodating increased flow without some rise in pressure.

Pulmonary Emphysema

The piecing together of the natural history of pulmonary hypertension and right ventricular hypertrophy and failure in this disease requires ventilatory and arterial blood studies, and cardiac catheterization of a large number of patients over long periods. I am particularly grateful to Drs. Harvey, Ferrer, Richards, and Cournand (1951) for allowing me to use, before publication, some of the results in the largest series yet studied, of which I have some personal knowledge.

The first group studied consisted of mild to moderate cases of emphysema as judged clinically and radiologically. Their residual volumes were increased and the ventilatory capacity greatly impaired. There was no significant degree of arterial blood oxygen desaturation (90% or above) and the standard step-test did not cause any fall in arterial oxygen saturation below this level. None of these patients showed any rise of pulmonary artery pressure or circulatory abnormality while at rest. A few who were exercised showed a moderate increase in pulmonary artery pressure. Such a finding in the absence of arterial hypoxaemia would suggest that the pulmonary vascular bed was unable to accommodate the increased flow with exercise without a rise in pressure. This would further suggest that the pulmonary bed is damaged and restricted in this disease.

In the second group studied the emphysema was more severe, as judged clinically and radiologically and by the increase of residual volume and impairment of ventilatory capacity. All these patients showed considerable arterial blood desaturation on exercise and most of them had carbon dioxide retention (high arterial pCO₂). As in the previous group, none had a history suggesting right heart failure. Only moderate pulmonary hypertension was found, the mean pulmonary artery pressure at rest being about 25 mm. Hg. There was no alteration of the size of the heart or of the pulmonary arteries. Electrocardiographic studies, using the criteria of Goldberger (1944), Wilson *et al.* (1947), and Myers *et al.* (1948), showed no evidence of right ventricular hypertrophy. The cardiac output, total blood volume, and haematocrit reading were slightly raised. There are no reports of the effect of exercise in this type of patient, although a few that I have catheterized have shown a considerable rise of pulmonary artery pressure.

Lastly, there is the group of emphysematous patients in congestive heart failure (cor pulmonale). Almost without exception the failure had been precipitated by an acute anoxic episode such as severe bronchitis or pneumonia. All these patients had severe pulmonary hypertension (around 50 mm. Hg. mean pressure) and extreme arterial blood oxygen desaturation (50 to 60% saturation). Polycythaemia was pronounced and the total blood volume was increased. These patients had large right ventricles and the electrocardiogram showed marked right ventricular hypertrophy. These electrocardiographic findings are a measure of muscle mass, and one must conclude that hypertrophy of muscle mass, and one must conclude that hypertrophy had been present for some time. In most of these cases the cardiac output was high or high normal. The few patients who had low cardiac outputs in this state did not recover.

When these patients responded to treatment such as oxygen therapy, antibiotics, aerosol inhalations, and "anti-spasmodics" to improve ventilatory function, and mersalyl, digitalis, and bleeding to relieve the circulatory embarrassment, and were again studied, a surprising series of findings emerged. The pulmonary artery pressure dropped to very moderate and, in some cases, near normal figures. The respiratory function, as judged by arterial percentage haemoglobin saturation, lung volumes, and ventilatory capacity, was also greatly improved. In fact, after recovery from heart failure these cases were almost indistinguishable from the previous group, who had very mild pulmonary hyper-

tension and no evidence of right heart hypertrophy or insufficiency. A number of patients who had had right-sided heart failure, and had recovered, showed similar findings. The blood volume was significantly raised, and there was of course evidence of right ventricular hypertrophy. This marked fall in pulmonary artery pressure on recovery is probably due to relief of the anoxic vasoconstriction, decrease in the blood volume and viscosity, and the reduction of cardiac output. Thus the old concept that right-sided heart failure in these patients is mainly due to irreversible structural damage to pulmonary vessels can no longer be supported. Prompt and active therapeutic measures are life-saving and cause a dramatic reversal of many of the most adverse factors.

Although many cases of severe emphysema are under medical supervision over long periods, it is most unusual for one of these patients to develop a large heart with right ventricular hypertrophy and, finally, failure while under observation. In fact, practically all patients with cor pulmonale due to emphysema are seen for the first time when they are, or have recently been, in heart failure and already have right ventricular hypertrophy. Further, when these patients are studied after recovery a number show a smaller degree of pulmonary distension and a better ventilatory capacity than severely emphysematous patients without cardiac involvement.

I would like to offer a tentative explanation of these facts. If a patient with emphysema suffers from severe ventilatory disability, then this of itself may protect the right ventricle by greatly limiting activity and any resultant pulmonary hypertension due to increased blood flow and, perhaps, severe anoxia. Thus right ventricular hypertrophy and dilatation, which in some ways is the "beginning of the end," does not develop. However, those patients with less ventilatory impairment are not so limited in their activities and are able, without intolerable ventilatory discomfort (dyspnoea), to carry out regularly enough exercise to cause pronounced pulmonary hypertension. Thus right ventricular hypertrophy may develop and any sudden further stress due to infection or added anoxia may cause failure.

Although ventilatory studies help to measure dyspnoea, the most important symptom and disability so far as the patient is concerned, the circulatory aspects of this disease must also be studied, especially when prognosis is being considered. Clinical examination, electrocardiography, and screening make this assessment relatively easy in most cases, without cardiac catheterization, which should be reserved for those who are studying the disease, as well as the patient. Even in cases with moderately good ventilatory function, if there is right ventricular hypertrophy then there is constant danger of heart failure that may be precipitated by one of the almost inevitable respiratory infections that are a feature of this disease. At present there is no general agreement as to whether patients with emphysema should restrict their activities or not. It would be of great use to know whether elaborate and unremitting therapy to improve alveolar ventilation, in an attempt to avoid anoxaemia and pulmonary hypertension, is really worth while. Further work is needed to clarify such problems so that the clinician is better equipped to advise the patient with emphysema.

Pulmonary Fibrosis

Up to the present pulmonary circulatory studies have been carried out in very few cases of generalized pulmonary fibrosis. Any attempt to assess the disability and prognosis in occupational lung fibrosis must include a thorough study of the effect of the disease upon the pulmonary circulation and the right heart. Electrocardiographic studies are not enough, and the development of pulmonary hypertension, and its relation to exercise, must be determined. In view of the fact that the ventilatory capacity is often not greatly restricted, the safety of encouraging men with pulmonary fibrosis to increase their activity, and even carry out hard physical tasks, should be more carefully considered.

[Part II, with a list of references, will appear in our next issue.]

SYMPATHETIC NERVES AND ECLAMPSIA

BY

G. W. THEOBALD, M.D., F.R.C.Sed., F.R.C.O.G.
M.R.C.P.

(From St. Luke's Maternity Hospital, Bradford)

It is the rule, rather than the exception, for a woman who suffers from eclampsia at the end of her first pregnancy to have normal subsequent confinements. The earlier the onset of hypertension and proteinuria during pregnancy the more likely is the patient to suffer the same sequence of events in succeeding pregnancies. The onset of this so-called toxæmic state at or about the 30th week of pregnancy is often associated with an unduly small foetus, which does not appear to grow, and which is prone to die *in utero*, with or without evidence of ante-partum haemorrhage.

These facts are illustrated by the following two case histories; several others could be cited.

Case I.—The patient was aged 36 in 1949. *First pregnancy*, 1941: eclampsia at 32nd week; stillborn premature infant. *Second pregnancy*, 1944: eclampsia at 32nd week; S.B. premature infant. *Third pregnancy*: last menstrual period (L.M.P.) March 4, 1949; expected date of delivery (E.D.D.) November 12. On May 26 the blood urea was 20 mg. per 100 ml.; urea concentration, 4.4%; intravenous pyelogram, normal. No abnormal cells discovered in urine. July 5: booked; B.P., 130/80 mm. Hg; urine, N.A.D.; weight 11 st. 6 lb. (72.6 kg.). September 1: 26 weeks pregnant; urine, N.A.D.; B.P., 140/90. From September 1 to October 10 the B.P. varied between 140/90 and 170/120; no proteinuria. October 11: B.P., 180/130; proteinuria; oedema; weight, 13 st. 3 lb. (83.9 kg.). October 19: 32 weeks pregnant; alb.,* 11 parts; oedema; emesis. Caesarean section: male infant, 4 lb. 3 oz. (1.9 kg.), died from pulmonary atelectasis. November 25: B.P., 140/70; urine, N.A.D.; very well.

This patient, influenced largely by her doctor and her husband, refused to have her iliac vessels denervated and asked instead to be sterilized.

Case II.—This patient, aged 25, had Raynaud's disease. Bilateral cervical sympathectomy had been successfully carried out in 1950.

First pregnancy, 1949 (in Sunderland): 30th week. B.P., 166/110; alb., 2-8 parts; oedema of ankles. April 3: spontaneous delivery; stillborn (S.B.) foetus, 3 lb. 2 oz. (1.4 kg.). *Second pregnancy*, March, 1950: an abortion. *Third pregnancy*, 1951: L.M.P., February 27; E.D.D., December 6. May 29: 12-14 weeks pregnant; B.P., 100/64; urine, no protein; weight, 8 st. (50.8 kg.); Hb, 65%. From May 29 to August 17 the B.P. varied between 110/66 and 120/80. August 25: admitted with B.P. of 150/100; no proteinuria. B.P. then varied between 140/90 and 156/90; no symptoms. September 17: sudden appearance of 6 parts of albumin in urine; oedema; B.P. rose to 170/120; weight, 8 st. 5 lb. (53 kg.). September 29: spontaneous breech delivery; S.B. macerated foetus, 2 lb. 6 oz. (1.1 kg.). October 7: B.P., 104/76; trace of albumin in urine. October 9: B.P., 150/110; trace of albumin in urine; recurrence of symptoms of Raynaud's disease.

Such cases are not common, but they demonstrate that women without detectable stigmata of the cardiovascular-renal system may develop recurrent hypertension, proteinuria, oedema, and other symptoms at about the 30th week of pregnancy in spite of the most careful antenatal care.

*Alb.=proteinuria expressed in parts recorded in Esbach's albuminometer.

Apart from the preparations women may get from the food office, each who attends the antenatal clinic receives:

Tabellae ferri sulphatis compositae (N.F.), 1 tablet thrice daily. Each tablet contains exsiccated ferrous sulphate, 3 gr. (195 mg.), copper sulphate, 1/25 gr. (2.4 mg.), and manganese sulphate, 1/25 gr. (2.4 mg.).

Tabellae calcii cum vitamino D (N.F.), 1 tablet thrice daily. Each tablet contains calcium sodium lactate, 7½ gr. (488 mg.), calcium phosphate 2½ gr. (163 mg.), and calciferol 1/4,800 gr. (0.014 mg.), which is equivalent to 500 international units of vitamin D.

Those in the antenatal ward are given:

Tabellae ferri sulphatis compositae (N.F.), 2 t.d.s.

Tabellae calcii cum vitamino D (N.F.), 1 t.d.s.

Vitamin B₁, 3 mg. t.d.s.

Vitamin C, 25 mg. t.d.s.

Capsules containing 4,500 units of vitamin A and 450 units of vitamin D, 1 t.d.s.

Case II was also given stilboestrol, 5 mg. t.d.s., working up to 30 mg. daily from the time that she booked. She was seen by me almost every week, and put on only 5 lb. (2.3 kg.) in weight.

A number of gynaecologists have attributed eclampsia and pre-eclampsia to abnormalities in the haemodynamic balance (Baker, 1925, 1948; Page, 1939; Bouwduik and Bastiaanse and Mastboom, 1950). Bartels (1928) and Wettley (1938) reported that the vascular system was hypoplastic in a high proportion of fatal cases of eclampsia. Kellogg (1945), Newell and Smithwick (1947), and Peet and Isberg (1949) have recorded successful pregnancies following lumbar sympathectomy, but they were dealing with hypertension of the order of 196/130, and were mainly concerned in lowering the systemic blood pressure.

Since 1930 I have maintained that eclampsia is due to faulty nutrition, together with the mechanical disadvantages which are inevitably associated with the pregnant state. It occurred to me that denervation of the internal iliac vessels might in certain cases improve the blood supply to the placenta and prevent the recurrence of toxæmic symptoms in succeeding pregnancies. This procedure, if effective, might operate: (1) by increasing the blood supply to the uterus; (2) by cutting off afferent and efferent impulses travelling from and to the uterus along sympathetic pathways.

The possible significance of afferent nervous impulses travelling from the uterus is suggested by the following facts. (a) Afferent nervous impulses occasioned by attempts at lumbar puncture in the dog provoked inhibition of water diuresis and proteinuria (Theobald, 1934). (b) The painless introduction of a small dilator through the internal os uteri of a conscious patient and the dilatation of the cervical canal under general anaesthesia may cause the blood pressure to rise by some 10 mm. Hg. Traction on the obstetric forceps during delivery commonly causes a rise in blood pressure which may on occasion exceed 60 mm. Hg. Conversely, cauterization of the uterus by the silver stick may cause a fall of blood pressure from 120/80 to 70/40, a pulse rate of 40, emesis, and a cold sweat. All these phenomena may occur apart from pain (Theobald, unpublished observations).

Lastly, it may be recalled that Franklin and Sophian (1949) and Franklin (1951) advanced the hypothesis "that toxæmia of pregnancy is, or includes, a progressively increasing tendency for the renal shunt to be

brought into operation, and that fatal bilateral cortical necrosis is the maximal, irreversible result of this tendency."

The Operation

The abdomen is opened by a midline subumbilical incision, the intestines packed off, and the peritoneum divided to expose the bifurcation of the right common iliac artery. This is cleaned with scissors and gauze dissection. Approximately the first 1½ in. (3.8 cm.) of the internal iliac artery is stripped and denervated and the corresponding portion of the internal iliac vein is then treated in like manner. After this procedure has been carried out on the left side the abdomen is closed. It must be observed that the proximal portions of the external iliac vessels are inevitably denervated.

The first two operations were performed in January, 1950, but the original patient has not yet become pregnant. In subsequent operations the stripping of the internal iliac vessels was more extensively carried out so that the obliterated hypogastric arteries were cleaned. Large amounts of nervous and other tissue removed from the blood vessels were fulgurated with the diathermy point. In some cases presacral neurectomy was performed before the abdomen was closed.

The operation is tedious, and the only danger is from haemorrhage, particularly when cleaning the veins deep down in the pelvis. Of the seven patients on whom I have operated only three have become pregnant; their histories are here reported.

Case A

This patient was aged 33. I have looked after her in all three pregnancies.

First pregnancy, 1947.—L.M.P., October 4, 1946; E.D.D., July 11. February 11: booked; 18 weeks; B.P., 140/90. April 24: 28 weeks; B.P., 200/130; alb., 6 parts; admitted. In addition to the routine dietetic and hygiene treatment, paravertebral blocks on both sides were carried out on several occasions during the first week. April 30:—eyes: right disk, physiological cupping, exudate, haemorrhage; left disk, normal. Headache, vomiting, epigastric pain. Morphine regime. May 16: slight accidental haemorrhage; B.P., 230/130; alb., 4 parts. May 17: intrauterine death of foetus. May 23: B.P., 170/110; alb., 4 parts; general condition improved. May 24: delivery, following induction of labour, of S.B. male foetus, 2 lb. 8 oz. (1.1 kg.). It was some weeks before the urine became protein-free. The B.P. subsequently varied for some months between 145/85 and 165/120.

Second pregnancy, 1948.—L.M.P., March 25; E.D.D., January 1, 1949. July 6: 12 weeks; B.P., 130/80-122/94; weight, 9 st. 1 lb. (57.2 kg.). August 23: B.P., 170/110; alb., 1 part; weight, 9 st. 6 lb. (57.3 kg.); admitted. During the seven weeks in the antenatal ward the blood pressure varied between 140/90 and 170/120. The protein disappeared from the urine, but recurred, although it did not exceed ½ part. The secretion of urine was poor and varied between 20 and 60 oz. (570 and 1,700 ml.) in 24 hours. October 9: intrauterine death of foetus. October 16: spontaneous delivery of S.B. male macerated foetus, 3 lb. 14 oz. (1.8 kg.).

Denervation of the internal iliac vessels, appendicectomy, and partial resection of right ovary were carried out on January 24, 1950. The internal iliac vessels were noticeably small—approximately half the normal size.

Third pregnancy, 1951.—L.M.P., September 5, 1950; E.D.D., June 12, 1951; weight, 8 st. 13 lb. (56.7 kg.). The blood pressure varied between 120/74 and 138/84 throughout the antenatal period until the 37th week. No proteinuria was detected. Admitted to ward in 37th week. B.P., 150/90; weight, 11 st. 1 lb. (70.3 kg.). B.P. settled in ward to 130/90. June 11: induction of labour; quinine;

artificial rupture of membranes (A.R.M.); oxytocin drip. June 13: female infant, 6 lb. 7 oz. (2.9 kg.). B.P. rose during puerperium to 160/105 and then returned to normal.

Case B

This patient was 38 years old.

First pregnancy, 1941.—Pregnancy "injected away" at 20 weeks because of "kidney trouble and blood pressure."

Second pregnancy, 1943.—Seventh month; premature S.B. foetus; "kidney trouble and blood pressure."

Third pregnancy, 1950.—L.M.P., November 12, 1949; E.D.D., August 19, 1950. February 2: 12 weeks; B.P., 150/90. March 8: 17 weeks; B.P., 110/70; weight, 9 st. 12 lb. (57.5 kg.); Hb 100%. From March 8 to June 17 the B.P. varied between 100/60 and 120/80. She then developed hypertension and proteinuria, and was kept in bed at home by her doctor. July 1: admitted to ward; B.P., 168/100. In the ward B.P. varied between 130/84 and 200/120, but during the last two weeks was in the neighbourhood of 160/120. Proteinuria, alb., 2½ parts. Maximum weight, 11 st. (69.9 kg.). August 1: spontaneous delivery of macerated female child, 4 lb. 10 oz. (2.1 kg.). Very small placenta. This patient took cod-liver oil, orange juice, iron, and calcium from the very beginning of pregnancy, and stilboestrol in the antenatal ward. August 26: B.P., 180/100.

Denervation of internal iliac vessels, presacral neurectomy, and partial resection of left ovary were performed on October 24, 1950.

Fourth pregnancy, 1951.—L.M.P., March 24; E.D.D., December 31. June 19: 12–14 weeks pregnant; B.P., 110/70; weight 9 st. 2 lb. (58.1 kg.); Hb, 75%. July 27: went cycling in Scotland. B.P. throughout pregnancy, until 36th week, varied between 110/70 and 120/80. November 30: 36 weeks; admitted, as she lives in the country; B.P., 136/90. During second week in hospital B.P. varied between 110/70 and 120/80. Labour induced at 38 weeks, as baby was considered "large enough." December 17: male infant, 7 lb. 8 oz. (3.4 kg.); weight, 11 st. 6 lb. (72.6 kg.); Hb, 75%.

Case C

Infertility patient, aged 40, married 14 years.

First pregnancy, 1949.—L.M.P., June 7; E.D.D., March 24, 1950. October 4: 12–14 weeks pregnant; B.P., 120/80; weight, 9 st. 10 lb. (61.7 kg.). November 30: 22 weeks; B.P., 170/110; alb., ++; oedema, ++; weight, 11 st. 4 lb. (71.7 kg.). Admitted. B.P., 214/120; alb., 4 parts; a few granular and hyaline casts, and red blood cells in urinary deposit; oedema of face, pitting oedema of knees; short of breath; eyes—striated greyish disks, white streaks along main vessels. "Proctocaine" was injected into broad ligaments, 6 ml. on each side. Morphine regime. December 13: blurred, misty vision; everything looked like a shadow; left eye mainly involved; weight, 10 st. 9 lb. (67.6 kg.). December 14: some oedema of retinae; tortuous vessels. December 28: intrauterine death of foetus. January 7: macerated male foetus, 3 lb. 8 oz. (1.6 kg.).

During her five weeks in hospital the blood pressure at first fell slightly, then rose steeply to 230/170. It then became stabilized at about 190/110–220/130, falling in the last week to 160/100–180/120. The blood urea reached a maximum of 30 mg. per 100 ml. Proteinuria varied from 0.5 to 4.5 parts, Esbach. The remarkable feature of this case was the constant excellent output of urine throughout her time in hospital, which reached the level of 205 oz. (5,825 ml.) in 24 hours. This in no way suggested the "Oxford shunt." On January 24 Mr. Ivor Lloyd reported as follows: "Both eyes show severe hypertensive and albuminuric retinopathy with papilloedema. I fear, however, that the retinal changes indicate severe damage to the vascular system and the kidneys, and the prognosis, as judged from the ophthalmic point of view, is not good. The blood pressure was 160/90." On November 20, 1950,

the urea clearance was 142% of normal. The electrocardiogram showed the usual pronounced left axis deviation of hypertension.

On February 12, 1951, denervation of internal iliac vessels and presacral neurectomy were carried out. Congenital absence of the left kidney was noted.

Second pregnancy.—L.M.P., August 30, 1951; E.D.D., June 6, 1952. November 19: B.P., 140/90—occasional beat at 170; weight, 9 st. 9 lb. (61.2 kg.). February 13: 24 weeks; B.P., 126/76, this was the only low reading; weight, 9 st. 12 lb. (62.6 kg.). The patient was nervous, not very co-operative, and always feared the worst. Her weight remained almost constant at 9 st. 12 lb. (62.6 kg.) for over four months. She did not look well. No proteinuria. April 9: B.P., 138/96; weight, 10 st. 7 lb. (66.7 kg.); looked better; no proteinuria. April 23: B.P., 170/106; weight, 10 st. 12 lb. (68.9 kg.); admitted; no proteinuria. April 29: B.P. had varied since admission from 150/84 to 160/100; alb., 0.5 part; foetal heart irregular. In view of the irregular foetal heart caesarean section was performed. Female infant, 5 lb. 2 oz. (2.3 kg.). On May 9 Mr. Ivor Lloyd reported: "Bilateral retinal arteriosclerosis and early retinopathy." After delivery the B.P. varied between 110/70 and 138/90. Apart from the temporary recurrence of an anxiety state the mother did well. The baby flourished.

Denervation of the Aorta, Inferior Vena Cava, and Left Iliac Vessels by Means of 5% Phenol Solution

In view of the above results it was decided to determine whether hypertension and proteinuria, once established during pregnancy, could be affected by a comparable procedure.

A primigravida aged 26 was admitted as an emergency case. E.D.D., September 17, 1951. June 28: B.P., 190/100; alb., 4 parts; blood urea, 40–65 mg. per 100 ml.; maximum concentration of urea, 2%; some oedema; foetal heart very irregular. July 3: an incision was made through the left loin, the dissection remaining retroperitoneal. The left common iliac artery and vein, the lower part of the abdominal aorta and inferior vena cava (as it was impossible to expose the right common iliac vessels without making another incision), and the left ureter were generously painted with a 5% solution of phenol: the exposed portion of the left lumbar sympathetic chain was coagulated by diathermy. The patient made an excellent recovery from the operation. From July 4 to August 17 the B.P. varied from 150/100 to 200/120; alb., 2–9 parts. August 18: labour induced at 36th week. August 19: female infant, 2 lb. 14 oz. (1.3 kg.); 36 weeks' gestation; died shortly after delivery. Numerous infarcts in the placenta. May 2, 1952: B.P., 110/76; some protein was still present in the urine.

The abdomen became extremely distended during the last few weeks of pregnancy owing to gaseous distension of the bowel, which took some time to disappear and was still present when she left hospital. It is reasonable to suppose that this distension was due to damage done to the autonomic nervous system by the phenol solution.

Water Diuresis

A Balloon in Uterus.—A rubber balloon was introduced into the uterus a few days after delivery and distended with water to a pressure of 70 mm. Hg. so that it could be felt as a tensely cystic mass reaching 3 in. (7.6 cm.) above the symphysis pubis. The distension of the uterus so occasioned did not seem to affect water diuresis, not even when a weight of 1½ lb. (0.68 kg.) was attached to the end of the balloon.

Faradic Current to Cervix Uteri.—The cervix uteri was stimulated by a faradic current which was just appreciated but did not cause pain. This procedure was tried on three patients and in no way affected water diuresis.

Normal Confinements following the Pre-eclamptic Syndrome Occurring in Pregnancy

During the past five years the few cases in which normal confinements have followed pregnancies in which the pre-eclamptic symptomatology occurred at or about the 30th week of pregnancy have been collected. They number four in all, with a doubtful fifth case (Case 5).

Case 1.—Patient aged 42, Rh-negative. *First pregnancy, 1950:* hypertension, 130/90 to 160/124; alb. varied from 0 to 1 part; usual antenatal treatment and stilboestrol; in antenatal ward five weeks. June 15, 1950: macerated female foetus, 2 lb. 6 oz. (1.1 kg.). The maternal weight increased from 7 st. 11 lb. to 8 st. 2 lb. (49.4 to 51.7 kg.). *Second pregnancy, January 9, 1951:* spontaneous delivery, female infant, 7 lb. 6 oz. (3.3 kg.). Normal pregnancy.

Case 2.—Patient aged 21. November 6, 1950: antepartum haemorrhage at home; B.P., 160/110; alb., 22 parts. November 15: severe frontal headache, photophobia. Caesarean section, male infant, 3 lb. 6 oz. (1.5 kg.), died two days later. *Second pregnancy:* slight oedema up to knees and puffiness of face. Neither hypertension nor proteinuria. February 4, 1952: female infant, 5 lb. 6 oz. (2.4 kg.), delivered at term.

Case 3.—Patient aged 28. *First pregnancy, 1951:* normal until 32nd week, then B.P. 160/100; alb., 4–5 parts. Eleven days later: headache; vomiting; B.P., 180/120; alb., 24 parts; male infant, 5 lb. 3 oz. (2.3 kg.); (36 weeks) did well. When she left hospital the B.P. was still elevated and there was 1 part of albumin in her urine. *Second pregnancy* normal in every respect, except that her blood pressure was 150/90 when she booked. This was the only abnormal reading. June 18, 1952: male infant, 7 lb. 12 oz. (3.5 kg.).

Case 4.—Patient aged 26. *First pregnancy:* booked September 12, 1950; weight, 8 st. 2 lb. (51.7 kg.); B.P., 100/60. December 28: B.P., 180/140; alb., 14 parts; generalized oedema; admitted. No improvement in antenatal ward. January 1, 1951: 30 weeks pregnant; induction of labour; male infant, 3 lb. 9 oz. (1.6 kg.); died aged 24 hours. *Second pregnancy:* E.D.D., August 8, 1952. Normal pregnancy; highest B.P., 140/80; September 9, 1952: male infant, 9 lb. (4.1 kg.).

Case 5.—Patient aged 37. *First pregnancy:* ? hypertension and proteinuria at 36 weeks; male infant, 4 lb. 8 oz. (2 kg.), died. *Second pregnancy:* twins induced at 26th week. S.B., 1 lb. 8 oz. and 2 lb. 4 oz. (0.68 and 1 kg.). *Third pregnancy, 1946, St. Luke's Maternity Hospital:* Normal pregnancy. Female infant, 8 lb. 8 oz. (3.9 kg.). *Fourth pregnancy, May 5, 1952:* Normal pregnancy; female infant, 7 lb. 6 oz. (3.3 kg.).

Living Children, but Not Quite Normal Pregnancies, following Pre-eclamptic Symptomatology

Case 6.—Patient aged 25. October 5 to November 10, 1949: hypertension, 150/100 to 170/120; alb., 2–14 parts. November 10: female infant, 4 lb. 15 oz. (2.2 kg.); died of bronchopneumonia. *Second pregnancy:* B.P. varied between 120/80 and 146/110; alb., 1–3 parts. February 5, 1952: male infant, 8 lb. 8 oz. (3.9 kg.).

Case 7.—Patient aged 27. *First pregnancy, 1947:* abortion at 11 weeks. *Second pregnancy, 1950:* emergency admission in premature labour with transverse lie; B.P., 140/108 to 160/110; alb., 14–16 parts; granular + hyaline casts, many red cells; papilloedema. June 20: S.B. female foetus, 3 lb. 5 oz. (1.5 kg.). September 8, 1951: B.P., 130/76; urine, no protein. *Third pregnancy:* hydramnios; B.P., 120/76–140/94; alb., 0.5 to 2 parts. March 16: breech, male infant, 7 lb., 6 oz. (3.3 kg.).

Case 8.—Patient aged 31. All confinements except the first in this hospital. *First pregnancy, 1941:* ? eclamptic fits; 3 lb. 8 oz. (1.6 kg.) baby; died same day. *Second*

pregnancy, 1942: hypertension up to 180/110; alb., 15 parts; S.B. infant. *Third pregnancy, 1943:* hypertension up to 150/100; no proteinuria; infant weighed 4 lb. (1.8 kg.); died after 36 hours. *Fourth pregnancy, 1944:* hypertension up to 150/95; infant, 4 lb. (1.8 kg.); lived a few hours. *Fifth pregnancy, 1947:* hypertension up to 150/85; infant, 7 lb. 12 oz. (3.5 kg.); did well. *Sixth pregnancy, 1949:* hypertension up to 176/100; no proteinuria; baby, 7 lb. 4 oz. (3.3 kg.). *Seventh pregnancy, 1951:* hypertension; alb., 7 parts; ante-partum haemorrhage; placenta praevia; caesarean section; male infant, 5 lb. 3 oz. (2.4 kg.); did well (37 weeks' gestation). It will be noted that, with the exception of the second pregnancy, all the infants were born alive.

Case 9.—Patient aged 28. *First pregnancy:* hypertension up to 160/118; no proteinuria; forceps; male infant, 9 lb. 3 oz. (4.2 kg.); maternal weight, 13 st. to 13 st. 9 lb. (82.6 to 86.6 kg.). *Second pregnancy:* hypertension, 170/120; alb., 12 parts; headache; dizziness; poor secretion of urine; caesarean section at 36 weeks; female infant, 6 lb. 14 oz. (3.1 kg.). Maternal weight: 14 st. 12 lb. (94.3 kg.) at 17 weeks, 17 st. 2 lb. (108.9 kg.) when delivered. *Third pregnancy:* emergency admission; B.P., 140/100; renal glycosuria; no proteinuria; caesarean section; male infant, 8 lb. 8 oz. (3.9 kg.). Maternal weight: 15 st. 11 lb. (100.2 kg.). The weights both of the mother and of the infants were probably significant in this case.

Case 10.—Patient aged 24. *First pregnancy:* emergency admission on February 4, 1948; three weeks in an antenatal ward; B.P., 220/140; scanty secretion of urine; alb., 20 parts; granular and hyaline casts; blood urea, 60 mg. per 100 ml.; headache; epigastric pain; vomiting. Eyes: slight retinal oedema and evidence of hypertension in arteriovenous crossings. February 24: caesarean section; male infant, 3 lb. (1.4 kg.); died on fourth day. Alb., 0.5 part, present in urine when she left hospital. *Second pregnancy:* E.D.D., January 14, 1949. Hypertension at 28 weeks; admitted. Maternal weight, 8 st. 2 lb. to 9 st. 8 lb. (51.7 to 60.8 kg.); B.P., 140/80 at six weeks; 140/76–155/95 in ward; no proteinuria. Eyes: fundi satisfactory. January 23: female infant, 5 lb. 5 oz. (2.5 kg.); did well. December 21, 1949: B.P., 140/80; neither protein nor abnormal cells discovered in urine.

Discussion of Results

I recounted the obstetric history of the second "denervation" patient, while she was still pregnant, to a colleague whose opinion is valued very highly throughout the country and asked him what chance he thought she had of a living child. He replied that her only sporting chance was a caesarean section at about the 34th week of pregnancy. She delivered herself of a healthy infant weighing 7 lb. 8 oz. (3.4 kg.), at the 38th week, after a completely uneventful pregnancy. In my judgment it is most improbable that any of these three patients could have given birth to a living child, and the fact that each of the three has a healthy infant can reasonably be attributed to the operation that was performed.

It is nevertheless necessary to exercise the utmost caution in accepting any such conclusion, and for this reason all the known relevant cases, occurring among some 30,000 deliveries during the past five years in Bradford, have been reviewed. It will be seen that four patients who developed the pre-eclamptic symptomatology at or about the 30th week of their first pregnancies did have normal second confinements. A further five such patients were delivered of healthy children at term, although the pregnancy in each case was complicated by hypertension and in three cases by proteinuria. It must also be recognized that hypertension, proteinuria, oedema, and other symptoms associated with pre-eclampsia do not have the same significance when occurring concomitantly with some forms of antepartum haemorrhage. A patient was recently delivered of a perfectly healthy infant after a normal pregnancy. Her first pregnancy was uneventful, but her second was complicated

Post-mortem Findings

The post-mortem examination was conducted thirty-two hours after death, the body having been stored at about 4° C. Externally the body appeared well nourished, there was some pallor of the lips and nail-beds, and the livid markings were light pink in colour. Needle-puncture marks were seen on the lateral aspect of each thigh, the right thigh was swollen, and the right knee-joint was enlarged by effusion. The skin of this region was tense and discoloured by patchy blue and pink markings, and there was "marbling" due to prominence of the superficial veins. The left thigh appeared normal in size and colour. The scrotum was red and oedematous. Incisions into the right thigh revealed widespread necrosis with liquefaction and gas production in the lateral group of muscles deep to the injection marks in the skin, the appearances being typical of clostridial myositis. Similar changes, but without gas production, were found in the right psoas and iliacus muscles. Several localized areas of coagulative necrosis, each deep to an injection puncture in the skin, were found in the lateral muscles of the left thigh; no necrosis of the superficial fat was present, and each necrotic area lay deeply in muscle. There was no evidence of infection in this thigh.

Considerable haemolysis was present in the general circulation, with staining of the blood vessels. Little aortic atheroma was found, but a solitary plaque was demonstrated in the upper part of the anterior descending branch of the left coronary artery, immediately below which was a recent ante-mortem occluding thrombus. No evidence of gas embolism could be demonstrated in any part of the circulatory system.

Chronic bronchitis was found, and a partially healed acute gastric erosion was seen on the posterior wall of the cardiac end of the stomach; no free blood was present. The liver was slightly enlarged by fatty change and discoloured by haemolysis. The spleen was slightly enlarged, dark red in colour, and congested. Blood-stained urine was present in the bladder. The brain was oedematous, a few cerebral petechial haemorrhages were seen, and there was blood-staining of the cerebrospinal fluid.

Microscopy.—Histological examination confirmed gas-gangrene of the muscles of the right thigh, and many Gram-positive bacilli were seen in sections. Neither clostridial lesions nor organisms were found in sections of the liver and other viscera, and the necrotic masses in the left thigh were also free from any infection.

Bacteriology.—A direct smear from the necrotic muscle of the right thigh showed pus cells and Gram-positive bacilli. Anaerobic cultures produced a heavy pure growth of *Clostridium welchii*, while aerobic cultures remained sterile. No organisms were cultured, either by aerobic or by anaerobic means, from the brain and cerebrospinal fluid or urine, and only coliform bacilli were grown from the spleen. The *Cl. welchii* was found to be resistant to penicillin and sulphonamides. Efforts to trace the source of the infection were unsuccessful. Suitable cultures were attempted from ampoules of sulphathiazole, apyrogenic distilled water, and paraldehyde, each from the same batch as that injected in this case. Scrapings from the two ward sterilizers were cultured, and the surgical spirit was similarly investigated, but no clostridia were grown.

Experimental Investigations

The pH of the sodium sulphathiazole, when made up as a 33.3% solution in sterile distilled water, is about 10.5, and it was thought desirable to investigate the growth of *Cl. welchii* in alkaline media. This investigation was deferred because of extensive structural laboratory alterations, and the original strain of *Cl. welchii* was inadvertently destroyed during the delay; subsequently three further strains of *Cl. welchii* were used.

Tubes containing 0.1% glucose broth, set up to cover a pH range of 10.5 to 4 by adding varying quantities

of concentrated sulphuric acid and concentrated sodium hydroxide, were inoculated with the clostridia. No growth occurred at pH 10 and higher or at pH 6 and lower, and the latter observation was confirmed on repeating the experiment from pH 7 and below.

In order to avoid precipitation of calcium from the media, two further experiments were performed; in the one concentrated hydrochloric acid and in the other glacial acetic acid was substituted for sulphuric acid. As growth had been shown to occur on the alkaline side of neutrality, only tubes with pH values of 7 and below were set up. No growth occurred at pH 6 and below with hydrochloric acid, or at pH 5.5 and below with acetic acid. The tubes in which no growth occurred were reinoculated and further incubated; but again there was no growth (see Table).

Effect of pH on Growth of *Cl. welchii* in 0.1% Glucose Broth

pH	Conc. H ₂ SO ₄ and Conc. NaOH	Repeat with Conc. H ₂ SO ₄	Conc. HCl	Glacial Acetic Acid
10.5	—	—	—	—
10.0	—	—	—	—
9.5	—	—	—	—
9.0	—	—	—	—
8.5	—	—	—	—
8.0	—	—	—	—
7.5	—	—	—	—
7.0	—	—	—	—
6.5	—	—	—	—
6.0	—	—	—	—
5.5	—	—	—	—
5.0	—	—	—	—
4.5	—	—	—	—
4.0	—	—	—	—

+ = Growth. — = No growth.

It thus appeared that the inhibition of growth was related to the acidity and not to calcium precipitation. We have since found references to the effect of pH on the growth of *Cl. welchii*, in which it is shown that this organism is cultured only with difficulty at low pH values (Gale, 1941; Gale and van Heyningen, 1942).

Discussion

The depth, position, and number of the necrotic foci in the muscles of the left thigh indicate the sodium sulphathiazole as the necrotizing agent in this case, and as injections of the compound were given into each thigh it is reasonable to suppose that similar necrotic lesions had been present in the right thigh, later becoming unrecognizable when the myositis developed. We have seen identical foci of muscle necrosis due to sodium sulphathiazole injections in other cases, and similar lesions are mentioned in the literature (Banks, 1940; Selbie and McIntosh, 1943). The necrosis seems to be due to the very alkaline reaction of the injection solution.

It is well known that deep necrosis of muscle is a favourable site for infection by clostridia, and the local pH in this case would have been above 7.7, though reduced from the initial high pH of the solution by buffering in the tissues and by dilution by oedema. There can be little doubt that the infection began in a sulphathiazole-induced necrotic focus in the right thigh: the organism isolated from the muscle happened to be resistant *in vitro* to penicillin and to sodium sulphathiazole; but, even had *in vivo* sensitivity to the latter been a characteristic of the bacillus, infection could still have occurred, as dormant spores might well have persisted in the tissues until the effective concentration of the sulphonamide became reduced, when active infection of the necrotic muscle would occur.

It has been shown that if an injection of *Cl. welchii* into the thigh muscles of mice is followed one hour later by injection of sulphathiazole into the same site, then only a small percentage of the mice survived (McIntosh and Selbie, 1943).

The source of the *Cl. welchii* in this case was not discovered: skin contamination from the bowel is a possibility,

the organism being a normal inhabitant of the intestinal tract of man. The customary brief skin "cleansing" with alcohol would not be sufficient to kill spores. Alternatively, the organism may have been present in any of the injection solutions or apparatus; proof of this is impossible to obtain.

Summary

Myositis due to *Clostridium welchii* infection was found in the region of injections of sodium sulphathiazole at the post-mortem examination of a man who died of acute coronary thrombosis. It is believed that the very alkaline solution of sulphathiazole was responsible for muscle necrosis, and that accidentally introduced infection of a necrotic focus led to gas-gangrene. The possible source of the infection is mentioned, and some simple experiments in the culture of *Cl. welchii* at varying pH values are described.

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PETHIDINE AND THE TRIPLE RESPONSE

BY

B. L. FINER, M.B., B.S.

AND

M. W. PARTINGTON, M.B., B.S.

(From the Department of Physiology, London Hospital Medical College)

Zuck (1951) and Pearce (1951) observed that the intravenous injection of pethidine was followed by the appearance of a wheal extending proximally along the line of the vein. Nasmyth and Stewart (1950) observed that the injection of pethidine into human skin produced a triple response which was reduced in extent by antihistamines, and suggested that pethidine was a histamine liberator. We have made similar observations. In view of the widespread use of pethidine and reports of unexpected hypotension and collapse following its administration (Giff, 1947; Butler, 1951; Zuck, 1951), it was decided to investigate the production of this triple response further. The results are reported below.

Methods

Intradermal injections (0.1 ml.) were made into the skin of the forearm with a Mantoux syringe.

The effects of intravenous injections were studied under two different sets of conditions. (1) *Venous congestion*:—A sphygmomanometer cuff was placed round the upper forearm and pumped to 70 mm. Hg. The injection (in a volume less than 0.5 ml.) was made into a small wrist vein. Immediately the needle was removed, pressure was applied with a pad of cotton-wool over the site where the vein had been punctured to

prevent blood leaking out of the vein. The pressure in the cuff was maintained for three to four minutes after the injection and then released. (2) *Circulatory occlusion*:—A sphygmomanometer cuff was placed round the upper forearm and pumped to 70 mm. Hg. This pressure was maintained for one minute to congest the vessels of the forearm and then raised to 200 mm. Hg. One minute later the injection was made into a wrist vein, and after a further five minutes the pressure was released.

The Intravenous Injection of Pethidine and Histamine

A triple response is seen over the veins in the forearm if pethidine (25–100 mg.) is injected into a wrist vein with an unrestricted circulation in the arm. The reaction is more conveniently studied if smaller doses (5–15 mg.) are used with some obstruction of the venous return as described above.

Within 30 seconds of injection under these conditions an intense sensation of itching spreads up the forearm. This is often followed by a change in the colour of the vein to a characteristic mauve or plum colour. At the same time a flare appears in the skin round the site of injection and then on each side of the vein for a distance of up to 3 cm., progressively following the vein up the forearm. Within five minutes of injection a wheal appears, localized at first to a thin strip over the vein, but later spreading a few millimetres into the skin on each side. If the vein divides, the flare and wheal follow the branches. Sometimes an unaffected area of skin is seen between the site of injection and the changes higher up in the forearm. Whealing and flaring may occur distal to the site of injection and occasionally discrete wheals form in the skin. Massive wheals are sometimes seen. The typical appearance following an injection of pethidine under these conditions is shown in Fig. 1.

Within two or three minutes of the intravenous injection of pethidine with the circulation occluded, a red reaction is seen in the skin. A number of discrete irregular red areas appear, some distal and some proximal to the site of injection. The areas lie over and on each side of the veins in the forearm. They increase in size slowly and may coalesce. When the circulation is re-established and the reactive hyperaemia has subsided the forearm is seen to be extensively whealed, and the margins of the wheals roughly correspond with the margins of the previously observed red reactions. Surrounding all the whealed areas there is a bright red arteriolar flare. On four occasions after the pressure in the cuff was released, the subject's face was seen to flush, and a characteristic metallic taste and a transitory headache were experienced, indistinguishable from those produced by injections of histamine.

All these changes, except the very large wheals, may be reproduced exactly if histamine (15–30 µg. in terms of the base) is substituted for pethidine in the above experiments.

The lymphatic vessels play no part in this response, as the following experiment shows: if pethidine or histamine

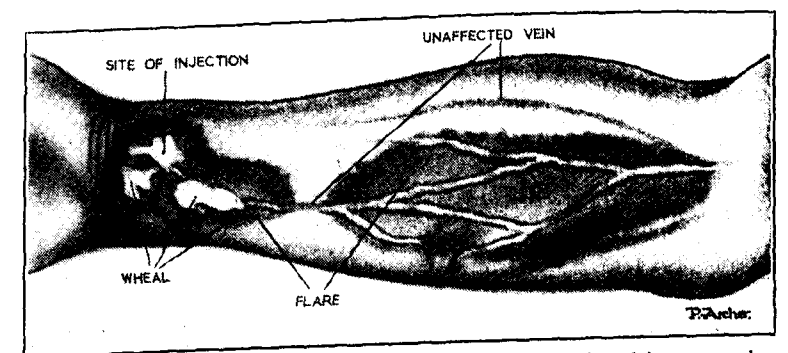


FIG. 1.—Changes in the forearm after 15 mg. of pethidine injected intravenously. Sphygmomanometer cuff (at 70 mm. Hg) at the elbow for four minutes after injection.

is injected intravenously with the veins congested, and immediately after the injection a tourniquet is applied to the forearm just proximal to the site of injection, the changes in the forearm occur in their usual sequence.

These observations can be most readily interpreted by assuming that the vein wall is permeable to both histamine and pethidine.

Effect of "Histamine Liberators" on Skin Over Vein

MacIntosh and Paton (1949) have shown that, although the injection of a histamine liberator compound into the skin is followed by a triple response, a second injection of the same substance into the same site within 24 hours produces either no response or one that is much reduced. They suggested that the original injection had reduced the normal complement of histamine in the skin, and that this had not been restored by the time the second injection was given. We have found that the skin behaves similarly after intradermal injections of pethidine (50 µg.), which supports the conclusion that pethidine is a histamine liberator.

Pethidine (10 mg.) was injected intravenously while the circulation was occluded and the areas of red reaction were outlined in ink. Twenty-four hours later pethidine (50 µg.) was injected intradermally into an area of skin which had previously shown a red reaction. The response was grossly reduced compared with an intradermal injection of the same amount into a comparable site on the other forearm. An intradermal injection of histamine had its usual effect. It seems likely, therefore, that the triple response seen after an intravenous injection of pethidine is due to the liberation of histamine from the skin.

Effects of Antihistamines

Treatment with an antihistamine drug modifies the triple response to a subsequent intradermal injection of histamine. Experiments were therefore carried out to investigate the

Effect of Pre-treatment with Diphenhydramine Hydrochloride (100 mg.) on Skin Response in Forearm after Intravenous Injections of Pethidine (100 mg.)

Subject	Effect of Pethidine	
	Without Diphenhydramine Hydrochloride	With Diphenhydramine Hydrochloride
1		0
2	++	
3		++
4	++	
5		+
6	++	+
7	++	
8	++	
9	++	
10		0
11		+
12	++	
13	++	
14		+
15		+
16	++	

0 = No response.

++ = Mauve vein coloration with or without flare.

+++ = Includes whealing of all grades.

Subject 6 was seen twice, with three-weeks interval between observations.

results of (a) the oral administration of an antihistamine drug (diphenhydramine hydrochloride) on the response of the skin to an intravenous injection of pethidine given two hours later; (b) the injection of mepyramine alone; and (c) the intravenous injection of mixtures of mepyramine and pethidine and of mepyramine and histamine.

(a) In a series of 16 cases for operation, it was arranged that half the patients received diphenhydramine hydrochloride (100 mg.) by mouth two hours before the anaesthetic was given. The patients were induced with thiopentone, and then pethidine (100 mg.) was injected into a wrist vein. The reactions in the forearm were noted and graded on a rough quantitative scale (see Table) before the observer knew which patients had received diphen-

hydramine hydrochloride. All except one of the subjects who received this drug showed either no changes in the skin or a much reduced response compared with the controls.

(b) The intradermal injection of mepyramine is followed by the appearance of a red reaction in the skin (Halpern, 1952). This reaction may be distinguished from the red reaction produced by histamine by the following characteristics: (1) the colour is a dull rather than a bright red; (2) when the red area fades there is no "speckling" at its margin; and (3) the intradermal injection of mepyramine into an arm with the circulation occluded does not give rise to a red reaction until the circulation is re-established. When mepyramine (5-10 mg.) is injected intravenously under the conditions of venous congestion a red reaction is seen in the forearm which is in every way similar to that described above as following the intradermal injection of mepyramine. This red reaction is distributed along the course of the veins in a manner similar to that of the triple response after injections of pethidine. If mepyramine is injected intravenously when the circulation is occluded no red reaction appears until the circulation is re-established. These results may best be explained by assuming that the vein wall is permeable to mepyramine.

(c) The intravenous injection of mixtures of mepyramine (10 mg.) and pethidine (5 mg.) or of mepyramine (10 mg.) and histamine (20 µg.) under the conditions of venous congestion described above produced no whealing in the forearm, but only a red reaction similar in character to that following the injection of mepyramine alone. Further, the intravenous injection of such mixtures when the circulation was occluded produced no red reaction until the circulation was re-established.

Since mepyramine does not prevent the liberation of histamine but modifies its effects by competing with it for tissue receptors (Paton and Schachter, 1951), the inhibition of the triple response in the above experiments supports the conclusion that the vein wall is permeable to mepyramine.

Effects of Pethidine on Cat's Blood Pressure

The effects of pethidine on the cat's blood pressure were found to be substantially the same as those described by Duguid and Heathcote (1940). The fall in blood pressure in cats under chloralose following the intravenous injection of pethidine (3 mg./kg.) lasted from 45 to 90 minutes (Fig. 2). Recovery from the hypotension from pethidine was not hastened by mepyramine (0.8-1.6 mg./kg.), nor did pre-treatment with mepyramine in doses up to 3 mg./kg. modify the blood-pressure response.

It follows that the hypotensive effects of pethidine in the cat cannot be explained solely on the basis of histamine liberation.

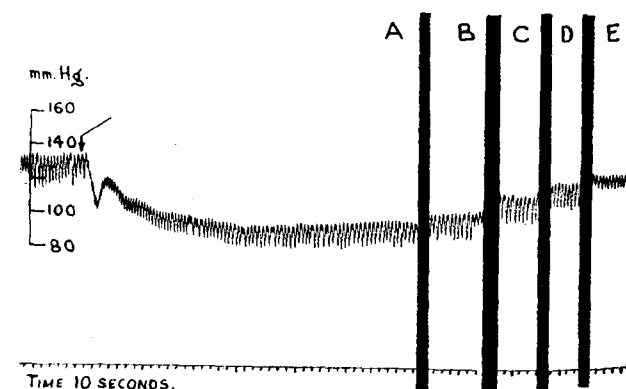


FIG. 2.—Cat, 2.9 kg.; under chloralose. Effects of pethidine (3 mg./kg.) on the blood pressure. Time of injection marked with an arrow. B, C, D, and E are successive tracings at 15-minute intervals.

Discussion

Lewis (1927) presented evidence that when a substance, other than histamine, was injected into human skin and produced a triple response, it did so by virtue of the liberation of the histamine already present in the skin but held in an inactive form. The demonstration that a triple response is inhibited by treatment with one of the anti-histamine drugs supports Lewis's conclusions. MacIntosh and Paton's (1949) observations in man that the second of two injections of a histamine-liberating compound into the same site within 24 hours fails to produce a full triple response, coupled with the work of Feldberg and Talesnik (1952) on the slow rate of recovery of skin histamine following its liberation in animals, also supports Lewis's hypothesis. It follows that if any substance (1) produces a triple response on intradermal injection in man, (2) produces a reduced triple response when the subject is treated with an antihistamine drug, and (3) fails to produce the same response when a second injection is made into the same site within 24 hours, it is likely that the substance is a histamine liberator.

The present observations show that pethidine fulfils these criteria, and so support the conclusions of Nasmyth and Stewart (1950). They also provide an explanation for the observations of Zuck (1951) and Pearce (1951), and show that the walls of the veins in the forearm are permeable to pethidine, histamine, and mepyramine. No other reference has been found to the passage of substances through the walls of veins of comparable size apart from the observation of Magendie, who in the early part of the nineteenth century applied a "spirituous extract of nux vomica" to the outside of the jugular vein of a dog and observed signs of poisoning within four minutes (Franklin, 1937).

In man, the present observations show that the appearance of a triple response in the skin after the intravenous injection of pethidine is to be expected if the injection is made into a superficial vein. Although a fall in blood pressure is common after giving pethidine intravenously (Branwood, 1943), sustained hypotension and collapse are rare. The experiments on the cat indicate that, at least in this animal, the hypotensive effect of pethidine is not due solely to the liberation of histamine. It seems likely that in man some factor other than histamine liberation is involved in the production by pethidine of severe hypotension and collapse.

Conclusions

The triple response in the skin after an intravenous injection of pethidine is due to the permeation of pethidine through the vein wall and the liberation of histamine from the skin overlying it. The walls of the superficial veins in the forearm are also permeable to histamine and mepyramine.

It is unlikely that the occasional case of vascular collapse and marked hypotension following an injection of pethidine occurs as the result of the liberation of histamine.

We wish to thank Professor J. L. D'Silva for continued advice and encouragement. Miss P. Archer kindly drew the illustration for Fig. 1.

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THE "REFLUX" FACTOR IN ERYTHROCYTE SEDIMENTATION TESTS

BY

W. D. ALEXANDER, M.B., Ch.B.

(From the Gardiner Institute of Medicine, University of Glasgow)

The most popular methods of determining the erythrocyte sedimentation rate are those of Wintrobe and Westergren. The internal measurements of Wintrobe and Westergren sedimentation tubes are similar except that the length of the former is half that of the latter (2.5 mm. diameter; 100 and 200 mm. long). It was therefore surprising to find that the sedimentation rate of a specimen of oxalated blood determined in a Wintrobe tube differed from the determination in a half-filled Westergren tube. It was noticed that the period of aggregation before fall of the cells started was much longer in the Wintrobe than in the Westergren tube. The technique used to fill the tubes would seem to be the cause, since the columns of blood are identical qualitatively and quantitatively.

One way in which the method of filling the tubes differs is that in the Westergren method blood is drawn past the zero mark and then allowed to fall to it, so that a thin film of blood is left on the inside of the tube above the mark; whereas the Wintrobe tube is filled to the zero mark and the pipette withdrawn, leaving the inside of the tube above the mark free of film. In the first few minutes after a Westergren tube is set up there is therefore a reflux of cells and plasma on to the blood level at the zero mark as the blood adherent to the inside of the tube above the mark runs down to the meniscus. This reflux of blood is of course absent in the Wintrobe tube.

Since the presence or absence of this reflux of blood seemed to exert some effect on the sedimentation of oxalated blood, the effect of this factor on the classical Wintrobe and Westergren methods was investigated. The objects of this paper are: (1) to show that reflux of blood on to the meniscus is a factor frequently affecting the half-hour reading in the Wintrobe method of determining the E.S.R.; and (2) to demonstrate, in four cases in which the readings of the two classical methods were in disagreement, that if reflux of blood on to the meniscus was made to occur in the Wintrobe tube the discrepancy disappeared.

Methods

Comparisons between the readings of the standard Wintrobe and Westergren methods were made on blood from 40 unselected patients. By the Westergren method 7 showed a sedimentation rate between 0 and 10 mm., 14 between 10 and 30 mm., and 19 over 30 mm.

In four cases there was disagreement between the one-hour readings of the two methods, a raised Westergren reading being associated with a normal Wintrobe reading. Each of these patients had active organic disease, and a raised E.S.R. was expected. Blood from these four cases, and from a further 24 in which the readings of the methods were in agreement, was examined to determine the effect of reflux of blood on to the meniscus in each of the two techniques.

In the group of 24 patients in whom the standard methods gave similar readings two pairs of tubes were set up: (1) a pair of Wintrobe tubes (containing oxalated blood), and (2) a pair of Westergren tubes (containing citrated blood). In one of each pair reflux of blood on to the meniscus was allowed, in the other prevented.

Reflux of blood normally occurs when a Westergren tube is filled—in this series the blood was drawn 4 to 5 cm. past the mark and allowed to fall to it. In the tubes in which it was desired to prevent reflux the rubber tube from a W.B.C. pipette was attached to the top of the Westergren tube. Blood was sucked slowly up, and when it reached the mark was stopped by pressing the rubber tube on to the top of the Westergren tube.

Reflux does not normally occur when a Wintrobe tube is filled, the pipette being removed when the blood reaches the mark. When it was desired to cause reflux the tube was filled to the top (1 cm. above the mark), sucked back to the mark, and a small drop of blood left at the top of the tube as the pipette was withdrawn. This small drop runs back on to the meniscus.

In the four cases in which a discrepancy was known to exist between the one-hour readings of the classical methods three pairs of tubes were set up: (1) Westergren tubes (containing citrated blood); (2) Wintrobe tubes (containing oxalated blood); and (3) Westergren tubes filled to the 100 mark with oxalated blood. In one of each pair reflux was allowed; in the other it was prevented.

Results

Of the 24 cases in which the classical methods gave comparable one-hour readings, 5 showed an E.S.R. between 0 and 10 mm., 9 between 10 and 30 mm., and 10 over 30 mm.

One-hour Readings.—In each case the one-hour readings in all four tubes were comparable.

Half-hour Readings.—(a) *Oxalated blood*:—When the half-hour readings in the pairs of Wintrobe tubes were considered the cases seemed to fall into two groups—those with a P.C.V. above 37%, and those with a P.C.V. of 34% and below. The former group numbered 19, and in all these the half-hour reading when reflux was present was twice or more the half-hour reading when reflux was absent. There were five cases with a P.C.V. below 35%. In all these the half-hour readings in each pair were very similar. They were 31, 21 mm. (P.C.V. 34%); 1, $\frac{1}{2}$ mm.; 15, 15 mm.; 13, 12 mm.; 36, 36 mm. (b) *Citrated blood*:—The half-hour readings in the Westergren tubes, with or without reflux, were usually very similar; the average difference was 2.5 mm. Nevertheless in five cases the readings varied in the ratio of 2:1 or more. In all these cases the P.C.V. was 46% or more; and it is interesting to note that the P.C.V. of the blood-citrate mixture would have been 37% or more. The half-hour readings in the five cases mentioned were 3, 1 mm.; 3, 1 mm.; 2, 1 mm.; 6, 3 mm.; and 17, 7 mm.

For the four cases in which the classical methods gave dissimilar results the details of the one-hour readings are set out in the Table.

Four Cases in Which the Classical Methods Gave Dissimilar One-hour Readings

Diagnosis	Westergren		Wintrobe		Westergren Half Filled with Oxalated Blood		P.C.V.
	R.A.	R.P.	R.A.	R.P.	R.A.	R.P.	
Lung neoplasm ..	45	39	31	7	27	2	42
Bronchiectasis ..	22	19	22	12	33	2	48
Coronary thrombosis ..	60	58	38	10	37	16	46
Pyelonephritis ..	58	55	44	12	46	18	38

R.A.—Reflux of blood on to meniscus allowed.
R.P.—Reflux of blood on to meniscus prevented.

Discussion

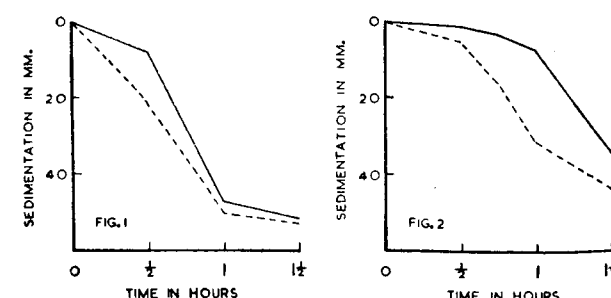
It is clear that if the effect of a physical factor on the sedimentation rate of a blood is to be tested, the test should be made in a pair of tubes identical in every other way.

In each of the 28 cases examined a pair of Wintrobe and a pair of Westergren tubes were set up. In any pair the

blood filling the tubes was identical, and they were set up in the same stand. It seems reasonable to attribute any difference between the readings of a pair to the solitary difference between them—that the one was filled so that reflux of blood on to the meniscus occurred, the other so that it was prevented.

Fig. 1 shows the usual significance of this factor on the Wintrobe method of determining sedimentation rate. The half-hour reading is considerably affected, being greater when reflux is present, whereas the one-hour reading is affected slightly or not at all. The one-hour reading in each tube agrees well with the one-hour Westergren reading.

The position was entirely different in the four cases in which the one-hour readings of the standard methods were at variance. In them (with oxalated blood), when reflux was absent, the period of aggregation before sedimentation proper starts was greatly prolonged. In each case the difference between the Wintrobe tube filled so as to produce reflux of blood and that filled without reflux, marked at half-hour, were also present at one hour. The period of "disappearance of the discrepancy" occurred between 1 and $1\frac{1}{2}$ hours, instead of between the $\frac{1}{2}$ and 1 hour as is usual (Fig. 2).



Variation in sedimentation rate in Wintrobe tubes (each pair filled with identical oxalated blood) according as reflux is present or absent. The continuous line shows rate without reflux, the broken line rate with reflux.

FIG. 1.—Usual pattern, with half-hour discrepancy disappearing at one hour. FIG. 2.—The pattern in four exceptional cases—the half-hour discrepancy persisting at one hour and becoming insignificant only at one and a half hours.

To corroborate that this behaviour was dependent on the method of filling the tube, and not on some inherent property of the Wintrobe tube, a pair of Westergren tubes were at the same time half filled with oxalated blood, one so that reflux of blood on to the meniscus occurred, the other so that it was prevented.

The half-filled Westergren tube and the Wintrobe tube in which reflux had been prevented gave readings of a similar order. Those with reflux present gave similar readings. The latter pair were in good agreement with the classical Westergren one-hour reading, whereas the former pair gave much smaller readings.

In all 28 cases examined reflux of blood on to the meniscus did not materially affect the one-hour Westergren reading. As mentioned above, it did affect the half-hour reading in five cases. It seems from the practical point of view that here the factor can be ignored because the Westergren tube is usually filled so that reflux of blood is inevitable, and because half-hour readings (the only ones affected) are not usually made.

The point of practical importance is that if this series of patients had been examined by someone who habitually fills the Wintrobe tube to the top and then sucks out blood to the zero mark no case would have been found in which the one-hour reading differed materially from that of the Westergren method. Whereas had the cases been examined by someone who (like myself) was accustomed to fill Wintrobe tubes to the zero mark, and then remove the pipette so that reflux of blood does not occur, four cases would have been noted in which the one-hour Wintrobe reading was at variance both with the clinical condition of the patient and with the reading of the Westergren tube.

Why the difference, described above, in the filling of the tubes should be the cause of differences in sedimentation rate in a particular blood is a question of theoretical interest. It may be due to the momentum of the cells, gained by flowing down the inside of the tube to reach the zero mark, carrying them on downwards. Their momentum might act in certain circumstances as an accelerating factor on the sedimentation of rouleaux forming near the blood surface. As other suggestions can be offered, further work is required on this problem. For the present, however, it is desired to emphasize only the practical aspects.

It seems quite clear from recent papers that there is more than one cause for discrepancy between the readings of the Wintrobe and Westergren methods. Goldberg and Conway (1952) found in two cases that the discrepancy was due to the retarding effect of the oxalate. Goldberg, Glynn, and Bywaters (1952), in a preliminary note, state that the cause of discrepancy in their cases seems to have been the effect of the anticoagulant on the blood pH. In both these series the discrepancy has always taken the form of a high Westergren reading with a normal or near normal Wintrobe reading. Davis (1946) has reported cases in which a high Wintrobe but normal Westergren reading has been found.

It seems that, if the Wintrobe tube is filled so that reflux of blood on to the meniscus occurs, at least one factor causing unexpectedly low Wintrobe readings will be eliminated.

Summary

The Wintrobe and Westergren readings were compared in 40 cases and found to be at variance in four, the Westergren reading being more compatible with the clinical state of the patient.

The effect of reflux of blood on to the meniscus was examined in 28 cases, including the four in which discrepancy was noted.

This factor is of no practical importance in the Westergren method.

In the Wintrobe method it affected the one-hour reading in four cases—the cases in which discrepancy was noted. In these when reflux was present the one-hour reading agreed with the Westergren reading; when it was prevented the reading was discrepant.

One of the factors sometimes causing unexpectedly low Wintrobe readings will be eliminated if the Wintrobe tube is filled so that reflux of blood on to the meniscus occurs.

Grateful acknowledgments are due to Professor Sir John McNeer for providing facilities in the Gardiner Institute and for guidance in the preparation of this paper; also to Drs. H. Conway, A. Goldberg, and J. Cochran for their helpful advice and criticism.

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A note on dahlia tubers as a source of food is contributed by Mr. S. G. Harrison to the February issue of the *Journal of the Royal Horticultural Society*. The tubers consist partly of inulin, and though not palatable either to man or domestic animals they could be a useful source of laevulose if a cheap process were devised for converting the inulin into that monosaccharide. The present small demand for inulin is being partly met by a firm which is processing three tons of dahlia tubers a year to produce it; the tubers used are normal horticultural surplus. It is thought that breeding experiments might lead to the development of tubers with a higher content of inulin than the present 9% to 13%, for the sugar content of sugar beet has been increased from about 7% sucrose to about 20%.

A SURGICAL METHOD FOR MANAGEMENT OF PATIENTS WITH PORTAL CIRRHOSIS

PRELIMINARY REPORT OF A CASE

BY

CARLO A. MONTAGNANI, M.D.

(From the Surgical Clinic of the University of Florence)

Ligation of the hepatic artery, alone or together with the splenic and left gastric arteries, has been used in recent years as a treatment for portal hypertension and its complications. Success has been claimed in a number of these cases. Ascites and bleeding oesophageal varices appear to be favourably influenced by a reduction in arterial blood supply to the liver, and liver function seems to improve.

The rational basis for this surgical method can be traced back to the studies of the intrahepatic circulation in portal cirrhosis by Kretz (1904), Herrick (1907), McIndoe (1928), and Dock (1947), and to the more recent demonstration by Montagnani and Paci (1952) of a tremendous increase in the arterial circulation in the cirrhotic liver with widespread arterio-portal shunts of varying size.

Berman *et al.* (1950, 1951) and Berman and Hull (1952) have suggested that the method works by reducing arterial blood flow and pressure in the liver parenchyma so that more blood can pass through the portal bed and portal venous pressure is lowered.

Ligation of the terminal part of the hepatic artery carried great hazard, and as a compromise the artery has been tied proximal to the origins of the gastroduodenal and right gastric branches so that a free collateral circulation is possible. Experimental studies in dogs (Montagnani, 1952) have led to the development of a method of gradual occlusion of the hepatic artery or its terminal branches by wrapping around it a "cellophane" band treated with dicetyl phosphate. This led to a fibroblastic reaction of the surrounding tissues, ending in complete obliteration of the hepatic artery. In the meantime a collateral circulation developed towards the liver through the inferior phrenic arteries and minute arterial branches along the portal vein and the common bile duct. No impairment of liver function or damage to the liver parenchyma was observed after such a procedure. No antibiotics were given at any time.

The favourable results of these experiments encouraged clinical application of the procedure in the following case.

Case Report

A man of 58 was transferred from the medical service with Laennec's hepatic cirrhosis and ascites, which had not responded to medical treatment. His father had died of hepatic cirrhosis and he himself had worked for years in a winery, drank 1.5–2 litres of wine each day, ate little, and smoked much. For two months before admission he suffered from dyspepsia, alternating diarrhoea and constipation, asthenia, and loss of weight.

On admission he was found to be wasted and breathless. The sclerae were icteric. The abdomen was greatly distended by fluid and the lower half of the body was oedematous. Distended veins were present on the lower abdomen. There were no abnormalities in the chest. The relevant laboratory findings were: total plasma protein 5.8 g.% (albumin 2.3 g., globulin 3.5 g.); prothrombin 50%. During

two months of medical treatment the loss of weight continued and ascites recurred after repeated tapping. He was transferred to the surgical side on March 22, 1952. The laboratory findings then were: total protein 6.2 g.% (albumin 2.6 g., globulin 3.6 g.); prothrombin 50%. After treatment with vitamin K and blood transfusion, peritoneoscopy was done on April 1 to confirm the diagnosis. After further fresh blood transfusion the prothrombin rose to 65%.

Operation was performed on April 16. The abdomen was entered through a right rectus incision. About a litre of clear fluid was evacuated. The liver was small and hard, with rounded borders and grossly granular surface. The gall-bladder was small and thick-walled. The hepato-duodenal ligament was carefully dissected and the hepatic artery was found and freed. Three branches were identified: the right branch, and two smaller ones directed to the left and middle (quadrate) lobes. The portal pressure measured from an omental vein was 365 mm. of heparinized saline. After occlusion of the three hepatic branches with bulldog clamps the portal pressure fell to 254 mm. The two branches to the left and middle lobe were ligated with No. 1 linen ligatures and the larger branch to the right lobe was wrapped with two turns of a cellophane band treated with dicetyl phosphate. The arteries were buried in the hepato-duodenal ligament with three stitches of 000 silk, and the abdomen was closed without drainage.

The post-operative course was uneventful except for a haematoma of the wound followed by a small dehiscence which was repaired on May 28. The abdomen was tapped once, on May 20, to avoid the danger of a post-operative hernia, and 800 ml. of fluid was withdrawn. The patient had a normal diet from the sixth post-operative day, and by the time of his discharge from hospital on June 23 he was eating well, had normal bowel movements, and a slight amount of fluid was present in his abdomen. He had gained 1 kg. in weight.

He was seen again on September 25, when he was feeling well, had gained 5 kg. in weight since discharge, and was eating well. He had slight constipation, which he corrected with some laxatives. No jaundice was present and the venous collateral circulation on his abdomen had almost completely disappeared. He had not been tapped since his discharge from hospital, and a small amount of fluid was detectable. The plasma protein at this time was 7.39 g.% (albumin 2.97 g., and globulin 4.42 g.).

The favourable result of this first case supports the belief that the method, which was developed experimentally, is worthy of further clinical application.

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The physiology of vision is the subject of a dozen articles in the current issue of the *British Medical Bulletin*. Sir John Parsons, F.R.S., consulting surgeon to the Royal London Ophthalmic Hospital, contributes a preface which draws attention to some of the implications of modern research into vision. A mechanism that corrects the lens system of the eye so as to overcome chromatic aberration is the subject of an article by Professor H. Hartridge, F.R.S. Professor A. Sorsby discusses the nature of refractive errors, and Dr. Hugh Davson some problems of the formation and circulation of aqueous humour. In this connexion Sir John Parsons suggests in the introduction that further knowledge of the production of aqueous humour may have a bearing on the formation of cerebrospinal fluid and of lymph production in general. A useful bibliography of British books and periodicals concerned with the physiology of vision is included. The *Bulletin* is published by the British Council; the price of the current number is 15s.

TRICHLORETHYLENE IN LABOUR

BY

E. E. RAWLINGS, M.D., M.R.C.O.G.

Consultant Obstetrician and Gynaecologist, Hope Hospital, Salford

Browne *et al.* (1951) described the use of Steel's inhaler for administering trichlorethylene in labour. Commenting on this, the *British Medical Journal* (1951) stated: "The argument over analgesia in labour creaks on . . . Steel's inhaler . . . unfortunately does not contain all the safeguards generally considered necessary for its use . . . by a midwife." I wish, therefore, to describe the results obtained with a "Tecota" inhaler (manufactured by Cyprane Ltd.), which contains many of these safeguards and apparently fulfils most of the specifications laid down by the Medical Research Council. The machine used is readily portable and delivers a concentration of vapour of 0.45% trichlorethylene in air with

Trichlorethylene

PATIENT'S NAME..... DATE.....

TIME COMMENCED..... CERVIX.....dilated (PR/PV)

TIME FINISHED.....

DURATION.....HRS.....MINS.

USED FOR BIRTH OF HEAD { YES EFFECT: Satisfactory
 NO Unsatisfactory

BABY: First cried.....minutes after birth.

Resuscitation needed by MIDWIFE { YES
 NO

DOCTOR { YES
 NO

F. Hts..... Regular..... Irregular.....

MOTHER: Co-operation: Average Fair Poor
Ill-effects (e.g., irregular pulse, giddiness, or anaesthesia)
After-effects:.....

RELIEF: Patient's opinion: Very good Good Fair Poor
Attendant's opinion:.....

REMARKS:.....

a variation of about 10% with temperature and normal breathing rates. The concentration is within these limits in all working positions and after shaking or inversion of the apparatus. The concentration falls to about 0.4% for breathing rates below a minute volume of 7 litres.

The investigation was instituted primarily to ascertain if the machine could be used safely by unsupervised midwives, and, secondarily, to attempt to assess its efficiency and detect its disadvantages. There are many drawbacks to such an investigation. On the one hand, the subjects are often extremely impressionable, and, on the other hand, one has to allow for the varying standards and enthusiasms of different observers. The present series of 400 cases is a personal one. All the patients were seen by me during labour and/or interviewed by me 24 hours later. The form reproduced here was completed for each patient by the supervising midwife immediately after delivery. The main points were that the administration was not begun until the cervix was dilated at least three fingerbreadths and was discontinued after six hours. The machine was charged with 30 ml. for each case and not refilled during that time. Chloral and bromide, and pethidine, were often used as premedication, but no drug was given once

the administration of trichlorethylene had begun. The results are presented on lines similar to those in the survey undertaken by the Royal College of Obstetricians and Gynaecologists (1947).

Type of Case

There was no selection of the 400 cases. Any patient who had been certified by the doctor as "fit for gas and air" was given trichlorethylene if a machine was available. The age incidence and the parity of the patients are shown in Tables I and II. Of all the hospital deliveries approximately 54% are primigravidae and 46% are multiparae. The reason

TABLE I.—Age Groups

Age:	20 and Under	21-25	26-30	31-35	36 and Over	Total
No.:	87 (21.75%)	138 (34.5%)	106 (26.5%)	40 (10%)	29 (7.25%)	400

TABLE II.—Parity

Primigravidae	1-para	2-para and Over	Total
295 (73.75%)	65 (16.25%)	40 (10%)	400

for the preponderance of primigravidae in the series is the fact that many of the multiparae were delivered so soon after admission that trichlorethylene was not given, or was used for less than the required minimum period of 20 minutes.

Efficacy of the Analgesia

The mothers were questioned immediately after delivery, and again 24 hours later; their opinions are shown in Table III. In 16 cases (4%) reflection caused the mother

TABLE III.—Mother's Opinion of the Efficacy of the Analgesia

Very Good	Good	Fair	Poor	Total
135 (33.75%)	155 (38.75%)	80 (20.0%)	30 (7.5%)	400

to take a more favourable view of the analgesia, and in 10 (2.5%) the reverse occurred. However, in these cases the more unfavourable opinion has been accepted for the analysis. Adequate analgesia (very good or good relief) was obtained in 290 cases (72.5%) and inadequate relief (fair and poor) in the remaining 110 (27.5%). In the observer's opinion (Table IV) adequate analgesia was obtained in 294 cases

TABLE IV.—Observer's Opinion of the Analgesia

Very Good	Good	Fair	Poor	Total
92 (23%)	202 (50.5%)	91 (22.75%)	15 (3.75%)	400

(73.5%) and inadequate relief in 106 (26.5%). Tables III and IV show a discrepancy in the numbers in the very good, good, and poor columns, although the combined figures for adequate and inadequate analgesia are very similar. This is probably due to the fact that the mother who has no previous experience to guide her is less likely than the trained observer to be addicted to moderation in her opinions.

In interpreting the results shown in Table V it must be remembered that many of the labours in which the adminis-

TABLE V.—Effect of Duration of Analgesia on its Efficacy

Period of Administration	Adequate Analgesia Very Good and Good	Inadequate Analgesia Fair and Poor	Total
Less than 2 hours	184 (75.7%)	59 (24.3%)	243
2-4 hours	76 (73.1%)	28 (26.9%)	104
More than 4 hours	34 (64.2%)	19 (35.8%)	53

Note: Cases in which trichlorethylene was administered for less than 20 minutes have been excluded from the series.

tration lasted for more than four hours were in themselves long and often complicated by uterine inertia or terminated in operative delivery, factors which in themselves would lead the mothers to take a more pessimistic view of the analgesia. On the other hand, a short administration often indicated a reasonably quick labour, with the greater likelihood of a satisfactory opinion of the analgesia.

Effect of Analgesia on Course of Labour

Co-operation of Patient.—A few of the mothers refused the trichlorethylene after a few breaths. Typical comments were: "Cannot get my breath," "Instinct told me to pull it off," "Feel as if I am choking." These cases have been excluded, as the trichlorethylene was not administered for the minimum of 20 minutes. The exact number of such cases is not known, but the estimate is between 10 and 20. Apart from this, lack of co-operation occurred in two groups of cases. In the first group analgesia was excellent, but the patient became too sleepy to push during the second stage. This occurred in five cases (1.25%). The second and larger group consisted of mothers who used trichlorethylene reasonably well until the contractions became more severe late in the first stage or during the second stage, when, owing to inadequate analgesia or slow progress of the labour, they became very restless or hysterical. There were 27 such women (6.75%), in only two of whom did the observer consider that the excitable state might have been produced by the trichlorethylene.

Delay in Labour Due to the Analgesia.—The length of labour in 400 cases having trichlorethylene is compared with a similar group of 400 women the conduct of whose labours did not include the administration of trichlorethylene. These are termed "controls" (Table VI). Of the cases of uterine

TABLE VI

	Trichlorethylene		Controls	
	Primi-gravidae	Multiparae	Primi-gravidae	Multiparae
	Hrs. Mins.	Hrs. Mins.	Hrs. Mins.	Hrs. Mins.
Length of 1st stage	20 —	12 5	19 —	11 15
" 2nd "	1 5	22 —	58 —	17 —
Total length of labour	21 5	12 27	19 58	11 32

inertia it was considered that in six the trichlorethylene probably was the major factor in production of the inertia. In all these cases the administration had begun rather early in the labour.

Forceps Rate.—Forceps were used in 1 of the 105 multiparae (1%) and in 27 of the 295 primigravidae (9.2%), a total of 28 out of 400 cases (7%). The forceps rate for the hospital is 5.3%. The increase for the trichlorethylene series can be entirely accounted for by the high percentage of primigravidae in the series.

Primary Post-partum Haemorrhage.—This is defined as a loss of more than 20 oz. (570 ml.) within 24 hours of delivery. There were 12 cases (3%). The incidence of post-partum haemorrhage for the hospital, if one excludes emergencies admitted because of post-partum haemorrhage, is 3.8%.

Conclusions.—Trichlorethylene does not appear to increase the operative delivery rate or predispose to post-partum haemorrhage. Occasionally it may cause uterine inertia if begun too early in the labour.

Ill-effects on Mother

There were no maternal deaths. No ill-effects on the respiratory rate were noted. No cases of bradycardia or arrhythmia were noted, but in three cases tachycardia was possibly connected with the administration of trichlorethylene.

Conclusion.—There was no definite evidence of any ill-effect on the mother from the administration of trichlorethylene.

Effect on the Foetus

Stillbirths.—There were 10 stillbirths among the 405 babies born, a rate of 24.7 per 1,000 total births. The stillbirth rate for the hospital is 27.4.

Neonatal Deaths.—There were 14 neonatal deaths, a rate of 35.4 per 1,000 live births. The neonatal death rate for the hospital is 36.6.

Incidence of Asphyxia.—Asphyxia was regarded as present if the baby did not cry within two minutes of birth or if it required resuscitation other than clearing of the air passages. Forty cases in which caesarean section, forceps, or other operative deliveries were carried out have been excluded, as other forms of anaesthesia were used. Using the above criteria, 28 babies showed evidence of asphyxia (7.8%).

Effect of Combination of Pethidine and Trichlorethylene in Production of Asphyxia.—Of the 28 cases of asphyxia 17 (60.7%) had pethidine in addition to trichlorethylene. In the whole series 57% had pethidine in addition to trichlorethylene. Thus it seems that, contrary to the Royal College of Obstetricians and Gynaecologists report, pethidine does not increase the incidence of asphyxia.

Premedication

A potassium bromide and chloral hydrate mixture was used in the early stages of labour followed by pethidine. By so doing, adequate analgesia was provided and the administration of trichlorethylene delayed until the cervix was dilated at least three fingerbreadths. The Royal College of Midwives allows these drugs to be administered by unsupervised midwives. No other drugs were used as premedication and no analgesic was given once the administration of trichlorethylene had begun.

Of the 228 patients who were given pethidine, 163 (71.5%) were in the "adequate analgesia" group and 65 (28.5%) in the "inadequate analgesia" group. Of the 172 patients who had trichlorethylene not preceded by pethidine, 127 (73.8%) were in the "adequate analgesia" group and 45 (26.2%) in the "inadequate analgesia" group. Pethidine can safely be combined with trichlorethylene, thereby shortening the duration of the administration of the latter, though it does not appear to improve the degree of analgesia obtained.

Conclusions

Trichlorethylene administered by the method described produces satisfactory analgesia, and it can safely be combined with pethidine without increasing the risk of foetal asphyxia. It does not increase the operative delivery rate or predispose to post-partum haemorrhage. It can safely be used by unsupervised midwives trained in the method of administration, with the following provisos: that administration is delayed until the cervix is dilated at least three fingerbreadths; that if the labour is not completed at the end of six hours the administration is stopped; and diminution in strength and frequency of the uterine contractions is an indication for discontinuing the administration.

I wish to thank the midwives for their co-operation and assistance in completing the forms.

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The St. John Ambulance Association has published a booklet designed to show older children the importance of personal hygiene and the hygienic handling of food. It is intended as the basis for the association's preliminary course on these subjects. The booklet, which has been written by Dr. Guy Bousfield, may be obtained from the association at St. John's Gate, London, E.C.1, price 1s. 6d. (by post 1s. 8d.).

Medical Memoranda

A Case of Primary Red-cell Aplasia

Primary aplastic anaemia is a rare condition occurring usually before the fourth decade. All the elements of the bone marrow are depressed, and the consequent symptoms of anaemia, with mouth infection and haemorrhage into skin and mucous membrane, have been long recognized. In recent years, however, it has been demonstrated that aplasia of bone marrow can occur which involves only the red-cell element. In view of the rarity of this condition it is of interest to record the following case.

CASE REPORT

A male infant aged 11 weeks was referred to hospital on July 3, 1950, because of extreme pallor. It was stated that the pregnancy and delivery had been normal, and that he had weighed 7 lb. (3.2 kg.) at birth. The mother declared that the child had been slightly yellow on the first day of life and had remained so for two or three days. Pallor had been noticed some weeks before admission, but it had grown steadily worse. There were two other children. The first had died of pneumonia at 7 months, and the mother stated that it also had been slightly yellow on the first and second days of life. The second baby was healthy and of normal colour. The mother and father were in normal health.

The baby, which weighed 10 lb. (4.5 kg.), was seen to be very pale. There was no icterus; neither liver nor spleen was palpable, and there were no other abnormal physical signs. A green stool was passed soon after admission, but subsequent stools were normal. Blood examination on July 3 showed: haemoglobin, 16%; red cells, 630,000; white cells, 5,850, with 41% polymorphs. The red blood cells showed macrocytosis, anisocytosis, and poikilocytosis. The blood was Group O, rhesus-positive. The mother's blood was Group B, rhesus-positive. Tibial marrow examination showed "moderate cellularity, red-cell precursors almost entirely absent, an occasional normoblast (less than 0.5%), and no gross abnormality of white cells. Apparently a pure red-cell aplasia." The blood W.R. and Kahn test were negative, and x-ray examination of the long bones revealed no abnormality.

Blood transfusions were given at intervals of three to five weeks. He was also given iron and folic acid by mouth, and liver by intramuscular injection, which proved ineffective. The baby has continued to develop well, and usually seems happy until the haemoglobin drops below 40%. At the time of writing he is 18 months old and in good health, having had no illness except mild diarrhoea once in the past three months. Further bone-marrow examinations confirmed the diagnosis.

COMMENT

Clinically this case was one of severe anaemia. There was no history of blood loss, and examination of the bone marrow showed that the essential defect was failure to produce red cells, and red cells only.

Prior to 1932 three cases of pure red-cell anaemia had been described (Kaznelson, 1922; Baar, 1928; Lupu and Nicolau, 1931). Since then, however, further cases have been put on record. Diamond and Blackfan (1938) described four cases, with recovery in one case after two years' treatment with blood transfusions. Numerous substances were given by mouth in the hope of stimulating erythropoiesis, but none were successful. Splenectomy, performed at 16 months, produced a remission in one case. They thought that aetiological factors involved were probably either congenital deficiency of red-cell element of the marrow or a defect in the metabolism of the blood.

Macfarlane and Currie (1943) described a case occurring in a woman aged 22 who died of fatal pyrexia following a blood transfusion. Rinvik (1941-2) described two cases in infants between 2 and 3 months who were kept alive for long periods by blood transfusions. Robson and Sweeney (1948) described a case of red-cell aplasia arising in a child of 18 months.

Smith (1949) refers to the condition as chronic congenital aregenerative anaemia. He postulates prolonged depression of the red-cell elements of the marrow by an antibody of the red-cell elements formed during foetal life. This antibody is thought to be due to ABO incompatibility between mother and child—for example, the infant's group being A and the mother's O. The history of jaundice shortly after birth would make this theory attractive in our case, but the patient's being Group O militated against the hypothesis. Further test showed no incompatibility between the child's cells and the mother's serum.

I am indebted to Dr. R. D. C. Johnstone for permission to publish this case, and to Dr. F. Graham Lescher for his advice and encouragement.

MICHAEL DONNELLY, M.D., M.R.C.P.,
Senior Medical Registrar, General Infirmary, Burton-on-Trent.

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Immediate Death after Intravenous Injection of Iodoxyl

Death following the intravenous injection of contrast media for pyelography is very rare. When it does occur it may be immediate or delayed, the immediate death being due to reaction to the drug, and the delayed death being due to pre-existing severe renal damage, which may or may not be aggravated by the injected substance. All immediate deaths hitherto reported in the literature have followed the injection of diodone (3:5-di-iodo-4-pyridone-N-acetic acid and diethanolamine), and none so far have been reported after the administration of iodoxyl (disodium-N-methyl-3:5-di-iodo-4-pyridoxyl-2:6-dicarboxylate). The following case, therefore, is of interest in that a fatal anaphylactic type of reaction occurred after the injection of this drug.

CASE REPORT

A technical mechanical engineer aged 53 was admitted to hospital on September 8, 1951, for investigation of diarrhoea, vomiting, and swelling of the left leg. These symptoms had been present for three weeks. There was nothing relevant in the past history: his general health had been good and his weight was steady.

Physical examination revealed a large fixed mass in the pelvis and gross oedema of the left leg, extending to the groin. There were no other abnormal physical signs. His blood pressure was 150/90, and Hb 92% Haldane (13.6 g.%). Urine: reaction acid, no albumin or sugar, culture sterile. Blood urea, 15 mg. per 100 ml.; serum protein, 6.48 g.%.

Sigmoidoscopy under anaesthesia revealed no growth. It seemed probable that the oedema was due to pressure of the mass on the vessels of the left leg, so intravenous pyelography was ordered to exclude ureteric obstruction by the mass.

On September 13 20 ml. of iodoxyl solution ("pyelectan") was injected intravenously. The solution had been warmed to 37° C. and was given slowly (three to four minutes). During the injection the patient was asked whether he felt any ill effects, particularly pain in the arm, which often

occurs with this preparation. The complete absence of any local reaction was remarked upon at the time. As the radiographer was about to take the five-minute picture she noticed that he failed to co-operate. He complained of dyspnoea, a tight feeling in the chest, and a desire to defaecate.

On examination he was dyspnoeic and his pulse was weak, fast, and irregular. Nikethamide, 3.5 ml., was given intravenously at once, with slight improvement, and he was returned to the ward immediately. By the time he arrived in bed (10 minutes after the injection) he had become intensely dyspnoeic and moist sounds could be heard all over the lung fields. He began to expectorate a large amount of frothy sputum. His pulse was now imperceptible and there was marked peripheral circulatory failure, with deep cyanosis. Atropine, 1/33 gr. (2 mg.), and morphine, 1/16 gr. (4 mg.), were given intramuscularly.

In spite of all efforts at resuscitation (oxygen, artificial respiration, and aspiration of the pharynx) his condition deteriorated rapidly and he died three-quarters of an hour from the time of the injection.

Post-mortem Report.—A well-nourished man. No external injuries. Heart: muscle rather flabby and fatty, otherwise normal. Lungs: acute oedema present; all air passages full of pale frothy fluid. Liver: slightly congested and slightly fatty. The spleen and kidneys were congested. The bladder was normal. In the pelvis was a small collection—a few drachms—of thick yellow pus arising from a perforated diverticulum of the rectum. There was an area of induration around the bowel, but the mucosa was normal. The stomach and intestines were otherwise normal. Oedema of the left leg was present, but no thrombosis was found. **Cause of death:** acute pulmonary oedema and myocardial degeneration accelerated by perforation of diverticulum of the rectum.

COMMENT

The empty ampoule and the remaining full ampoule of the box were returned to the manufacturers for analysis, and were found to be pharmacologically pure.

Pendergrass *et al.* (1942), in their survey of 661,800 pyelographic examinations, record 10 immediate deaths—all following the administration of diodone. Of these, three presented a clinical picture and necropsy findings very similar to the above case.

The cause of the reaction is obscure, but it is now generally agreed that it is not due to the iodine in the compound, but to some other part of the molecule. Thus, Gautot (1950) suggests that these are anaphylactic reactions, and that the sensitizing agent is diethanolamine in the case of diodone. He points out that this substance is used in the manufacture of many toilet and household preparations, and that from these sensitivity is acquired.

No reliable test for sensitivity has so far been discovered, and the prevention of an occasional very severe or even fatal reaction in a healthy patient with normal renal function seems to be impossible at present.

If the condition is recognized at once adrenaline should be given. However, in the present case it was not until the patient had developed acute pulmonary oedema that the true nature of the condition was recognized; at first, either a coronary occlusion or a pulmonary embolus appeared more likely. Even if treatment is given promptly, as it was in most of the cases so far reported, it seems to have little or no effect upon the course of the illness in the fatal case.

I wish to thank Mr. Kenneth James for permission to report this case, and Messrs. Glaxo Laboratories Ltd. for their help.

G. S. RAMSAY, M.B., F.R.C.S.,
Surgical Registrar, Gordon Hospital, London, S.W.1.

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Reviews

PROGRESS IN ENDOCRINOLOGY

Ciba Foundation Colloquia on Endocrinology. Volume 1: Steroid Hormones and Tumour Growth and Steroid Hormones and Enzymes. Volume 2: Steroid Metabolism and Estimation. Volume 3: Hormones, Psychology and Behaviour and Steroid Hormone Administration. Volume 4: Anterior Pituitary Secretion and Hormonal Influences in Water Metabolism. General Editor for the Ciba Foundation, G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., assisted by Margaret P. Cameron, M.A., A.B.L.S. (Pp. 1,716. 30s., 35s., 35s., and 45s. respectively.) London: J. and A. Churchill. 1952.

In recent years increasing use has been made of the colloquium to enable research workers in a particular field to discuss together their progress and their problems. The main purpose of such colloquia is the airing of difficulties, and papers submitted therefore tend to serve a rather different purpose from those published in the scientific and medical periodicals. In the colloquium, for example, the subsequent discussion of a paper may sometimes be more valuable than the paper itself. To be effective such conferences must be restricted to a relatively small number of experts and must be rather informal. Inevitably many workers in the subject will be excluded from attendance.

The Ciba Foundation in London is to be congratulated on the very successful manner in which it has organized and sponsored a series of such colloquia on various subjects and has been able to ensure a genuinely international representation. Many of these have been on matters related to steroid and pituitary hormones, and the reports of eight conferences on steroids are now published in the four volumes under review, so that the full discussions may be available to a wider audience.

The number of papers, each with its subsequent discussion, is so large that no adequate mention can be made here. The first conference is on hormones and tumour growth. Most of the papers relate to animal experiments, but two are devoted to the use of oestrogens in human cancer control, and a third to the use of cortisone and A.C.T.H. in acute leukaemia in children. In the second conference, on steroids and enzymes, many papers are concerned with the functions of β -glucuronidase in synthesis of glucuronides, but several other enzymes are discussed. In the conference on estimation of steroid hormones five papers are devoted to pregnanediol excretion and estimation, eight to the chemical methods of estimation of oestrogens, and one to the metabolism of radioactive oestrogens. Many papers also are devoted to the difficulties of extraction and estimation of urinary so-called adrenal steroids. A major conclusion in this section is that no satisfactory technique is yet available for extracting such adrenal steroids from urine and that indeed "no worker at the present time is estimating the total urinary corticoid." The reasons for such a conclusion are well discussed. The fourth conference deals mainly with the intermediate metabolism of the steroid hormones. In the conference on hormones, psychology, and behaviour the influence of hormones on sexual behaviour and drive are fully considered. Apparently sexual performance in the male is far more dependent on an intact cerebral cortex than it is in the female. An interesting study shows that the wild rat, exposed to the frequent stresses of its natural life, has far larger adrenal glands than its sheltered cousin the laboratory rat. Interesting speculations are made on the possible comparable effects of civilization on the adrenals of man. The authors of some papers discuss at length the effects of hormone therapy and of endocrine disease on personality, others study endocrine function in patients with established mental disorder. Qualitative and quantitative differences are found in schizophrenia. The sixth colloquium is on modes of hormone administration. The graphic method of displaying oestrogen action on the feathers of fowls is well illustrated in a series of plates, and several

studies are reported of the rate of absorption of steroid from implanted pellets in man. Useful clinical data are presented in this section.

The conference on anterior pituitary secretion comprises 37 papers and their discussions. It deals with the cells in the pituitary originating the various hormones, the hypothalamic paths of pituitary control, the bio-assay of the various hormones, the fate of tracer-labelled pituitary hormones, and many allied aspects. The eighth conference, on water metabolism, presents 15 papers covering excretion of sodium, water, acids and bases, and so on. It includes evidence suggesting the presence of a sodium-retaining hormone in human urine.

The very large amount of information in these volumes is of interest primarily to research workers and others interested in the technical problems concerned. Much of it is difficult to obtain elsewhere. The books are well produced, but it is disturbing to find that about two years have elapsed between the holding of many of these colloquia and their appearance in book form. In a research field as active as endocrinology this is far too long an interval, and speedier methods of publication must be found if these reports are adequately to serve the purpose for which they are intended.

C. L. COPE.

MEDICAL MYCOLOGY

Medical Mycology: An Introduction to its Problems. By G. C. Ainsworth, B.Sc., Ph.D., F.L.S. (Pp. 105; illustrated. 15s.) London: Sir Isaac Pitman and Sons. 1953.

In about 100 pages the author makes a commendable effort to introduce to students of mycology, medicine, and microbiology the history, pathogenesis, epidemiology, and clinical aspects of fungous diseases. The book is a useful introduction to classical and recent literature, but the absence of reservation when referring to certain published works may give rise to misleading impressions. Minor inaccuracies, too, arise from excessive summarization. *Cryptococcus neoformans*, for example, is described as producing no local tissue reaction, while, in fact, various degrees of subacute inflammation do occur in torulosis. Established clinical names like "tinea capitis" are criticized for being imprecise. But general terms for ringworm infections of this kind are found useful in practice, and the degrees of acuteness of inflammation produced by their various causative fungi are well recognized. Undue prominence is given to the virulence of *Candida albicans* by attributing to its invasion the death of infected children. Reference to this organism as a secondary invader in tuberculosis is unqualified. Therapeutic measures against moniliasis and aspergillosis are mentioned as if their efficacy was proved. It is more than can be expected from a work of this size, which deals with so much, that the incidence of mycotic infections in any one country could be made apparent. The author states that neither the mycologist nor the clinician alone is usually in a position to come to a correct decision on the right interpretation of fungi found in the sputum or associated with pulmonary disorders. This problem does not occur in practice. Sections are devoted to botanical taxonomy (on which Dr. Ainsworth is an accepted authority) and to serology. There is a useful chapter on allergy, and a place is found for the poisonous fungi. The structure of pathogenic fungi and the histological reactions they incite are not described.

R. W. RIDDELL.

USING THE LIBRARY

How to Use a Medical Library. By Leslie T. Morton, A.L.A. Second edition. (Pp. 44. 5s.) London: William Heinemann Medical Books. 1952.

To the student, using the library often enough means asking at the desk for a familiar book or periodical; if it happens to be "out," he grumbles and waits or chooses the next best thing. The doctor, especially if he is a research worker, is more resourceful. He has a vague idea that libraries do more than issue books, but it may take him years to learn,

in casual fashion, of the full range of services available to those who know how to ask for them. By buying this excellent little book he can anticipate experience and do himself—and librarians—a good turn. The author, formerly librarian of St. Thomas's Hospital Medical School and now information officer of the *British Medical Journal*, here provides a complete guide to all who use medical libraries—students, doctors, and research workers.

He begins by noting that work in the library is just as important as bench work—a point not always fully appreciated. Later chapters are on the geography of a library, sources of information and how to use them, the location of works not possessed by the library, references, catalogues, periodicals, and abstracts. The last chapter, based on Le Fanu's directory, is an up-to-date guide to the chief British medical libraries.

The information is comprehensive and the advice in the main sound. The style is close-knit, and most of us will have to read the book more than once to understand it—have not an easy task because of the very small type. When looking up the literature on any topic, surely it is best to get the latest review and to work back. This, so far as I know, is standard practice, but it gets three lines, as against the page or so for the appalling method of starting at the year dot and working forward. The research worker can no more delegate his bibliographic work than a surgeon can his operating—if he has any self-respect. In fairness to authors, original papers should always be studied, because abstracts are of necessity selective and do not provide a satisfactory basis for criticism of their work. The book will serve its main purpose admirably; may it also bring home to many the grievous blow medicine has suffered by the stoppage of the *Index-Catalogue*.

RAYMOND WHITEHEAD.

PSYCHIATRY AND THE STUDENT

Psychiatry and Medical Education. Report of the 1951 Conference on Psychiatric Education held at Cornell University, Ithaca, New York, June 21-27, 1951. Organized and conducted by the American Psychiatric Association and the Association of American Medical Colleges. (Pp. 164. No price.) Washington: American Psychiatric Association. 1952.

As a counter to increasing specialization in medical and scientific work it is now very fashionable to hold conferences for the exchange of views between the different branches. Advanced by the need for urgent solutions to technical problems in time of war, the method had considerable success, inspiring as it did a generous pooling of knowledge and the suppression of prejudice. It was soon recognized that it was in the preparatory commissions that the real work was done, and that the formal sessions tended to vagueness and platitudes. Psychiatric education has a good precedent in this field, and the reports of the four annual conferences of 1933-6 on this subject give a very great deal of information, even if every school has since continued to develop in its own way. This book contains a well-edited report of the conference conducted in 1951 by the American Psychiatric Association and the Association of American Medical Colleges.

The subjects under discussion included the extent to which a student should, on qualification, be able to deal with personal problems as well as those of disease, the selection and preliminary training of students from the point of view of their later contact with the social and psychological aspects of disease, and the deficiencies in the present medical curriculum. The view appears now to have been accepted that teaching on mental disorders is of secondary importance to educating the student in the psychological aspects of physical disease and of his relation with his patients. In selection, the early enthusiasm for the use of tests and selection procedures instead of traditional methods has settled down to a useful compromise in which the value of character as well as mere intellect is recognized. Some remarkable figures are given for the incidence of personality problems requiring psychiatric help among medical students,

amounting to nearly half in some studies, and it is refreshing to hear that at one school at least the students were "as a group rather hostile to psychiatric help."

The report is a readable but rather inconclusive presentation of the present situation in the United States, and it contains much experience from which we in Britain could benefit. It would be a pity if medical-school authorities expressed any strong views without first reading this book and being aware of the excellent bibliography on the subject. A selection of original papers likely to be of use to those concerned in designing the medical curriculum is given at the end of the book, and sets of these have been reprinted as a companion to the report.

ALEXANDER KENNEDY.

THERAPEUTIC THORNS

Side Effects of Drugs. By L. Meyler. Translated by Ph. Vuisje and W. Mulhall Corbet. (Pp. 268. £1 10s.) London: Elsevier Publishing Co. 1952.

There are no potent therapeutic roses without their thorns. In this work the author has attempted to enumerate all the side-effects of various drugs in common use in the hope that the book will be useful in determining whether new symptoms arising in the course of certain diseases are due to the malady suffered or to the remedy given. The ambition is laudable, and one can imagine a work of reference of this kind being of the greatest service. The present volume, however, is the most extraordinary hotch-potch of information on the subject derived partly from original articles and partly from a study of the abstracts in *Excerpta Medica*. The facts are thrown together without any plan or arrangement in an utterly higgledy-piggledy and inconsequent manner interspersed with the most erratic punctuation. The translators have a somewhat sketchy knowledge of English, derived, it would seem, from an extensive study of Mr. Jingle's pronouncements. Little or no attempt is made to indicate the relative frequency of this or that side-effect or toxic reaction, their mode of production, or their prevention and treatment. A sentence describing some of the side-effects of "antabuse" will indicate better than any description the singular style of the book:

"The patients feel very sick, they have a throbbing headache; itching erythema; glycosuria. Fatal cases have been reported. A patient died after taking 30 ml. of rum; a marked dilatation of the right heart was found. Tetany due to hyperventilation; acute nephrosis. Persons taking antabus cannot use tonics and cough medicines in alcoholic vehicles; neither can they have massage with alcohol."

While the book has a certain charm because of its ingenuous quality and the amount of odd and alarming information which it contains, it can hardly be recommended.

D. M. DUNLOP.

Among new editions of British books that have appeared recently is MacKenna's *Diseases of the Skin* (Baillière, Tindall and Cox, 42s.). The fifth edition has been prepared by Dr. R. M. B. MacKenna, son of the original author, Dr. R. W. MacKenna. It is a textbook designed to meet the needs of student and practitioner, and has been completely revised. Many illustrations are included, some in colour. Dr. C. Langton Hewer has revised his *Recent Advances in Anaesthesia and Analgesia* (J. and A. Churchill, 30s.) for the seventh edition, and added a new chapter on the induction of hypotension to minimize blood loss during operations. Many chapters have been largely rewritten. In the thirteenth edition of Dr. W. M. Frazer's *Textbook of Public Health* (E. and S. Livingstone, 42s.) the author has made many changes in order to describe the effects of the National Health Service on the public health and hospital services. New material is also included on the National Assistance Act of 1948, and on the supervision of milk supplies. In the sixth edition of his well-known textbook *Medicine: Essentials for Practitioners and Students* (J. and A. Churchill, 37s. 6d.) Dr. G. E. Beaumont writes that he has endeavoured to omit what one of his reviewers referred to as the "organic nonsense" and the "historical nonsense" of medicine, and he has added much material on recent advances. There are new articles on, among other subjects, Q fever, temporal arteritis, anticoagulant drugs, headache, and the adrenocortical hormones.

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THE VESALIAN HERITAGE

Who are they whose work forms the foundation of scientific medicine? In judging special eminence opinions may differ, but few would dispute the claims of four men—Andreas Vesalius of Brussels (1514–64), William Harvey of Folkestone (1578–1657), Herman Boerhaave of Leyden (1668–1738), and Louis Pasteur of Dole (1822–95). On Vesalius, first of these great men in point of time, two works have appeared quite recently. One is *Three Vesalian Essays*, issued by the New York Academy of Medicine; the other, by Professor Singer, is *Vesalius on the Human Brain*, and is reviewed at p. 449.

Vesalius is a critical figure not only in the history of medicine but also in the history of thought and therefore in world history. His great book, *De Humani Corporis Fabrica* (1543), "On the Working of the Human Body," is a turning-point of the human spirit, for it set men on the task of exploring with their hands and eyes the intimate nature of living things. In it is clearly felt for the first time since antiquity the authentic and refreshing breeze of scientific research, conscious of itself and of its aims. In that book the systematic observation of Nature is set forth as a guide to the systematic control of Nature: *savoir afin de prévoir*. Foreseeing, *prognosis*, the Father of Medicine advised us more than two thousand years ago, lends peculiar confidence to the physician and peculiar power to his words. Anatomy, the only sure foundation of prognosis and the basis of all that is exact in medicine, must always look back to Vesalius. It is likely that Vesalian research and the flow of Vesalian literature will long continue, for the book of Vesalius is both enormous and difficult; it is a thing of such beauty that it must arrest attention in any library or museum; its author's life was linked with certain great movements of history; he was a spiritual wanderer between two worlds, the mediaeval and the modern. There are still many unsolved problems concerning both the man and his book, and their solution demands many kinds of knowledge seldom assembled in the same head.

For many years it had been known to a small circle that there survived some of the wood blocks of the figures in the great work of Vesalius. In 1932 the matter came to the ears of the late Dr. Samuel W. Lambert, a distinguished New York physician. On Lambert's action these blocks were ultimately discovered by Dr. Wiegand, of Munich, in the university library there. In 1934 they were used by the New York Academy of Medicine in conjunction with Munich University for their magnificent volume *Vesalii Icones Anatomicae*. This superb volume, itself a showpiece, contains all the figures associated with Vesalius and puts them within the reach of all who have access to a good library. This was none too soon. The service which the initiators of this noble tome were rendering to learning was greater than they knew, for the original blocks were utterly destroyed during the war.

A hardly less important production was Harvey Cushing's posthumous *Bio-Bibliography of Vesalius* (New York, 1943), which appeared at about the time that the blocks of Vesalius were themselves destroyed. Finally revised and certainly greatly improved by Professor John F. Fulton and his coadjutors, after Cushing's death in 1939, this work represents a constant interest of Cushing's, extended over more than 40 years. Every bibliographical detail that could be desired is included. It is an indispensable work not only for the life of Vesalius but for the study of a most eventful and critical period of cultural and political history.

Since the end of the war the rate of appearance of Vesalian literature has accelerated rather than slowed. Professors J. B. de C. M. Saunders, the anatomist, and C. D. O'Malley, the historian and Latinist, have long been collaborating in Vesalian research. In 1946 they produced an impressively documented translation of the difficult *Blood-letting letter of 1539*. Though this work of Vesalius is of little scientific significance in itself, it is perhaps the most important of all his writings for the understanding of the background of his life, his labours, and his personality.

In the same year the Wellcome Historical Medical Museum issued Professor Singer and Dr. Rabin's *Prelude to Modern Science*, a translation with running commentary of the *Tabulae Sex* of 1538, the first anatomical work of Vesalius. It displays the mental equipment with which he started on his great task and reveals much of the origin of our own anatomical nomenclature. We still lacked an English version of any considerable part of the *Fabrica*; Vesalius issued with it in the same year his so-called

Epitome of that work. This was intended not for medical but for "general" readers and perhaps especially for art students. It was rendered into English for the Historical Medical Library of Yale by Professor Lind in 1949, and is perhaps of most value for the light it throws on the adaptation by Vesalius of ancient Greek anatomical terms. It was followed in 1950 by the convenient quarto volume by Saunders and O'Malley, *The Illustrations from the Works of Vesalius*. This last contains the best account of the life of Vesalius together with translations of the captions of all the figures that he used and much other very valuable material.

The *Three Vesalian Essays* is now issued to accompany the *Icones* of 1934. In the foreword Dr. Malloch justly remarks that to many the impressions of the woodcuts in the *Icones* are even more beautiful than those in the original works from which they were prepared. The *Three Essays* open with a learned account by Dr. Lambert of the initial letters used by Vesalius. These are skilfully and often humorously decorated with human figures. They tell much of anatomical and surgical practice of the time. "Marginal Notes" by Dr. Willy Wiegand recount the story of the discovery of the lost blocks. Lastly Mr. Ivins eloquently expounds yet again his unconvincing and quite untenable theory that Vesalius was a nonentity whose sole originality was in choice of artist and that his text is of little value. In fact the Latin of Vesalius is difficult and verbose. This may explain why no substantial part of the *Fabrica* has been made available in English. However, in his *Vesalius on the Human Brain* Professor Singer has now provided a version in plain English of all on that subject that the *Fabrica* has to say. He has equipped it with an illustrated record of the debt that the account of the brain by Vesalius owed to its predecessors.

In looking at all these beautifully illustrated books the reader has constantly to remind himself that Vesalius had no means of preserving or hardening pre-structures, and that he had hardly any effective predecessors since Galen, though it is true that he acknowledges inadequately such debt as he does owe them. Professors O'Malley and Saunders have long been at work on their translation of the complete text of the *Fabrica*. Its completion and publication must still take years—perhaps many years. When in due course it appears it will crown the series of *opera magnifica* which meanwhile not unworthily commemorate the great father of anatomy whose work is the foundation of all scientific medicine.

TRICHLORETHYLENE ANALGESIA
IN LABOUR

Provision for pain relief during childbirth varies widely from country to country. At one end of the scale is Britain, with some form of analgesia available to every mother: at the other are countries where even leaders in the field of obstetrics hold the opinion—perhaps not always shared by their patients—that the pain of childbirth has a beneficial effect on mother and child and that relief is undesirable. It is sometimes held against us in Britain that so many home confinements are supervised by midwives, but a point in favour of our practice is that midwives are permitted, if not encouraged, to administer gas-and-air analgesia. This method, if it has not brought complete relief to more than a relatively small proportion of patients, at least has done few of them and their babies any harm. Moreover, ever since gas-and-air analgesia began to come into fairly general use by midwives in this country in the years immediately before the war there has been a restless search, perhaps stimulated by an insistent demand from the public, for an alternative method which could be equally easily and safely self-administered and which would be more effective in a greater proportion of cases.

Many are now pinning their hopes on trichlorethylene ("trilene"), the analgesic powers of which have been known ever since the first world war, when German workmen learnt the effects of inhaling the vapour as they leaned over degreasing vats containing the liquid. In recent years trichlorethylene has been used on an increasing scale both as an anaesthetic and as an analgesic, and its actions and effects are reasonably well understood pharmacologically and clinically. If numbers of administrations mean anything, it has proved itself a very safe anaesthetic and analgesic. A characteristic example of the careful and thorough investigations into the efficacy of trichlorethylene as an analgesic in labour is that of Seward,¹ who four years ago determined the effective concentrations of trichlorethylene in air, and concluded that it was a more satisfactory and powerful analgesic than gas and air, though he pointed out that its prolonged use might lead to some cumulation. The advisability of allowing midwives to use trichlorethylene has been under consideration for the last few years by a committee consisting of obstetricians, anaesthetists, midwives, and research workers. Difficulty has apparently arisen over which apparatus midwives should be allowed to use. Understandably, the desire

¹ *Lancet*, 1949, 2, 781.

of the committee has been to make sure that any device approved for this purpose should deliver suitable, safe, and unvarying concentrations of the vapour. So far the committee has not yet given its approval to any apparatus. Commercial interests, however, alive to the possibilities of development in this field, have put several inhalers on the market. These are not only said to administer the concentration of trichlorethylene in air which clinical observation has determined to be effective, but also have a device which automatically neutralizes the effects of changes of temperature within the inhaler. On another page in this issue Dr. E. E. Rawlings describes his experiences with one such inhaler. He comes to the conclusion that the analgesia produced by it is satisfactory, but he adds a similar caution to that of Seward in advising against prolonged administration. For this reason he delays the administration of trichlorethylene until the cervix is dilated to three finger-breadths. On the basis of these two careful investigations alone—and there are others—it seems that perhaps there is still some justification for caution before allowing midwives to administer trichlorethylene on their own, not so much on the grounds that the inhaler is not mechanically all that it should be, but rather that trichlorethylene itself, by virtue of its cumulative effects, demands skill and judgment in the administrator which not all midwives would necessarily possess. It would in any case hamper the acceptability of an analgesic if the time for beginning its administration had to be fixed by any criterion other than the patient's sensations. Pain, being subjective, can hardly be related to some objective fact such as the dilatation of the cervix. Any acceptable method of analgesia should be usable as soon as the patient desires relief from pain, the intensity and nature of which only she can judge. In the meantime there is no reason why doctors should not continue to administer trichlorethylene analgesia in labour with one of the inhalers available. The accumulation of their experience will help to clarify still further the value and place of trichlorethylene in labour.

At least one expression of opinion on this vexed question will find general agreement—that in spite of the progress that has been made the alleviation of pain in labour remains an urgent and important task for all working in this field.

LEUKAEMIA IN DOCTORS

In the U.S.A. leukaemia has been found to occur much more frequently as a cause of death among radiologists than among physicians in general, and the excess has been associated with exposure to x rays.¹ The radiologists constitute less than 1½% of the medical profes-

sion, and it would be interesting to know whether physicians who are exposed only occasionally to x rays show any increased incidence of leukaemia in comparison with other professions. In Britain evidence on this point is lacking, and the Registrar-General's report on occupational mortality during the three years round the census of 1931 gave no conclusive indication of any such excess.² In the years 1930–2 there were five deaths among 25,063 physicians and surgeons between the ages of 20 and 65 compared with an expectation of three if the rates at each age had been the same as for all males; and there were three deaths at ages over 65 in a population of 4,838. In another professional group of similar size, clergymen and other ministers of religion, nine deaths occurred at ages 20–65 in a population of 25,721 compared with an expectation of three; and there were six at ages over 65 among 10,976. These figures were not suggestive of special risk from x rays at that time, and no more recent national figures are available; the occupational mortality analysis round the census of 1951 must be awaited.

In a recent paper Peller and Pick³ have produced statistics derived from the obituary notices of physicians which appeared in the *Journal of the American Medical Association* during 1947–51, and have compared them with the official statistics of deaths in the United States in 1948. The cause of death was disclosed for a total of 11,481 physicians out of 14,516 whose deaths were reported, and 133 of the total were attributed to leukaemia and 1,426 to other forms of malignant neoplasm. The proportion of leukaemia to all causes of death among the doctors was 5% at ages under 35, 2.3% at 35–44, 1.1% at 45–54, 1.2% at 55–64, and 0.9% at ages 65 and over, compared with about 1.2, 0.8, 0.7, 0.6, and 0.4% respectively among all males according to official statistics. Proportionate mortality may be deceptive unless the death rates from all causes of the groups compared can be safely assumed not to differ appreciably. But the authors estimate that, after correcting for peculiarities in the age distribution, there was no appreciable disparity between the general death rates of physicians and the average for all males.

The Registrar-General's statistics of 1930–2 showed that in England and Wales mortality of physicians and surgeons from all causes was 8% below average at ages 25–34, 6% below at 35–44, 8% above at 45–54, and 11% above at 55–64. It is highly probable that this gradient of relative general mortality is now more pronounced than it was, and this might go some way to account for the diminution with advancing age in the proportionate mortality for leukaemia in physicians, from four times the average at 25–34 to about twice the average at 45–64. Neither this, nor the changes in the method of selecting the underlying cause of death which were made in the United States after 1949, seem to account for the excessive leukaemia death rate indicated in this study among doctors in the U.S.A. It is estimated, further, that among the physicians who were neither radiologists nor dermatologists the leukaemia

¹ Dublin, L. I., and Spiegelman, M., *J. Amer. med. Ass.*, 1948, **137**, 1519.
² Registrar-General's *Decennial Supplement for 1931, Occupational Mortality*, 1938, Table 4A. H.M.S.O.
³ Peller, S., and Pick, P., *Amer. J. med. Sci.*, 1952, **224**, 154.

rate at ages between 35 and 74 was twice the average for all males. There remains the possibility that diagnosis and certification of leukaemia is more complete in respect of doctors than the general population, and, since this can neither be proved nor disproved, no firm conclusion can be reached at present. It is reassuring that by the same process of calculation the authors show that proportionate mortality from all other forms of malignant neoplasm among the physicians was substantially below that of all males at each age group between 40 and 75.

WORLD FOOD NEEDS

Over large areas of the world the supply of food remains less than it was before the war. This is the conclusion to be drawn from the Second World Food Survey undertaken by the Food and Agriculture Organization of the United Nations.¹ The first survey was made in 1946, when the world food position was at its worst, supplies were at their smallest, distribution most uneven, and hunger and outright famine most widespread. Since then, over the world as a whole, food production has expanded, but the increase has barely kept pace with the increased population resulting from a higher birth rate and, owing to the control of mass diseases such as malaria, a decreased death rate. Clear signs of any far-reaching changes in the scale of food production, essential for the improvement of nutrition, are lacking. In what are known as the O.E.E.C. countries—that is, the countries of Western Europe (except Spain and Portugal) and Greece and Turkey—if the total agricultural output was reckoned at 100 before the war, it is now 111. In the underdeveloped areas elsewhere in the world progress since the war ended has been much slower, and political disturbances in the Far East have hindered recovery. In striking contrast to the slow and painful progress in most of the other parts of the world, the high post-war output of North America stands out. In the United States, if again the pre-war figure be taken as 100, it is now 131, and in Canada 130. A quantitative estimate for the world as a whole shows the average food supplies, measured in calories, to be 6% lower than in the pre-war period. In the Far East, where nearly one-half of the world's population is concentrated, the decline is of the order of 10%. The large gaps between the better and the worse-fed nations have been widened. In India the calories supplied by the available food are 24% below the estimated need; in the United States 18.5% above the estimated need, and in the United Kingdom 17% above. To assess nutritional quality is more difficult than a quantitative reckoning, but surveys in most of the heavily populated regions of the world have provided evidence that diets are not satisfactory nutritionally.

The F.A.O. has worked out for each region of the world the gross quantity of foodstuffs that it should be possible to produce by 1960. One overriding consideration is that in seven years' time there is likely to be an

11% increase in world population, which is increasing by slightly more than 1% per annum. In Latin America, the Near East, and Africa the increase is about 2%, and in the Far East probably more than the 1% shown in statistics admittedly faulty. The largest increases of population are still taking place in areas where food supply is most seriously inadequate. On the other hand, the problem may be eased by the improvement in human efficiency resulting from successful public health measures. The attainment of the targets for 1960 assumes a favourable economic and political situation, financial and technical assistance for underdeveloped countries, and an immense capital investment.

FEELING THE COLD

The patient who complains of the cold may have a poor circulation through the skin or a poor metabolic heat production, as in myxoedema, muscular hypotonia, or flaccid paralysis, since the musculature is an important heat-producing tissue. Lack of subcutaneous fat, as in malnutrition or wasting disease, allows the heat produced to leak away faster, while the thicker layer of fat normally present in women enables them to stand the cold better than men. Their heat loss is 10% less under the same conditions. Their skins are colder in cold weather, but warmer in the hot by over 1° C. than those of men, because they sweat less. Clothing is an important barrier against the cold provided it is dry, absorbs sweat easily, and remains porous, so that air is trapped as stationary poorly conducting air cells. To these well-known facts must be added one sometimes overlooked: cold sensations are relative. If the left hand is placed in a bowl of water at 20° C., the right hand in one at 40° C., and then both are transferred to water at 30° C., the same water feels cold to one hand and hot to the other. This raises the question of how we appreciate cold, and it has to be admitted that there is no satisfactory explanation of all the facts.

Cold and warmth are separately appreciated.¹ Different points on the skin respond either to cold or to warmth, and peripheral sensory nerves when treated with cocaine or asphyxiated or cooled lose the power to transmit cold or hot sensations separately and under different conditions.² Cold-sensitive spots are at least 10 times more numerous than heat-sensitive ones, and it seems probable that they are fixed in location in spite of the fact that their distribution appears to change from test to test. They are not all equally sensitive to a given cold stimulus, and their individual sensitivities are constantly changing. This accounts for spatial differences found in different experiments. Certainly in the outer part of the cornea, in much of the conjunctiva, and in the glans penis—all sites which lack most of the senses of ordinary skin—cold is appreciated by histologically distinct sense organs, the end bulbs of Krause; these are small solid spheres of epithelial cells among

¹ Wadsworth, R. S., *Experimental Psychology*, London, 1938, p. 454.

² Bickford, R. J., *Clin. Sci.*, 1939, **4**, 159.

³ Hensel, H., *Pflug. Arch. ges. Physiol.*, 1950, **282**, 146, 197.

⁴ — and Zotterman, Y., *Acta physiol. scand.*, 1951, **22**, 96.

⁵ *Ibid.*, 1952, **28**, 345.

⁶ *Brain*, 1952, **75**, 325.

¹ Food and Agriculture Organization of the United Nations. *Second World Food Survey*, Rome, 1952. Obtainable from H.M.S.O., London. Price 2s. 6d.

which the sensory nerve fibrils branch. Elsewhere in the skin, biopsy of cold-spots has not shown any special structure.

The normal temperature of exposed skin is about 30–32° C., and usually the cold-spots give rise to sensations of cold only below 30° C. Paradoxically, however, they also give rise to sensations of cold when heated to 45° C., care being taken not to warm the heat-spots at the same time. They also may respond to mechanical and electrical stimulation. Hensel has been able to show with the help of his delicate thermocouple introduced into different levels of the skin³ that warm-spots continue to signal the heat long after the warmed skin has attained constancy at the new hotter temperature, while cold-spots in the tongue continue to send cold sensations when the tongue is kept constantly cold.⁴ In fact Dodt and Zotterman⁵ have demonstrated that these temperature sense organs send impulses up their nerves with a frequency which corresponds to the constant temperature, whatever it is. Further, they find that, in the cat's tongue at least, the heat spots cease to signal at temperatures over 47° C., and it is the cold spots in their paradoxical phase which then yield the sensation of heat.

How do these end-organs act like thermometers? Possibly, as O'Connor and McCarthy⁶ have recently suggested, changes in the physical state of fatty acids in the skin with changes in temperature may have something to do with the response, but it must be remembered also that the metabolic reactions of skin and nerve, like all chemical reactions, double their velocity for every 10° C. rise of temperature. The refractory period of the sense organ will change, and also the nature and concentration of substances in the surrounding tissue fluid. There may also be changes in blood flow and sweat rate to reckon with, for the skin is an organ and not a homogeneous tissue. Hitherto most research on temperature sensations has been carried out on normal persons. Perhaps repetition of the experiments on people with metabolic and neurovascular disorders, or with skin diseases such as psoriasis, would help to clarify what is at present a complex problem.

NURSES IN HOSPITAL

A model piece of research following upon the report, published in 1947, of the Working Party on the Recruitment and Training of Nurses has been undertaken by the Nuffield Provincial Hospitals Trust in the shape of a job-analysis of hospital nursing.¹ The work has been carried out by seven field investigators under the directorship of Mr. H. A. Goddard, with the help of an advisory panel of which Sir Ernest Rock Carling has been chairman. The investigators have directed their attention to the pattern of hospital ward work, the allocation of duties among different grades of nurses, and the manner in which the needs of patients are met. Twelve general teaching hospitals, covering a wide geographical area, were taken for the purpose, and about a week was spent in each of the medical and surgical wards selected for observation.

A distinction is made at the beginning of the latest report between basic nursing—by which is meant the care required for the well-being and comfort of the patient irrespective of the disease from which he is suffering—and technical nursing, a term which describes the special care given on account of the disease. Basic nursing was found to take up rather more than two-thirds of the nurse's time, and technical nursing just under one-third. The view of those responsible for this report is that the two functions cannot be separated and assigned to different individuals. Obviously the patient's physical comfort and freedom from mental worry may be as important a factor in his recovery as any technical treatment, and his nursing needs in both respects must be met by the same person.

It is sometimes said that the doctor claims an undue proportion of the time of the ward staff, but it was found on analysis that the time spent by the nurse with doctors averaged less than half an hour per bed per week. Consultants, in this observation at least, were always escorted by nursing staff, but in the case of house officers the practice varied. Allied with this was the vexed question of early wakening in the wards. The determining factor is the routine tasks to be completed before the doctors' rounds, which may begin at 9 a.m. In 18 of the 22 wards investigated patients were wakened before 5 a.m. A study of the rounds of visits showed that of 350 rounds by consultants 43 began before 10 a.m., a few before 9 a.m., and on 21 occasions house-physicians and house-surgeons visited the wards before the earlier hour. In two-thirds of the wards consultants' rounds were between noon and 2 p.m., the peak hours for basic nursing. Some ward sisters said that they had established the precedent that there should be no rounds during patients' mealtimes.

Student nursing figures largely in this investigation. Shortages of trained nursing staff or domestic workers react on the student nurse, who has to make good most of the nursing deficiency. So long as student nurses comprise more than half the labour force in the wards it is inevitable that their training should on occasion be subordinated to administrative necessity. The term "student nurse" is misleading; she is employed in the ward, but not specifically taught. The report states that maximum use is not made of the grade of ward orderly. Many people now filling the domestic post of ward orderly would be well qualified with suitable training to hold auxiliary nursing posts. Actually 25,000 ward orderlies are employed in the hospitals in this country, and there would be no difficulty in most areas in increasing the number, whereas assistant nurses are not coming forward in as large numbers as was hoped. To avoid the present excessive dependence on student nurses it is urged that more nursing auxiliaries be recruited from the labour sources which now provide ward orderlies, and, in the words of the advisory panel, the practical work entrusted to the student nurse should be planned in accordance with her training needs and carried out in conjunction with trained staff.

¹ *The Work of Nurses in Hospital Wards. Report of a Job-Analysis, 1953.* London.

REFRESHER COURSE FOR GENERAL PRACTITIONERS MISCARRIAGE

BY

JOHN BEATTIE, M.D., F.R.C.S., F.R.C.O.G.

Gynaecologist and Obstetric Surgeon, St. Bartholomew's Hospital, London

In this article the terms miscarriage and abortion are synonymous, and refer to the termination of pregnancy before the twenty-eighth week of intrauterine life. The incidence of spontaneous abortion in this country probably varies between 8 and 10% of all pregnancies. It is difficult to assess the frequency with which abortion is induced criminally, but the figure is high, particularly in the large cities, and it is this type of abortion which has the highest morbidity and mortality.

Causes

The commonest cause of spontaneous abortion is an abnormality of development of the foetus or trophoblast which is severe enough to cause death. This condition is in most cases a non-recurring factor, and the patient has an 80 to 90% chance of going to full term on the next occasion. For this reason it is safe to reassure the patient who has miscarried for the first time that her next pregnancy will most likely be uneventful. The mother is always anxious for a reason why she has miscarried, and it is safe to tell her that the most likely cause of a single miscarriage is a developmental abnormality of the foetus, so that it is as well that it did not survive. Reassurance is then given that such abnormalities are most unlikely to recur in subsequent pregnancies. Needless to say, this advice should not be given when the patient is still suffering only from a threatened miscarriage.

Probably the second commonest cause of miscarriage is an abnormality either of hormonal balance or of development of the uterus. In the former case the ratio between pituitary and placental hormones and oestrin and progesterone secretion is abnormal. In the latter case the uterus, being deficient in development, becomes more and more irritable as the cavity is stretched by the growing foetus, so that it begins to contract and retract, thus discharging its contents.

Diabetes, chronic nephritis, the acute specific fevers, and any disease which produces an acute toxæmia are less common causes of abortion. There is little evidence at present that rhesus incompatibility is a cause of miscarriage in the first three months of pregnancy. An acute emotional upset undoubtedly can cause the uterus to evacuate its contents.

A fibromyoma of the uterus may cause a miscarriage if it is submucous in distribution. However, many women with small uterine fibroids which are not submucous both succeed in becoming pregnant and in having a normal labour. Retroversion of the uterus is often associated with early pregnancy, but the malposition itself is rarely the cause of abortion. If abortion should be threatened or become inevitable in a first pregnancy, then the accompanying hypoplasia of the uterus is the more likely cause.

Thyroid deficiency may be a cause of miscarriage, but it is unjustifiable to administer thyroid unless clear evidence of deficiency is present. It is very doubtful if deficiency of vitamin E is ever a cause of infertility or miscarriage, at least in Britain.

Threatened Abortion

The symptoms of this condition are well known: bleeding from the uterine cavity, with or without a dull backache suggestive of the onset of menstruation, or even the presence of rhythmical uterine contractions. It is wise to pass a speculum with great gentleness to make sure that the haemorrhage is not caused by a mucous polypus or even a

carcinoma of the cervix. It is important to cause the patient as little discomfort as possible; a well-lubricated Fergusson, or duckbill, speculum should be passed upwards and depressed backwards until the cervix is exposed. It is common to have difficulty in finding the cervix because the speculum is passed into the anterior fornix.

The type of bleeding in threatened abortion is of interest. The haemorrhage comes from either the potential cavity in the decidua lining the uterus, which is present until the ovum fills the whole cavity at the third month, or more often from the attachment of the foetal trophoblast to the decidua basalis or the decidua capsularis. In either case the haemorrhage is at first bright in colour. If this continues to be bright red and increases in amount the prognosis is correspondingly less good. A single bright loss followed by the escape of old brown blood merely means that an initial haemorrhage has occurred but none since. It is not uncommon in threatened abortion after the third month for such a dark brown blood loss to go on for one to two weeks. This can usually be taken to mean that the foetus is growing satisfactorily; as the foetus grows it squeezes out the remaining old blood from the uterine cavity.

The amount of blood loss and pain which can occur without the abortion becoming inevitable is surprising. All cases should be treated as threatened unless there is very good evidence for saying they are inevitable.

With a threatened miscarriage the patient should stay in bed for five days after the bright red haemorrhage has ceased. The loss of dark brown blood is not a reason for keeping her in bed. There are few households now where a patient can be given a bed-pan on these occasions, and it will do her little harm if she is encouraged to use a commode or to go to the lavatory when necessary. Other-wise she should stay strictly in bed. It is important to give the patient paraffin or any mild aperient which suits her so that she does not have to strain at stool. Administration of sedatives is important. An initial dose of morphine, of ½ gr. (11 mg.), is advisable if the patient is much upset, and then phenobarbitone, 1 gr. (65 mg.) or less, three times a day, should be given for the next few days. Opinions differ so much on the vexed question of hormone deficiency in these cases that it is difficult to be dogmatic on this subject. The chances of a spontaneous recovery are high, and it is doubtful whether the administration of progesterone will be of any value, but the injection of 10 mg. on alternate days for five doses can do no harm. The use of anterior pituitary and chorionic gonadotrophic hormones is valueless.

When the patient has recovered she should be warned to take great care at the next two period times and to avoid coitus for the next three months.

Inevitable Abortion

A threatened abortion becomes inevitable when the bleeding increases greatly and uterine contractions become rhythmic and strong. The cervix then begins to dilate and products of conception may sometimes be felt protruding through the external os. Before the third month it is quite common for the foetus and trophoblast to be extruded intact when the abortion becomes complete. At about the third month the membranes often rupture and the foetus is passed, leaving the placenta behind, and all the complications of an inevitable incomplete abortion may arise.

It is of vital importance therefore to encourage complete evacuation of the uterus and to conserve blood loss

as much as possible. Everything that is passed per vaginam should be kept for examination; in this way it is often possible to establish that the abortion is complete. The passage of a decidual cast in a case of ectopic pregnancy may be mistaken for products of an intrauterine conception.

Treatment consists in complete rest in bed, which of itself lessens the amount of bleeding. An intramuscular injection of ergometrine, 0.5 mg., should be given four-hourly for three doses, and may be repeated in the next 12 hours. The use of oxytocin, 5 units (0.5 ml.), may be substituted for ergometrine, but the latter has a more prolonged effect on the uterine muscle. Posterior pituitary extract or vasopressin should never be used. Apart from maintaining asepsis as much as possible there is no other treatment to be given in a complete miscarriage other than the administration of the liquid extract of ergot, 1 dr. (3.5 ml.), thrice daily for a few days, as involution of the uterus is slow after abortion.

Inevitable Incomplete Abortion

This condition may create one of the worst emergencies that any practitioner has to deal with. It is possible for a woman to bleed so severely within the space of a few hours that the haemoglobin level drops to 20 or 30%, and often accompanying this is a severe degree of shock. If a patient is moved to hospital by ambulance before the shock is treated the latter may increase to a dangerous degree so that resuscitation becomes impossible. Such patients require immediate first aid, and if a flying squad is available this should be called upon to administer blood in the house before an ambulance takes the patient to hospital. The blood pressure should be taken and ergometrine, 0.5 mg., be given at once by intramuscular injection. The patient should be encouraged to take warm sweetened drinks and should be kept reasonably warm; the foot of the bed should be raised and morphine $\frac{1}{4}$ or $\frac{1}{2}$ gr. (16 or 11 mg.), given. When the blood pressure has reached a more normal level the patient should be transferred to hospital.

In some cases an incomplete abortion is not associated with severe bleeding, but the haemorrhage continues intermittently for many weeks and is due to a placental polypus. The uterus remains bulky and the cervix slightly dilated. Surgical evacuation of the uterus is then essential, and the patient should be admitted to hospital.

Sometimes it is difficult to decide whether prolonged irregular bleeding after a miscarriage is due to a placental polypus or to a complete abortion followed by an anovular type of bleeding from the endometrium. This may occur before the ovarian cycle is re-established normally. In either event, if the haemorrhage does not cease after a reasonable time a curettage is the best and most efficient form of treatment.

Septic Abortion

The uterine cavity may become infected before an abortion begins. This is often the result of a criminal attempt to produce abortion by an instrument in the cervical canal. The patient presents with severe suprapubic pain and a raised temperature and pulse rate. There may be no bleeding or uterine contractions and the cervical canal remains closed. There is some rigidity of the abdominal wall spreading outwards and upwards from the pelvic brim. The uterus is exquisitely tender on bimanual examination. Unlike puerperal intrauterine infections the organism in cases of septic abortion is often the staphylococcus and not the haemolytic streptococcus. Other organisms may also be present, such as *Bact. coli* and *Streptococcus faecalis*. An anaerobic streptococcal infection is not uncommon and gas-forming organisms may also be found. Massive doses of crystalline penicillin, 500,000 units six-hourly, should be given, together with a sulphonamide, until the symptoms and signs subside. It is wise to continue the antibiotic treatment for at least five days after the temperature has reached normal. A sterile throat swab should be used to

obtain a specimen of secretion either from the vault of the vagina or from the cervical canal through a vaginal speculum as soon as the patient is first seen. This is particularly necessary at present, because it is now common to find penicillin-resistant staphylococci. The swab should be sent to the laboratory at once for culture and to determine the sensitivity to antibiotics and sulphonamides. After the temperature has subsided the uterus may be left to evacuate itself spontaneously if the ovum is dead.

In cases of inevitable incomplete septic abortion the treatment may be of two kinds. First, the infection may be treated as described above and, if necessary, a blood transfusion given (with iron by mouth) to combat the anaemia. When the infection has been cured the uterus is then evacuated—by surgical means if oxytocic drugs fail. The theoretical advantage of this line of treatment is that the protecting mechanism, consisting of a zone of plasma cells and polymorphonuclear leucocytes in the uterine wall, is left intact while the infection is still present. The disadvantage is that haemorrhage may be severe, and dead placental tissue and blood clot in the uterus are excellent media for the growth of organisms, particularly of the anaerobic variety.

Secondly, it is possible to start giving the antibiotics and sulphonamides at the same time as ergometrine, and then after a short time evacuate the uterus surgically if necessary. It is common for the temperature and pulse rate to drop dramatically after the removal of a large piece of placenta which has been blocking the internal cervical os and allowing pus to collect above it.

Septic abortion, particularly in virulent infections, may be complicated by a spread of the organisms from the uterine cavity, causing salpingitis, peritonitis, parametritis, or septicaemia. In self-induced abortion the infection may reach the peritoneum directly owing to the passage of an instrument through the pouch of Douglas. If the instrument is passed into the cervical canal with the woman in the squatting position, perforation of the fundus may occur, but penetration sideways into the broad ligament is more likely to take place. This may produce an acute parametritis. A strange variety of instruments have been used in self-induced abortion, and any of these may be passed by mistake through the urethra into the bladder. In view of the dangers associated with septic abortion it is probably better to admit these cases to hospital for treatment. The medico-legal aspects of abortion have been discussed by Dr. Donald Teare in an earlier contribution to this series (see *Journal*, April 26, 1952, p. 915).

Missed Abortion

The formation of a carneous mole is uncommon. In these cases the patient usually notices a little bloodstained discharge for a day or two at about the eighth to the twelfth week of pregnancy. After this the breasts cease to be tender and swollen, but the patient often pays no attention to this. It is necessary in all cases of pregnancy to examine the abdomen at the fourth or fifth month in case the uterus has ceased to increase in size after the third month. A carneous mole can remain in the uterus for many months, and if it is not diagnosed the mother may have everything ready for the baby, only to be told late in pregnancy that the foetus died in the first few weeks. In cases of missed abortion the breasts show no signs of recent activity and the uterus ceases to grow from the date of the small haemorrhage. A pelvic examination reveals a firm uterus usually smaller than that of a three-months pregnancy. The uterus is filled with laminated blood clot with a shrunken amniotic sac in the centre. The biological pregnancy tests become negative about 10 days after the death of the ovum in these cases, and a pregnancy test should be carried out to confirm the diagnosis if this is made shortly after the vaginal haemorrhage.

All cases of carneous mole undergo spontaneous evacuation eventually, but sometimes it is many months before this happens. Massive doses of oestrogenic preparation never cause sensitivity of the uterus to oxytocic drugs when

the foetus is alive, and it is doubtful if they do so even when the foetus is dead. It is probably wiser to leave the uterus to evacuate itself spontaneously. If the patient is distressed by the knowledge that she is carrying about a dead foetus the uterus may be emptied surgically, using either laminaria tents or ovum forceps.

Vesicular Mole

This condition is one of the rarer causes of abortion, but it is of great importance because of the severe haemorrhage and sepsis which may occur and because a chorion epithelioma may develop. The patient usually begins to bleed between the eighth and the twelfth week of pregnancy. The uterus is always much larger than it should be, reaching nearly to the umbilicus, except when it is associated with a missed abortion. It is doughy in consistence and a little tender. If vesicles are seen in the blood lost from the vagina the diagnosis is established, but unfortunately these are not often found.

It is quite easy to make a mistaken diagnosis of vesicular mole. The differential diagnosis amounts to a mistake in the date of the last menstrual period, multiple pregnancy, pregnancy and fibroids, or pregnancy and an ovarian tumour. The diagnosis is established by having a quantitative biological pregnancy test performed. A morning specimen of urine should be collected and the pathologist requested to carry out the test in undiluted urine and in a dilution of 1 in 200. If the test is positive in both cases a vesicular mole is almost certain to be present. A normal pregnancy at about the third month sometimes gives a positive biological pregnancy test in a dilution of 1 in 100.

The evacuation of a vesicular mole requires great skill and judgment, and the patient should always be admitted to hospital for this. If the abortion is spontaneous it is almost the rule for some vesicles to be retained in the uterus, and it is wise to curette these patients as a routine procedure two weeks after the spontaneous evacuation. The patient is never safe until the pregnancy test is negative, and this test should be repeated at four-weekly intervals until it is so. If the test remains positive and perhaps in increasing dilutions the danger of chorion epithelioma is great. A further pregnancy should be discouraged for at least six months to avoid confusing the issue.

Habitual Abortion

By definition this refers to any case in which three consecutive spontaneous miscarriages have occurred. It can be shown statistically that a woman who miscarries for the first time has about an 87% chance of going to full term the next time she is pregnant. A woman who has had two consecutive miscarriages still has a 63% chance in the next pregnancy, but after three consecutive abortions the chances of reaching full term on the fourth occasion drop to 16%.

In habitual abortion the cause is usually of maternal origin. It has been suggested that it may be due to deficiency of progesterone secretion, and good results are claimed from the use of progesterone or, alternatively, of high doses of stilboestrol, which are believed to stimulate progesterone secretion. It is difficult to be dogmatic about these treatments, as there are many conflicting opinions on them. Vitamin E has also been tried in these cases, but there is no convincing evidence of its value. If the basal metabolic rate is below minus 10, thyroid deficiency may be the cause of abortion and thyroid should then be given.

In cases of habitual abortion a hysterosogram should be done to exclude an abnormality of development such as a septate uterus, but any such condition is seldom found to be the cause. Fibromyomata of intramural or submucous distribution should always be removed if found in a case of habitual abortion. Deep cervical lacerations may be the cause of habitual abortion. Deep cervical lacerations may be repaired. Retroversion of the uterus should be corrected, if possible before pregnancy occurs, by the insertion of a Hodge pessary so that the pregnant uterus will not drop further back into the hollow of the sacrum. Only very occasionally is a ventri-

suspension justifiable, as the retroversion is often associated with a generalized hypoplasia of the uterus, which is likely to be the real cause of habitual miscarriage.

A popular treatment at present consists in the implantation of progesterone pellets. Six pellets, each of 25 mg., are introduced below the deep fascia covering the gluteal muscles or under the fascia covering the lateral aspect of the thigh. A general anaesthetic is advisable. If the pellets are placed more superficially they will find their way to the surface. Alternatively, stilboestrol may be prescribed. The dosage begins at 5 mg. daily by mouth, starting during the sixth or seventh week (counting from the first day of the last menstrual period). The daily dosage is increased by 5 mg. every two weeks until the fifteenth week, when 25 mg. daily is given. Thereafter the daily dosage is increased by 5 mg. each week. Administration is discontinued at the end of the thirty-fifth week, since a drop in oestrogen and progesterone normally precedes the onset of labour.

Limitation of activity at the missed period times must be insisted on, and defaecation should be controlled by the use of mild aperients. Coitus must be avoided altogether.

Finally, there is much evidence for saying that there is a functional factor in cases of habitual abortion which may be largely responsible for subsequent miscarriages. It is most important therefore to reassure the patient that she still has a chance of reaching full term. The elaborate treatment so often given to these patients may be a potent factor in increasing confidence, thus promoting the chance of a successful delivery.

Next Refresher Course Article.—"Tachycardia," by Professor Crighton Bramwell.

Nova et Vetera

VESALIUS ON THE HUMAN BRAIN

Vesalius on the Human Brain. Edited and Translated by Charles Singer. (Pp. 151. £1 1s.) Published for the Wellcome Historical Medical Museum by Geoffrey Cumberlege (Oxford University Press). 1952.

This is the first book to contain a translation into English of any substantial part of that truly epoch-making work on anatomy, the *Fabrica* of Vesalius, originally printed at Basle in 1543. It was the first great work of science in the modern manner, the first to adapt exact graphic treatment to biological research, and the first to introduce a positive basis into medical education. Professor Singer has chosen the section on the brain because it is probably the most mature section of the work of Vesalius and because it illustrates the trend of medical thought at the time, prior to the work of Harvey.

There can be no doubt that the *Fabrica* depended for its success on the magnificent illustrations, more accurate than any before them except those of Leonardo, who failed to publish his researches. The drawings have a remarkable dynamic quality, and they surpass those of Calcar, who drew the illustrations for the earlier work of Vesalius, called *Tabulae Sex* and dated 1538. Professor Singer does not think that Calcar was the artist of the *Fabrica*. The letterpress in its original Latin, which the translator stigmatizes as vast, verbose, clumsy, and ill-chosen, is greatly inferior to the drawings. Nevertheless this was the best account of the brain of that time and for several generations to follow, based as it was upon observation and not on tradition. Professor Singer gives some valuable notes on previous anatomical work, and he shows how Vesalius, in dissecting the brain, followed the method he had learned in Paris. Anatomists, historians, and others may well feel grateful to Professor Singer for providing a translation of this important part of a medical classic which exercised so profound an influence on the progress of medicine.

DOUGLAS GUTHRIE.

THE HUNTERIAN BIRTHDAY ORATION

Twenty years after John Hunter's death Matthew Baillie and Sir Everard Home arranged for the delivery of an annual oration on his birthday, February 13. The latest in the long succession of orators was Mr. L. E. C. Norbury, who, before the Royal College of Surgeons the other evening, gave a discourse in which he managed to throw a kindlier light on Hunter's character than has been current in recent times. He described Hunter as emotional and quickly moved to sympathy, and with a sense of humour which came out particularly in letters to his brother William and others. Some people had a notion that Hunter's marriage was unhappy, perhaps because of the often published story of his irritation at his wife's taste for fashionable society. Hunter married Anne Home in 1771; she was 29 at the time and he was 43. She was a charming lady, and talented, too—did she not write the lines beginning "My mother bids me bind my hair"?—and she was, moreover, a good wife, devoted to her husband, and Hunter had the felicity of matrimonial success.

Mr. Norbury described Hunter as a great experimenter and observer and a great thinker above all. He read from Nature and took his science from no other source. An indefatigable worker, he was never satisfied until he thought his observations were correct. Observing many things, he tried to press a great deal into little, which perhaps was the reason for his defects as a lecturer. He was himself conscious of the difficulty of making others understand what seemed simple to himself. His writings were extensive, his first published work being a treatise on the natural history of the human teeth, dated 1771.

The lecturer concluded with a glance at some of Hunter's great contemporaries. A great legacy which Hunter left to posterity was his museum, but greater still was the spirit and tradition which had animated his disciples.

Hunterian Festival Dinner

A few hours after the Oration a large company of guests assembled at the invitation of the Royal College of Surgeons for the Hunterian Festival Dinner at the College. Mr. Iain Macleod, the Minister of Health, proposing the toast to "The College," said that since the days of John Hunter British surgery had led the world; in particular, British surgeons had been pre-eminent in operations on the lungs, heart, and brain, and in plastic surgery. Developments in the science of anaesthesia had been as splendid in this country as anywhere in the world. The great tradition of the College in research and education would certainly endure.

In response, Sir Cecil Wakeley reviewed the activities of the College and described the impressive progress that was being made with the building of the new College. The Queen, an Honorary Fellow of the College, would lay the memorial stone of the new buildings on May 5. The President also announced that the Duke of Edinburgh had accepted an Honorary Fellowship of the College, and would come to the College to receive it later in the year. Among the research activities of the College Sir Cecil mentioned particularly the new department of pharmacology which was coming into being, thanks to the generosity and interest of certain pharmaceutical firms; Imperial Chemical Industries, Limited, had agreed to finance the department to the extent of £10,000 per annum for the next seven years. The museum was about to benefit from a new trust fund—the Macrae-Webb-Johnson Fund. Lady Webb-Johnson had joined her husband as a college benefactor by making over a fund worth about £1,000 a year, to be used for the benefit of the museum on the advice of the Hunterian Trustees. This gift was made to commemorate her father and as a tribute to her husband's presidency of the College.

Sir James Paterson Ross had the formidable task of proposing the health of the many distinguished guests. After Sir Denys Lawson had replied for the guests, Sir Reginald Watson-Jones proposed the toast to the Hunterian Orator, Mr. L. E. C. Norbury, who made a brief response.

Correspondence

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

The Metric System

SIR,—The metric system is rather like the sea serpent in that it gives rise to periodical discussion in which feelings run high. Like many other "tidy" plans, it looks admirable on paper, but actually bristles with difficulties when applied to medicine. In the first place, Professor W. C. W. Nixon and Mr. T. D. Whittet (February 7, p. 327) are not really advocating the metric system at all but the "international system of weights and measures," and this is full of anomalies. For example, a purist will hold up his hands in horror if you talk about cubic centimetres, but if you ask him what his red blood count is he will say five million per cubic millimetre. I happen to be partly responsible for the publication of a quarterly journal, and the history of this very minor matter is instructive. Some time ago we were solemnly admonished by some semi-official body, whose name I have forgotten, that it was very wrong to use c.c. and c.cs. for the singular and plural of cubic centimetres, and that the correct abbreviation was c.cm. for both. We had just got our compositors clear on this, when another notice arrived, saying that, as cubic centimetres were not a measure of volume, the correct designation was millilitres abbreviated to ml. Once bitten twice shy, and we did nothing, which was just as well, as the abbreviation was next altered to mil., which at least had the advantage of being a word in its own right. Alas, this has also gone with the wind, and we are now back at ml. Our journal now rests on the conservative platform of c.cm. This type of meddling is not only exasperating but is exploited by manufacturers. For example, the makers of one type of syringe advertised its advantage by saying that it was calibrated in millilitres instead of cubic centimetres. I believe that a syringe would have to be of at least two litres capacity to detect any difference at all.

The change-over to the new system would not be so easy as the authors suppose. They have pointed out the dangers of misplacing decimal points, but there is much more to it than this. A good deal of the method of memorizing doses is built up on the *avoirdupois* system, and all sorts of difficulties would arise. For example, any houseman knows that the usual pre-operative rectal dose of paraldehyde is 1 drachm per stone body weight, but is he going to remember it as 3.55 ml. per 6.35 kg.? If the change is to be made at all, it would have to be complete, and medical literature will be still further divorced from that of everyday life. How many people could visualize a patient 1.895 metres high weighing 64.37 kg.?

To avoid this kind of thing, agreement would have to be reached in the medical, scientific, and industrial worlds of the English-speaking nations. There is no prospect of this in the foreseeable future. For example, the last time this subject was discussed at the Engineering Section of the British Association members could not even agree that the change is desirable, let alone practicable. The view was freely expressed that, as in many fields production by Anglo-Saxon countries was greater than that of the rest of the world put together, it was unreasonable to expect the vast effort of changing over to be made. An American closed the discussion with the trenchant summary, "Your metre, my foot."—I am, etc.,

London, E.C.1.

C. LANGTON HEWER.

Emphysema

SIR,—Dr. J. Todd's letter (January 24, p. 219) puzzles me. He criticizes me because I "made no attempt to define the clinical criteria which would enable the practitioner to decide which of these cases could be given morphine with

'safe and useful' results," yet I thought my letter made it quite clear that I was asking for just that guidance. I doubt if any G.P. has enough experience and knowledge to supply it, but I did hope that possibly the author of "the erudite address," which I obviously appreciated, could do so.

Our problem may be illustrated by the example Dr. Todd offers. It is, of course, conceivable that all our cases of status asthmaticus which have benefited by morphine have really been attacks of cardiac asthma in our chronic asthmatics, but, if so, how are we to tell? Incidentally, the cough reflex he mentions is not of first importance in a man gasping for his life, but the factors I mentioned—"anxiety, distress, and the demand of the tissues for oxygen"—most certainly are. It is incontestable that vastly more lives have been saved in general practice by the use of morphine than by withholding it, and one main object of my letter was to find out how to avoid using it in dangerous cases.

We must remember that conditions in hospital are not the same as in general, especially country, practice, but it is certainly wrong to condemn potentially life-saving treatment just because it has potential dangers. The task of medicine remains, as I said in my first letter, not to damn but to define "when it is safe and useful and when it is not," and it requires much experience as well as great erudition to do so.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

Parenteral Treatment of Crushed Abdomen

SIR,—The object of this case report is to show how modern intravenous treatment may keep both fluid and biochemical balance over a long period. Facilities for blood analysis are the only special ones necessary.

A 19-year-old man, weighing 8 st. 8 lb. (54 kg.), was crushed between two heavy vehicles. He was in a state of shock and showed signs that were those of either a ruptured gut or intra-abdominal haemorrhage. He had also a contusion of the right lung and heart. Laparotomy revealed a deeply lacerated liver that was repaired and a retroperitoneal haematoma of the right colon. On the 11th day a burst abdomen was found to be due to the effects of traumatic pancreatitis. On the 20th day a duodenal fistula appeared in the wound and persisted. Thereafter residual abscesses declared themselves by spontaneous discharge through the fistula and by discharge through a right loin incision made for that purpose. Until the 65th day his evening temperature averaged 102° F. (38.9° C.) and pulse 120. On the 65th day a painful abdominal episode associated with distension was accompanied by a sudden cessation of fever. This indicated that his major residual abscess had discharged into the gut. Then his major improved, and recovery has since been complete.

Management was based on clinical observation assisted by accurate fluid charts and blood analyses for biochemical and haematological information. Intravenous management was particularly important in the first 19 days, when 65 pints (36.92 l.) of fluid were removed from his stomach by hourly suction. During this time intravenous fluids amounted to 115 pints (65.32 l.). This consisted of calculated quantities of Ringer's solution and This consisted of glucose, saline, protein hydrolysate ("casydrol"), combinations of glucose, saline, protein hydrolysate in fluid and salt. How- and blood. At this time he was balanced in fluid and salt. However, the protein had fallen to 6.3 g. % with an A/G reversal and the potassium to 15 mg. per 100 ml. The CO₂-combining power was 75 volumes %.

From the 20th to the 26th day the duodenal fistula discharged copiously. Having forgone solid food for three weeks, it was considered necessary tentatively to introduce protein and salts considered necessary tentatively to introduce protein and salts by mouth. This, with intermittent stomach suction and continuous fistula suction, was augmented by repeated intravenous drips that included Darrow's and Ringer's solutions. By the 30th day the fistula was practically dry. There had developed, however, an alkalosis, indicated by 79 volumes % CO₂ combining power, and a blood salt reduced to 480 mg. per 100 ml. The potassium meanwhile had improved to 17 mg. %. Subsequently the diet was supplemented by potassium chloride cachets of 1 g. daily and deliberate salt consumption by the patient. It was noted how chloride continued in the urine in spite of a depleted blood salt while the alkalosis remained. Thus blood samples were essential for chloride estimation. Protein hydrolysate intravenously and by mouth assisted the recovery

of the plasma protein. By the 35th day the patient's blood chemistry was normal apart from a slightly reduced plasma protein, and he was taking increasing quantities of light diet. Until the 65th day his weight remained the same at 6 st. 12 lb. (43.2 kg.) in spite of the continued fever. During this period transfusions were also administered at about fortnightly intervals to restore his haemoglobin from 60% to 75% on each occasion. The co-operation of the patient in taking all necessary dietary supplements was achieved by keeping him informed of his requirements. Thus his nutrition remained virtually balanced for nine weeks with intravenous administrations and a small diet.

Grateful acknowledgments are due to Mr. J. H. Conyers for his encouragement in treating this young man. For the careful attention that resulted in his recovery they are due in particular to Captain Smith and Sister Lester of the Military Hospital, York.—I am, etc.,

Manchester, 6.

STEVENS DIMANT.

Bathing and Vestibular Palsy due to Streptomycin

SIR,—May I raise the question of the behaviour under water of the children who were treated in the earlier post-war years with streptomycin for tuberculous meningitis, and who may be making their first ventures into a medium entirely new, constituting a special predicament for them, denuded as they invariably are of vestibular sensation? My own belief, based on otoneurological observations at the time, is that few, if any, will have recovered from this selective paralysis, and a pronouncement by more recent workers is desirable as to whether complete immersion during swimming and diving may prove a hazard. Ordinarily, the direction of light penetration and water-pressure at body surface will be aids to orientation, but young children with bilateral vestibular palsy may be expected to panic or even drown if unattended.

I would remind physicians who have had the immense satisfaction of delivering these children from a previously fatal disease at so relatively small a cost in terms of sequelae that successful performance of the ordinary clinical neurological tests of balance can cover gross vestibular defect; they may wish to advise school health services of cases where recovery of specific vestibular function has not been established.—I am, etc.,

Bramhall, Cheshire.

H. C. PURCER SMITH.

Use of Succinylcholine in E.C.T.

SIR,—We have read the article on the use of succinylcholine in E.C.T. by Drs. D. J. Adderley and Max Hamilton (January 24, p. 195) with much interest. We should, however, like to suggest that the rise in blood pressure following the injection of succinylcholine is not due to the drug but to the fact that the patient was ventilated with a mixture of 5% carbon dioxide in oxygen. This subject, could easily produce a carbon dioxide build-up, the effect of which has been long known to cause an increase in blood pressure at least as high as that recorded in the article.—We are, etc.,

J. A. SMITH.

F. G. WOOD-SMITH.

London, W.12.

Relationship of the Suprarenal Cortex to the Differentiation of Chromaffin Cells

SIR,—As a result of our studies in several species of animals, we reported in 1951¹ that the amounts of noradrenaline and adrenaline found in the suprarenal glands seemed to bear some relationship to the relative size of the cortex. In the rabbit and guinea-pig (where the cortex is large relative to the medulla), methylation of noradrenaline to form adrenaline is almost complete, whilst in the whale and fowl (where the medulla is relatively large) only a small amount of adrenaline is found. It was suggested that the cortex might be intimately concerned with methylation of noradrenaline.

Further work indicates that methylation can occur even in the absence of intimate relation with the cortex. Both adren-

aline and noradrenaline have been detected, for example, in the rudimentary suprarenal medulla of the dogfish,² and in the organs of Zuckermandl in children aged 6 months or more,³ although both these structures are quite separate from cortical tissue. In our view there is no convincing evidence to connect the functions of the cortex with those of the medulla, though it is possible that cortical hormones may affect the degree of methylation in these chromaffin structures via the blood supply.—I am, etc.,

Dundee.

G. B. WEST.

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- ³ *J. Physiol.*, 1952, 118, 11.

Soft-tissue Radiology

SIR,—I have read with interest your annotation on "Soft-tissue Radiology" (January 10, p. 89), with its survey of technical advances in this field. I notice that mention is made of the problem posed by the fact that x rays are absorbed by soft tissues to a uniform degree. I therefore expected to find some mention of the late A. E. Barclay's work in this respect,^{1,2} but was disappointed. His micro-radiology, a direct and more practical advance from the technique of Lamarque,³ should, I feel, receive especial mention in any discussion of soft-tissue radiology, for the technique has much to offer in many fields of medical and biological research.—I am, etc.,

Crawley, Sussex.

DONALD LEATHERDALE.

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- ² *Microangiography*, 1951. Blackwell, Oxford.
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Measurement of Tissue Components Radiologically

SIR,—Dr. Frank Falkner and Miss Sylvia Wisdom (January 31, p. 275) did not need the tube-plate distance or object-plate distance in order to find the length of the object, because they already had the tube-shift, image-shift, and length of image. Their graph was unnecessary, therefore. Thus: O=object, I=image, TS=tube-shift, IS=image-shift.

$$O = I \times \frac{TS}{TS + IS}$$

In their formula $\frac{K-d}{K}$ is the same as $\frac{TS}{TS + IS}$

This is the formula for a length parallel to plate and plane of source of rays. It is of little use for an irregular object. I imagine it would be better to abandon calculation and instead to reproduce to scale the triangles in question, and in that way find by direct measurement the limits of the dimensions of the object.—I am, etc.,

Heath Hayes, Staffs.

P. J. O'BRIEN.

The General Practitioner and Mass Radiography

SIR,—It may interest you and your readers to know that in August last the North-west Metropolitan Regional Hospital Board set up a mass x-ray unit at the Central Middlesex Hospital as an extension of the radiological services provided by it, with the primary object of carrying out an investigation into the incidence of unsuspected chest disease in the patients attending or admitted to the hospital. It was found possible to extend the mass radiographic facilities to general practitioners in the surrounding area. Practitioners are able to refer patients direct to the mass radiography department on any weekday within normal working hours without appointment. A member of the radiological staff reports on the films within 24 hours, and a negative report is received by the practitioner within three days of the patient attending. If the report indicates suspicions of disease a large film is taken, and any of the further necessary radiological investigation is carried out in the main x-ray department and a subsequent report sent to the practitioner. Should a diag-

nosis of active, or possibly active, tuberculous disease be made, the chest physician of the area in which the patient lives is informed at the same time as the patient's general practitioner.

It is intended to publish an account of the experience gained in this scheme after a trial period of approximately a year. So far, out of the comparatively small number of 1,431 patients referred by general practitioners, 21 have had active, or possibly active, pulmonary tuberculosis, and five patients have been diagnosed as suffering from neoplasm of the lungs. It is not intended in this letter to do more than draw attention to the fact that the opportunity referred to in the final paragraph of your annotation (February 7, p. 322) has already been taken, and that in at least one area the radiological services have been extended even a stage further than that described in the very interesting article by Dr. F. A. Nash, Mr. B. Benjamin, and Dr. T. J. Lee (p. 304).—I am, etc.,

London, N.W.10.

F. PYGOTT.

SIR,—I would like to congratulate Dr. F. A. Nash and his colleagues on an excellent piece of work (February 7, p. 304), which will focus attention once more on the ever-present need for the early diagnosis of pulmonary tuberculosis. The suggestion that the services of the mass radiography unit should be employed in this fashion, however, is both impracticable and dangerous, and if adopted would constitute a disservice to the anti-tuberculosis campaign.

While it is not my purpose to attempt to devalue an excellent paper, I am struck by the relatively small number of patients attending for the first time at the chest clinics in the survey area (less than one-third the number in my own area of similar population). It is also clear that the number of patients x-rayed falls far short of the estimated needed requirements. The authors refer to the work of Toussaint, but do not mention that schemes similar to their own on a comparable scale are a common feature of many chest clinics. It is my opinion that the chest physician is best fitted to control the attack on tuberculosis. So far as diagnosis is concerned, this should be effected by a harmonious co-operation between general practitioner and chest physician. A split in the tuberculosis service between diagnosis, treatment, and prevention and aftercare has already been imposed from above, to the detriment of the patient. Let us take care that a further split does not arise, this time of our own making.—I am, etc.,

Wrexham.

E. CLIFFORD-JONES.

Reprints of Communications on Stress and the Adaptive Hormones

SIR,—In perusing the current literature with which your *Journal* is concerned, we note that an ever-increasing number of its articles deal with problems pertaining to research on "stress" and the so-called "adaptive hormones" (A.C.T.H., S.T.H., corticoids, adrenergic substances, etc.). We are writing to you because, in our opinion, the success of research in this complex and rapidly developing field largely depends upon the prompt availability and evaluation of relevant publications, a task for which we should like to solicit the assistance of your readers.

In 1950 our Institute initiated the publication of a series of reference volumes entitled *Annual Reports on Stress* (Acta Medical Publishers, Montreal) in which the entire current world literature is surveyed every year (usually between 2,000 and 4,000 publications). Up to now we had to compile the pertinent literature partly from medical periodicals, monographs, abstract journals, and partly from reprints sent to us by the authors themselves. Of all these, reprints proved to be the best source of data which we felt deserved prompt attention in our annual reports. Hence, in the past, we have sent out several thousand individual reprint requests to authors whom we knew to be engaged currently in research on stress and allied topics. Even this procedure did not give us the wide coverage which would

be desirable, because it is materially impossible to contact all these authors individually, and it often takes too much time to get the requested reprints.

It is evident that in order to ensure prompt inclusion of publications in the annual reports these surveys must develop into a co-operative effort between the authors of original papers and the reviewers. This co-operation was greatly enhanced of late by the publication of announcements, in several medical journals, encouraging investigators interested in stress research to send us their reprints for this purpose as soon as they become available. We should be grateful if, by the publication of this note, you would also bring this problem to the attention of your readers.—We are, etc.,

HANS SELYE,

Professor and Director of the Institute of
Experimental Medicine and Surgery.

ALEXANDER HORAVA,

Co-author, *Annual Reports on Stress*.University of Montreal,
Montreal, Canada.

"Pasteur's Flask" in Sydney University

SIR,—I wish to thank Dr. Lilian A. Bates for her interesting letter (November 1, 1952, p. 993) concerning the flask of bouillon or beef broth which was brought to Sydney from the Pasteur Institute in Paris in 1888. I regret my error in stating (August 23, 1952, p. 439) that the flask of broth was put up by Pasteur himself. The association interest remains, however, because, although Pasteur did not put up the flask himself, it was prepared by his nephew, Dr. Adrien Loir, in Pasteur's laboratory on Pasteur's instructions. Madame Pasteur, it appears, also came into the story, because it was her scrutiny of *Le Temps* which brought the need of the Government of New South Wales under the notice of her husband.

Sydney students will still regard the Pasteur flask as a precious exhibit, because it is one of the few links our museum provides with France, a country which has made outstanding contributions to the welfare of mankind. This flask, because of its associations, will continue to remind us of one of the noblest sons of France, Louis Pasteur, whose life and work are an inspiration to students in every land.—I am, etc.,

Sydney.

KEITH INGLIS.

Misuse of Words

SIR,—As a critic of the usage of words, is not Professor A. G. Watkins (February 7, p. 335) himself in error? Since "gynaecological" means "concerning the science of diseases of women," is it the medical student or the patient who undergoes a gynaecological examination? Similarly, since "pathological" means "concerning the science of disease," it is surely nice usage when this adjective is applied to a department.—I am, etc.,

London, S.W.10.

M. J. PURDY.

Quintuple Pregnancy

SIR,—The birth of quintuplets is still an obstetrical rarity, and it is thought that the following notes of the general practitioner's antenatal findings in such a case may be of interest.

The mother, aged 36, had previously had five full-term single pregnancies. All these births had taken place in hospital, and her last baby, now aged 6, weighed 9½ lb. (4.3 kg.) at birth. She was first seen in the pregnancy which is the subject of this report on August 25, 1952, being then about 12 weeks pregnant. Apart from varicose veins of both legs there was nothing abnormal in her condition. She was next seen on November 17, when one foetal heart was heard. The blood pressure was 120/80, and no abnormality in size or condition was noted.

The patient did not present herself for examination, as requested, in December, and she was next seen on January 6, 1953. The changes which had occurred were quite alarming. The abdomen was greatly distended, and at the twenty-eighth week appeared to be at full-term. There was a

gain in weight of 15 lb. (6.75 kg.). A foetal heart was heard in the left sacro-anterior foetal position. The blood pressure was elevated to 150/80, and there was moderate oedema of both legs and ankles, but no undue distress. On examination the uterus was tense, as with hydramnios; no foetal movements were felt. Palpation revealed the presence of many small hard protruding lumps, especially on the right side of the uterus. This would have been consistent with the presence of multiple small intramural fibroids. The urine was free of frank albumin, but the Bence Jones reaction was present.

A diagnosis of multiple pregnancy was made, with an alternative diagnosis of breech presentation and multiple small uterine fibroids. The patient was referred to hospital, where macerated male quintuplets were born nine days later within the space of three hours.—I am, etc.,

Herne Bay, Kent.

P. DE B. RANSOME-WALLIS.

Intraperitoneal Rupture of Rectovaginal Abscess Due to Proctotomy

SIR,—Although the weight of present-day opinion is in general against proctotomy for abscess in the rectovaginal or rectovesical pouch, the procedure is still occasionally recommended by writers on the subject, and rare cases occur in practice in which it seems the obvious treatment. To the numerous objections advanced we have to add another unfortunate accident.

The patient, a female aged 17 years, had an acutely inflamed unruptured appendix removed and the abdomen closed without drainage. She thereafter developed signs of a residual abscess, which was eventually located in the pouch of Douglas. In view of the degree of toxæmia, it was thought best to open this rather than wait for spontaneous evacuation per rectum. Incision was carried out under a general anaesthetic 15 days after her original operation. Only a small amount of pus was obtained. Some hours later the general condition became much worse, and obviously some catastrophe had occurred. Sixteen hours after the proctotomy a simple laparotomy and drainage was performed. The abdomen was found full of pus. The patient died later in the same day.

It seems fairly certain that rupture of the abscess into the general peritoneal cavity was caused by the sudden increase of tension when the instrument was thrust into it from the rectum. This has doubtless occurred before, though we have found no record of it even among the stock objections to the operation. Rupture of adhesions due to the collapse of the cavity consequent upon drainage has been recorded,¹ but in such a case there would be a profuse flow of pus first. Spontaneous rupture in both directions has also been mentioned by the same author; presumably it was also simultaneous.—We are, etc.,

Salisbury.

R. D. N. BISSET.
A. DUFF.¹ *Vale, C. F., Ann. Surg.*, 1940, 111, 396.

The Climacteric

SIR,—With reference to your timely annotation on "The Climacteric and Oestrogen Therapy" (January 3, p. 37), the following additional psychological aspect of climacteric disturbance needs to be more widely appreciated. The psychological reaction both to increasing age and temporary enhancement of inner tensions are sharper in those women whose cultural achievement has been severely limited; this applies to women of various social status and otherwise different personality background. Where a woman's life has previously centred almost exclusively about her domestic, motherhood, and sexual functions without any consolidated outer interests, the increasing independence of the children and the changing body image serve to evoke feelings of loss and anxiety which are especially threatening because there are no available compensations which can be more energetically utilized. In "minor" psychotherapy it is necessary to encourage the evolution of interests outside the home and to engage the attention of available social agencies so that they can help with this problem. This is

especially the job of the general practitioner, and in giving this aspect of treatment his serious attention involuntarily trouble can be averted in many cases. Of course, in some with, for example, severe obsessional character disorder and a good deal of inward guilt and tension in their personality background such "minor" psychotherapy would not be sufficient. But I feel that attention directed towards the change in the life situation of the patient in discussion with her usual physician is a very important therapeutic and prophylactic measure. Especially in the culturally restricted woman, the feeling that life has at this stage of the game lost its value, and she hers, is one to be energetically countered by her medical adviser.—I am, etc.,

Chapel Hill, North Carolina.

D. W. ABSE.

Abuse of Antibiotics

SIR,—I agree entirely with Mr. Norman Lake's letter on abuse of antibiotics (December 13, 1952, p. 1307), but I am writing to express my surprise that he reports without comment the case in which a perforated appendix was left *in situ* in the presence of generalized peritonitis. I am not surprised to learn that the patient's peritoneum was found to be full of pus at the second operation; on the contrary I would have been very surprised indeed if this had not occurred. Drainage alone in a case of perforation of the appendix is permissible only when a localized abscess is present. In a case in which generalized peritonitis is diagnosed at or before operation the appendix must be removed. Once this is done drainage is of comparatively secondary importance now that we have efficient antibiotic agents; but the actual removal of the offending appendix is absolutely essential to prevent the continuation of infection of the peritoneum.

This letter is not written in order just to criticize the management of the above case (there are, of course, possible exceptions to every rule in medicine), but to be a reminder and a warning to the more junior and less experienced surgeons, and to prevent them from adopting drainage without appendectomy as the correct treatment of generalized peritonitis due to a perforated appendix.—I am, etc.,

Georgetown, British Guiana.

N. N. IOVETZ-TERESHCHENKO.

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The Dangers of Blood Transfusion

SIR,—The article on the D-/D- genotype (January 24, p. 198) attracted my attention merely because of the name of one of the co-authors, Dr. Ruth Sanger, whom I was glad to have seated at my table on one of my transatlantic voyages. Other readers, like myself, may find this article beyond their complete comprehension, and without the personal contact might pass it by. However, do not these highly technical articles on blood emphasize what a dangerous treatment transfusion may be? Frequent discoveries of antibodies and genotypes not previously suspected should make one wary of administering blood except as an urgent necessity. The great number of transfusions now being given on one pretext or another must enormously increase the risk of conflicting antibodies endangering life when a subsequent transfusion may be a necessity.

Statistics seem to prove that there is an immediate advantage in using whole blood, but, in view of the highly technical and skilful investigations which constantly are discovering potential dangers and which are demonstrated to us by complicated formulae, ought we not to regard a transfusion of blood, not as a routine measure, but as a dangerous major operation? The Christian pronouncement of nearly 2,000 years ago, "It is more blessed to give than to receive," may well be true as regards the giving and receiving of blood. The recipient, perhaps, is being conditioned for future unknown dangers—but what of the donor? The generous donor is willing to give blood to "save

life," but I do not think that gallons of this precious and dangerous fluid should be wasted as a routine administration in operative technique. If a pint of blood is essential for recovery, or merely the more rapid recovery, of the patient, then surely the blood cannot be obtained from the donor without cost? Wolstein said in 1791, when condemning blood-letting, the fashion of his day, "Blood is no water—it is the juice of life; a juice which after each venesection Nature replaces rapidly, but in a raw, unprepared, watery, spiritless state." We have learned much about "the juice of life" since Wolstein's day, but no doubt his clinical observation was correct, as also that of Marshall Hall, who denounced the same practice, calling the lancet "a minute instrument of mighty mischief." Some time ago when doing a short locum for a friend I saw two patients, man and wife, labelled as suffering from rheumatism. Neither had ever had any serious illness, but each appeared to be debilitated and only very slowly convalescing. They complained of great tiredness and lack of energy and indefinite aches and pains, which evidently suggested the "diagnosis" of rheumatism. They said that neither had felt well since their last donation of blood. They were universal donors and both had been called upon, and had responded willingly, many times.

I am not satisfied that the sacrifice of the donor is as harmless as is generally supposed, nor am I satisfied that a transfusion is always a good thing for the recipient. I would only submit myself and members of my own family to a transfusion if I considered it an absolute necessity, and this must be the criterion for my patients. What can I tell the would-be donors who ask my advice? I do not wish to discourage them, nor do I wish to embarrass the workers in the blood-collecting squad, but I do feel that it is time we exercised extreme economy in the use of blood, other persons' blood, and ensure that it is used only for the purpose for which most persons think they give it—to save life.—I am, etc.,

Huddersfield.

S. H. WADDY.

Treatment of Bowel Infections of the Tropics

SIR,—I would like to express disagreement with a statement made in Dr. A. R. D. Adams's article on bowel infections in the Tropics (February 7, p. 308). He says: "While emetine will unfailingly bring an acute attack of amoebic dysentery rapidly to an end, usually it will not sterilize the bowel of the infection, however unwisely the drug may be pushed or the course of treatment with it be prolonged." During the years 1942-4 I had in my care 363 cases of amoebic dysentery among British troops in India, and although the response to emetine was dramatic in most instances I encountered a number of patients who showed no response whatever. Some of these showed an immediate response to carbarsone given orally, and the history indicated that the disease had been contracted in North-east India. Conversely, there were patients from the Madras district who failed to show any response to carbarsone but reacted at once to emetine. At that time carbarsone had a high reputation in Calcutta, and one wonders whether "emetine-resistant" and "carbarsone-resistant" strains exist in India and whether Dr. Adams has been fortunate enough to work only in an area where the amoebae were "emetine-sensitive." I had hoped to gather some accurate information on the subject, but we had only just become aware of the possibility when the hospital in which I was working moved elsewhere and the unofficial "dysentery unit" ceased to exist.

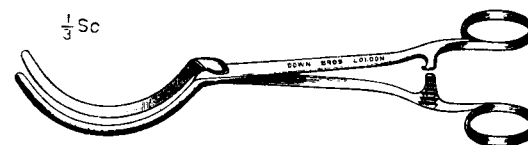
Failure of emetine to sterilize the bowel, as Dr. Adams says, is well known, and the majority of the persistently relapsing cases had received treatment in the first instance of emetine only, sometimes only six injections being given. Once an adequate supply of chiniofon ("quinoxyl") became available and was given in a five-day course by mouth and as retention enemas, the obstinate relapsing cases became less frequent, and few cases who had had the full course came back as relapses. It would be interesting to know if other workers have found any evidence of strains of the entamoeba which can be differentiated therapeutically.—I am, etc.,

Keighley.

IAN STEWART.

Half-circle Intestinal Clamps

SIR,—The spring clamp illustrated was originally devised for anterior resection of the rectum. It has also proved useful in intraperitoneal intestinal resection and even in oesophago-gastric or oesophago-jejunal anastomosis. The



depth of 2 in. (5 cm.) allows enough bowel to project for anastomosis, and the maximum diameter of 3½ in. (8.75 cm.) permits haemostasis and freedom of movement in an otherwise restricted space.

I am indebted to Messrs. Down Bros. for making this instrument for me.—I am, etc.,

London, S.E.1.

GUY BLACKBURN.

Prevention and Treatment of Tetanus

SIR,—In my recent refresher course article on the prevention and treatment of tetanus (January 17, p. 150) I said that mephenesin ("myanesin") "may be given either intramuscularly or orally in doses of 0.5 to 1 g. for an adult, repeated every few hours according to the effect produced." The British Drug Houses, Ltd., comment on this as follows: "Myanesin is available for oral administration both in the form of elixir and tablets. We do not advocate the use of elixir by mouth in cases of tetanus, since myanesin possesses local anaesthetic properties, so that if the elixir is given to a case of tetanus in which dysphagia is present the local anaesthetic effect may result in abolition of the swallowing reflex with the consequent aspiration of foreign material into the trachea and lungs. The administration of myanesin tablets does not give rise to the local anaesthetic effect on the palate and pharynx, but, on the other hand, we have no records of its therapeutic efficacy in tetanus. According to our records the most satisfactory method of administering myanesin in cases of tetanus is by intramuscular injection." I think this observation is important.

Dr. L. H. Cane (February 14, p. 403) asks a pertinent question regarding the dosage of International Units for passive immunization. As he states, the 1950 I.U. is twice the potency of the 1928 I.U. Throughout the article both for immunization and treatment the dosage was expressed in 1928 I.U. It would have been more correctly and clearly expressed in 1950 I.U., the figures "1950" being added for clarity.

The question of negligence and blame for failing to give a prophylactic injection of antitoxin to a patient who subsequently develops tetanus is a very difficult one. Each case must be judged on its merits, and the types of wound enumerated which are known to have caused the disease only serve as a general guide and warning. It may be some help to remember that wounds which have never been properly cleaned but have been allowed to scab over while dirty appear more prone to harbour the organism. In my opinion whitlows in those working in earth or manure do merit antitoxin, but it is manifestly impossible and inadvisable to give prophylactic antitoxin after every trivial wound, and therein lies the chief reason for failure of the method of passive immunization to afford complete protection to the community. The degree of natural resistance in man depends on many factors and is extremely difficult to assess.

Dr. R. G. Abercrombie (February 14, p. 403) raises the difficult problem of the danger of active surgical treatment to the wound after tetanus has declared itself. In my article I emphasized the importance of minimum disturbance of tissues after a large dose of antitoxin had been given. I agree that the stress should be on the "minimum," and

nothing should be done until *after* antitoxin has been given, but with these reservations it would appear rational to try to prevent the continued production of toxin locally. I have never observed harmful effects from such limited interference, but admittedly this statement applies to patients with comparatively slight wounds. Owing to the increasing use of antitoxin in the 1914-18 war, tetanus following serious wounds in those who had not been passively immunized must have been comparatively rare after the first few months. Similarly in civilian patients they are exactly the cases to which prophylactic antitoxin is almost always given, and in the 1939-45 war tetanus was almost unknown. I have seen no example of this type from which to judge the effects of surgery. On the other hand, I have seen several on whom no surgical treatment was practised who died in spite of enormous doses of antitoxin. The answers to such questions depend a little on the definition of the word "severe" as applied to tetanus. It is only by the application of the prognostic criteria I outlined to a large number of cases that the relative values of different methods of treatment can be assessed.—I am, etc.,

Cambridge.

LESLIE COLE.

Sensitization to Local Application of an Antihistamine

SIR,—Nowadays, when ready resort is made to the various antihistamines by mouth for a variety of allergies and hypersensitive reactions, it may not be readily realized that hypersensitivity may develop to antihistamine substances themselves when applied locally in the form of ointments. The following case illustrates well this seeming paradox.

The patient developed eczema of the hands and arms in 1949. The usual ointments were applied and each produced a temporary slight improvement. In July, 1952, he was given mepyramine maleate ("anthisan") by mouth, 100 mg. three times a day for 12 days, with no improvement. On September 1 phenindamine hydrogen tartrate ("thephorin") ointment was applied and produced a dramatic improvement. On October 18 he developed impetigo of the face, which failed to respond to gentian violet. Eleven days later his face had shown little improvement, and his hands gradually became oedematous, with exfoliation of the skin of the fingers. Phenindamine hydrogen tartrate ointment and gentian violet were discontinued. Mepyramine maleate, two tablets three times a day, was given, and acriflavine emulsion was applied to the face. The oedema of the hands quickly subsided and the impetigo of the face quickly disappeared. On November 15 an eczematous rash of hands and arms reappeared, and the effect of applying phenindamine hydrogen tartrate ointment was again tried. The oedema appeared as dramatically as before, with exudation of serous fluid; and again responded quickly when phenindamine hydrogen tartrate ointment was withheld and mepyramine maleate given by mouth. Since that time the hands have shown a steady improvement from the application of zinc and castor oil.

I reported this case to Roche Products Ltd., the manufacturers of theophorin ointment, asking if a constituent of the ointment base was the cause of the hypersensitivity. I received a reply from the medical adviser stating that this was unlikely and that it was much more probably caused by the theophorin itself, as other similar cases had occasionally been reported.

It seems strange that the cure of a disease should cause the disease itself.—I am, etc.,

Bristol.

W. A. HEATON-WARD.

Medical Services for American Personnel

SIR,—It has been suggested by several British physicians, particularly those practising in the communities which are adjacent to United States bases in the United Kingdom, that information be circulated concerning the type of medical services available to American personnel and their dependants in the United Kingdom.

There are four U.S. Air Force hospitals in England: the 59th Medical Group located in Burtonwood, near Warrington, Lancs, serving the Liverpool region, telephone Warrington 3000, extensions 1070 or 1060; the 5th Hospital Group at Burdorp Park, near Swindon, Wilts, serving

the Oxford area, telephone Wroughton 391; the 3rd Hospital Group at Wimpole Park, near Royston, Cambs, serving East Anglia, telephone Arrington 381; and the 494th Medical Group, serving the London area, telephone Waxlow 4300, extensions 112, 113, or 114. All of these hospitals have the following services and facilities available: general surgery, general medicine, ophthalmology, oto-rhino-laryngology, orthopaedics, paediatrics, obstetrics, gynaecology, out-patient, laboratory, pharmacy, and radiology. In order to provide the best type of specialized medical care, certain of these hospitals have been staffed and equipped over and above the others. Therefore in the case of difficult diagnostic problems covering the following specialties patients should be referred as indicated: neuro-psychiatry—Burderop Park; urology—Burderop Park or South Ruislip; orthopaedics—Burderop Park; cardiology—South Ruislip; allergy—Wimpole Park; mortuary service—any hospitals listed or secure information from nearest American installation.

Should any British physician desire to use any of these facilities in his diagnosis or treatment of American patients, he may call on them direct or may ask the nearest hospital for assistance in securing consultation and transport facilities. X-ray examinations, all laboratory procedures, including basal metabolic rates, and electrocardiograms can be done. Prescriptions can be filled at all these and other medical establishments, such as infirmaries, although substitutes may be necessary where British and American medicines differ slightly.—I am, etc.,

L. R. BRASWELL,
Air Surgeon, Third U.S. Air Force.

Ruislip, Middlesex.

POINTS FROM LETTERS

Feeding of Babies

Dr. A. L. E. FILMER COLEMAN (Evesham) writes: I may be old and behind the times, but I am still convinced that if only we returned to starting babies off with three-hourly feeds, gradually lengthening the interval to four hours, we should not hear so much about this self-demand feeding. . . . Dr. J. Irene Rosie (January 31, p. 273) says, "The breast-feeding record is better in those babies who in the first 10 to 14 days of life are not kept on a too strict feeding régime." It is not the lack of strict régime; it is the fact that the mother, showing common sense, refuses to follow the, to my mind, silly and harmful four-hourly feeding.

"Prescribers' Notes"

Dr. F. E. S. HATFIELD (Chipping Ongar, Essex) writes: I have recently received a copy of *Prescribers' Notes*. I am fully in sympathy with the objects of this publication, but I feel that greater endeavours should be made to be objective. For instance, in this number a page is devoted to the drug "pregnenolone" which gives the impression that the drug is not only expensive but therapeutically valueless. In my experience—admittedly limited, as most general practitioners' experience of any one type of case must be—this drug gives symptomatic relief in most cases of active rheumatoid arthritis. I have had three cases in which a life of great suffering only made bearable by the constant ingestion of large quantities of tab. cod. co. was transformed by the drug. Unfortunately the symptoms relapse as soon as the drug is withdrawn, and in one case the dose had to be pushed to 10 tablets a day to get the full effect. In my opinion, rheumatoid arthritis is a disease which can cause so many years of prolonged suffering that any drug which promises relief should be fully utilized. It is common experience that costly drugs soon become cheaper if extensively used, and there has been at least one reduction of price in this case to my knowledge. If the reports in *Prescribers' Notes* are to be as biased on the one side as some of the reports of the less reputable drug firms are on the other, then it will certainly fail in its mission.

Second Attack of Chicken-pox

Dr. M. A. G. PIETRONI (Nicosia, Cyprus) writes: With reference to Dr. N. H. H. Gollidge's letter (January 17, p. 163), I have personally witnessed undoubted second attacks of chicken-pox on two occasions. I have no records of the first case, but I observed in the second patient, now aged 7½, a definite though mild attack of chicken-pox in January, 1951, which lasted only a few days and which coincided with an epidemic at her school. Her second attack occurred in January of this year. This attack was profuse enough and will probably allow the little girl to build up her immunity.

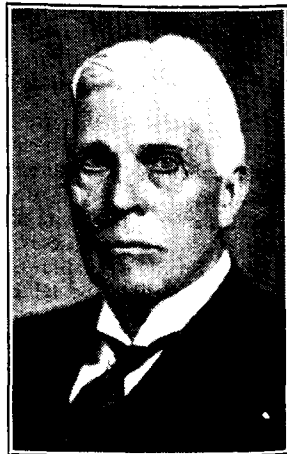
Obituary

Sir HOLBURT WARING, BT., C.B.E.
M.S., F.R.C.S.

Sir Holburt Jacob Waring, who died at his home in Gloucestershire on February 10 at the age of 86, occupied an outstanding position in British surgery for many years. He had lived since the middle thirties in retirement at Tidenham in Gloucestershire, but many in London will vividly recall him not only as a surgeon of great eminence but as a dignified Vice-Chancellor of the University and a man of high capacity in administration in many public bodies. He never lost during his long career in the south his native Lancastrian abruptness of speech and manner, but those who got behind the manner to the man found a charming personality and a real friend.

He was born on October 3, 1866, the son of Isaac Waring, of Southport, and was educated at Owens College, Manchester. He took his medical training at St. Bartholomew's, the hospital on whose staff he was to serve actively for thirty years. His university career was a brilliant one; he seemed to carry off all the prizes. He took the B.Sc.Lond. in 1888 with honours in physiology, the M.B. in 1890 with honours in medicine and forensic medicine, the B.S. in 1891 again with honours, and the M.S. in 1893, qualifying for the Gold Medal. His whole career was devoted to surgery. He became F.R.C.S. at the age of 25. In January, 1902, he was elected assistant surgeon at St. Bartholomew's, and full surgeon in 1909. He was also consulting surgeon to the Metropolitan Hospital, the Royal Dental Hospital, and to the Ministry of Pensions. His career was interrupted by service in the first European war, in which he held the rank of brevet-colonel R.A.M.C.(T.) and was mentioned in despatches. Before the war he had served in the volunteer Medical Staff Corps and had transferred to the Territorial Force when it was established in 1908.

His election in 1932, in succession to Lord Moynihan, to the presidency of the Royal College of Surgeons of England, a position which he held for three years, was the crown of a long association with the Royal College in many capacities. In 1897-8 he was Erasmus Wilson lecturer, in 1921 Bradshaw lecturer, and in 1928 he delivered the Hunterian Oration. He was a trustee of the Hunterian Collection of the College and for 10 years a member of the Board of Examiners. He was also examiner in surgery for the universities of London, Oxford, and Manchester. In the University of London he had been Dean of the Faculty of Medicine and in 1922-4, at a time of important constitutional change in the University, he held the office of Vice-Chancellor. He was closely associated with the establishment of the London School of Hygiene and Tropical Medicine, and



(Elliott & Fry, Ltd., London)

the great institution in Gower Street owes much to his business ability in the chair of the Court of Governors and as its treasurer. For many years he was the representative of his university on the General Medical Council, and there and on the Dental Board, of both of which bodies he was treasurer, his business and financial ability proved of great service.

Waring was an able if somewhat formidable teacher, and the terseness of his style was well suited to the compilation of medical textbooks. His *Manual of Operative Surgery* was first published in 1892, when it consisted of 687 pages. In the sixth edition, published in 1927, the pages ran to nearly one thousand. In 1928 he published *The Surgical Treatment of Malignant Diseases*. An early work of his, published in 1897, was *Surgical Diseases of Liver, Gall Bladder, and Biliary System*, a dissertation on which subject had gained him the Jackson prize of the Royal College of Surgeons a few years before. He also contributed to many medical textbooks and periodicals. The articles on operations on the tongue and floor of the mouth in Burghard's *System of Operative Surgery* and on surgical disease of the pancreas in the *Encyclopaedia of Medicine and Surgery* were from his pen. With the late Sir D'Arcy Power he wrote a short history of St. Bartholomew's Hospital.

Among other leading positions which he occupied from time to time were those of president of the Medical Society of London in 1925-6, president of the Section of Surgery of the Royal Society of Medicine in 1928-30, vice-treasurer of the Imperial Cancer Research Fund, vice-president of the Grand Council of the British Empire Cancer Campaign, and governor of East London College and of Christ's Hospital.

Waring was made C.B.E. at the close of his war service in 1919 and was knighted in 1925. In 1935 he was created a baronet "of St. Bartholomew's of the City of London." He was the recipient of honorary degrees of the Universities of Cairo and of Bristol and Durham, and was an honorary Fellow of the Royal Australasian College of Surgeons. He was also an officer of the Legion of Honour. Sir Holburt Waring, whose wife died in 1948, is survived by a son and two daughters.

We are indebted to Mr. J. BASIL HUME for the following appreciation: Holburt Waring, though never a very great surgeon, achieved distinction by a record of service in the profession which can rarely have been equalled. His offices, which included those of President of the Royal College of Surgeons, Vice-Chancellor of the University of London, and Chairman of the London School of Hygiene and Tropical Medicine, covered a wide field concerned with the co-ordination and advancement of medicine. With all this he never neglected what he considered to be his first duty—the care of patients at St. Bartholomew's. For thirty years he was a familiar figure in and about the hospital. The house-surgeons and dressers, all in clean white coats, awaited his arrival in the square. He was invariably punctual, and immediately led the way into the wards or the theatre. The dresser's notes were read and severely criticized, the patient was thoroughly examined, and a diagnosis or provisional diagnosis made. He hated indecision: his judgment was based on facts, and in these when duly weighed made him firm and prompt in action. The great majority of his house-surgeons held him in high esteem and many in affection. They had to pass through the stage of being "the worst house-surgeon I have ever had" to be able to graduate to competence, but, that achieved, their interests were his.

In the same way Waring was sure of himself in matters of policy. The facts had been carefully ascertained and

considered, and by his forceful speech and manner and skill in committee procedure he nearly always won his way. It is doubtful whether the new surgical block at Bart's would ever have been built if he had not forced the necessity for the building on governors and colleagues alike. Some were afraid of the cost, others that the square would be altered, but Waring had a conviction of future needs and developments that overcame all obstacles.

It is sad to recall that, with the loss of his friends Lockwood and Harrison Cripps, Waring became a very lonely man, plunging more and more actively into public affairs. That he lived to an advanced age with almost unimpaired mental powers is not remarkable when one considers the number of interests he maintained after his retirement. He came on the staff of Bart's in 1902, and is the last of the great men of the turn of the century.

W. H. GRACE, M.D., F.R.C.P.

Dr. W. H. Grace, who died at Chester on February 10 at the age of 60, was the Home Office pathologist for the north-western region from January, 1947, to March, 1952, when ill-health obliged him to resign from the appointment.

Walter Henry Grace was born in Australia on December 25, 1892, and, after graduating B.Sc. at the University of Sydney, he came to England to continue his medical studies at Guy's Hospital. He qualified M.R.C.S., L.R.C.P. in 1918 and took the degrees of M.B., B.S. of the University of London in the same year. After qualification he held a number of appointments at Guy's Hospital, including that of senior assistant bacteriologist, and then in 1922 he moved to Chester. Before leaving London he took the M.R.C.P. and the D.P.H., and in 1922 he proceeded to the degree of M.D. and took the D.T.M.&H. He was elected F.R.C.P. in 1939. At Chester Dr. Grace quickly made his mark as a pathologist of reliability, and his services were made full use of by the hospitals in the district. He became honorary pathologist and senior assistant physician at Chester Royal Infirmary, consulting pathologist to the Cheshire County Mental Hospital, and honorary pathologist to the Wrexham War Memorial Hospital and to Denbigh Infirmary. With the introduction of the National Health Service he was appointed consulting pathologist to the Chester group of hospitals. He was also part-time lecturer in forensic medicine and toxicology and examiner in forensic medicine at the University of Liverpool for some years. When the British Medical Association held its Annual Meeting at Liverpool in 1950 he served as a vice-president of the Section of Pathology and Bacteriology. On the establishment of the Chester and District Hospital Management Committee under the National Health Service in 1948 he was appointed vice-chairman, a position he held until 1952. He had also been chairman of the appointments subcommittee and vice-chairman of the staffing subcommittee.

As a Home Office pathologist Dr. Grace was often called on to give evidence in criminal prosecutions, and he appeared as an expert witness in the trial for murder of Dr. Buck Ruxton in 1936 and of Dr. R. G. Clements in 1947. As a witness his quiet, incisive voice commanded respect, and his answers to questions were uttered slowly and deliberately, without waste of words. By nature a cheerful, kindly man, he was most reluctant to give up much of his work last year, but ill-health made this inevitable. His memory will be cherished by his many friends.

Dr. GRIFFITH LLEWELYN JONES died at his home at Llangefni, Anglesey, on January 17 at the age of 80. He was born at Llanllyfni, Caernarvonshire, on October 25, 1872, and was educated at Denstone College, Uttoxeter, and St. Mungo's College, Glasgow. After obtaining the Scottish triple qualification in 1897 he was appointed house-surgeon to the Royal Infirmary, Glasgow. He volunteered for service in the South African war, and was senior medical officer to the Ladysmith, Pinetown, and Merebank camps. In 1903 he settled in general practice at Llangefni, where he remained for the rest of his life. During the first world war he held a commission in the R.A.M.C. and had charge of various auxiliary hospitals, as he also had during the last war. He was medical officer to the County Isolation Hospital for many years. An accomplished horseman for over fifty years, he was one of the most active members of the Anglesey Harriers. He married Miss Grace Rowlands, of Clegir Mawr, Anglesey, and she, with their three daughters, survives him.

Professor O. HERBERT WILLIAMS writes: Dr. Griffith Llewelyn Jones was the perfect family doctor. He had a keen and lively intelligence, unbounded energy, an understanding mind, and an inexhaustible fund of kindness, which he lavished on his patients. His response to a medical call was immediate. He used to dart along the Anglesey lanes like a swallow to see his patients, and he accomplished a prodigious amount of work in the 24 hours, but once inside the sick-room he was never in a hurry. He had that skill, which is tending to disappear, of making a remarkably accurate assessment of the patient's condition from symptoms and physical signs and with the aid of the simple armamentarium of the doctor's bag. Nevertheless, he was fully alive to the latest laboratory aids to diagnosis and made full use of them. If one of his patients was transferred to hospital or to a nursing-home he still kept in constant touch, for he considered that he was always in overall charge of the case, and kept himself continually informed of the patient's progress. No man served his generation better than did Llewelyn Jones, and no one was held in higher esteem. This was plainly shown by the mourning crowds from all parts of the island and beyond who lined the streets of Llangefni and congregated at the old church of Llangristiolus to pay their last homage to one who was indeed a "beloved physician."

Dr. N. H. Joy, who died at Chichester on January 20 at the age of 78, was the author of several well-known books on natural history. H. B. writes: Norman Humbert Joy was the son of a clever father and was himself of a rare type. As a student at St. Bartholomew's Hospital he was above the average at work and games, but his scope in both was curtailed by the need to qualify as quickly and inexpensively as possible. After a house-surgeoncy at the Southport Infirmary and a short assistantship in private practice, he became doctor to Bradfield College, an appointment for which he was well adapted. His domestic happiness and professional outlook were, however, early shattered by a motoring accident which left him a permanent cripple. Thereafter his energies were mainly confined to natural history, in which his powers of observation were extraordinary. He once said to me, "I know only part of my brain is working"; but in spite of this, and in spite of diplopia, severe headaches, and other handicaps, he had some notable achievements. He produced a large two-volume work on British beetles, illustrated by himself, which is still the standard book on the subject. He wrote also a small handbook on the identification of British birds in the field; this quickly went through several editions, and, like the beetle book, was illustrated by himself. During his lifetime he added more new species to the list of British beetles than anyone else; and once, while crossing Windsor Park, he discovered an ant new to science, named by Rothschild *laetitia* in a play on Joy's name. Among other exploits Joy made a complete collection of British butter-

flies, which he characteristically gave to a London museum. Another of his successful accomplishments which I like to remember was the photography of a cuckoo laying an egg. Through the 60 years of our friendship I have been continually inspired by Joy's brave mastery over cruel frustrations. He leaves two married daughters and a son who prospers as a doctor in the West Country. They have our sympathy with their sad memories.

We record with regret the death of Dr. E. E. PAGET-TOMLINSON at his home at Summerhill, near Ulverston, Lancashire, on January 20, at the age of 70. Edward Edmondson Paget-Tomlinson was born on April 26, 1882, the son of the late Dr. W. S. Paget-Tomlinson, of Kirkby Lonsdale. At Trinity Hall, Cambridge, he distinguished himself as an athlete, gaining a half-blue for the long jump. He also played Association football for the Corinthians, and was in a team which toured South Africa. From Cambridge he went on to the London Hospital, qualifying in 1909 and graduating M.B., B.Chir. in the following year. After holding house appointments at the London Hospital Dr. Paget-Tomlinson went into general practice in his home town of Kirkby Lonsdale, in Westmorland, and then moved to Malton, in Yorkshire, where he stayed until he entered the R.A.M.C. to serve in the war of 1914-18, much of the time in Salonika. He proceeded to the degree of M.D. in 1920 and then practised for some 15 years at Horncastle, Lincolnshire, where he was medical officer of health to the urban district council and honorary surgeon to the War Memorial Hospital and Dispensary. He left Horncastle early in 1935 and for a time lived at West Tanfield, near Ripon, and at Bedale, Yorkshire, until in 1938 he settled at Summerhill. For some years he had been in poor health, but during the last war he came out of retirement to help doctors in the Ulverston area. He was a governor of Sedburgh School and a magistrate on the Ulverston bench. He leaves a widow and one son.

We are indebted to Sir PHILIP MANSON-BAHR for the following appreciation: Dr. E. E. Paget-Tomlinson, or "P.-T." as he was known, was a friend and fellow student of mine at the London Hospital from 1905 to 1908. There are others of my contemporaries who will treasure the memory of "P.-T.'s" many lovable characteristics. He was the type of athletic student of his day, fresh from the University of Cambridge and excelling in every form of field athletics, especially in the jumps and hurdles. He was good to look upon, with his neat, well-proportioned figure and his charming, cheery smile. He was gifted with a particularly inquiring mind and would pose questions on all kinds of subjects, ending his inquiries always with a throaty chuckle. He was the most humble and modest of men, but under his diffidence there lurked a sincerity and a love of his fellow creatures. He was thus fitted with those qualities most needful to become a successful country practitioner. He filled the bill so well that his name has gone down as a household word in Lancashire and Lincolnshire, wherever he worked. He was a good naturalist and a keen observer of plant and bird life. It was always a pleasure to look forward to meeting him at reunion dinners of the London Hospital, but of recent years his visits became rare, and it is sad to think that such a fine, athletic person as "P.-T." should have suffered so much in his last long illness.

Dr. A. F. GOLDSMITH, who was for many years a greatly respected medical practitioner in Bedford, died on January 27 at the age of 82. Born at Bedford on June 18, 1870, the youngest son of the late Dr. G. P. Goldsmith, who had practised in the town for over 40 years, Arthur Frederick Goldsmith was educated at Bedford School and at St. George's Hospital, London, qualifying M.R.C.S., L.R.C.P. in 1894. Soon after qualification he joined his father and his brother, Dr. G. Harvey Goldsmith, who died in 1940, and he and his brother succeeded to the practice

when their father retired in 1904. Dr. A. F. Goldsmith himself retired in 1932 and for a time lived in Cornwall, but his home in recent years was at Biddenham, near Bedford.

Dr. H. DEAN POLLARD writes: As a contemporary colleague I would like to add a personal tribute to the late Dr. A. F. Goldsmith. I first met him when he had been in practice about three years, and we were often in contact since then. "Dr. Fred," as he was almost universally known, was a modest, unassuming, but greatly loved practitioner, one of the old school, who made friends of his patients but who did not make patients of his friends. His kindness and generosity to his poor patients were unstinted, but were known by them alone. He married, somewhat late in life, Miss Helen Rickard, a member of a well-known Bedford family, and he retired so that he could devote his whole attention to his wife, whose health was not robust. I cannot omit a reference to his zeal and enthusiasm for his church, St. Paul's, where he worked for many years in different offices, especially in connexion with the Sunday school. It irradiated his whole life and shone out in his geniality, his kindness, and his self-sacrificing hard work for poorer brethren.

Dr. WALTER SHARPIN writes: Fred Goldsmith was a contemporary of mine from my early student days at St. George's Hospital, and, although he was my senior by a year, he became one of my friends. He was known as a quiet, hard-working student and he gained the prize in anatomy for his year. When he gave up his practice in Bedford his patients felt his loss very keenly. Among his colleagues he was deservedly popular, being always cheerful, always loyal, a true friend, and one who had no enemies.

Dr. J. A. LEAHY writes: With the passing of Dr. A. F. Goldsmith, Bedford has lost a much-loved citizen and the medical profession a colleague who was held by all in terms of sincere affection and esteem. He was the last of a family of doctors, which included an ophthalmic surgeon, the late Dr. Harvey Goldsmith, who had practised in Bedford for nearly 70 years. It was my good fortune to succeed "Dr. Fred" in practice, but it was difficult to follow in the footsteps of a man whose kindness, cheerfulness, wit, and good humour were a by-word in Bedford; even a passing acquaintanceship showed him to be "full of the milk of human kindness." His old patients still talk of his skill and of his never-failing generosity, especially to the poor; and he possessed in ample measure the greatest of all virtues, Christian charity. His deep religious faith, manifest to all, enabled him to bear with Christian fortitude the infirmities which afflicted him towards the end of his days. He is buried in his beloved Biddenham close to the south wall of the church where he worshipped.

Dr. LESLIE LYNE, whose sudden and untimely death at the age of 57 occurred on February 2, was born on April 21, 1895, and educated at St. Olave's Grammar School and Guy's Hospital. As a result of this early and long association he acquired an affection for "The Borough" and its inhabitants which neither time nor separation could dull. After qualifying in 1919 Dr. Lyne held the posts of house-physician to Dr. (later Sir) Arthur Hurst and obstetric resident at Guy's. Subsequently he widened his experience by spending two years in India and Persia with the Indian Medical Service and a period as resident at Lambeth Infirmary before settling at Ascot at the suggestion of Sir Arthur Hurst. There he combined general practice with anaesthetics, being at one time on the staff of the King Edward VII Hospital, Windsor. But his real life's work began when, mainly for reasons of health, he moved to Bedford in 1934. There his sterling qualities as a man and as a physician were quickly recognized and he soon formed a large and ever-widening circle of patients, who found in him the ideal family doctor—selfless, reliable, capable, and gentle. By them he will be greatly missed, perhaps not least by the aged, whose problems he seemed to understand so

well. But in addition to the ties of a busy general practice he continued his interest in anaesthetics and held various appointments, most notably at the Sussex Throat and Ear Hospital, where he was senior anaesthetist for the past 14 years. Throughout innumerable operating sessions his quiet efficiency would allay anxieties and his unvarying good temper and charm alleviate tedium. Apart from his work, his happy family life occupied him entirely, and his joy was complete when in the same month last year his daughter graduated B.Sc. and his son M.B., B.Chir. To them and to his widow our deepest sympathy goes out in their irreparable loss.—T. S. A.

Dr. BERTRAM ROGERS, who died at Oxford on February 9 at the age of 92, spent most of his active professional life in Bristol. His father was J. E. Thorold Rogers, M.P., professor of political economy in the University of Oxford and at King's College, London. Bertram Mitford Heron Rogers was born on August 25, 1860, and was educated at Westminster School and at Exeter College, Oxford, where he gained a blue for Association football. He played at centre-half for the University against Clapham Rovers in the F.A. Cup Final at Kennington Oval in 1880. After leaving Oxford he began the study of medicine at University College, London, graduating B.M., B.Ch. in 1889 and proceeding M.D. in 1892. On going to Bristol he engaged in general practice, but was appointed physician to the Bristol Royal Hospital for Sick Children and Women, and more or less specialized in children's diseases at a time when that was very unusual, at any rate in the provinces. At the Annual Meeting of the B.M.A. in 1894 he was one of the secretaries of the Section of Diseases of Children and vice-president of the Section at the Annual Meeting in 1902. A member of the Territorial Army, he commanded a field ambulance in the war of 1914-18, and attained the rank of lieutenant-colonel. He was very active in local affairs, being president of the Bristol Medico-Chirurgical Society in 1910 and editorial secretary to its journal. He was local secretary of the British Association twice, in 1898 and 1930, chairman of the Bristol branch of the St. John Ambulance Association, and honorary treasurer of the local Royal Empire Society. As may be gathered from this record, he was highly esteemed by his colleagues, but few of them, if any, are left now to mourn his loss. After his retirement from clinical practice he worked for a time as a regional medical officer of the Ministry of Health. He married Agnes Fletcher in 1891, and had two daughters. Mrs. Rogers died in 1939.

Medical Notes in Parliament

Antibiotics for Fattening Stock

The Therapeutic Substances (Prevention of Misuse) Bill occupied the House of Lords for only a short time on its second reading on February 12.

The EARL OF ONSLOW, moving it, said that no one quarrelled with the Penicillin Act, 1947, but other substances had since come forward, and this Bill sought to regulate them so that their use should not be detrimental to the public. This applied particularly to isoniazid, which was cheap to produce, and could, if used for self-medication or without proper advice, do a great deal of harm to the person concerned. The other main purpose of the Bill was to permit the use of some of these drugs, particularly at the moment penicillin, in the feeding of pigs and table poultry. A tiny quantity of penicillin in their diet fattened them more quickly, and thus produced more pork and bacon.

The only substantial point raised in the discussion was put most succinctly by Lord O'HAGAN, although other peers spoke about it. It was to seek assurance that the effect of the inoculation of pigs by penicillin would neither be

deleterious to human beings who were allergic to penicillin when the pig-meat was eaten, nor conversely affect the effectiveness of the drug when it was properly administered to human beings.

The EARL OF ONSLOW assured them that the Agricultural Research Council and the Medical Research Council were satisfied that penicillin fed to pigs in this form could do no harm whatever.

As a footnote to this debate, an answer given in the House of Commons on February 12 stated that the Minister of Health was advised that the quantities of antibiotics needed would be minute—of the order of 2 to 20 parts in a million—and that there would remain in the meat from stock so fattened no traces of a kind that would entail any risk to the consumer.

Chemicals in Food

Mr. D. W. WADE asked the Minister of Food on February 11 what investigations he was undertaking into the use of chemicals and synthetic substitutes in the production of food, and when he would be able to publish the results.

Major G. LLOYD GEORGE replied that the Food Ministry did not itself undertake investigations of this nature. The work was carried out through continued consultation with the Health Departments and the Medical Research Council and by close co-operation with the Industrial Research Associations and other technical bodies concerned.

Mr. WADE said there had been an alarming increase in recent years in the use of chemicals in the production and processing of food, and there had been no adequate inquiry into either the short-term or long-term effects on the health of the nation.

Major LLOYD GEORGE would not accept the phrase "alarming increase." Chemicals need not necessarily be a cause for alarm; they had been used for many years in foodstuffs. Very careful investigation indeed was going on into important aspects of the matter.

Treatment of Flour

The MINISTER OF FOOD, answering a question by Mr. R. BELL on February 11 asking why, and under what authority, chalk is added to the national loaf, stated that calcium carbonate was added to National flour to ensure that total food supplies provided sufficient calcium to meet nutritional requirements. This was done under Articles 2 and 6 of the Flour Order, 1952, and Article 2 of the Bread Order, 1952. The addition of nutrients to flour was under discussion with the trades concerned, and an announcement would be made when the details had been settled.

Mr. D. W. WADE asked the Minister what progress had been made in the investigations into the existing methods of treatment of flour, and whether he would give an assurance that the process of agenization would be abandoned. Major G. LLOYD GEORGE stated that these complex and important investigations into possible alternatives to agene as a flour improver were requiring considerably more time than was originally thought necessary. They were being pursued with all possible speed, but it would be premature to take any action until they were completed.

In a further reply he said that since the investigations started one or two possible alternatives had been suggested, but it was obvious that careful research must be undertaken before either could be accepted.

Mr. G. NICHOLSON asked whether it had been accepted that agene was a contributory factor to hysteria in dogs.

Major LLOYD GEORGE said that was one of the things the committee was investigating. He also pointed out that agene had been used in bread in this country for over 30 years.

Lung Cancer

Mr. S. T. SWINGLER asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, for a statement on the lines of research into the incidence of lung cancer among gas workers to be pursued by the Medical Research Council.

Mr. A. H. E. MOLSON replied on February 10 that the possibility of conducting further research on the incidence of lung cancer among gas workers was still under discussion by the Medical Research Council in consultation with other departments. He was therefore unable to make any statement at present about investigations which might be undertaken in the future.

London Sickness Claims

Lieutenant-Colonel M. LIPTON asked the Minister of National Insurance to what extent the number of claims for sickness benefit in the London area during December, 1952, exceeded the corresponding figure for 1951. Mr. O. PEAKE stated that the number of new claims to sickness benefit received in the offices of the Inner London region of the Department during the period of four weeks ending January 1, 1952, and December 30, 1952, were 52,770 and 77,040 respectively.

Lieutenant-Colonel LIPTON said that in view of this further evidence of loss caused by fog in London there should be more energetic action to deal with air pollution.

Elastic Stocking Prescriptions

Mr. W. W. HAMILTON asked the Minister of Health how many pairs of elastic stockings were supplied through the National Health Service on the prescription of general practitioners in the six months June–November, 1952; and what were the corresponding figures for each year since the inception of the Service.

Mr. IAIN MACLEOD, in a reply on February 6, said he regretted that when he answered a previous question on December 18 he omitted to make it clear that the figures he gave were for the hospital service only. Precise figures were not available, but it was estimated that the number of orders for elastic hosiery supplied on the prescription of general medical practitioners was at least ten times the number supplied through the hospital service. In his reply in December the Minister stated that the numbers supplied in June–November, 1952, were 16,055; in July–December, 1948, 4,788; and in the following complete years 23,331 (1949); 31,155 (1950); and 35,732 (1951).

Health Service Charges

Mr. A. BLENKINSOP asked the Minister of Health on February 12 what financial saving he estimated would result from the charges imposed under the Health Service Act, 1952, how much of this saving resulted from a fall in use of the services concerned, and how the savings compared with the estimates originally given. Mr. IAIN MACLEOD replied that the estimated amount of the charges paid or to be paid in 1952–3 by patients in England and Wales under the 1952 Act was about £2m. In addition, while figures to enable a complete estimate to be made were not available, the reduction in the demand for dental treatment and for hospital appliances for which charges were made compared with the previous year was estimated to show a saving of about £1,750,000. Comparisons could not usefully be made with estimates framed in the expectation that the charges would operate for a full year and before modifications in the original proposals were made.

Licence Duty on Cars

Lieutenant-Colonel W. H. BROMLEY-DAVENPORT asked the Chancellor of the Exchequer whether he was aware that, although veterinary surgeons, doctors, dentists, and midwives had been exempted under the Road and Rail Traffic Act (Exemptions) Regulations, 1951, from the necessity of obtaining a carrier's licence for their utility vehicles when used for carrying medicines, drugs, and instruments for use in their professional work, these vehicles were still subjected to the higher rate of Road Fund duty irrespective of ownership and use; and whether, in view of the difficulty for such

persons in obtaining small low-taxed private cars in substitution, he would take steps to ensure that the utility vehicles in question qualified for private-vehicle taxation rates.

Mr. J. A. BOYD-CARPENTER, the Financial Secretary, answered on February 12 that under section 5 of the Vehicles (Excise) Act, 1949, and s. 7 of the Finance Act, 1952, vehicles constructed or adapted for the conveyance of goods must pay duty as goods vehicles if used to convey goods for hire or reward or in connexion with a trade or business. He had no power to exempt particular classes from the general law.

Consultants in West Scotland

Sir THOMAS MOORE stated in a question to the Secretary of State for Scotland on February 10 that there was public concern in Ayrshire about the efficiency of the National Health Service and the shortage of trained medical and surgical consultants. Mr. J. STUART undertook to consider any particulars of deficiencies brought to his notice. Sir T. MOORE mentioned that there had been a disturbing number of resignations lately, especially among consultants. Mr. STUART said he was assured that the regional board were taking proper steps to replace those who had resigned. Mr. A. C. MANUEL said that doctors generally in West Scotland had expressed to him their satisfaction at the better service available since the National Health Service was begun.

Medico-Legal

LIABILITY OF HOSPITAL AUTHORITY

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

In an action for negligence against the surgical registrar of the Mayday Hospital, Thornton Heath, and the Croydon Hospital Group Management Committee in respect of the death of a patient from peritonitis after appendicectomy, a novel defence was raised on behalf of the management committee. The committee pleaded that in undertaking the care and treatment of patients they did so in pursuance of their duty to provide hospital specialist and general medical services under the National Health Service Act, 1946, that the surgical registrar was acting on their behalf in fulfilment of that duty, and that section 72 of the Act therefore relieved them of liability.

s. 72 of the Act of 1946 provides that s. 265 of the Public Health Act of 1875 shall have effect as if the authorities mentioned in it include hospital management committees. s. 265 of the Act of 1875 provides that no matter or thing done by local authorities shall, if done bona fide for the purpose of executing the Act, subject them personally to any action, liability, claim, or demand whatsoever.

But s. 13 of the National Health Service Act, 1946, provides that hospital management committees shall, notwithstanding that they may be exercising functions on behalf of the regional hospital board, be liable in respect of any liabilities incurred in the exercise of those functions, including liabilities in tort—for instance, for negligence.

This defence of the committee was tried as a preliminary issue in the action before Mr. Justice Parker on February 12.¹ In his judgment he said that it would be a very strange result if, in face of the plain words of s. 13 of the 1946 Act, the effect of s. 72 of that Act and s. 265 of the Public Health Act, 1875, absolved the committee from the Public Health Act, 1875, in *Davis v. Board of Management for Glasgow Victoria Hospitals*,² that, by reason of equivalent but not identical provisions in the statutes applicable to Scotland, the management committee could not be sued. But the decision was not binding on the English

courts and Mr. Justice Parker felt unable to follow it. He decided the preliminary issue against the management committee, but granted leave to appeal.

This is apparently the first time in England since the National Health Service Act, 1946, came into force that a hospital management committee has relied on this defence. Lawyers and management committees throughout the country will await with great interest the result of an appeal from Mr. Justice Parker's decision, which is of the highest medico-legal importance.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on January 22 the degree of D.M. was conferred on T. Stapleton and F. J. Flint.

The following reappointments are announced: A. G. McD. Weddell, M.D., Reader in Human Anatomy, from October 1, 1953, to September 30, 1960; and D. C. Sinclair, M.D., Demonstrator in Human Anatomy, and George Gordon, D.M., Demonstrator in Physiology, both from October 1, 1953, to September 30, 1958.

Among the honorary degrees the University proposes to confer at a Convocation on July 1, in connexion with the Rhodes Centenary, is that of D.C.L. on Professor W. G. Penfield, F.R.S., who was awarded the Order of Merit in this year's New Year Honours.

UNIVERSITY OF CAMBRIDGE

The establishment of the Elisabeth Storey Fund for research on leukaemia and allied diseases was announced in the *Journal of Medicine* 6, 1952 (p. 1267). The Vice-Chancellor of the University announced on January 12 that he had received a gift of £220 from Mtre Mahmoud El-Darwish for use in connexion with the fund.

Professor J. S. Mitchell, F.R.S., has been appointed representative of the University at the seventh International Congress of Radiology, to be held at Copenhagen in July.

In Congregation on December 23, 1952, the following medical degrees were conferred by proxy:

M.B., B.CHIR.—J. M. S. Grieve, H. E. Lichtenstein, T. M. O. Morris, R. D. W. Romanis, H. C. M. Walton, M. H. Bennett, R. L. Morgan, J. F. Preece, T. L. Ringrose, J. O. Winter, M. D. Heyman, P. M. H. Rack, I. F. Smith, G. D. Stones, P. A. Watt, W. M. Beatley, W. A. G. Roper, M. C. Thornton, D. A. P. Burton, A. M. B. Golding, B. S. Jay, P. L. Maybury, K. F. Morrice, F. Reiseiger, C. S. Savage, L. J. Stretton, I. Weinbren, R. K. Greenwood, H. F. Grundy, I. S. Lister, M. T. O'Donnell, I. A. Stewart, D. S. Trouton, R. C. Curry, S. H. Dallas, B. L. Hoskyns, H. S. Chen, E. M. Orton, J. T. H. Pick, J. A. M. Tudor-Hart, A. E. Wagstaff, D. W. K. Bird, W. H. Chapman, S. J. Fisher, D. B. Fox, E. P. Simkin, A. W. Warltier, F. L. S. J. Adams, L. P. Balfour-Lynn, A. N. Griffith, Whalley, C. W. M. Adams, L. P. Balfour-Lynn, A. N. Griffith, R. D. Hernaman-Johnson, T. L. Scully, J. A. Fiddian, W. G. Williams, Aileen B. Donnison, Ruth M. Turner, Mrs. Hanna French, Vera M. C. B. P. Hollyhock, Gillian G. Matthews, G. M. P. Boyes.

The Council of the Senate of the University has accepted the offer of a grant by the Nuffield Foundation of £8,650 spread over five years in support of work in experimental embryology under the direction of Professor J. D. Boyd in the Department of Anatomy, and an additional grant from the Foundation of £550 a year for the three years of the grant for work on cellular biology to be conducted under the direction of Professor David Keilin, F.R.S., in the Molteno Institute of Biology and Parasitology (see also *British Medical Journal*, November 15, 1952, p. 1106).

In Congregation on February 6 the following medical degrees were conferred:

M.D.—I. S. Hodgson-Jones.
M.B., B.CHIR.—I. M. Brown (by proxy).

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on February 12, with Sir Cecil Wakeley, President, in the chair, the death of Sir Holburt Waring (Past President) was reported and the Council unanimously adopted a resolution of condolence.

An Honorary Fellowship was awarded to Professor Reynaldo dos Santos, of Lisbon.

Mr. Geoffrey Keynes was presented with the Cecil Joll Prize.

¹ *The Times*, February 13.
² 1950, S.C. 382.

A Hunterian Lectureship was awarded to Professor Wilder Penfield, O.M., Hon.F.R.C.S., of Montreal, and a Moynihan Lectureship to Dr. H. L. Jaffe, of New York.

The Hallett Prize was awarded to Dr. A. T. Matheson (Cape-town) and the Hancock Prize to Mr. A. H. Tooley (King's College Hospital).

It was reported that gifts had been received from Lord Webb-Johnson (bringing his total contribution to the Restoration and Development Fund to £2,500), from Professor A. V. Neale, and from Professor A. J. E. Cave.

Diplomas of Membership were granted to J. R. B. Saxby and to the recipients of the diploma of L.R.C.P. printed in the *Journal* of February 7 (p. 342).

Diplomas in Public Health, in Industrial Health, and in Anaesthetics were granted, jointly with the Royal College of Physicians of London, to the candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of February 7 (p. 342).

Hospitals were recognized under paragraph 23 of the F.R.C.S. regulations as follows: North Middlesex Hospital, Edmonton, decennial revision, three surgical registrars, for a year; six house-surgeons, for six months. Warneford General Hospital, Leamington Spa, decennial revision, resident surgical officer; house-surgeon, both for six months; from January, 1954, casualty officer. Royal Victoria Hospital, Folkestone, decennial revision, resident surgical house-surgeon (until February, 1954), for six months. Lewisham Hospital, paragraph 23c, ear, nose, and throat registrar. Central Middlesex Hospital, paragraph 23c, ear, nose, and throat registrar. County Infirmary, Louth, resident surgical officer, for six months. Fulham Hospital, additional recognition, orthopaedic house-surgeon, for six months. Southmead Hospital, Bristol, additional recognition, house-surgeon (genito-urinary), for six months; from January, 1954, two casualty house officers. Royal East Sussex Hospital, Hastings, from January, 1954, casualty officer. West Norfolk and King's Lynn General Hospital, from January, 1954, casualty officer. Maidenhead Hospital, from January, 1954, casualty officer. Dreadnought Seamen's Hospital, London, from January, 1954, casualty and receiving-room officer. Ingham Infirmary, South Shields, from January, 1954, casualty officer. Chelmsford and Essex Hospital, from January, 1954, casualty officer. Wanstead Hospital, from January, 1954, casualty officer. King George Hospital, Ilford, from January, 1954, casualty officer. West Middlesex Hospital, from January, 1954, two senior house-surgeons (casualty department). Rochdale Infirmary, from January, 1954, resident casualty officer. Selly Oak Hospital, Birmingham, from January, 1954, two casualty officers (senior house officers). Worcester Royal Infirmary, from January, 1954, casualty officer (senior house officer). Walsall General Hospital, from January, 1954, casualty officer.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College held on February 3, with the President, Dr. W. A. Alexander, in the chair, the following were elected Members of the College: D. G. McIntosh, D. G. C. Whyte, M. P. Goel, L. S. C. Mendis, G. M. Baird, B. Bevan, D. P. Gupta, J. B. Gibson, A. D. Muldoon, F. C. Friedlander, L. Rabinowitz, S. A. Syed, W. Frain-Bell, J. Paul, C. Marks, C. H. Sivaraman, E. M. McLachlan, J. M. Neilson, R. H. Gosling, A. R. Somner, S. J. Cohen, D. H. H. Pullon, M. Dan, Z. H. El Massry, S. Sing, J. A. Chunn, J. L. Potter, S. J. Irani, P. Sobti.

The Services

The *London Gazette* has announced the creation of the rank of Surgeon Rear-Admiral (Dental) with effect from October 1, 1952. The announcement states that the Lord Commissioners of the Admiralty are of the opinion that the duties of the Senior Dental Officer have so increased in scope as to justify the new rank.

Surgeon Lieutenant J. I. McL. Forsyth, R.N.Z.N. (H.M.N.Z.S. *Taupo*), and Temporary Surgeon Lieutenant R. A. Rowan, R.N.V.R. (H.M.S. *Belfast*), have been mentioned in dispatches for distinguished service in operations in Korean waters.

Major A. B. Kerr, O.B.E., T.D., R.A.M.C., has been awarded the First and Second Clasps to the Territorial Efficiency Decoration.

The Air Ministry has announced the upgrading of the post of Director of R.A.F. Dental Services, which is now to be held by an officer of the R.A.F. dental branch in the rank of Air Vice-Marshal.

Vital Statistics

Influenza

In the week ending February 7 there were 446 deaths from influenza in the great towns of England and Wales. In the previous week there were 313. Since the beginning of the year there have been 1,014 deaths in the great towns as compared with 197 in 1952 and 5,914 in 1951. The increased mortality in the week reviewed was mainly confined to London and the south-eastern region, where the deaths were 123 more than in the preceding week. The deaths in the towns of the eastern region were 22 more and in the southern region 17 more; in the remainder of the country the deaths were only 19 more than in the preceding week.

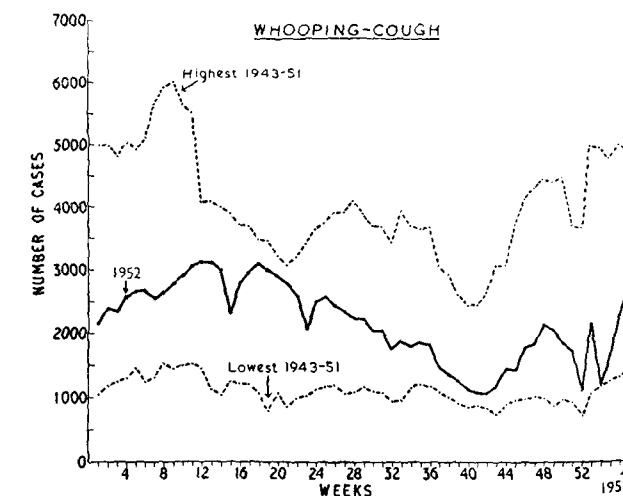
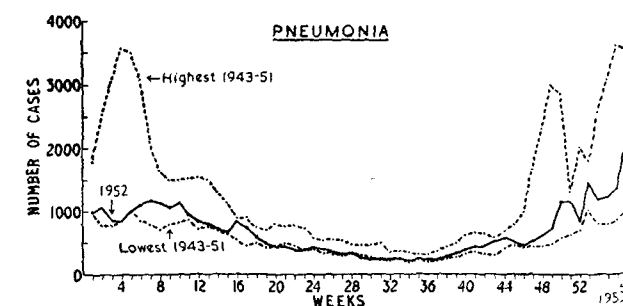
Although virus B has occasionally been demonstrated, the organism mainly responsible is a virus A-prime closely related to the Scandinavian type. Probably the serological type of the virus does not in general determine the severity of the disease except in so far as it is an antigenic novelty in a community without any resistance to it.

Week Ending February 7

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,545, whooping-cough 2,571, diphtheria 16, measles 31,494, acute poliomyelitis 26, dysentery 286, paratyphoid fever 15, and typhoid fever 2.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1943-51 are shown thus -----, the figures for 1952-3 thus ———. Except for the curves showing notifications in 1952-3, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 31 (No. 4) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	24	1	9	1	0	27	1	14	1	2
Dysentery ..	435	32	110	6	0	547	38	72	2	
Encephalitis, acute ..	8	2	0	0		6	0	1	0	
Enteric fever: Typhoid ..	1	0	0	0	7	2	0	0	0	0
Paratyphoid ..	7	0	2(B)	0	0	10	2	1(B)	0	0
Food-poisoning ..	60	6		1		90	8		0	
Infective enteritis or diarrhoea under 2 years ..				13	12				10	9
Measles*	26,460	1470	273	49	178	2,837	41	287	143	61
Meningococcal infection ..	45	5	12	0	2	37	3	11	1	2
Ophthalmia neonatorum ..	32	2	5	0		30	4	9	0	
Pneumonia†	2,029	183	245	61	25	836	38	294	10	1
Poliomyelitis, acute: Paralytic ..	22	2	1	1	0	18	0	0	1	0
Non-paralytic ..	7	1			4	9	0	0	0	2
Puerperal fever‡	282	32	16	0		207	28	14	1	2
Scarlet fever ..	1,850	85	292	41	57	1,293	39	233	36	34
Tuberculosis: Respiratory ..			165	27				154	37	
Non-respiratory ..			21	4				19	8	
Whooping-cough ..	2,799	153	159	35	187	2,573	86	318	152	75

Infectious Diseases

With the exceptions of a rise of 4,578 in the number of notifications of measles, from 21,882 to 26,460, and 680 for acute pneumonia, from 1,349 to 2,029, only quite small variations were reported in the incidence of infectious diseases in England and Wales during the week ending January 31.

The largest increases in the number of notifications of measles were 607 in Yorkshire West Riding, from 1,182 to 1,789; 514 in Middlesex, from 1,574 to 2,088; 422 in Devonshire, from 314 to 736; 316 in Lancashire, from 1,843 to 2,159; 250 in Sussex, from 516 to 766; 241 in Durham, from 587 to 828; 223 in Surrey, from 685 to 908; 203 in Staffordshire, from 663 to 866; and 202 in Warwickshire, from 1,184 to 1,386. Only small variations occurred in the local trends of scarlet fever and whooping-cough. The number of notifications of scarlet fever was 1,850, 18 more than in the preceding week, and the notifications of whooping-cough, 2,799, were 7 more than in the preceding week. 24 cases of diphtheria were notified—an increase of 5 on the preceding week. Half of the cases were notified in two counties, Lancashire 5 (Liverpool C.B. 4) and Warwickshire 7 (Birmingham C.B. 7). The notifications of acute pneumonia were the highest for almost two years. The largest rises during the week were 74 in Middlesex, from 97 to 171, and 68 in Yorkshire West Riding, from 128 to 196.

29 cases of acute poliomyelitis were notified during the week—7 more for paralytic cases and 2 fewer for non-paralytic cases than in the previous week. The largest returns were 3 in each of the counties of Berkshire, Essex, Lancashire, and London.

The 435 notifications of dysentery were 16 more than in the preceding week. The largest returns were Lancashire 116 (Liverpool C.B. 52, Warrington R.D. 24, Salford C.B. 10), Essex 91 (East Ham C.B. 89), Lincolnshire 40 (Grimby C.B. 38), London 32 (St. Pancras 9), Yorkshire West Riding C.B. 13), Cambridge 23 (Cambridge M.B. 23), Middlesex 17 (Edmonton M.B. 7), and Kent 16 (Penge U.D. 10).

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	1	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0	0	0	0	0	0	0	0	0
Encephalitis, acute ..	0	0	0	0	0	0	0	0	0	0
Enteric fever ..	0	0	0	0	0	0	0	0	0	0
Infective enteritis or diarrhoea under 2 years ..	11	2	3	1	1	13	4	0	1	
Influenza ..	313	54	2	2	5	33	4	2	0	
Measles ..		0	1	0	0		0	0	0	0
Meningococcal infection ..		0	1				1			
Pneumonia ..	654	153	29	15	11	303	41	7	8	
Poliomyelitis, acute ..	4	0			0	0	0		0	0
Scarlet fever ..		0	0	0	0		0			
Tuberculosis: Respiratory ..	145	28	20	2	7	176	26	30	2	13
Non-respiratory ..	5	3	1	1		4	3	1	0	
Whooping-cough ..	4	0	1	0	0	1	0	0	0	0
Deaths 0-1 year ..	321	37	38	13	14	269	31	30	14	24
Deaths (excluding stillbirths) ..	8,403	1542	621	143	189	6,345	964	754	135	202
LIVE BIRTHS ..	7,437	1103	849	228	419	7,564	1164	840	217	413
STILLBIRTHS ..	211	27	27			194	15	31		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Hunterian Society.—The annual dinner of the Hunterian Society was held at the Savoy Hotel on February 12, when the president, Dr. B. Parsons-Smith, was in the chair. Lord Reading, in proposing the health of the Society, referred to its "long and fluctuating" history and its close connexion with the City of London. "To doctors patients are a virtue, and to some patients doctors are a vice," was one of his witty remarks. In response the president gave an account of the Society's activities in the past year. The Lord Mayor, Sir Rupert de la Bere, was welcomed in a gracious speech by Mr. J. H. Doggart. The Lord Mayor, in reply, mentioned the intensive voluntary work at the Mansion House for the flood relief fund. The toast, "The guests and kindred societies," was proposed by Dr. George Day in a witty speech which kept everyone anxiously guessing what he might say next. Sir Raymond Evershed and Dr. F. M. R. Walshe replied.

Pharmacy Bill.—The removal of the disqualification upon members of the medical profession from being registered as pharmaceutical chemists is one of the objects of the recently published Pharmacy Bill. The Bill is a private Member's Bill with support from both sides of the House. Other provisions include the creation of a single statutory register of pharmacists and the extension of the powers of the Pharmaceutical Society in connexion with the examination and registration of pharmacists.

R.S.I. Prize Essays.—The Royal Sanitary Institute is offering two open prizes this year for essays on health subjects. The prizes are the John Edward Prize of £60 for an essay on "Internal planning lay-out and equipment of dwellings to reduce domestic work without loss of efficiency and within reasonable expenditure"; and the John S. Owens Prize of £15 for an essay on "The location of industry having regard to the health of the people." Intending competitors should apply to the secretary, The Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1, for a copy of the conditions. The last date for entries is December 31.

Family Doctor.—In the March issue of *Family Doctor* Professor W. C. W. Nixon and his colleagues complete their series of articles on having a baby. To judge from the two pages of correspondence on the propriety or otherwise of dealing openly with this subject in a family magazine, readers have been both interested and helped. In the same issue, Dr. T. Anderson summarizes the arguments for and against whooping-cough immunization. On psychological questions there are articles by Miss Alcock on the "schoolgirl crush" and by Professor R. S. Illingworth on "family favourites." Articles of general interest include accounts of what is being done for spastics and old people, and the story of a seven-months voyage in a whaler.

New Cancer Periodical.—The first volume of *Advances in Cancer Research* has just been published by the Academic Press, New York. It is edited by Professor Alexander Haddow (Royal Cancer Hospital, London) and Dr. J. P. Greenstein (National Cancer Institute, Bethesda, Md), and is designed to present authoritative reviews on various phases of cancer research. It is international in scope; vol. 1 (590 pages) is priced at \$12.00 (£4 6s.).

Extension of Bart's.—The Court of Common Council has approved plans for the building of a 120-bed extension to St. Bartholomew's Hospital, London. The site for the new block is separated from the main hospital buildings by a street, and a tunnel will be needed to link the two together. It is not yet known when building will be begun.

Coccidioidin, Histoplasmin, and Blastomycosis Antigen for diagnostic skin tests are now obtainable from the department of pathology, St. John's Hospital for Diseases of the Skin,

Lisle Street, London, W.C.2 (Tel. Gerrard 8383, Ext. 22), instead of from the London School of Hygiene and Tropical Medicine as previously.

Colyer Prize.—The Royal Society of Medicine invites applications for the triennial Colyer Prize for the best original work in dental science during the preceding five years. The prize is valued at £20. The closing date for applications is September 21.

Refresher Course Book.—Copies of the first Refresher Course book are now available once more. The first impression, which appeared last October, sold out shortly after publication. The book contains all the Refresher Course articles printed in the *Journal* from October, 1949, to December, 1950. Each article has been revised by its author and brought up to date. Copies of the book may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1. The price is 25s.

Emergency Bed Service: Applications and Admissions.—During the seven days ending February 16 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 1,730, of whom 77.93% were admitted. A yellow warning indicating that the percentage of admissions fell below 80 was issued on February 10.

Dr. L. Justin-Besançon, professor of medicine at the Sorbonne, has been elected a member of the French Academy of Medicine.

COMING EVENTS

Robert Campbell Memorial Oration.—Dr. E. E. Pochin will deliver a Robert Campbell Memorial Oration on February 26 at 8.30 p.m. in the Whitla Medical Institute, Belfast. His subject is "The Value of Radioactive Isotopes in Medicine."

Chesterfield Medal in Dermatology.—The examination for the Chesterfield Medal will be held on March 9, 10, 18, and 19. February 28 is the closing date for entries, which should be lodged with the secretary, Institute of Dermatology, Lisle Street, London, W.C.2.

Postgraduate Examination Courses.—Courses for candidates for the D.M.R.D. and D.M.R.T. (R.C.P.Lond. and R.C.S.Eng.), commencing in October, 1953, are being organized by the Faculty of Radiologists. Further information will be found in the advertisement columns.

NEW ISSUES

Archives of Disease in Childhood.—The next issue (Vol. 128, No. 137) will be available in a week's time. The contents include:

REMNANTS OF THE VITELLO-INTESTINAL DUCT. A CLINICAL ANALYSIS OF 88 CASES. John Aitken.

OVARIAN AGENESIS OR PTERYGIUM SYNDROME. Per Skjelbred.

CHONDRODYSPLASIA WITH ECTODERMAL DEFECTS. E. J. Gallagher, M. E. MacGregor, and M. Israelski.

TYPHOID OSTEITIS IN INFANCY. Harris Jackson, I. Kessel, S. N. Jayett, and P. Kushlick.

A CASE OF OSTEOMYELITIS OF ALL THE SMALL BONES OF HANDS AND FEET. M. D. Baber.

ACCIDENTAL POISONING OF YOUNG CHILDREN. Douglas Swinscow.

THE SENSITIVITY TO ANTIBIOTICS OF STRAINS OF BACT. COLI ASSOCIATED WITH INFANTILE GASTRO-ENTERITIS. J. Smith and W. H. Galloway.

KILLED ANTITUBERCULOUS VACCINE AND HYALURONIDASE (D.V.). G. Salvioi.

OBSERVATIONS ON FOETAL HAEMOGLOBIN. C. Gardikas, D. G. Scott, and John F. Wilkinson.

TENSION PNEUMOTHORAX COMPLICATING STAPHYLOCOCCAL PNEUMONIA AND EMPHYSEMA THORACIS. DESCRIPTION OF A CASE. R. Spencer.

HAEMANGIOENDOTHELIOMA OF THE LIVER SIMULATING CONGENITAL HEART DISEASE IN AN INFANT. C. Blaxland Levick and J. Rubie.

THE INCIDENCE AND SIGNIFICANCE OF SYSTOLIC CARDIAC MURMURS IN INFANTS. W. C. Taylor.

IDIOPATHIC RENAL ACIDOSIS IN TWINS, WITH ALKALOSIS RESULTING FROM OVERDOSAGE OF CITRATE MIXTURE. John Rendle-Short.

TREATMENT OF THE SCHOENLEIN-HENOCCH SYNDROME WITH ADRENOCORTICOTROPIC HORMONE (A.C.T.H.) AND CORTISONE. A REPORT OF NINE CASES. J. N. Briggs and M. G. Philpott.

THE URINARY EXCRETION OF HISTAMINE IN CHILDREN. H. M. Adam and R. G. Mitchell.

PNEUMOPERITONEUM AS A DIAGNOSTIC PROCEDURE. J. Rubie.

THE ABSORPTION OF CHLORAMPHENICOL IN THE NEWBORN. Donough O'Brien.

TWO CASES OF CHRONIC POLYNEURITIS IN CHILDREN. J. S. Oldham.

DUPPLICATION OF THE ILEUM. W. S. Kilpack.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

Details in this column are necessarily brief. Further information and tickets where required (marked ●) should be obtained from the institution concerned.

Monday, February 23

HUNTERIAN SOCIETY.—At Mansion House, 8.30 p.m., Hunterian Oration by Mr. A. Dickson Wright: Quacks of John Hunter's Time.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: lecture-demonstration for postgraduates.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., pathological meeting.

UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., public lecture by Professor Jean Roche (Collège de France, Paris): Comparative Biochemistry of Iodoproteins.

Tuesday, February 24

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. P. L. Mollison: Life-span of Red Cells.

CHADWICK TRUST.—At 26, Portland Place, W., 2.30 p.m., Dr. G. Decharneux (Liège): Industrial Medicine and Hygiene in Belgium.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. L. Forman: Skin Diseases Related to Cancer.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor J. Moroney: Colonic Replacement and Restoration of the Human Stomach.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Dr. Colin Edwards: Neurological demonstration.

Wednesday, February 25

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Virus Diseases.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, W.C., 4.30 for 5 p.m., Mr. J. G. Sandrey: Vesical Neoplasms.

ROYAL EYE HOSPITAL CLINICAL SOCIETY.—5.30 p.m., clinical meeting: 6 p.m., film by Miss J. M. Dollar and Miss M. Savory: Exenteration of the Orbit.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Dr. James Watson Lecture by Mr. A. G. Macgregor: Thyrotoxicosis: Its Diagnosis and Treatment by Modern Techniques.

YORKSHIRE SOCIETY OF ANAESTHETISTS.—At Leeds General Infirmary, 8 p.m., Dr. G. E. Hale Enderby: Reduction of Surgical Haemorrhage by Controlled Hypotension.

Thursday, February 26

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. A. H. T. Robb-Smith: Functional Significance of Connective Tissue.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., B.M.A. Lecture by Professor Ian Aird: Modern Exercises in the Hunterian Discipline.

INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. G. Stewart Prince: Emotional Problems of Puberty.

LIVERPOOL MEDICAL INSTITUTION.—4.30 p.m., Sir Russell Brain: Neurology of the Cervical Spine.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Sir Clement Price Thomas: Carcinoma of the Lungs (with lantern slides).

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Arris and Gale Lecture by Mr. L. P. Le Quesne: Management of Water and Electrolyte Administration during the Post-operative Period.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor G. A. H. Buttle: Chloramphenicol, Aureomycin, and Terramycin and the Resistance Developed to Them.

SOCIETY OF CHEMICAL ENGINEERS.—6.15 p.m., papers by Dr. C. Cockburn, Institution of Electrical Engineers, and Dr. Joan Taylor: Pathogenic Organisms in Food.

UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., public lecture by Professor V. B. Wigglesworth, F.R.S.: Chemical Aspects of Insect Physiology.

WHITLA MEDICAL INSTITUTE, Belfast.—8.30 p.m., Robert Campbell Memorial Oration by Dr. E. E. Pochin: Value of Radioactive Isotopes in Medicine.

Friday, February 27

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. D. I. Williams: Alopecia.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—4.30 p.m., Mr. N. Asherson: Mastoiditis.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—7.30 p.m., Dr. Denys K. Ford: Arthritis of Genital Origin—Treatment with A.C.T.H.

ROYAL INSTITUTE OF PHILOSOPHY.—At University Hall, 14, Gordon Square, W.C., 5.15 p.m., Dr. J. Hardland-Swann, B.Litt., Ph.D.: Nature of Mind.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Chartres.—On February 8, 1953, at Churchill Hospital, Oxford, to Mary (formerly Gaudin), wife of John C. Chartres, B.M., B.Ch., D.T.M.&H., a sister for Roger—Diana Crispin.

Cross.—On February 5, 1953, at King's College Hospital, London, S.E., to Pamela (formerly Hufeland), wife of Dr. A. F. Cross, a daughter—Melanie Jane.

Duff.—On February 13, 1953, at the Yarrowburgh Nursing Home, Southsea, Hants, to Audrey, wife of Dr. Derek R. Duff, a daughter.

Morrison.—On February 11, 1953, to Ina, M.B., Ch.B., D.Obst.R.C.O.G. (formerly Alexina Myles), wife of Dr. Leslie G. Morrison, 8, St. Catherine's Place, Edinburgh, a daughter.

Rigby.—On February 5, 1953, to Joan, wife of Dr. J. P. V. Rigby, of Huntsmoor Weir, Cowley, Middlesex, a daughter.

Wollner.—On February 8, 1953, at the Churchill Hospital, Oxford, to Sylvia Wollner, M.B., B.S. (formerly Colquhoun), wife of Leopold Wollner, M.B., B.S., a son—Mark Edward.

Wurm.—On February 10, 1953, at King's College Hospital, London, to Rhonda, wife of Roger Wurm, M.B., M.R.C.O.G., a son—Jeremy.

DEATHS

Balme.—On February 13, 1953, Harold Balme, O.B.E., M.D., F.R.C.S., D.P.H., of 64, Copers Cope Road, Beckenham, Kent, formerly of Shantung, China, aged 74.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Gastric 'Flu'

Q.—Is there such a thing as gastric 'flu'?

A.—Gastro-intestinal symptoms may occur as a complication of true virus influenza. There is, however, no evidence that outbreaks in which the symptoms are predominantly gastro-intestinal have anything whatever to do with influenza. A form of gastro-enteritis due to a filterable agent has been described and outbreaks of Sonne dysentery may also masquerade as "gastric 'flu.'" The term may be a useful label for practitioners to use, but it has no scientific basis, and its use in publications may lead to confusion.

Wheat Gluten in Sprue and Steatorrhoea

Q.—Does the exclusion of wheat gluten from the diet of adults with sprue or idiopathic steatorrhoea have the same beneficial effect as in coeliac disease in children?

A.—The effect of excluding wheat gluten from the diet in adult cases of sprue and idiopathic steatorrhoea is still under investigation. Some cases undoubtedly show improvement, but it is too early to say whether this method of treatment will prove generally effective. It does not seem likely that any form of treatment can bring about dramatic recovery in patients with many years' history of steatorrhoea and multiple deficiencies. Chronic deficiency of nutrients alone may cause irreversible structural changes which may prevent or delay complete recovery.

Aetiology of Chronic Bronchitis and Emphysema

Q.—What aetiological factors are of importance in the development of chronic bronchitis and emphysema? Are outdoor workers, such as policemen, specially liable to the condition?

A.—Factors of importance in the aetiology of chronic bronchitis and emphysema are climatic, environmental and occupational, constitutional and hereditary, and the effect of smoking. Chronic bronchitis is principally a disease of those temperate climates which are liable to spells of cold, damp, foggy weather. The environmental factor may be illustrated by the much greater frequency of bronchitis and emphysema in industrial areas, irrespective of occupation. Among occupations, those which expose the worker to dust (even apart from those dusts known to be specifically harmful) and to violent changes of temperature show a high incidence of chronic bronchitis. Heavy physical work out of doors in all weathers, such as that of navvies, is said to be a factor, though there is no evidence that outdoor occupation in itself is important. Smoking is undoubtedly important, and giving up this habit is nearly always beneficial to the chronic bronchitic. In addition to these external factors, hereditary constitution plays an important part. Many patients whose final condition is best described as chronic bronchitis and emphysema start as asthmatics and show the well-known family predisposition to allergic disorders; apart from this, chronic bronchitis itself often seems to be regarded as causing chronic bronchitis, or simply as another manifestation of the same underlying abnormality of the entire respiratory mucosa, is a matter of controversy.

Treatment of Psoriasis

Q.—Have there been any recent notable advances in the treatment of psoriasis?

A.—The treatment of psoriasis has unfortunately not altered. Year after year new treatments are introduced and praised and, before long, discarded. Undecylenic acid is now recognized to be useless; cortisone and A.C.T.H. are only of doubtful value. Other current and widely advertised treatments with proprietary remedies will, one suspects, go the way of the rest before long. Dr. R. M. B. MacKenna's Refresher Course article (*British Medical Journal*, 1950, 2, 207) still remains a complete and up-to-date summary of treatment.

Brittle Nails

Q.—What is the present informed opinion of the cause and treatment of brittle nails—that is, nails which crack and flake at the edge? One authority says it is connected with the general health, another says it is due to detergents and degreasers. It is a very common complaint among women.

A.—Both authorities are correct. There is no single cause; disturbances of general and nervous health are common causes, but external agents may be responsible, and often both factors play a part. Among external factors excessive manicuring, the use of enamels with ethyl acetate or acetone to dissolve them, and the use of alkaline cuticle removers are important. The moderate use of enamels may, however, be protective, but they should not be frequently removed. The effect of detergents and degreasers can in part be warded off by protective barriers.

Soaking in warm water and the inunction of olive oil are recommended as local treatment, together with attention to the general health.

Pyocyanea Infections

Q.—What antibiotics are effective against *Pseudomonas pyocyanea*?

A.—*Ps. pyocyanea* is totally insensitive to penicillin. It is usually resistant enough to the newer antibiotics to preclude successful treatment with them, although terramycin tends to be rather more active against it than either aureomycin or chloramphenicol. Sensitivity to streptomycin varies, some strains being highly resistant and others quite sensitive. The only antibiotic to which this organism is regularly and highly sensitive is polymyxin.

Either streptomycin or polymyxin may be used (the former assuming that the strain has been shown to be sensitive) for both the common forms of treatment called for in connexion with *Ps. pyocyanea* infections—namely, intramuscular injection for urinary infections, and local application for superficial sepsis, as in burns. The main advantage of streptomycin at present is that it is more easily obtainable, of polymyxin that it is more effective, particularly for the second purpose named. Both drugs can cause toxic effects, streptomycin on the eighth nerve and polymyxin on the kidney, but neither need be given for a urinary infection in such doses or for such a length of time that such complications need be feared. The local application of polymyxin is harmless from this point of view, as is its intrathecal injection for the treatment of meningitis.

Road Accidents

Q.—What is the best immediate treatment for a shocked patient after a road accident? Are heat and morphine still regarded as good treatment?

A.—In itself, shock is a meaningless term. Shock after a road accident should be treated according to its cause. The ill effects of road accidents may be due to fright (most commonly), to blood loss, internal injury, fracture, or fat embolism. External application of heat is impor-

tant only for the patient's comfort, or if the patient has been left out for a long time in cold weather without protection. He should be given warm fluids, such as tea. Morphine is generally most useful, particularly if there is pain: a note should always be left on the patient saying what dose has been given, since serious overdosage sometimes occurs. In the absence of serious complications, the state of stress, mental and physical, should be dealt with by making the patient comfortable and by assuring him that there is no serious complication. If it is not possible to give this assurance he should be sent to hospital and told that a more adequate examination will be made there. Should any more severe complication be present, this should be treated according to accepted first-aid principles and the patient transferred to hospital.

Enteric-coated Ferrous Sulphate

Q.—Are enteric-coated ferrous sulphate tablets absorbed by the intestine? Coating has been recommended to limit symptoms of intolerance in pregnant women, but I understand that iron is absorbed only from the pyloric end of the stomach and the first half of the duodenum.

A.—Iron is absorbed from the stomach and from the small intestine, chiefly the upper part, but there is evidence that absorption can occur from lower parts of the intestine. The usual enteric coating should ensure the liberation of the tablet's contents in the alkaline part of the duodenum, although certain proprietary forms of coating may liberate the contents after contact with fluid which is not alkaline. It may be expected, therefore, that ferrous sulphate can be absorbed from enteric-coated tablets, but positive proof of this should be easy to obtain by serial estimation of the blood haemoglobin. If a pregnant woman is intolerant of ferrous sulphate it might be worth using one of the other preparations, such as iron and ammonium citrate mixture or a colloidal iron preparation such as Liq. Ferri Dialysati B.P.C.

Toxaemia of Pregnancy

Q.—What is the present view of the aetiology and pathology of the toxaeimias of pregnancy?

A.—This question is beyond the range of a concise reply because the aetiology and pathology of toxaeimias of pregnancy remain to a large extent obscure. The present-day tendency, however, is to regard the basis of toxaeimia of pregnancy as uterine and placental ischaemia, with possibly associated imbalance of the endocrine functions of the placenta, adrenal, and pituitary.

Books of "Any Questions?"

Q.—Are copies of both the first and second books of "Any Questions?" still available?

A.—No. The first book has sold out after a total printing of 10,000 copies, but copies of the second book, published in December, 1952, are still available. Copies of the second book may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, for 7s. 6d. (postage 6d.). Please order now so as to ensure getting a copy.

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BRITISH MEDICAL JOURNAL

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ELECTROPHORESIS OF HUMAN GASTRIC JUICE IN RELATION TO CASTLE'S INTRINSIC FACTOR

BY

A. L. LATNER, M.D., M.Sc., D.I.C., A.R.C.S.

AND

C. C. UNGLEY, M.D., F.R.C.P.

With the collaboration of E. V. COX, B.Sc., M.B., B.S., E. McEVOY-BOWE, M.Sc., and LAUREEN RAINE, Ph.D., B.Sc.

From the Departments of Pathology and Medicine, King's College, University of Durham, and the Royal Victoria Infirmary, Newcastle-upon-Tyne

In the period 1929–37 Castle and his colleagues showed that normal gastric juice (intrinsic factor) administered orally to patients with pernicious anaemia would potentiate the haemopoietic effect of beef muscle (extrinsic factor). Later they showed that the extrinsic factor in beef muscle was vitamin B₁₂ or a related compound (Gardner *et al.*, 1949), and that vitamin B₁₂ itself behaved like extrinsic factor when small doses were administered orally (Berk *et al.*, 1948). Meanwhile there were many unsuccessful attempts to isolate Castle's intrinsic factor, which is heat-labile and readily inactivated by chemical procedures (see Ungley, 1951–2; Welch and Heinle, 1951; Welch and Nichol, 1952).

The methods employed in the present study were mainly physico-chemical: ultrafiltration and freeze-drying followed by preparative electrophoresis on filter paper. The techniques used were devised by one of us (A.L.L.). The method of electrophoresis has already been demonstrated (Latner *et al.*, 1952).

METHODS

These are the methods finally adopted. Their development from earlier ones is described below.

Acid gastric juice was collected from students and patients after stimulation with histamine or aminoethyl pyrazole dihydrochloride. The juice was neutralized and stored at approximately –20° C. Ultrafiltration was carried out at 0–5° C. Then the ultrafiltrate residuum was freeze-dried and reconstituted with buffer so that the gastric juice had been concentrated 150–200 times.

The filter paper used for electrophoresis was Whatman No. 31 extra thick. Each of the six strips was subdivided into 25 segments 1 cm. wide. The ultrafiltrate residuum from 500 to 800 ml. of gastric juice was applied with a paintbrush to these six strips so that each contained an approximately equal amount. After electrophoresis, separation of liquid from the segments by centrifuging gave 25 fractions labelled from 1 to 25, starting at the cathode end. A barbitone buffer at pH 8.6, used initially, was later replaced by a buffer at pH 6.35.

To test their vitamin B₁₂-binding power as a basis for grouping fractions for clinical trial, samples of 0.1 ml. from each fraction were added to 1 ml. of a solution containing 200 µg. vitamin B₁₂. Any vitamin left unbound was then estimated by plate assay using *Bact. coli* (Bessell, Harrison, and Lees, 1950). Fig. 3 shows vitamin B₁₂-binding peaks demonstrated in this way. (Figs. 1 and 2 relate to some preliminary observations in which vitamin B₁₂ was added before electrophoresis.) Later, a method used for staining protein was found equally effective for the grouping of fractions (see Experiment E).

Clinical Trials

Tests were conducted in 15 cases of pernicious anaemia. Methods are described elsewhere (Ungley and Campbell, 1949; Ungley, 1950), but certain points need re-emphasis. The diet was restricted to reduce the intake of extraneous haemopoietic factors, particularly vitamin B₁₂. Food was withheld for at least six hours before and after the administration of test material. Test material was given orally as a single dose with 50 µg. vitamin B₁₂. The administration of vitamin B₁₂ with a possible source of intrinsic factor was preceded by a test in which an equal dose of vitamin B₁₂ was admin-

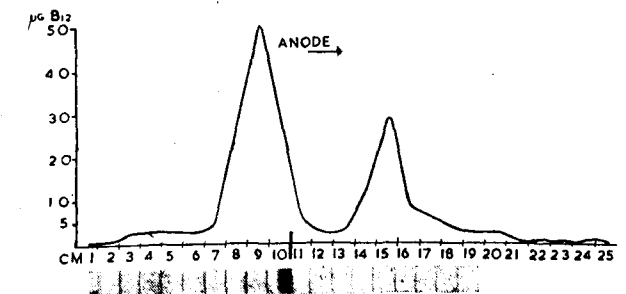


FIG. 1.—Tests on fractions obtained by electrophoresis (in barbitone buffer) of gastric juice concentrated 20 times: the curve shows two B₁₂-binding peaks. Shown below is a strip of paper stained for protein. The thick line on the abscissa represents the point of application of the material.

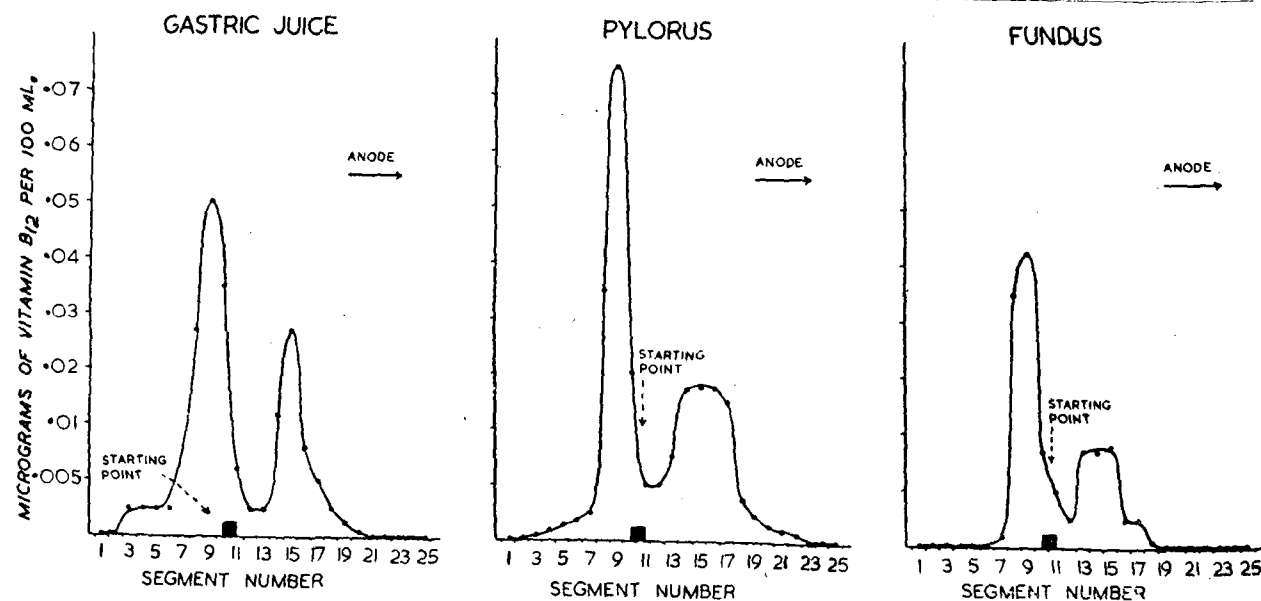


FIG. 2.—Results of simultaneous electrophoresis (in barbitone buffer) of gastric juice and extracts of pylorus and fundus mucosa of pig's stomach. Two vitamin B₁₂-binding peaks are shown in each case.

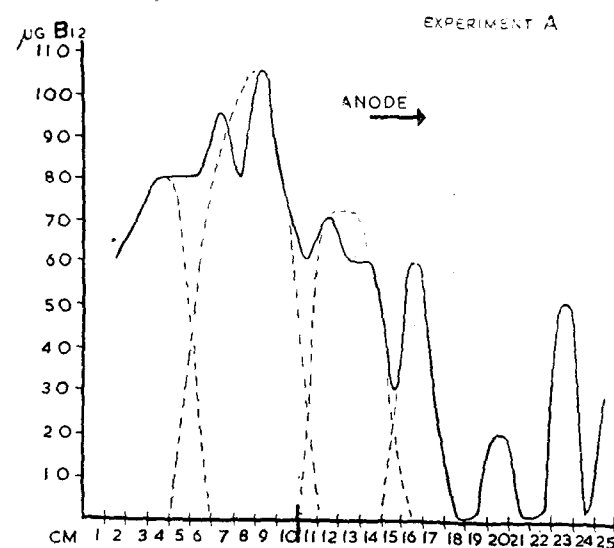


FIG. 3.—Results of electrophoresis (in buffer at pH 6.35) of gastric juice used in Experiment A. Vitamin B₁₂ was added after electrophoresis, and the vitamin B₁₂ bound by each fraction was determined. The thick line on the abscissa indicates the point of application of material.

istered alone or with an inactive fraction. A second test was not begun until any haemopoietic response initiated in the previous period had ceased: reticulocyte counts were <2%, serial estimations of red blood cells (R.B.C.), haemoglobin (Hb), and packed cell volume (P.C.V.) were level or falling, and the marrow was megaloblastic. A further point—namely, the use of one rather than several subjects for the comparison of fractions derived from one electrophoresis—is mentioned later.

Haematological Methods

Reticulocytes were counted daily by a wet method. Multiple determinations (usually two to five) of R.B.C., Hb, and P.C.V. were made every three to five days. Only mean values determined at five-day intervals are recorded here. Reticulocyte responses were observed, but were used only as an indication of the presence or

absence of activity. For the quantitative evaluation of haemopoietic responses the rate of increase of R.B.C. and P.C.V. in 15 days was expressed in terms of the number of micrograms of injected vitamin B₁₂ which would be expected to produce a similar response (Ungley and Campbell, 1949, and unpublished).

PRELIMINARY OBSERVATIONS

In an early study gastric juice was concentrated 20 times by ultrafiltration and vitamin B₁₂ was added to the concentrate. Fig. 1 indicates the amounts of bound vitamin B₁₂ in each of the 25 fractions obtained by subsequent electrophoresis.

Two peaks of vitamin B₁₂-binding can be seen—one on the cathode side near the starting-point and one on the anode side. For comparison, a strip of filter paper from the same electrophoresis was fixed and stained for protein. Protein could be demonstrated in the region of the cathode vitamin B₁₂-binding peak, but not in the region of the anode peak. This did not necessarily mean that the vitamin B₁₂-binding compound on the anode side was not a protein, for protein may have been present in amounts too small to be demonstrated. If this were the case, the vitamin B₁₂-combining power of the compound per mg. would be very high—a possibility which we thought might indicate the presence of intrinsic factor.

This possibility was strengthened by the result of experiments in which extracts of pig's gastric mucosa (Ungley and Moffett, 1936) were subjected to ultrafiltration and electrophoresis. For when the source was fundus mucosa, which is clinically inactive, the anode peak was smaller—both relatively in comparison with the corresponding cathode peak, and absolutely, in terms of vitamin B₁₂ bound per mg. of protein in the extract—than when the source was pylorus mucosa, which in the pig is a rich source of intrinsic factor (see Fig. 2).

The findings could also be expressed in terms of the amounts of material needed to ensure that 50 µg. vitamin B₁₂ would be bound in the anode peak—namely, 500 ml. gastric juice, extract from 400 g. pylorus mucosa, and extract from 800 g. fundus mucosa. It was of interest to compare these amounts with doses used clinically—for example, a single dose of 500 ml. of gastric juice to potentiate 50 µg. vitamin B₁₂ (Ungley, 1950) and daily doses of extract from 40 g. pylorus mucosa given with yeast extract

as extrinsic factor (Ungley and Moffett, 1936). The weaker binding activity of fundus mucosa was matched by its clinical inactivity in the dosage used.

These findings encouraged us to undertake electrophoresis on a larger scale, so that the fractions could be tested clinically. Some of this work was reported at the International Congress of Biochemistry in Paris in July, 1952,* when it was stated that material with intrinsic-factor activity had been separated from other vitamin B₁₂-binding substances in gastric juice. For at this time the selection of fractions was based on the distribution of peaks of vitamin B₁₂-binding activity. Subsequently, a method used for staining and scanning protein on filter paper after electrophoresis (Latner, 1952a, 1952b) was found to be equally effective.

In these earlier experiments vitamin B₁₂ was added before electrophoresis, and barbitone buffer at pH 8.6 was used. Fractions from the cathode and anode vitamin B₁₂-binding peaks, tested in Cases 1 and 2, gave unsatisfactory results, which will not be described. About this time one of us (A. L. L.), in the course of collaborative work with Professor A. A. Harper in which paper electrophoresis was used, found that barbitone buffer at pH 8.6 could destroy the physiological activity of secretin. As it was thought that barbitone buffer might destroy intrinsic factor also, the following experiments were conducted with another buffer, the pH of which was 6.35.

MAIN OBSERVATIONS

Experiment A

The ultrafiltrate residuum from one litre of gastric juice was applied to paper strips and separated into 25 fractions by electrophoresis. The vitamin B₁₂-binding power of these fractions is shown in Fig. 3. Two or possibly three peaks were visible on the cathode side and four on the anode side of the line of application of the concentrate. As a first step towards determining where the intrinsic-factor activity lay, the 25 liquid fractions were separated into two groups. The group from the anode side was tested in Case 3, the cathode group in Case 4.

Case 3 (a Female Aged 62). Anode

In a preliminary period 50 µg. vitamin B₁₂ administered orally alone produced merely a slight reticulocytosis of 4.2% without a rise in R.B.C. or P.C.V. When the same dose of vitamin B₁₂ was given with the liquid fractions from the anode side, reticulocytes rose on the third day and reached a peak of 17.6% on the sixth day (Fig. 4). Clinical improvement was evident and R.B.C., Hb, and P.C.V. increased as follows:

Days:	0	5	10	15
R.B.C. (10 ⁶ per c.mm.)	2.00	2.24	2.44	2.68
Hb (g. per 100 ml.)	9.3	10.1	10.5	10.5
P.C.V. %	21.5	24.0	27.0	29.0

Values continued to rise up to 81 days.

The increase of R.B.C. and P.C.V. in 15 days was slightly less than that which would be expected from an injection of 5 µg. (Ungley and Campbell, 1949, and unpublished). This result falls within the lower range of responses obtained with 50 µg. vitamin B₁₂ and 500 ml. of gastric juice (Ungley, 1950).

Case 4 (a Female Aged 63). Cathode

The liquid fractions from the cathode side were administered orally together with 50 µg. vitamin B₁₂. There was no haemopoietic response. Subsequently a good response

*Unfortunately, an account does not appear in the abstract, which was submitted long before the meeting.

to the injected vitamin was obtained, but unfortunately the response to a potent oral preparation was never observed, so that the patient may have been resistant to oral therapy. Results reported later indicate that liquid from the cathode side usually does in fact possess some intrinsic factor activity. At this stage, however, we knew only that liquid from the anode side possessed such activity, whereas liquid from the cathode side might or might not be active. For this reason in the next three experiments, B, C, and D, only material from the anode half of the papers was tested clinically. In each instance material derived from 800 ml. of gastric juice was applied to six strips of paper.

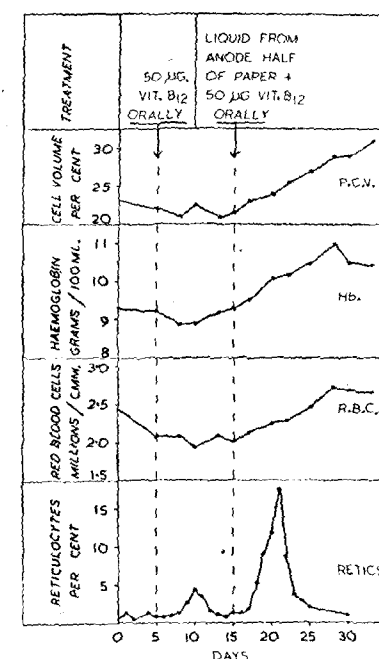


FIG. 4.—Clinical response to anode fractions in Case 3 (Experiment A).

Experiment B

Segments 1 cm. wide were drawn on the anode side of the line of application of material and numbered from 1 to 15. Liquid from segments 2, 3, and 4, which represented the B₁₂-binding peak on the anode side nearest to the starting position (see Fig. 5), was tested in Case 5.

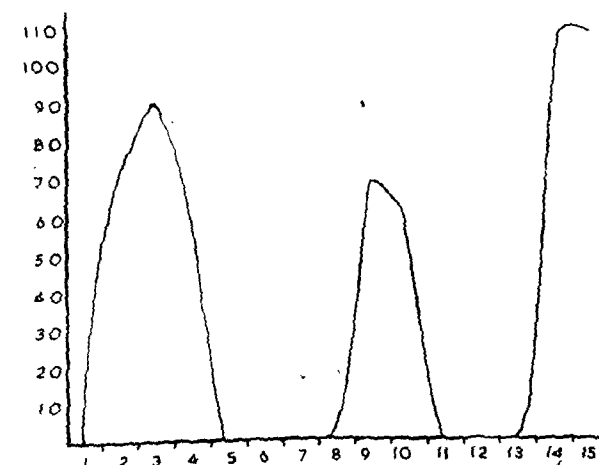


FIG. 5.—Vitamin B₁₂-binding in fractions obtained by electrophoresis of gastric juice used in Experiment B, in which only the anode side was tested.

Liquid fractions from the rest of the anode side were tested in Case 6. In this and subsequent experiments the anode and cathode peaks nearest to the line of application of concentrated gastric juice are referred to as the "first anode peak" and "first cathode peak" respectively.

Case 5 (a Female Aged 72). First Anode Peak

There was no reticulocyte response to 50 µg. vitamin B₁₂ administered orally alone and the absolute values fell.

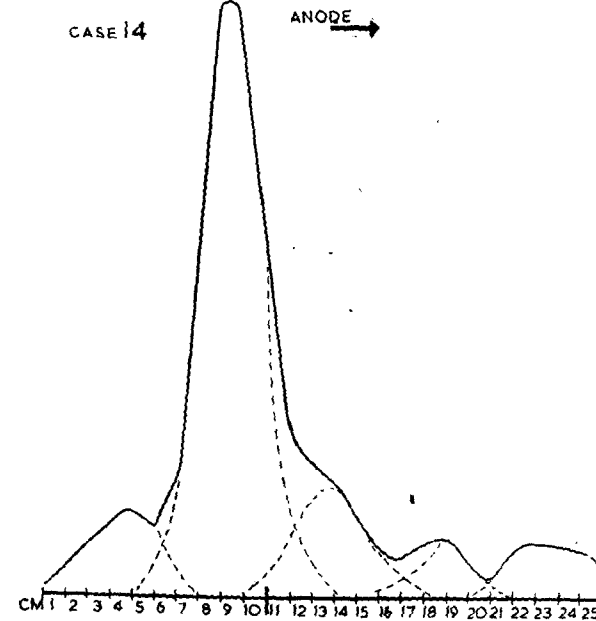
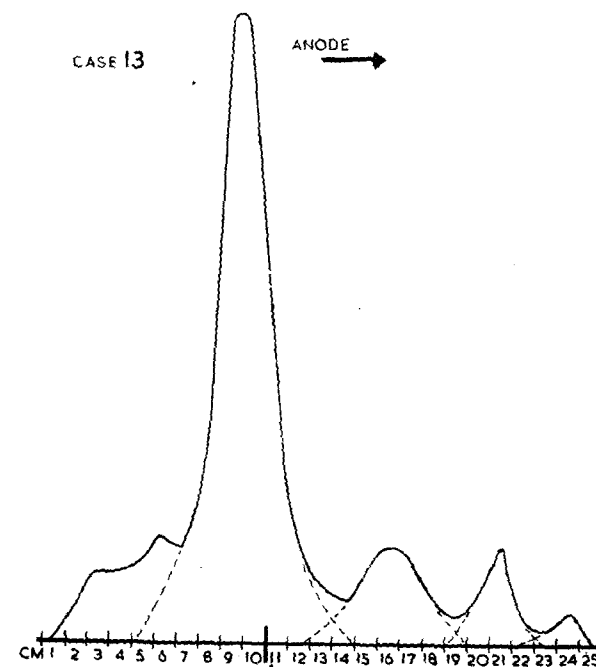
When the same dose of vitamin B₁₂ was given with the liquid from segments 2, 3, and 4, reticulocytes rose to a maximum of 10.3% on the sixth day. The R.B.C., Hb, and P.C.V. changed little:

Days:	0	5	10	15
R.B.C.	1.48	1.54	1.64	1.48
Hb	6.2	6.2	7.3	6.5
P.C.V.	15.0	16.5	19.0	17.5

There was subsequently a considerably greater response to a single oral dose of 3,000 µg. vitamin B₁₂.

Case 6 (a Male Aged 64). Rest of Anode Material

There was no response to 50 µg. vitamin B₁₂ administered orally alone. An equal dose of the vitamin was then given together with the liquid from segment 1 and segments 5 to 15. Reticulocytes rose only to 2.8%, but there was some increase in absolute blood values.



Days:	0	5	10	15
R.B.C.	2.20	2.42	3.12	2.92
Hb	10.4	11.3	13.1	11.4
P.C.V.	31.0	35.0	37.0	35.0

Unfortunately, liquid from segment 1, which was erroneously included, might have had sufficient intrinsic factor activity to account for these changes. Desiccated stomach, 40 g. daily, subsequently produced a satisfactory increase in absolute values without a reticulocytosis.

Our conclusion from Experiment B was that the material corresponding to the first B₁₂-binding peak on the anode side had some intrinsic factor activity. The rest of the material from the anode side (which may have included part of the first peak) perhaps also had some intrinsic factor activity.

Experiment C

Fractions from this electrophoresis caused no response in Cases 7 and 8. Either the patients were resistant to oral therapy or any intrinsic factor present had been inactivated.

Experiment D

In this experiment a 1-cm. segment on the cathode side was included, together with the first four on the anode side, and tested in Case 9. Liquid from the rest of the anode side was tested in Case 10.

Case 9 (a Male Aged 38). First Anode Peak

There was no reticulocyte response to 50 µg. vitamin B₁₂ administered orally alone, and absolute values fell slightly. When this amount of vitamin was given with the first anode peak (and one segment from the cathode side) reticulocytes rose to 8.6% on the fifth day. Absolute blood values (R.B.C., 1,200,000; Hb, 5 g.; P.C.V., 13.0%) showed little change. There was subsequently an excellent response to injected vitamin B₁₂.

Case 10 (a Female Aged 59). Rest of Anode Material

There was no response to 50 µg. vitamin B₁₂ given orally alone. When 50 µg. was given with liquid from the rest of the anode side the response was negligible. There was no reticulocytosis, and the increase in absolute values was insignificant. The patient responded to desiccated stomach and later to injections of vitamin B₁₂.

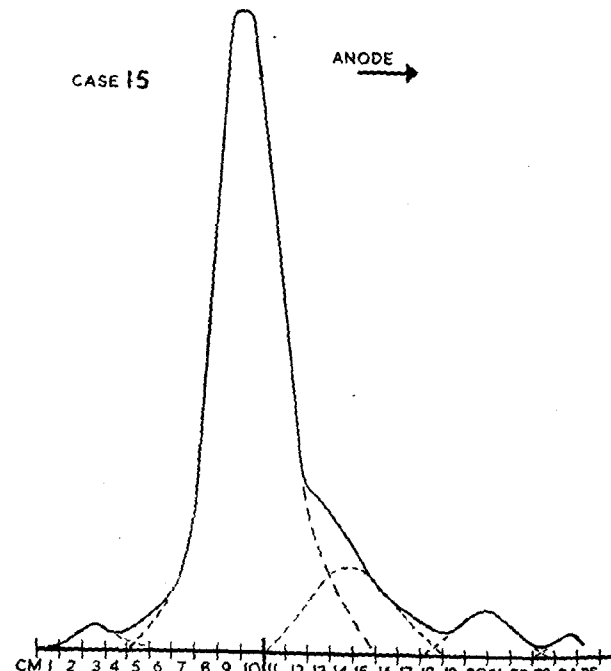


FIG. 6.—Intensity of protein staining in 25 fractions obtained by electrophoresis of aliquots of a large pool of gastric juice, and tested in Cases 13, 14, and 15 (Experiments F, G, and H).

Our conclusion from Experiment D is that any intrinsic-factor activity in the liquid from the anode side was mainly concentrated in the first anode peak, which in this case included one segment from the cathode side. There was little or no intrinsic-factor activity in the remainder of the anode side.

Experiment E

Neither of the patients (Cases 11 and 12) responded to the fractions administered. The same remarks apply as in Experiment C.

We now reached the conclusion that testing the various fractions from one electrophoresis in different patients was not completely satisfactory since individuals differ in their responses, especially to oral therapy. It was decided to test the fractions successively in the same patient, who then acted as his or her own control. We also reverted to our original procedure of testing fractions from both the anode and the cathode side of the starting position.

The three final experiments were carried out with a single pool of concentrated gastric juice. The aliquots taken for each electrophoresis corresponded to an original volume of 800 ml. The fractions after electrophoresis were tested not only for vitamin B₁₂-binding power but also for protein content. For the latter purpose 0.02-ml. portions of each fraction were placed in line on a strip of filter paper. The spots were fixed in the oven and stained by a technique already described (Latner, 1952a). The stain used, naphthalene black, is not necessarily specific for protein. The density of each stained spot was determined with a modified Spekker absorptiometer (Latner, 1952b), and plotted graphically as shown in Fig. 6. The peaks so obtained agreed fairly closely with the peaks of vitamin B₁₂-binding obtained microbiologically. Since the staining method was less arduous and gave smooth, easily reproducible curves, it was used henceforth as the guide for grouping fractions for clinical trial.

Experiment F

Several peaks were demonstrated by the staining method (Fig. 6, Case 13). The material was subdivided into three groups of fractions corresponding to the first anode peak, the first cathode peak, and the rest of the material. These were tested in successive periods in Case 13. Disappointingly, there was no response to any of them. A review of the technique suggested that there may have been undue warming during manipulation. In subsequent experiments, therefore, special care was taken to keep the material cool at all stages and in particular during centrifuging.

Experiment G

The peaks demonstrated by staining are shown in Fig. 6, Case 14. This material was also subdivided into three groups of fractions and tested in successive periods in Case 14 (see Fig. 7).

Case 14 (a Male Aged 60)

In the first period 50 µg. vitamin B₁₂ was given with liquid from segments 1 to 6 and 18 to 25. There was no response. In the second period the same amount of the vitamin was given with liquid from segments 7 to 10 (the first cathode peak). Reticulocytes rose to 15% on the fifth day and absolute blood values increased.

Days:	0	5	10	15
R.B.C.	1.52	1.60	2.12	2.02
Hb	5.9	6.4	7.7	7.7
P.C.V.	15.0	18.2	24.6	24.2

In the third period, when liquid from segments 11 to 17 (first anode peak) was given with 50 µg. vitamin B₁₂, there was a further reticulocytosis of 8.6% on the seventh day. Because of the higher initial R.B.C. level, this reticulocytosis is as significant as the peak of 15% in the preceding period. For similar reasons the increases in absolute blood values were also more significant.

Days:	0	5	10	15
R.B.C.	1.94	2.00	2.92	2.96
Hb	7.4	7.8	10.1	10.4
P.C.V.	23.5	25.5	34.0	32.5

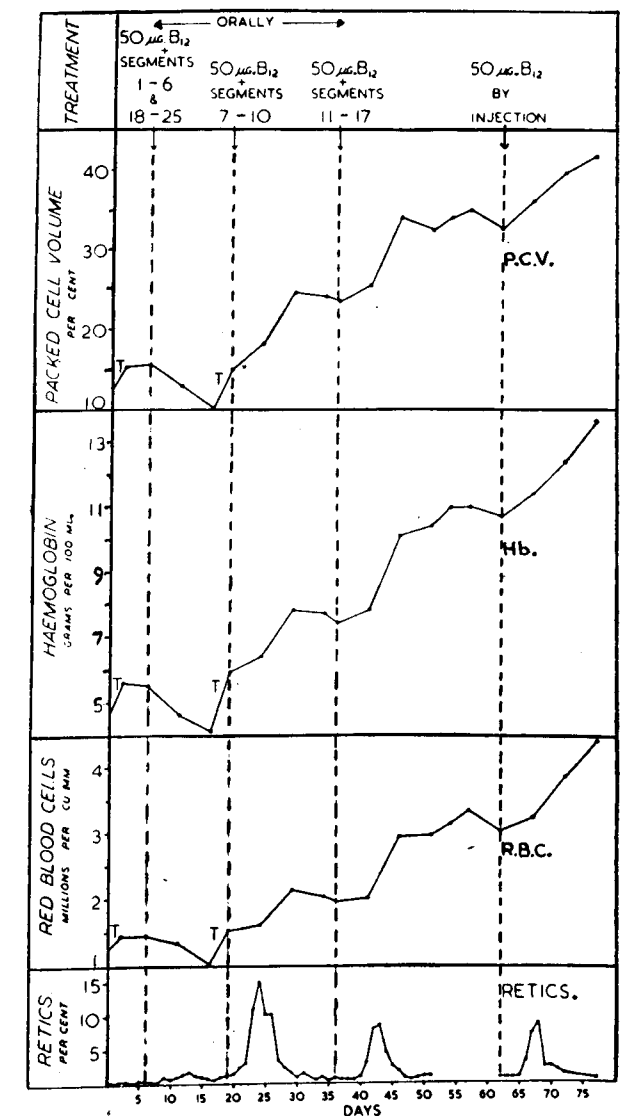


FIG. 7.—Clinical trial in Case 14; responses to first cathode peak (segments 7-10) and first anode peak (segments 11-17), but no response to rest of material (segments 1-6 and 18-25).

The increases of P.C.V. and R.B.C. in the second period were much less than would be expected from an injection of 5 µg. vitamin B₁₂. In the third period the increases were equivalent to those which would be expected from an injection of 5-10 µg.

Our conclusion from Experiment G is that the material corresponding to the first anode peak had a substantial amount of intrinsic-factor activity. It was particularly rich in terms of activity per mg. of stained material. Some intrinsic-factor activity stayed with the first cathode peak, but the activity of this region per mg. was much less than that of the first anode peak.

Experiment H

This experiment was similar to the previous one. The peaks demonstrated by staining are shown in Fig. 6, Case 15. The various fractions were tested in Case 15.

Case 15 (a Female Aged 56)

In the first period 50 µg. vitamin B₁₂ was given with liquid from the outer segments of cathode and anode sides (segments 1-6, 18-25). Reticulocytes rose only to 4.4% on the sixth day, and absolute blood values remained unchanged.

In the next period 50 µg. vitamin B₁₂ was given with the liquid corresponding to the first cathode peak (segments 7-10). Again reticulocytes rose to only 4.2% on the sixth day, although this time there was a very slight increase in absolute values.

Days:	0	5	10	15
R.B.C.	1.76	1.68	2.16	2.16
Hb	7.8	7.8	8.7	8.4
P.C.V.	22.0	22.0	26.0	26.0

In the third period 50 µg. B₁₂ was given with the material corresponding to the first anode peak (segments 11-17). Reticulocytes rose to 7.2% on the sixth day, and the increase in absolute values was more significant.

Days:	0	5	10	15
R.B.C.	2.40	2.81	3.08	2.88
Hb	9.6	10.8	11.1	10.8
P.C.V.	25.7	31.0	31.0	29.0

The same conclusions were drawn from this experiment as from Experiment G. The liquid corresponding to the first anode peak was the richest in intrinsic factor, especially in terms of activity per mg. of stained material. Some activity stayed with the liquid corresponding to the first cathode peak.

Discussion

It has thus proved possible to fractionate intrinsic-factor activity in human gastric juice by preparative paper electrophoresis. Vitamin B₁₂-binding and later a method of protein staining were used as aids to the grouping of fractions for clinical trial.

When highly concentrated gastric juice was used, a "protein" peak could be detected in association with every vitamin B₁₂-binding peak. This suggests that our inability to demonstrate such a peak corresponding to the anode vitamin B₁₂-binding peak in an earlier experiment (see preliminary observations) was probably due to insufficient concentration of the gastric juice. It will be remembered that in this experiment the juice was concentrated only 20 times.

In experiment A, intrinsic-factor activity was clearly demonstrated in the anode fractions. But the absence of response to the cathode fractions did not necessarily mean absence of intrinsic-factor activity, for the recipient (Case 4) may have belonged to a group of patients who respond poorly to orally administered material. Of 10 patients with pernicious anaemia to whom 50-80 µg. vitamin B₁₂ was administered with 500 ml. gastric juice, no fewer than three had very trivial responses, and one failed to respond (Ungley, 1950, and unpublished).

It is interesting to note that in the last two experiments, G and H, when larger quantities of gastric juice were used, tests showed the presence of some intrinsic factor in material corresponding to the first cathode peak as well as to the first anode peak. The reaction to the anode peak material seems to be the more significant, for its activity is as great as or greater than that of the cathode peak material although the former contains much less protein.

In view of our finding that intrinsic-factor activity is associated with material corresponding to two peaks, it is interesting to speculate that the substance may exist in gastric juice both in a free and in a combined state. The former might be represented by the first anode peak and the latter by the first cathode peak. We already have evidence that the material of the first anode peak contains either a mucoprotein or a mucopolysaccharide, and that heparin, a related substance, has significant vitamin B₁₂-binding power. These facts will be reported in greater

detail elsewhere. We have also shown that the material of the first cathode peak, although it contains much more mucoprotein, has less intrinsic-factor activity. This may well represent the fraction isolated by Glass *et al.* (1952). It is possible, however, that the activity of the cathode peak material may have been due not to a chemical combination but to overlap of the peaks or to some physico-chemical phenomenon associated with the electrophoresis on filter paper of concentrated and highly viscous solutions.

In Experiments G and H the weight of organic material from the first anode peak was of the order of 40 mg. It would be misleading to compare this quantity with the daily dose of 0.6 mg. with which Welch and Heinle (1951) produced a response in one case. Our method has been to give a single dose orally and to evaluate the result on the rate of increase of R.B.C. and P.C.V. in 15 days (Ungley, 1950). Reticulocyte responses may provide evidence of the presence or absence of activity, but they are not a satisfactory basis for quantitative assessment (Ungley and Campbell, 1949). As determined by reticulocyte response, even 10 ml. of gastric juice daily was enough detectably to potentiate an oral dose of 5 µg. vitamin B₁₂ (Schilling *et al.*, 1950; and Castle, 1951, personal communication). Until details of their case are published it cannot be assumed that the 0.6 mg. of material used by Welch and Heinle (1951) had any greater activity than 10 ml. of gastric juice.

In Experiments G and H our material produced not only a reticulocytosis but a significant increase of R.B.C. and P.C.V. within the range of responses we have obtained with a single dose of 500 ml. gastric juice and 50 µg. vitamin B₁₂ (Ungley, 1950, and unpublished). The magnitude of these responses makes it reasonably certain that appreciably smaller doses, perhaps differing little from those used by Welch and Heinle in the single case referred to above, might have sufficed to produce a reticulocytosis alone.

But, whatever the basis of haematological assessment, allowance must be made for the wide scatter in the responses of different patients to equal dosage. This scatter is wide even when vitamin B₁₂ is administered parenterally, especially if the dose is less than 10 µg. (Ungley and Campbell, 1949, and unpublished). The scatter is even wider when the vitamin is administered orally, for increases of R.B.C. and P.C.V. tend to be small and individual differences in absorption are great. When different observers are concerned there are certain also to be differences in strictness of control, limitation of diet, and so on. Because of all these variables, attempts to compare the activity of our material with that of others might involve errors of several hundreds per cent.

Even an approximate comparison would call for many more clinical trials—preferably trials in each of which the two materials would be tested serially in one patient, as in our Experiments G and H. Alternatively, activities could be compared by the technique of Welch, Scharf, Heinle, and Meacham (unpublished data cited by Welch and Nichol, 1952). These authors measured the radioactivity of the stools of patients with pernicious anaemia in remission after administration of radioactive vitamin B₁₂, at first alone and then together with a source of intrinsic factor.

Welch and Nichol (1952) remark that a daily dose of 3 mg. of a crude concentrate of hog's stomach will promote the absorption of 0.5 µg. radioactive vitamin B₁₂. It is possible, however, that 10 times this daily dose of their intrinsic factor concentrate might be needed to potentiate 5 µg. vitamin B₁₂ administered orally to patients with pernicious anaemia in relapse.

Summary

Concentrated human gastric juice was subjected to preparative electrophoresis on filter paper. Several peaks were demonstrated by a protein-staining method. All had vitamin B₁₂-binding activity. Material from two of them—one on the cathode side and one on the anode side of the starting-point—was shown clinically to possess intrinsic-factor activity. Material correspond-

ing to the anode peak, which appeared to be the more active of the two, has been shown to contain either a mucoprotein or a mucopolysaccharide.

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THE DEFINITION AND ASSESSMENT OF
RESPIRATORY FUNCTION*

BY

K. W. DONALD, D.S.C., M.D., F.R.C.P.

Reader in Medicine in the University of Birmingham

PART II

FACTORS AFFECTING THE TRANSFER OF
OXYGEN IN THE LUNGS

It has already been emphasized that the main function of the lungs is the transfer of adequate quantities of oxygen to the blood to maintain a normal oxygen tension and content in the blood flowing to the body, no matter what the degree of activity or how great the oxygen utilization of the tissues. The removal of excess carbon dioxide from the blood rarely presents any difficulty in disease, except in a few special circumstances. I will therefore confine my main discussion to the problem of oxygen transfer.

Distribution of Blood and Gas to the Alveoli

The alveolus is the unit of lung anatomy and lung function. All aspects of structure and function are subservient to the proper supply of each alveolus with blood and gas in correct quantities so that an adequate oxygen tension gradient and gas transfer between them is maintained. In a theoretically perfect lung the inspired air that passes the anatomical dead space would be equally divided among all alveoli. In other words, if there were, for argument's sake, one million alveoli, then each would receive one-millionth of the effective inspired air that enters the alveoli. Similarly in such a lung each alveolus would receive one-millionth of the cardiac output. Such a state of affairs would repre-

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sent perfect blood and gas distribution and each of the million alveoli would have the same ratio of ventilation and perfusion as all the other alveoli and the total lung itself. The resultant gas and blood tensions in each alveolus would be similar to all other alveoli, and each will be a miniature lung in all respects.

It is easy to imagine various disturbances of blood and gas distribution that could occur. Certain alveoli could receive less than their "share" of ventilation and yet be perfused with their normal "quota" of mixed venous blood. The blood leaving such alveoli and joining the left heart outflow would be inadequately oxygenated.

Next there could be imperfect distribution of blood; this would result in alveoli which are adequately ventilated no longer receiving their quota of mixed venous blood from the right heart. Such blood-distribution defects would not cause any deficiency of blood oxygenation but would manifest themselves in the expired air, which would contain a larger-than-normal percentage of unchanged inspired air.

We shall see later how near normal and diseased lungs come to these entirely theoretical concepts of perfection and imperfection of blood and gas distribution.

Oxygen Transfer (Diffusion) in the Lungs

The diffusion characteristics of a membrane, in regard to a particular gas such as oxygen, can be described by the quantity of oxygen that passes across it in unit time when there is a unit pressure gradient of oxygen across the membrane. This quantity of gas, or the diffusion coefficient, will depend on a number of fairly obvious factors—surface area, thickness, and physical characteristics. If we wish to consider the diffusion characteristics and coefficient of the pulmonary membrane, we must remember that we are dealing with a very complicated structure. It will include all the tissues and fluids between alveolar gas and the haemoglobin molecule in the red blood cells in the pulmonary capillary. It is also possible that the effective area of this "membrane" may vary greatly in the normal lung during various degrees of activity. Marie Krogh (1915) attempted to measure the oxygen diffusion coefficient of the lungs in normal subjects by the use of carbon monoxide. This gas was used because it is taken up by haemoglobin with such avidity that its tension in the pulmonary capillary blood (amount in simple solution) was assumed to be zero at all times. The diffusion coefficient of oxygen was easily determined from these data, as the coefficient of each gas is a simple function of its solubility and molecular weight.

Since that time little definitive work has been done on this subject, but attempts have recently been made to measure the diffusion coefficient of oxygen more directly during normal respiration (Lilienthal *et al.*, 1946). This presents great difficulty even in the normal lung, where it can be reasonably assumed that the alveolar oxygen tension is fairly constant through all alveoli. If the alveolar oxygen tension is known, then the initial pressure gradient between this and the mixed venous blood entering the alveoli can be determined by cardiac catheterization. However, the determination of the final and mean gradient between the alveolus and capillary blood presents more difficulty. These difficulties are even greater in subjects with lung disease, in whom the alveolar oxygen tension may also vary greatly. The diffusion coefficient cannot be measured unless the mean alveolar capillary oxygen tension gradient is known.

Alveolar Gas Tensions. The Concept of Ideal Alveolar Gas Tensions

The determination of the actual gas tensions in the alveoli during normal respiration presents great difficulties. Without this information the analysis of blood and gas distribution and gas transfer would seem impossible. The Haldane (1915) technique of making a subject expire deeply and collecting the sample at the end of expiration has long been used for this purpose. There is no certainty that the gas obtained in this way is an accurate, statistically repre-

sentative sample of the gases actually present in the alveoli. Further, this method of sampling interrupts the normal rhythm of respiration and alters the very values it is attempting to determine. Various devices for aspirating a small quantity of gas from the end of each normal expiration over a period have been used; this avoids upsetting the natural respiration and gives far more repeatable results in normal subjects (Rahn *et al.*, 1946). However, the underventilated alveoli will not be adequately represented in such a sample. Recently new concepts and methods have partially solved these difficulties. Fenn *et al.* (1946) pointed out that, in the steady state, the difference of pressure of oxygen and carbon dioxide in the alveoli and the inspired air was a measure of the quantities of these gases being absorbed and excreted by the lungs. Now these quantities of gases are related, their ratio being the respiratory quotient, which is easily determined by the analysis of expired air collected over a period thus:

$$\text{Respiratory quotient} = \frac{\text{CO}_2 \text{ excreted}}{\text{O}_2 \text{ absorbed}} = \frac{\text{Pressure gradient of CO}_2 \text{ between alveoli and inspired air}}{\text{Pressure gradient of O}_2 \text{ between alveoli and inspired air}}$$

As the pressure of CO₂ in the inspired air is negligible the equation becomes:

$$\text{R.Q.} = \frac{\text{Alveolar pCO}_2}{\text{Insp. pO}_2 - \text{alv. pO}_2}$$

$$\text{or Alv. pO}_2 = \text{Insp. pO}_2 - \frac{\text{alv. pCO}_2}{\text{R.Q.}}$$

It will be obvious that to define the alveolar gas in a single equation, in which the body R.Q. describing total gas exchange is employed, is to assume that all alveoli are equally ventilated and perfused and have the same R.Q. and gas tensions. It would seem that this equation gives little advantage, as the alveolar pCO₂ is now needed to determine the alveolar pO₂.

Riley *et al.* (1946) pointed out that the arterial pCO₂ could be regarded as accurately representing the alveolar tension of carbon dioxide (pCO₂), as, owing to the extremely high rate of diffusion of carbon dioxide in fluids, there must be almost absolute equilibrium of this gas between alveolar gas and blood leaving the alveoli. Again, this would be valid only if the distribution of the blood and gas were perfect. Yet Riley and Courmand (1949, 1951) pointed out that even if there is considerable underventilation of normally perfused alveoli (poor gas distribution) the arterial pCO₂ will differ but little from that which would obtain in a perfect lung with perfect blood and gas distribution. The reason for this superficially surprising fact is that there is only 4-5 mm. difference in the pCO₂ of normally ventilated and of unchanged mixed venous blood, owing to the enormous capacity of the blood for this gas. Thus in most patients with diseased lungs the increase of the arterial pCO₂ above what would be found in the same patient with ideal lungs and perfect gas and blood distribution is rarely significant. This is a most important observation and the key to many advances. It means that the "alveolar oxygen tension" as calculated from the inspired oxygen tension and the arterial pCO₂ and body R.Q. is, even in abnormal subjects, very close to what the alveolar tension would be if the lungs were "ideal" and had perfect distribution of blood and gas and all alveoli had similar gas tensions. It is therefore an easily obtained arbitrary measure of perfection, and the deviation of gas and blood coming from the lungs from this theoretical figure gives much information concerning any departure from complete homogeneity of the ventilation-perfusion relationships of the alveoli.

Venous Admixture Effect

The effect of underventilation of alveoli on the arterial oxygen tension is considerable, as the difference in oxygen tension between mixed venous blood and adequately venti-

*Corrected for change in volume as in oxygen-consumption determination from analysis of expired air.

lated blood is of the order of 60 mm. Hg. Riley and Courmand (1949) therefore attempted to assess the underventilation of alveoli in the following manner. They studied a normal subject in the steady state and determined the inspired air oxygen tension, the body R.Q., and the arterial pCO₂. From these data they could calculate by the above equation the only alveolar oxygen tension that was possible if all alveoli were homogeneously ventilated and perfused. They then calculated what the percentage oxygen saturation of arterial blood would be if it had all passed through homogeneous "ideal" alveoli. For good reasons, which will be discussed later, they assumed that there was virtual equilibrium of oxygen tension between alveolus and blood in normal subjects when breathing air.

They then compared this arterial percentage oxygen saturation with that actually found in the subject. Any passage of blood through underventilated alveoli or systems unrelated to air spaces would cause the arterial saturation to be lower than the calculated ideal figure. They then expressed the drop of percentage oxygen saturation from the ideal as a certain percentage of unaltered mixed venous blood being added to ideally ventilated blood. This figure, stated as *percentage venous admixture*, is a measure of perfusion of poorly ventilated alveoli or of direct venous addition (bronchial veins, thebesian veins, etc.) to the blood in the left heart. It is in fact an integration of all degrees of imperfection of ventilation of blood passing through the lungs into ideal ventilation and complete lack of ventilation. In normal subjects studied the arterial oxygen tension is only a few millimetres below the "ideal" figure and the percentage venous admixture is usually well below 5%, over 95% of the cardiac output being perfectly oxygenated. This emphasizes how remarkably near to perfection the distribution of blood and gas is in the normal lung. It is not yet known whether the "venous admixture" is due to anatomical venous admixture, to a slight degree of alveolar underventilation, or to a combination of the two.

Dead-space Effect

Just as poor gas distribution, or alveolar underventilation, is studied by its effect on the arterial blood, so inefficient blood distribution, or alveolar underperfusion, can be assessed by the analysis of expired air. It is now well established that in a normal person two-thirds or more of the tidal air passes the conducting air passages in which significant gas exchange does not occur and enters the alveoli. As all the gas leaving the alveoli has been in virtual carbon dioxide equilibrium with the blood leaving the alveoli, then this gas will have a similar carbon dioxide tension to the arterial blood. In an ideal lung, which the normal closely approaches, all alveoli will be equally ventilated and perfused and thus the expired gas will have a carbon dioxide tension which is at least two-thirds of the arterial carbon dioxide tension, as two-thirds will be from the alveoli and not more than one-third returned unchanged from the anatomical dead space. The small amount of air leaving poorly ventilated alveoli will, for reasons already given, have a pCO₂ very close to the arterial pCO₂ and have little effect on the expired pCO₂. However, if there is poor distribution of blood to alveoli and a number are well ventilated but not perfused with venous blood, then the gas leaving these alveoli will be unchanged inspired air. Similarly, if the blood perfusing ventilated alveoli is reduced then less oxygen will be extracted and less carbon dioxide will be added to the alveolar gas. This will result in the gas leaving the alveolus being nearer in composition to inspired air than that from normally ventilated and perfused alveoli.

Now, many studies in various lung diseases have shown no significant increase of the anatomical dead space. Thus if the pCO₂ of the expired air is less than two-thirds of the arterial pCO₂ then this is regarded as good evidence of the ventilation of unperfused and poorly perfused alveoli. The overventilation of normally perfused alveoli will also add to this so-called "dead-space effect." This is an extension of Bohr's concept of the physiological dead space, which

again integrates the various degrees of imperfection of distribution into absolute lack of alveolar perfusion and ideal ventilation and perfusion. The dead-space effect can be stated as a percentage of tidal air or of total ventilation. It is estimated as follows:

$$\text{Dead-space effect (as \% tidal air or total ventilation)} = \frac{\text{Arterial pCO}_2 - \text{Expired pCO}_2}{\text{Arterial pCO}_2} \times 100$$

Diffusion Gradients in the Alveolus

It will be remembered that so far in this discussion it has been assumed that when a normal subject breathes air the transfer of oxygen across the pulmonary membrane is so efficient that there is no appreciable oxygen tension gradient between the alveolar gas and the blood leaving the alveolus, and that the diffusion factor did not contribute in the normal subject to the slight depression of arterial oxygen tension below the theoretical ideal. Let us return to the question of whether it is reasonable to assume that this depression of the arterial oxygen tension is due only to so-called "venous admixture" or distribution disturbance.

Lilienthal *et al.* (1946) studied the alveolo-arterial oxygen tension gradient in normal subjects breathing low percentages of oxygen. Under these conditions the effect of alveolar under-ventilation becomes insignificant and the whole of the alveolo-arterial oxygen tension gradient can be safely assumed to be due to the final alveolo-capillary gradient in the alveoli (final diffusion gradient). This allowed the mean oxygen tension gradient between the alveolus and capillary to be calculated, and from this the diffusion gradient (O₂ uptake per minute mean diffusion gradient). By applying this diffusion coefficient to the data obtained while the subjects were breathing air, they showed that under these conditions the mixed venous blood reaches that under these conditions with the alveolar gas when it oxygen tension equilibrium with the alveolar gas when it is about halfway through the alveolar capillary. They were thus able to state that the slight alveolo-arterial oxygen tension gradient in normal subjects when breathing air was due to slight distribution disturbances—that is, venous admixture.

The application of this "two-level" technique to abnormal patients presented many great difficulties. A smaller degree of anoxia was advisable, and it could not be assumed that distribution or diffusion gradients were negligible at any particular level of oxygen breathing. These difficulties were overcome (Riley *et al.*, 1951), and the resultant studies (Donald *et al.*, 1952) have allowed the disturbances of blood and gas distribution and of alveolo-capillary oxygen diffusion, and their role in arterial desaturation, to be more precisely assessed in various lung diseases. The most important findings can be briefly outlined.

Two main groups of patients were studied by this technique. Those in the first group were suffering from pulmonary disease in which the pathological processes involved the alveolar walls and in which interference with the diffusion of oxygen across the pulmonary membrane was suspected (Baldwin *et al.*, 1949a). The second group consisted of patients with pulmonary emphysema in whom impairment of the efficient distribution of blood and gas to the alveoli was thought to be the main disability.

Pulmonary "Infiltration," or "Pneumonitis"

These patients complain of severe shortness of breath on very slight exertion. All show radiological evidence of widespread pulmonary infiltration. Although the physiological findings are remarkably constant, there is a very wide range of diagnoses. These include beryllium granuloma, asbestosis, scleroderma, Boeck's sarcoid, reticuloses, "interstitial pneumonitis," and various unclassified granulomata. In those patients coming to necropsy the occurrence of pathological tissue in the alveolar walls can be demonstrated. All the patients studied had no spirometric evidence of ventilatory obstruction, and the residual volumes were equal to or less than the predicted normal range. The normal or nearly normal ventilatory capacity (M.B.C.)

in all cases was further evidence that emphysema was not present. At rest the arterial blood saturation was normal or only very slightly depressed, whereas on very mild exercise marked arterial blood desaturation associated with considerable dyspnoea occurred, despite the unimpaired ventilatory capacity.

In some of these patients, studied at rest, the gas and blood distribution in the lungs was normal, as shown by the normal dead space (33%) and the normal venous admixture effect (6%). Yet the mean oxygen diffusion gradient (mean alveolo-capillary oxygen tension gradient) was about twice that found in normal subjects (normal, 20 mm. Hg), the diffusion coefficient being abnormally low (normal, 15 ml./mm./minute). Thus the interference with the transfer of oxygen across the alveolar membrane, despite the relatively efficient distribution of blood and gas to the alveoli, which had been previously suspected in these cases, was now definitely demonstrated. This interference with the oxygen diffusion necessitated an increased oxygen tension gradient between alveolus and capillary to maintain the transfer of even the resting oxygen requirements.

Let us contrast these patients with normal subjects. It has been pointed out already that, under resting conditions, the blood in the normal alveolar capillary reaches almost complete oxygen equilibrium with the alveolar gas in just over half the capillary length. Further, when a normal subject exercises there is probably a considerable increase in the diffusing capacity of the lung due to this expansion of the alveolar capillaries or the opening up of new capillaries. Even if this mechanism is greatly limited the "reserve" distal half of the lung capillaries will allow a large increase in capillary blood velocity, even with the same or increased mixed venous blood desaturation, without any risk of incomplete oxygenation of the blood leaving the alveolus.

In this group of patients a measurable oxygen tension gradient between the alveolar gas and the blood leaving the alveolus could be demonstrated when air was breathed in the resting state. Thus the normal reserve of lung capillary was no longer available. It is probable that the ability to expand the pulmonary capillary bed and increase the diffusing capacity was also much impaired. More important is the fact that any increase in the velocity of blood through the lung capillary will inevitably increase the final alveolo-capillary oxygen tension gradient, and thus the blood leaving the lungs and entering the systemic circulation will be considerably desaturated. In more simple terms these patients show marked cyanosis and distress on exercise because they have no reserve diffusing capacity.

In the more severely affected patients not only was the diffusion of oxygen even more impaired but the dead-space and venous admixture effects were greatly increased. It was considered, in the absence of emphysema, that this was probably due to such severe involvement of the alveolar membrane in certain portions of lung that no significant gas exchange was possible, and that gas and blood were returned unchanged from such areas.

Pulmonary Emphysema

The patients investigated all had clinical and radiological evidence of emphysema. Lung-volume studies showed the usual increase of residual volume and decrease of maximum breathing capacity. A number of these patients showed moderate arterial blood desaturation at rest and considerable desaturation on exercise. Raised arterial blood carbon dioxide tensions were found in some cases.

It has been demonstrated in many ways that the distribution of inspired air throughout the lungs is exceedingly uneven and inefficient in this disease. The uniform distribution of blood is probably also impaired in emphysema owing to the damage to the finer branches of the pulmonary vascular tree; but there is so far only indirect evidence of this, such as histological and injection studies, and haemodynamic studies of the pulmonary circulation during rest and exercise.

In this investigation considerable increase of the dead-space effect (ventilation of underperfused and unperfused alveoli) and of venous admixture effect (perfusion of under-ventilated or unventilated alveoli) was demonstrated. In some patients the dead-space effect was well over 60% of the tidal air, the upper limit of normal dead space due to the conducting passages being about 33% of the tidal air. Similarly, venous admixture effects of nearly 50% of the cardiac output were found. Such findings indicated gross upset of the normal distribution of blood and gas to the alveoli and of the efficient correlation of alveolar ventilation and circulation. It must be remembered that, as it is impossible to describe the almost infinite variations of ventilation-perfusion relationships, the present method integrates all departures from homogeneity into ideal ventilation-perfusion relationship and into the return of unchanged gas and blood from the lungs.

It was also found that an increase of dead-space effect was not always associated with a similar increase of the venous admixture effect, and vice versa. This is an important finding, as it means that emphysema may interfere predominantly with alveolar ventilation in certain cases and with alveolar circulation in others. It may also explain the remarkable variation in disability and prognosis in this disease.

A somewhat unexpected finding in a number of these patients was a greatly increased oxygen diffusion gradient (mean alveolo-capillary oxygen tension gradient) and a decreased diffusion coefficient. Histological studies in emphysema do not suggest any structural interference with the diffusion of oxygen across the alveolar membrane. However, it must be remembered that lung which is ventilated but not perfused, or perfused but not ventilated, is as functionless as lung that receives neither blood nor air. Thus these distribution disturbances will render large amounts of lung quite functionless, and the effective blood-gas interface where blood and gas meet and there is an adequate gas gradient between them will become less and less as these disturbances increase.

In confirmation of this, the most pronounced impairment of diffusing capacity was found in those patients with the largest combined venous admixture and dead-space effects. Just as the area of the pulmonary membrane and the diffusing capacity will become less and less in patients whose lungs are being progressively destroyed by infection or cystic disease, so increasing disturbances of alveolar ventilation and perfusion will also reduce the amount of effective lung and diffusing capacity.

The findings further suggested that deficient arterial blood oxygenation at rest in emphysema is mainly due to alveolar underventilation, whereas marked arterial desaturation on exercise, as in the previous group described, was due to the limited diffusing capacity of the lung.

Practical Considerations

The methods required in such studies need a large trained team and generous facilities. These studies are necessary for furthering our knowledge of lung function but are quite impracticable as routine investigations. However, without such experiments the value and significance of the more simple tests which can be used in clinical medicine will remain obscure.

Arterial Blood Studies

In routine clinical work the commonest cause of severe cyanosis is severe congestive cardiac failure due to rheumatic heart disease. These patients have greatly reduced cardiac outputs, and their cyanosis is caused by the inevitable extraction by the body tissues of an unusually large percentage of oxygen from the reduced amount of circulating blood. Yet they have normal or nearly normal arterial blood oxygenation. Again, many patients with congenital heart disease and arterial blood desaturation have considerable polycythaemia, and their cyanosis is further increased because of this.

In most patients with lung disease the cardiac output is normal and marked polycythaemia is not present. In such patients it is most difficult to assess the degree of arterial blood oxygenation by visual inspection, and they may be dangerously anoxaemic with only what seems to be very slight cyanosis. Although the difference between "peripheral" and "central" cyanosis has been long appreciated, the difficulty of assessing the latter, particularly if acute, and its sinister import if marked, is not so clearly understood. In all cases of respiratory disease, whether acute or chronic (apart from pneumonia responding rapidly to treatment), the determination of the arterial blood oxygenation is as essential and obvious an investigation as the determination of the blood urea in kidney disease.

With practice arterial puncture is a smooth, easy, and painless procedure. The brachial artery is almost always used in respiratory studies, as most patients are conditioned to assault in this region and are not disturbed. It is not justifiable to risk damaging the femoral artery in middle-aged and elderly patients, as the circulation is always more precarious in the leg than in the arm. Further, the patient can be exercised without disturbing the needle. The best needle for this type of work is the Riley modification of the Courmand indwelling arterial needle, although, if only a single sample is needed, any medium-sized needle can be used, providing the bevel is kept short. The arterial blood is collected into a heparinized syringe and sealed after a drop of mercury has been added to facilitate mixing. It is quite incomprehensible why a number of workers continue to transfer these beautifully sealed blood samples to another vessel under oil. It is not only messy but an unnecessary additional manipulation. Further, the carbon dioxide diffuses through the oil at a high rate and is lost to the atmosphere. There is therefore a variable loss of this gas and change in the pH of the blood. Even more serious is the fact that when the sample is left to stand sedimentation of red cells occurs. Most vigorous stirring under oil will not give homogeneous red cell distribution, and thus samples taken for analysis may vary considerably and contain a greater concentration of red cells than in the original sample (Donald and Wade, 1952). A sealed syringe can be placed on a conical roller and the blood will remain well mixed until the analysis.

The most accurate method of determining the oxygen and carbon dioxide content of blood is the Van Slyke and Neil manometric technique (Peters and Van Slyke, 1932). The Haldane blood-gas analysis method is also satisfactory for determining the oxygen content if the Courtice and Douglas (1947) modifications are used. It takes less time than the Van Slyke method. However, the reliability of all methods is checked against Van Slyke determinations, and if several of these instruments are used, and all concerned are trained in its use, then the more reliable and accurate method can be employed without undue loss of time. An important point is that the oxygen capacity of arterial blood varies in different states and exercise will cause it to rise considerably. The use of a resting capacity in exercise studies may cause considerable errors.

If more precise and fundamental work is being done then it is necessary to measure the arterial blood-gas tensions. This procedure, although not yet suitable for routine clinical studies, is essential in the study of blood oxygenation in lung diseases. A glance at the oxyhaemoglobin dissociation curve will show why tension studies are so necessary for more precise work. It will be seen that, provided the blood pH does not alter, a fall in blood oxygen tension from 100 to 62 mm. Hg involves a drop of haemoglobin saturation of only 97 to 90%. Thus disturbances in alveolar ventilation or oxygen transfer have to be quite gross before pronounced arterial blood desaturation is obtained.

The bubble equilibration method of Riley, Proemmel, and Franke (1945), although not perfect and demanding great skill, is an essential weapon in modern respiratory research. Without it, as already emphasized, only the most severe disturbances in blood oxygenation can be demonstrated. It is unwise to attempt to develop this technique without first seeing it done by a worker who is trained in the method.

When arterial blood is being taken for gas-tension studies it is necessary to collect the expired air at the same time,

so that the expired-gas tension and respiratory quotient can be determined. This allows the ideal alveolar oxygen tension to be calculated and thus the gradient between this and the arterial oxygen tension. This is the most accurate and delicate method of expressing how far arterial blood oxygenation falls short of perfection.

Finally, let us consider the value of studying the oxygen and carbon dioxide content of arterial blood in various lung diseases.

Resting Studies

The arterial blood desaturation in emphysematous subjects at rest is never of the extreme order seen in many cases of congenital heart disease, unless there is extreme interference with alveolar ventilation due to acute bronchitis, severe asthma, or pneumonia. Figures below 85% saturation are unusual, but even this is roughly equivalent to 40% of the blood from the right heart passing through the lungs unchanged. This would again emphasize how relatively insensitive arterial blood saturation is as a measure of defective alveolar ventilation. It may also explain why marked polycythaemia is not often encountered in this disease. In fibrosis and pathological infiltrations of the lung there is rarely any significant arterial desaturation at rest.

Speaking in general terms, the arterial desaturation at rest is due to the venous admixture effect from under-ventilated alveoli and is not caused by any limitation of the diffusing capacity, which is adequate in the resting state even in patients with severe diffusion disturbances.

Patients may suffer severe anoxaemia after intrathoracic operations. This is due to acute and severe interference with alveolar ventilation caused by oedema, bronchial irritation and blockage, collapse, and effusions. Such patients are usually obviously cyanosed, and oxygen therapy is given until cyanosis is relieved. However, precise measurement of the arterial blood saturation in these patients can be of great help in the conduct of such cases. More studies of post-operative arterial oxygenation are needed to increase the knowledge of the hazards of various surgical procedures.

Again, arterial blood studies are most useful in the treatment of patients with chronic respiratory diseases who are suffering from acute pneumonic infections. The carbon dioxide content or tensions are particularly valuable in helping to assess the risk of carbon dioxide retention when oxygen therapy is given (Donald, 1949).

Finally, the only method of demonstrating deficient blood oxygenation at rest in early and moderate emphysema is that of measuring the alveolar-arterial oxygen tension gradient. This is greatly increased even in patients with what seems to be relatively normal arterial blood saturation (90-94%).

Exercise Studies

The fact that considerable alveolar underventilation or limitation of the oxygen diffusing capacity causes only very moderate depression of the arterial blood saturation at rest would appear to make this approach unfruitful if blood-tension studies are not available. However, it is fortunate that limited diffusing capacity can be demonstrated by increasing the oxygen demands of the body by brisk exercise. Any inability to increase oxygen transfer in the face of increased oxygen demands will cause dramatic arterial-blood desaturation. This inability to transfer increased quantities of oxygen to the blood is due to a decreased effective blood-gas interface or, more rarely, interference with oxygen diffusion into the alveolar capillary. Thus marked arterial desaturation on exercise may be due to faulty gas or blood distribution, rendering large amounts of lung relatively functionless (emphysema, bronchial obstruction), by disease destroying large amounts of lung tissue (extensive tuberculosis, cystic disease, etc.), or by pathological infiltration of the alveolar wall. The ability to maintain normal arterial oxygenation in the face of increased oxygen demands is therefore a remarkable test of overall respiratory effi-

ciency and actual amount of functioning lung. Arterial blood studies are carried out during various standard exercises (walking, step-test, treadmill), but this relatively simple method of assessing overall lung function is still in its infancy. As in this method study is made of the change or otherwise of arterial saturation, it is likely that oximetry may be of great help and render the test even more accessible to the practising physician.

Finally these various functions of the lungs can now be studied and to some extent assessed quantitatively. Nevertheless, although great progress has been made, mainly by academicians, the true value of these various concepts and methods of assessment of respiratory function will not be known until they are understood and used by practising chest surgeons and physicians, who can then reject, endorse, and advance in the light of real practical experience.

General Summary

The function of the lungs is defined. The importance of lung ventilation and circulation bringing blood and gas in close contact in all alveoli so that efficient gas exchange occurs is emphasized.

The various methods of assessing ventilatory function are discussed. The determination of the lung volumes and ventilatory capacity is described and the greater value of the more dynamic measurements emphasized. The relationship of the volumes ventilated to the ventilatory capacity present in the causation of ventilatory discomfort or dyspnoea is discussed.

The important features of the pulmonary circulation are detailed and the disturbances of this circulation in lung disease, and their effect upon the right ventricle, are described.

Finally, the problem of oxygen transfer and blood oxygenation is considered. It is emphasized that this depends upon the efficient distribution of gas and blood and the proper correlation of alveolar ventilation and circulation throughout the lungs. The diffusion of oxygen across the pulmonary membrane is considered. The theoretical concept of ideal distribution of blood and gas is elaborated and the application of this concept to the measuring of the efficiency of the lungs in this respect, both in health and in disease, is described. The diffusion gradients in the alveoli and the diffusing capacity of the lungs are also considered in both normal and abnormal subjects. The value and future of arterial blood studies in pulmonary disease is discussed.

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THROMBO-ANGIITIS OBLITERANS

CLINICAL DIAGNOSIS AND CLASSIFICATION OF CASES

BY

R. L. RICHARDS, M.D., M.R.C.P.Ed.

(From the Gardiner Institute of Medicine, University of Glasgow)

"Thrombo-angiitis obliterans is a segmental, inflammatory obliterative disease of the arteries and veins which occurs almost exclusively in young men, involves the extremities, and rarely the viscera also, and produces ischaemia of tissues and frequently gangrene."—Allen, Barker, and Hines (1946).

In 1908 Buerger suggested the name thrombo-angiitis obliterans for a disease of the peripheral arteries which he had studied in eleven lower limbs amputated for "pre-senile spontaneous gangrene." He did not claim that he had described a new disease, but gave due credit to earlier writers, notably von Winiwarter (1879), who had described the condition under other names. Nevertheless it was largely due to Buerger's (1908, 1924) publications that the disease became a recognized clinical entity, and the name which he suggested, or its eponymous alternative "Buerger's disease," came to be generally used. Since 1908 the literature on thrombo-angiitis obliterans has become extensive; among the more important contributions are the American monograph by Brown and Allen (1928) and, in this country, the papers by Parkes Weber (1916), Telford and Stopford (1924, 1935), and Telford (1937).

As a result of the attention thus focused on the disease it has become customary to classify patients with symptoms of occlusive disease of the arteries of the limbs into two groups: (1) a group of young patients in whom the diagnosis is thrombo-angiitis obliterans, and (2) an older group in whom the arterial occlusion is thought to be secondary to atheroma (arteriosclerosis obliterans). Although the patient's age is regarded as an important factor in deciding his grouping, it is recognized that there are other fundamental differences between the two conditions (Table I). There is, however, no unanimity

TABLE I.—Differential Diagnosis of Thrombo-angiitis Obliterans and Arteriosclerosis Obliterans

Feature	Thrombo-angiitis Obliterans	Arteriosclerosis Obliterans
Age at onset of symptoms	Usually under 35 years; rare over 40 years	Usually over 50 years
Sex	Almost exclusively males	Preponderantly males, but not rare in females
Distribution	Upper limbs often involved	Upper limbs seldom involved
Venous involvement	Superficial phlebitis in about 40% of cases	Rare
Blood pressure	Normal	Frequently elevated
Association with diabetes	Rare	Frequent
Radiography	Vessels seldom calcified	Vessels often calcified
Biochemistry	No constant abnormality	Blood cholesterol and total fats often high
Pathology	Acute or subacute "inflammatory" lesions	Degenerative lesions with benign thrombosis

regarding the age which separates the two groups. Buerger (1924) described thrombo-angiitis obliterans as a disease which begins in the twenties or early thirties, and the average age at the onset of the disease in his cases was 32 years and 5 months. Brown and Allen (1928) stated that 90% of cases of thrombo-angiitis obliterans occurred between the ages of 20 and 50 years. The average age in Telford and Stopford's (1935) series of 48 cases was 45 years, and Telford (1937) said, "A diagnosis of thrombo-angiitis obliterans may be made with some confidence in patients up to 45 years or even 50." Lewis (1936) thought that the onset of thrombo-angiitis usually occurred in the thirties, Homans (1939) stated that the disease occurred in young men between the ages of 20 and 40 years, and Wright (1948) said that all patients have symptoms before 55 and most before 45. The opinion of Allen *et al.* (1946) was that "it is fairly safe to consider that if the symptoms of chronic occlusive arterial disease begin after the patient is 50 years of age the lesion is arteriosclerosis, and if they begin before the age of 40 years the lesion is thrombo-angiitis obliterans."

Current views regarding the differential diagnosis between the two groups may be summarized as follows: a diagnosis of thrombo-angiitis obliterans may be made with some certainty in the case of a male patient suffering from occlusive arterial disease who was under the age of 35 years at the time of his initial symptoms, gives a history of superficial phlebitis, and has involvement of the arteries of the upper limbs; if the patient is over 50 years, if the disease is confined to the lower limbs, if there is some degree of hypertension, and if radiographs of the affected limbs reveal calcification in the walls of the arteries, then arteriosclerosis may be diagnosed confidently. There are many patients with occlusive arterial disease in whom the clinical picture is not sufficiently clear-cut to permit of these definite diagnoses. These patients are in the age group between 35 and 45 years; although their blood pressure is normal and they do not have calcified vessels, they do not give a history of

phlebitis and the disease is apparently confined to one or both lower limbs. Hitherto the tendency has been to regard these patients as suffering from thrombo-angiitis obliterans rather than arteriosclerosis obliterans, although the natural history of their disease is often different from that observed in younger patients who show all the classical features of thrombo-angiitis obliterans.

An attempt to clarify this situation has recently been made by Boyd and his colleagues (Boyd *et al.*, 1949; Boyd, 1950), who have proposed a new classification of obliterative arterial disease of the lower limbs:

1. Traumatic Arterial Thrombosis.

2. Juvenile Obliterative Arteritis.—"This comprises a group of cases corresponding to those described by Buerger, and the condition may be a pathological entity."

3. Primary Popliteal Thrombosis.—A benign condition in which a local thrombosis develops in the popliteal artery as a result of trauma to the vessel where it runs behind the knee-joint.

4. Senile Obliterative Arteritis.—An inclusive term which covers all forms of arterial disease generally referred to as arteriosclerosis; it accounts for 95% of all cases of occlusive arterial disease, and the cases may be subdivided into the following groups: (a) diffuse obliterative arteritis; (b) secondary popliteal thrombosis; (c) secondary femoral thrombosis; and (d) distal type.

It is apparent that many cases which would be regarded by most authorities on peripheral vascular disease as instances of thrombo-angiitis obliterans are classified by Boyd under the headings of primary popliteal thrombosis and senile obliterative arteritis.

Clinical Material

Consideration of these facts has led me to review the case histories of 85 patients who were first seen between 1941 and 1947, and in whom a diagnosis of thrombo-angiitis obliterans was made. There were 84 males and one female in the series and their ages ranged from 21 to 56 years. All were smokers, but few could be regarded as heavy smokers. The majority of the patients were Scots, but the series included a Belgian, a Dutchman, and an Italian; only one patient was of the Jewish race. Many of the cases have been included in the recent clinical review published by Lynn and Burt (1949); most of these have been followed for several years, and the natural history of their disease is therefore known. Lynn and Burt dealt with the clinical features, the treatment, and the results of treatment, and these aspects will not be reconsidered.

Because of the importance which has been attached to the patients' age in regard to the diagnosis of thrombo-angiitis obliterans the cases have been divided into three groups according to their age at the onset of the disease (Table II). Superficial thrombophlebitis occurred in 27

TABLE II.—Clinical Material

	Age Group			Totals
	Under 35	35-45	Over 45	
No. of cases	39	37	9	85
No. with superficial phlebitis	12	13	2	27
No. with involvement of upper limbs	15	8	2	25
No. with hypertension (B.P. 150/90)	4	8	3	15
No. with pathological confirmation of diagnosis	12	8	2	22

cases, an incidence of 32%, which is similar to that usually quoted (Buerger, 1924; Allen *et al.*, 1946; Edwards, 1949). In 25 cases (29%) there was clinical evidence of involvement of the arteries of the upper limbs, a lower incidence than that given by Allen *et al.* (1946) and Farber and McLain (1951).

Fifteen patients had a blood pressure higher than 150/90 mm. Hg; the highest pressure was 190/100 in a patient in whom the diagnosis of thrombo-angiitis obliterans was confirmed. In most of the cases, and in all patients over the age of 40, radiographs of the affected limbs were taken; these did not reveal calcification in the walls of the arteries. Pathological confirmation of the diagnosis was obtained in 22 cases—by examination of material obtained by amputation (18 cases), at necropsy (3 cases), and by biopsy of a thrombosed vein (1 case). In two other cases necropsies performed since 1947 have shown that the arterial lesions were due to atheroma and not to thrombo-angiitis obliterans.

Clinical Classification

Several clinical classifications of cases of thrombo-angiitis obliterans have been suggested. Brown and Allen (1928) described 12 clinical types, Learmonth (1937) stated that cases could be divided into four groups, and Allen *et al.* (1946) mentioned nine clinical types and four groups according to the course of the disease. None of these classifications was entirely satisfactory for the present series, which has been subdivided into five groups (Table III).

TABLE III.—Clinical Classification

Clinical Type	Age Group			Totals
	Under 35	35-45	Over 45	
Acute	8	4	1	13
Episodic	16	11	1	28
Slowly progressive	7	11	7	25
Acute arterial occlusion	5	10	0	15
Upper limbs	3	1	0	4

1. An "Acute" Group (13 cases).—In this group the disease began either suddenly or insidiously and progressed rapidly; within a year of onset gangrene was extensive enough to necessitate either a major amputation or the loss of more than digits.

2. An "Episodic" Group (28 cases).—The history of the disease was punctuated by a series of episodes separated by months or years, each episode corresponding to a wave of thrombosis, either venous or arterial. Between the episodes the disease was quiescent and the patients were apparently well except for such residual disabilities as were left by the previous wave of thrombosis.

3. A "Slowly Progressive" Group (25 cases).—Intermittent claudication affecting the muscles of the leg was the first symptom of the patients in this group. The condition progressed slowly with gradual shortening of the "claudication distance"; nutritional changes and gangrene were late manifestations.

4. An "Acute Arterial Occlusion" Group (15 cases).—The onset was sudden and indicated that the patient had suffered an acute occlusion of either the femoral or the popliteal artery. This did not result in gangrene, but thereafter the patient had intermittent claudication in the affected limbs and the foot blanched unduly on elevation.

5. An "Upper Limbs" Group (4 cases).—In this group the disease was either confined to the upper limbs or the symptoms in the hands were of major importance and only minimal signs of disease were found in the lower limbs.

The first three groups represent well-recognized types of thrombo-angiitis obliterans. It will be noted that the incidence of the acute and episodic cases was greatest in patients under 35 years of age, and that in only one patient in each group did the disease begin after the age of 45. The age distribution of the slowly progressive type of case was different: the cases were more evenly distributed throughout the three age groups, and the greatest incidence was in the 35-45 period. The incidence of superficial phlebitis in these cases was low (only 3 cases out of 25), and none of the patients had involvement of the upper limbs. There is therefore some reason for questioning the diagnosis of thrombo-angiitis obliterans in these cases.

The fourth clinical group is of particular interest. Ten of the 15 cases in this group were in patients whose ages were between 35 and 45 years, and it is in patients of that age that the problem of diagnosis is most difficult. Opinions differ on whether acute occlusion of a major artery occurs

in thrombo-angiitis obliterans. Telford (1937) gave an excellent description of this type of case, and expressed the opinion that the occlusion was due to an embolus—"the embolus having been derived from some patch of atheroma or calcification in a vessel proximal to the popliteal. That they are not true thrombo-angiitis obliterans is evident from the fact of the sudden very painful onset and from the observation that the other leg is apparently normal." Klostermeyer (1941), on the other hand, suggested that many cases of thrombo-angiitis obliterans begin with occlusion of a major artery. Allen *et al.* (1946) recognized a type of thrombo-angiitis obliterans with sudden arterial occlusion, but they also stated that "cases in which acute and extensive arterial occlusion occur are uncommon." According to Boyd's classification, cases of this type would be examples of primary popliteal thrombosis or of senile obliterative arteritis with secondary thrombosis of the femoral or popliteal arteries.

At least some of the patients over the age of 35 who presented with signs of an acute arterial occlusion probably do belong to the latter category. The five patients under the age of 35 are more difficult to classify. Three of these cases were reported by Learmonth *et al.* (1944) as instances of "localized arterial thrombosis of undetermined origin." The fourth case, which we reported at that time, is now included in the upper-limb group because the brachial artery was affected. The subsequent histories of these four patients are illuminating: two (Cases 1 and 4) have had further episodes of thrombosis, both venous and arterial, and therefore would now qualify for inclusion as cases of thrombo-angiitis obliterans with an episodic course; of the other two, one (Case 2*) has had no further trouble, and the fourth (Case 3) is untraced. The natural history of these cases is therefore different from Boyd's conception of primary popliteal thrombosis; he regards the latter as a benign condition, and states that he has followed patients for ten years and found no further evidence of arterial disease (Boyd, 1950).

Most writers agree that involvement of the upper limbs occurs more often in thrombo-angiitis obliterans than in arteriosclerosis obliterans. Boyd *et al.* (1949), however, state that juvenile obliterative arteritis (which they regard as corresponding to Buerger's original description of thrombo-angiitis obliterans) is confined to the lower limbs, and that involvement of the upper limbs is more characteristic of senile obliterative arteritis. In the present series 25 patients had symptoms or signs of arterial disease in the upper limbs (see Table II). In four patients the symptoms and signs in the hands were of major importance, and evidence of the disease in the lower limbs had to be sought; three of these patients were under 35 years of age and one was in the 35-45 age group. All were found to have occlusive arterial disease in the lower limbs, but only one gave a history of an attack of superficial phlebitis.

Classification According to the Site of the Arterial Lesion

An alternative method of classifying cases of occlusive arterial disease is according to the site of the arterial lesion. Clinically it is possible to recognize two distinct types (Boyd, 1938). (1) A proximal type: in this group the occlusion is in the main artery of the limbs, claudication in the calf muscles is the main symptom, and postural colour changes in the foot are pronounced. (2) A distal type: the disease appears to begin in the arteries of the foot, pain in the foot either on exertion or at rest is the presenting symptom, the progress of the disease is more rapid than in the preceding group, and ulceration and gangrene are common.

When an attempt was made to divide the cases in the present series into these two types it was found that, although some cases could be allocated to one or other of the groups with certainty, there were a larger number

in which the clinical findings and special investigations indicated that both proximal and distal vessels were occluded. These cases therefore constitute a third group, which may be called the "mixed type" (Table IV).

TABLE IV.—Classification According to Site of Lesion

Site of Lesion	Age Group			Totals
	Under 35	35-45	Over 45	
Proximal type	7	9	3	19
Distal "	18	11	1	30
Mixed "	14	17	5	36

1. *The Proximal Type* (19 cases).—The outstanding feature of the cases in this group was that at the initial examination the disease appeared to be confined to one lower limb. Fourteen of the patients presented clinically as instances of acute arterial occlusion (see Table III); the remainder gave a history which suggested that the disease was slowly progressive, but examination indicated that they had a localized block in a main artery.

2. *The Distal Type* (30 cases).—In 22 cases both lower limbs were affected when the patient was first seen; in eight cases the disease was unilateral. The cases were evenly distributed through the acute, episodic, and slowly progressive clinical groups.

3. *The Mixed Type* (36 cases).—In all the cases in this group the disease was bilateral; in some, distal vessels only were occluded in one leg and both distal and proximal vessels in the other lower limb. As in the second group, the cases were distributed throughout the acute, episodic, and slowly progressive clinical groups, but the greatest number (15) were in the episodic group.

Buerger's (1908, 1924) descriptions of thrombo-angiitis obliterans clearly indicate that he regarded the disease as one which affected principally the arteries of the foot and leg, and which tended to spread proximally, often with a patchy distribution to involve the popliteal and, occasionally, the femoral vessels. Certainly the majority of cases of thrombo-angiitis obliterans begin as a distal arteritis, although often in the early stages the correct diagnosis is not made, and by the time the true condition is recognized the disease has spread to the proximal vessels. It is unusual for the initial symptoms to be those of acute occlusion of a main vessel, and when this occurs the diagnosis is more likely to be arteriosclerosis obliterans. Nevertheless, experience with some of the cases in the proximal group has shown convincingly that thrombo-angiitis obliterans does occasionally present in this manner: if the patient with an acute arterial occlusion is under 35 years of age the possibility that the cause is thrombo-angiitis obliterans should not be too readily dismissed. If, when the patient is first seen, both distal and proximal vessels are occluded it is often impossible to determine the level at which the obliterative process began, and clinical diagnosis is more difficult.

Conclusion

It is apparent from this study that the clinical diagnosis of thrombo-angiitis obliterans is not a simple problem. Much of the present confusion is due to the fact that Buerger used the term "thrombo-angiitis obliterans" in the first instance to describe the pathological lesion which he found in the arteries of the original eleven amputated limbs; only later did he apply the name to a group of clinical cases. It was assumed by Buerger (1924) and others that all patients presenting features similar to those of his original cases were suffering from the same disease. The symptoms and signs of obliterative arterial disease, however, depend not so much upon the pathological nature of the occlusive process as upon the distribution and extent of the lesions in the arterial tree. With the possible exception of superficial phlebitis none of the clinical features of thrombo-angiitis obliterans is pathognomonic. The diagnosis therefore must often depend upon the natural history of the patient's illness. In the past too much emphasis has been placed upon such criteria as race, age, and involvement of the upper limbs.

Buerger's original contention that the disease occurred most frequently in the Jewish race has long been disproved. Pathologists have often commented upon the fact that atheromatous changes are sometimes found in the arteries of young adults who come to necropsy as a result of fatal accidents and other conditions which do not primarily affect the cardiovascular system. If proof were required that such changes can be the basis of obliterative arterial disease it is amply provided by the studies of Newman (1946, 1951) and Poe (1947) on cases of coronary artery occlusion in young adults. Newman reviewed 100 cases of coronary occlusion which occurred in patients under 35 years of age, and found that in all of them the pathological changes in the coronary arteries were similar to those found in older patients—namely, atheroma. What happens in the coronary arteries may also occur in the arteries of the limbs, and therefore the possibility of arteriosclerosis obliterans, the pathological basis of which is atheroma, cannot be dismissed merely on account of the patient's youth. Involvement of the arteries of the upper limbs is not uncommon in cases of arteriosclerosis obliterans. The two criteria which remain as reliable indications for a diagnosis of thrombo-angiitis obliterans are its constant association with tobacco-smoking and its predilection for the male sex. The value of these criteria is lessened by the fact that smoking is an almost universal habit, and that, except in diabetics, all forms of obliterative arterial disease are commoner in men.

In its classical form thrombo-angiitis obliterans presents as an acute or episodic type of obliterative arterial disease occurring in a young adult male who smokes; it begins in the arteries of the lower leg or foot, may be preceded or accompanied by superficial migratory phlebitis, and is often associated with fungus infection of the feet. In cases of this type pathological examination of the affected arteries or veins almost invariably reveals lesions similar to those found by Buerger in his original cases. Many cases do not conform to this classical picture, and the clinical diagnosis can then be only a tentative one. Nevertheless, as Buerger (1924) states, "a careful clinical study of thrombo-angiitis obliterans will dissipate all doubt as to the possibility of separating this disease, as a clinical entity, from the other types of organic vascular disease as well as from all those neurogenic varieties of vasomotor and trophic disorders that may be clinically confounded with it."

Summary

The criteria necessary for a clinical diagnosis of thrombo-angiitis obliterans are reviewed with particular reference to a personal series of 85 cases. The view is put forward that the diagnosis should be based principally upon knowledge of the natural history of the disease and that such factors as race, age, and involvement of the arteries of the upper limbs are of secondary importance.

The majority of the patients were under the care of Sir James Learmonth, to whom I am indebted for the opportunity to study them. I wish to thank Dr. C. C. Burt for help in case-taking and for providing me with follow-up data on many of the cases.

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SIMPLIFIED METHOD OF DRUG TREATMENT FOR THYROTOXICOSIS USING A UNIFORM DOSAGE OF METHYL- THIOURACIL AND ADDED THYROXINE

BY

RUSSELL FRASER, M.D., F.R.C.P.

AND

M. WILKINSON, M.R.C.P.

(From the Department of Medicine, Postgraduate Medical School of London)

The thiouracil drugs are now used widely both for the pre-operative management and for the prolonged medical control of thyrotoxicosis. The use of these drugs over long periods carries two potential disadvantages; first, the possibility of overdosage, which will cause further goitre enlargement and worsening of the eye signs along with subclinical or obvious myxoedema; and, secondly, the remoter risk of agranulocytosis or other lesser toxic effects. It is known from animal experiments that goitrogenesis during antithyroid drug administration depends on the increased output of pituitary thyrotrophin which is induced when the level of thyroid secretion is lowered, for it can be avoided by giving enough exogenous thyroxine (Purves, 1943; Astwood *et al.*, 1943) or by hypophysectomy (Griesbach *et al.*, 1941). The worsening of the eye signs of Graves' disease, which may also be seen as a manifestation of overdosage during thiouracil treatment, probably depends on the same mechanism. Thus the risks of thiouracil overdosage are those of its over-suppression of thyroid function.

Clearly these risks of overdosage should be avoidable either by adjusting the thiouracil dosage to levels just short of those which over-suppress thyroid function or merely by daily supplemental administration of thyroxine or thyroid. The former is the basis of the usual clinical practice of adjusting the thiouracil dosage to the patient's individual requirements; but this requires frequent and careful supervision, which can readily worsen the nervous state of such patients. We have therefore attempted to evolve a simpler procedure by giving the thyroxine with the methylthiouracil and so adopting the latter method of avoiding the risks which may follow undue suppression of thyroid function. A uniform basic dosage scheme giving both drugs should suffice, unmodified, for most cases if it provided enough methylthiouracil to block thyroid hormone production

*Case numbers refer to those used by Learmonth *et al.* (1944).

adequately in all cases and also supplied enough thyroxine for the normal daily needs of thyroxine. If the basic or standard dosages were correctly chosen the drug control should consist simply in watching the goitre size and adding thyroxine if goitre enlargement appears; while, to the occasional cases in which thyrotoxicosis does not seem controlled by this basic dosage, extra methylthiouracil could be given without any added risk of goitrogenesis. We have combined the basic dosage scheme into a single pill, so that one methylthiouracil co. pill is given thrice daily during the maintenance phase; and extra thyroxine is prescribed if goitre enlargement appears.

Present Investigation

A trial of this procedure seemed necessary to ascertain not only the optimal dosage schedule and whether it avoided the risks of thiouracil overdosage, but also whether its avoidance of over-suppression of thyroid function altered the frequency of permanent remissions after termination of the treatment. We have analysed the preliminary results of this treatment in our first 51 patients, particularly as regards the avoidance of goitrogenesis and of worsening of the eye signs during treatment, and the remission rate obtained after completion of treatment, comparing these with the published results of other methods of prolonged thiouracil treatment.

Selection of Cases.—This analysis concerns all our 51 patients (10 male, 41 female) who started this prolonged thiouracil treatment before August, 1951, and completed it before February, 1952; in all patients the diagnosis of thyrotoxicosis had first been confirmed by radio-iodine excretion test (Fraser *et al.*, 1952). All cases have been followed for one year or more after treatment ceased. The ages of these patients ranged from 11 to 68 years, with an average of 37.7 years. At first all cases of thyrotoxicosis were treated with methylthiouracil co. unless the patient expressed a preference for surgery. Later, radio-iodine treatment was used for all patients over 45 years of age and for a few younger subjects judged to have a life expectation of less than 20 years. Also, with increasing experience, surgical treatment was preferred for young patients with an initially large or nodular goitre or with evidence of a marked allergic diathesis, and for those patients considered insufficiently reliable for a prolonged drug treatment which needs precise regularity.

Methods

For the treatment two strengths of methylthiouracil co. pills were used—100 and 50 mg. During the evolution of this procedure there has been a change in the amount of thyroxine added to these pills, and so in the need for added thyroxine. We now believe that the new methylthiouracil co. pills, containing 0.1 mg. of L-thyroxine against the 0.075 and 0.05 mg. of the "old" methylthiouracil co. pills, provide the optimal added thyroxine (0.1 mg. t.d.s.) for the basic maintenance dosage schedule; clearly, giving the same dosage of these two drugs separately should provide equivalent control.

During the induction phase the patients received two 100-mg. methylthiouracil co. pills thrice daily until they were considered to be restored to a euthyroid state; this phase usually lasted six to eight weeks. They were then put on a maintenance dosage of either 50 mg. or 100 mg. (usually the former) of methylthiouracil co., taken in each case three times daily. Additional thyroxine was given at the first sign of enlargement of the thyroid gland and sometimes if the eye signs were initially severe.

Most cases were treated as out-patients, but in a few instances treatment was begun in hospital. Patients were seen at intervals of one to three months, when progress was assessed mainly from the body weight, the state of the circulation, the eyes, and the size of the thyroid gland. All patients were warned to report to hospital if a sore throat or other illness supervened. A white-cell count was done at the start of treatment but was not repeated unless any such symptoms developed.

The course of treatment was for a minimum of nine months, but was prolonged if the patient's physical state was unsatisfactory or if worries or stress were known to exist. Patients completing the course were treated for one month with thyroxine, 0.1 mg., and potassium iodide, 1/6 gr. (11 mg.) daily, the former to depress thyrotrophic hormone production during the restoration by the latter of the thyroid's depleted iodine store. All patients were reassessed clinically at three and twelve months after treatment, on one or both of which occasions a radio-iodine test was performed.

Results

The subsequent analysis concerns the 32 patients who completed a full course of nine months' treatment; 19 failed to complete a full course for the following reasons:

Agranulocytosis (later recovered)	3
Patient ceased attending	9
Other treatment preferred	7
Chosen for I^{131} therapy	3
Surgery for large goitre	3
Surgery because of cardiac state	1

Status After Ceasing Treatment (Remission Rate).—The results are shown in Table I; all of the 18 remitted cases have been observed for 12 or more months. They

TABLE I.—Clinical Status Six Months or More after Finishing Prolonged Treatment with Methylthiouracil Co.

Well, and normal I^{131} test	9 (28%)
" but residual eye signs	6 (19%)
" but abnormal I^{131} test	3 (9%)
Thyrotoxicosis relapsed	14 (44%)
Total	32

appear to be quite well and free from clinical signs of thyrotoxicosis, though the radio-iodine test suggested that three had hyperactive thyroids. One of these patients also had nervous symptoms, associated with an unhappy domestic situation. In six patients there were residual eye signs—two had minor ocular paresis and four had only slight degrees of exophthalmos or lid retraction. Of the 14 (44%) patients who relapsed, six did so in the first six months, six between 6 and 12 months, and two later. It seemed that the relapsed cases had had a longer illness before treatment, that they included more patients with

nervous or unstable personalities, and that they had more often (in 9 out of 14) had some persisting cause for anxiety during the period after ceasing treatment.

Control of Goitre Size.—As is shown in Table II, the size of the goitre increased temporarily during treatment in almost half the cases (14 out of 32), but when extra thyroxine was given the added enlargement almost always subsided. In only one case did the goitre size at the end of treatment exceed that noted at the start of treatment, and in 25 out of the 32 cases the goitre was then judged to be less than two and a half times normal size. Among the 19 patients not completing a full course of treatment there were three who had surgical treatment for a large goitre. All of these patients had initially large goitres which had at first further enlarged during thiouracil treatment; one case is of particular interest in that the goitre continued to enlarge despite the administration of L-thyroxine totalling 0.6 mg. daily. After surgical removal the thyroid in this case was found to weigh 300 g. This was the only case in the whole series in which thyroxine up to this dosage failed to prevent further goitre enlargement.

The Eyes During Treatment.—Eye signs were initially present in 23 patients: in 17 they were mild and in six severe (that is, including ocular palsy and/or obvious conjunctival congestion). As shown in Table II, in no case did eye signs develop or worsen significantly during treatment. The possible worsening noted at some stage in three patients was only temporary and slight. At the end of treatment relatively minor eye signs persisted in all six of those patients who had originally had severe eye signs and in four other patients. In six of these ten cases this was either mild exophthalmos or lid retraction, though two still had some diplopia and one had slight ptosis. Extra thyroxine was given to three of the patients with initially severe eye signs, so that their total daily thyroxine ranged from 0.3 to 0.6 mg.

Adequacy of Basic Dosage Schedule.—**Suppression of Thyrotoxic Features.**—During treatment these features were controlled in all patients, though in a few the usual maintenance dose of 50 mg. of methylthiouracil co. three times a day had to be increased to 100 mg. to achieve this. In one patient there was at first some doubt whether control was satisfactory; but as the symptoms persisted despite 7.2 g. of methylthiouracil daily it was concluded that these symptoms were of nervous and not thyrotoxic origin. **Use of Extra Thyroxine.**—At some stage 18 patients were given 0.1 to 0.3 mg. of additional thyroxine daily, apart from that included in the old compound tablets. This was prescribed in 15 instances because of goitre enlargement and in three because of severe eye features. In three patients this additional thyroxine was continued because pregnancy supervened. Extra thyroxine was given for less than three months in five cases and for longer periods in the remainder. Only five patients had received an average daily total of more than 0.3 mg. of L-thyroxine, which is the amount they would have received using only the new compound tablets now in use.

Control During Pregnancy.—Pregnancy occurred successfully in three patients. One patient, however, gave birth to a child with a large goitre, but this subsided rapidly with small doses of thyroxine for three months, and the child has since developed normally. The mother in this case had been maintained throughout most of her pregnancy on methylthiouracil co., 100 mg. t.d.s. (which included 0.225 mg. L-thyroxine daily) with 0.1 mg. t.d.s. of extra thyroxine until the last four weeks before delivery, when by accident the extra thyroxine was omitted. After this experience we have been careful to maintain pregnant patients on small doses of methylthiouracil co. (usually 50 mg. t.d.s.) with relatively large doses of added thyroxine (usually 0.3 mg. daily), and the results have been satisfactory. Only one child was breast-fed, and during the period of lactation the mother was maintained on methylthiouracil co., 50 mg. t.d.s., with 0.3 mg. of extra thyroxine daily.

Discussion

This preliminary report has been made on a small series because it suggests that control of thyrotoxicosis is possible by this fairly standardized and simple procedure, using methylthiouracil combined with thyroxine.

With one exception, which required surgical treatment, goitrogenesis has been adequately averted—provided extra thyroxine was prescribed if indicated. In no cases have the eye signs significantly worsened during or after therapy. Very few other reports give more than brief mention of the effects of prolonged antithyroid drug treatment on the goitre size and eye signs. Williams (1946), however, found that thyroxine was necessary because of goitrogenesis or worsening of the eye signs in 31 out of 247 cases treated with thiouracil; and among those patients receiving prolonged treatment the goitre enlarged in 7%. Dunlop and Rolland (1950) found that slight goitre enlargement "was not uncommon" during methylthiouracil treatment, while Frisk (1948) reported enlargement in 50% of cases. Obviously the frequency of goitre enlargement will depend on the degree of thyroid suppression attained. Astwood (1948) has suggested that it is better to keep the patient at a slightly hypothyroid level; if this is attempted goitrogenesis will probably be a very definite problem.

With this group of cases extra thyroxine was often necessary (in 14 out of 32) to avoid goitrogenesis. Our current practice, however, is to give a larger basic or standard dosage of thyroxine, to provide 0.3 mg. a day. The compound tablets now each contain 0.1 mg. of L-thyroxine with either 100 mg. or 50 mg. of methylthiouracil, so that either strength given thrice daily should provide a maintenance dosage. With this modified or "new" standard dosage extra thyroxine is rarely needed. There should be no hesitation about giving this extra thyroxine (0.1–0.3 mg. a day) in doubtful cases. The thyrotoxic features have usually been controlled with the 50 mg. of methylthiouracil co. thrice daily and always with the 100 mg. strength thrice daily. Thus the compound thiouracil tablets have provided satisfactory control in every case, and the use of these tablets does simplify the treatment. Ordinarily the patients follow a routine schedule and are maintained on 50 mg. of methylthiouracil co. three times a day. If the control of thyrotoxicosis then seems defective this is changed to the stronger compound tablets, 100 mg. three times a day, the only other dosage control required being to give extra thyroxine if goitre enlargement is noted. In a straightforward case there is no necessity for the patient to be seen more often than at three-monthly intervals during maintenance treatment.

When one considers the relapse rate there is less cause for satisfaction, though our results are probably similar to those achieved with the usual prolonged thiouracil treatment. Admittedly the results reported in the literature vary widely, and it is difficult to know which figures to choose for comparison. Starr *et al.* (1949), using propylthiouracil, failed to achieve a single lasting remission, whereas Frisk (1948), using methylthiouracil, claims a remission rate of 90%, though some of his patients had been followed for only six months after treatment, and several patients had required two courses of treatment. Williams *et al.* (1947) and Dunlop and Rolland (1950) followed patients for a year or more after prolonged thiouracil treatment, and reported remission rates of 46% and 47% respectively, which compares with our remission rate of 56%. Other recent reports claim remissions in 41% (Stirrett *et al.*, 1952), 70% (Murray, 1950), 85% (Astwood, 1948), and 88% (Iversen, 1951, but here relapses within six months of stopping treatment were excluded).

Final evaluation of these drugs must await further experience; possibly both case selection and variations in the technique of using thiouracil may have contributed to the varying results. A drug treatment is needed for those

TABLE II.—Goitre Size and Eye Signs During and After Prolonged Treatment with Methylthiouracil Co.

Grading Before Treatment:	Goitre Size			Eye Signs of Graves's Disease		
		Less Than 2½ Times Normal (21)	More than 2½ Times Normal (11)		Severe (6)	Mild (17)
Temporary change during treatment	Enlargement controlled by extra thyroxine	(7)	(7)	Possible worsening	(2)	(1)
Status on finishing treatment	Smaller than initially, and: Less than 2½ times normal	20	5	Nil	—	13
	More than 2½ times normal	—	6	Mild (lid retraction or mild exophthalmos)	—	3
	Larger than initially	1	—	Severe:	3	—
				Ptosis only	—	1
				Muscular paresis	3	—
				Significant worsening	—	—

patients who do not desire surgery and cannot have radio-iodine, and is used with many other patients for varying reasons.

We would suggest that the procedure outlined above, while simplifying the management of such cases, diminishes the risk of goitrogenesis and of worsening of the eye signs without impairing the therapeutic effects.

We should expect the procedure to be similarly suitable for preparing the thyrotoxic patient for operation, provided iodide is given in addition over the last two weeks. We are at present investigating the latter method.

Summary

A preliminary report is made of the practicability of treating thyrotoxicosis with both methylthiouracil and thyroxine to simplify the control of dosage. The results were apparently as satisfactory as the published results obtained with antithyroid drugs alone.

A basic standard dosage was used (enough methylthiouracil to control all but exceptional thyrotoxicosis and the minimal normal thyroxine requirements—that is, methylthiouracil, 50 mg., and L-thyroxine, 1 mg., thrice daily); this standard dosage, unaltered, suffices for the maintenance treatment of most patients, provided signs of goitre enlargement are sought and when seen are countered by giving additional thyroxine. If the adequacy of the control of thyrotoxicosis is doubted the methylthiouracil dose can be increased.

Among the first 32 cases completing a course of nine or more months of such treatment, in 18 (56%) the thyrotoxicosis was still fully remitted one year later, in no case had the eye signs significantly worsened, and in all except one the goitre size had decreased.

We are indebted to Glaxo Laboratories Ltd., who supplied the pills for this trial.

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Aided by a grant from the National Institute of Mental Health of the United States Public Health Service, the Yale Centre of Alcohol Studies recently surveyed current American work on alcoholism. Their findings, originally printed in the *Quarterly Journal of Studies on Alcohol* (1952, 13, 421-511), have now been published as a separate booklet entitled "Alcoholism, 1941-1951: A Survey of Activities in Research, Education, and Therapy." Although the main emphasis is naturally on American studies in this field, much of the material included in the book is of general application and likely to interest workers elsewhere. The book is comprised of six sections each written by members of the staff of the Yale Centre, and with an introduction by the Director of the Centre. The sections are entitled: Sources of Scientific Information; the Status of Physiological Knowledge; Social Science Research; the Treatment of Alcohol Addiction; Programmes on Alcoholism in the United States, 1952; and Activities of State Departments of Education concerning Instruction about Alcohol. Copies of the book may be obtained from: *Quarterly Journal of Studies on Alcohol*, 2162 Yale Station, New Haven, Connecticut, price \$1 per copy.

PITYROSPORUM OVALE AND SOME SCALY CONDITIONS OF THE SCALP

BY

F. A. WHITLOCK, M.D., M.R.C.P.

Dermatologist, West Cornwall Clinical Area

The part played by the organism *Pityrosporum ovale* in the aetiology of a number of conditions of the skin has been much debated. By some it is held to be the prime and only cause of dandruff of the scalp and "seborrhoeic" eczema of the body; by others it is denied that the organism is anything but a harmless saprophyte which thrives under the cultural conditions provided by certain diseases. The problem is not made any easier by the confused and confusing terminology which has been applied to the group of conditions variously labelled as dandruff, pityriasis capitis, seborrhoea, seborrhoeic eczema, pityriasis circinata, the eczemas, etc.; the list could be made very much longer. So far as this paper is concerned, I hope to avoid lengthy discussion of the problems of seborrhoea, male-pattern baldness, and seborrhoeic eczema, and to confine my attention to certain scaly conditions of the scalp. It is not entirely possible to do this, as the three diseases often coexist with the subject under consideration.

Review of the Literature

Sabouraud (1902) held quite firmly that the cause of dandruff, or pityriasis simplex of the scalp, was infection with *P. ovale*. In addition, when the scalp became infected with an organism variously named the polymorphic coccus of Cedercreutz or the morococcus (Unna), but which seems to be the same organism as the *Staphylococcus epidermis albus* of Welch, the nature of the scaling changes from a dry condition to one which appears to be greasy, and is termed pityriasis steatoides or serosa. To add to the problem the scalp might also be affected with the acne bacillus, held by Sabouraud to be the cause of increased sebaceous secretion on the skin, thus causing an oiliness of the scalp, with an aetiology differing from the supposed greasiness of pityriasis steatoides.

Darier (1920), however, propounding his doctrine of "kerose," was of the opinion that pityriasis capitis is but a manifestation of the underlying state which is characterized by a brownish dirty-yellow complexion, slight thickening and hyperkeratosis of the skin of the centre of the face, scalp, and other areas, and enlargement of the pilosebaceous follicles with hyperkeratosis of their openings. He regarded the kerosé as a constitutional condition normal to certain types of person rather than a disease, and that *P. ovale*, the acne bacillus, and the polymorphic coccus grew best on this type of "soil," but were in no way responsible for any disease or for the varying manifestations of kerosé.

Sabouraud was not able to culture *P. ovale*, but Macleod and Dowling (1928) cultured an organism which they thought to be *P. ovale*, and which they believed to be the cause of dandruff of the scalp. In addition, by inoculation experiments with their culture on the normal skin they produced lesions which they thought were identical with those of seborrhoeic eczema. However, it was later realized that the organism was not *P. ovale* but *M. pinoyi*, a fact acknowledged by Dowling (1939) himself. Unfortunately the original experiments are still cited in many modern textbooks of diseases of the skin and hair as if they are the proof positive that *P. ovale* is the cause of seborrhoeic eczema and dandruff. Why the later repudiation by Dowling

is not more widely known is difficult to understand, but Savill (1952), a strong supporter of Sabouraud, still writes as if it had never been made.

Templeton (1926) managed to culture the organism and made some scrapings from "normal" scalps and from scalps affected with pityriasis simplex and with oily dandruff. Of the 26 normal scalps it is significant to note that 13 were those of children under 15 years of age. *P. ovale* was present in 69% of these cases which were devoid of dandruff, in 27 out of 28 cases of pityriasis simplex, and in 85% of cases afflicted with oily dandruff. Templeton had some difficulty in deciding where dry dandruff ended and oily dandruff began, and I would agree with his conclusion that the two merge together imperceptibly. It is by no means easy to distinguish the minute details described by Sabouraud, and I suspect that many who describe his classification have difficulty in doing so themselves. Dry dandruff, or pityriasis simplex, is easy to recognize; so also is dry dandruff made greasy by sebaceous secretion. On the other hand, I am by no means convinced of the separate existence of pityriasis steatoides or serosa, which seems to be, as described by Sabouraud, an eczematous condition of the scalp more often to-day called seborrhoeic eczema.

Ota and Huang (1933) cultured *P. ovale*, and, after pointing out that the organism grown by Macleod and Dowling was not the same as their own, they attempted to repeat their experiments. They concluded that *P. ovale* was not the cause of seborrhoeic eczema, as they were unable to obtain more than a transient erythema with their inoculations. Moore and his colleagues (1936) cultured *P. ovale* and believed that they were able to produce lesions of seborrhoeic eczema by percutaneous inoculation, and could recover the organism later from the lesions. Unfortunately it was by no means clear (a) why some inoculations "took" and others did not; (b) what were their criteria for seborrhoeic eczema; and (c) whether the organisms they recovered were the same as those they inoculated or those which were on the skin of the patient before the experiment was started. Kile and Engman (1938) were able to find *P. ovale* in 21 out of 24 cases of seborrhoeic blepharitis, and thought that by inoculation of cultures on to scalps "clinically free from seborrhoeic eczema" they were able to cause scaling, itching, and lesions "like seborrhoeic eczema" after an interval of two weeks, during which the scalp remained unwashed. Unfortunately, again there was a total absence of control experiments, and the results cannot be held to be in any way conclusive.

Bigham (1937) made scrapings and cultures from patients with various scaly dermatoses and scalps, and detected the presence of *P. ovale* and a "yeast-like organism." He was able to find *P. ovale* in 20 control "normal" scalps and in all of seven cases of seborrhoeic eczema. He was also able to recover the organism from the scalps of patients affected with diseases such as psoriasis and pityriasis rosea, so he concluded that the *P. ovale* was not the cause of seborrhoeic eczema. Mackee *et al.* (1938) examined the flora of the scalps of 100 unselected persons and were unable to find any correlation between the incidence of *P. ovale* infection, seborrhoeic eczema, and normal scalps. In further studies Mackee *et al.* (1939) were unable to show any relationship between the type of skin and the presence or absence of various organisms, including *P. ovale*.

Barber (1948) concludes that *P. ovale* is the cause of simple dandruff and also says that dandruff is very rare before the age of 9-10. He believes that circulating androgen is necessary for the active growth of *P. ovale* and that oestrogen inhibits its growth. He also states that the administration of oestrogen to males with acne causes cessation of dandruff and diminution of seborrhoea, and that the local application of oestrogen diminishes dandruff. From these observations one assumes that Barber regards androgen and oestrogen as having a direct stimulating or inhibiting action on the growth of *P. ovale*. Unfortunately he is not precise on this point, as, after outlining Darier's views on kerosé, he considers that many of the complications

of this state, such as acne and increased sebaceous secretion and pityriasis capitis, are a direct androgen effect without the need for any organism such as *P. ovale* to cause the increased desquamation from the scalp. Again one does not know whether any of these views are supported by crucial experiments. Eller and Eller (1949) were unable to detect any changes in the skin of normal young women or in men after the inunction of oestrogen ointment, but they did not carry out their experiments on the scalp. If oestrogen has a direct inhibiting action on *P. ovale* one would expect that the organism would be absent during pregnancy. That this is not the case is shown under Survey 3 below.

Survey 1

Examination was made of scrapings taken from 200 normal scalps selected in such a way that the scalps were devoid of any active lesion or inflammatory condition other than dandruff or sebaceous secretion. Also, apart from diffuse thinning or male-pattern baldness of the hair, no abnormality of the hair was included in the series. The sexes were represented equally and were divided into ten-year age groups, from 0-9 to 80+ years. Each of the first eight groups contained 12 cases of each sex; the last group had four of each sex.

Method.—The scalps were examined and the presence or absence of dandruff was noted, as was the state of the hair, degree of hair loss, and degree of seborrhoea.

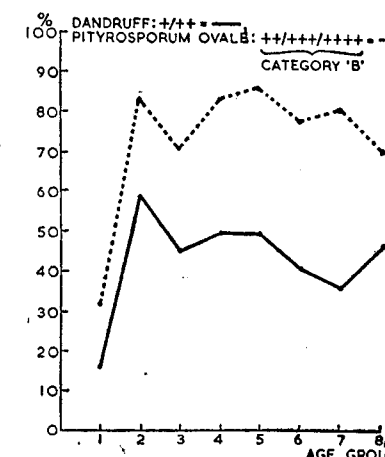
With a small Meibomian scoop scrapings were taken from six different areas of the scalp radiating in linear fashion from the vertex. The material collected was placed on a slide, mixed with 90% alcohol to facilitate spreading, heat-fixed, stained with methylene blue, and examined microscopically with the 1/12-in. objective lens. The slides were examined for the presence of *P. ovale*, and, depending on the numbers present, the findings were classified as follows:

- P.O.—: After an extensive survey of many fields the organism was not seen.
 P.O. scanty: The organism was found in numbers up to about 10 after a prolonged search of the slide.
 P.O.+ : The organism was present, a few being seen in most fields examined.
 P.O.+++ : Present in all fields in numbers up to about 20 in the majority of fields.
 P.O.++++ : Present in large numbers in most fields examined.
 P.O.+++++ : Present in large numbers and clumped together in masses in many of the fields examined.

This classification is admittedly an arbitrary one, depending in some degree on the person examining the slides. Nevertheless it seemed to work, and after a little experience it became a simple matter to assign a case to its proper category. Although this classification was useful when it came to assessing certain individual factors, such as greasiness of the scalp correlated with the number of organisms present, it was found simpler to group together the first three subdivisions as category A and the second three as category B for the purposes of recording the overall results.

The dandruff findings were recorded as follows:

- D—: No scaling or flaking seen on any part of the scalp.
 D slight: Fine white powdery scaling seen in a few areas on the scalp.



D+: White powdery scaling seen with ease, but not in large quantities.

D++: Large amounts of scaling and flaking present, with, in some cases, adherent greasy scaling over much of the scalp.

Results.—*P. ovale* was absent or scanty in 12% of cases—14 male and 10 female. Dandruff was absent or slight in 56.5% of cases—67 male and 46 female. Of these, 48 male and 33 female cases came into category B when the dandruff findings were correlated with those of *P. ovale*. Nine male and nine female cases with the finding "dandruff +/++" came into category A for the *P. ovale* result. Thirty cases showed "seborrhoea" of the scalp. Of these, all except one had infection with *P. ovale* in the range of category B, and nine of these showed the organism clumped in large masses (P.O.+++). Some degree of hair loss, ranging from diffuse thinning to severe Hippocratic baldness, was seen in 49 cases: 38 of them fell into category B for the *P. ovale* finding. The results when divided up into age groups were as follows:

0-9 years	P.O. Category B	33.3%	Dandruff +/++	16.5%	of cases
10-19	"	83.0%	"	58.3%	"
20-29	"	71.0%	"	46.6%	"
30-39	"	83.0%	"	50.0%	"
40-49	"	87.5%	"	50.0%	"
50-59	"	79.0%	"	41.5%	"
60-69	"	82.0%	"	37.5%	"
70+	"	72.0%	"	47.0%	"

These results may conveniently be plotted as a graph, as shown on the previous page.

Survey 2

It is known that *P. ovale* is a lipophilic organism, and during the course of the first survey of scalps it soon became clear that those cases having oily or greasy scalps would show the organism in abundance. In short, it seemed that the presence of sebaceous secretion was the ideal basis on which the organism could flourish. In order to make this point more evident scrapings were taken from the nose and naso-labial folds and from the eyelids of 20 patients. The skin of the nose is rich in sebaceous glands and secretion, whereas the eyelids appear to remain comparatively free from grease. The two areas are contiguous, so it would be perfectly possible for the organism to spread from one site to the other or be transferred by the fingers of the individual or by washing.

Results.—(1) Nasal scrapings gave the following results: P.O. +, 9; P.O. ++, 9; P.O. +++, 2. In all these cases the organism was found without much difficulty. (2) Eyelid scrapings gave the following results: P.O. -, 3; P.O. very scanty, 13; P.O. +, 3; P.O. ++, 1. In 16 cases (80%) the organism was not found or only found with considerable difficulty after a prolonged search of the slide.

Survey 3

As mentioned earlier in this paper, it has been suggested that under the influence of oestrogenic stimulation the infection of the scalp with *P. ovale* diminished. That there was no significant difference between the degree of infection in male and female cases in the first survey would seem to disprove this thesis, but in order to attempt to settle the matter examination was made of the scalps of 32 pregnant women attending an antenatal clinic, their ages ranging between 17 and 42 years.

Results.—(1) *P. ovale* was present in all cases, and, except for two who showed P.O. +, all the cases came into category B. (2) Dandruff was absent or slight in 19 cases and +/++ with some degree of seborrhoea in 13. (3) If these cases are grouped into age groups 17-29 and 30-43, and compared with non-pregnant women in the first survey of similar ages, the following results are obtained:

P.O. Category B:	Pregnant cases, aged 17-29	22 out of 23 (96%)
"	Non-pregnant cases, aged 17-29	12 " " 16 (75%)
"	Pregnant cases, aged 30-43	8 " " 9 (89%)
"	Non-pregnant cases, aged 30-43	17 " " 18 (94%)

Thus, so far as the first of these age groups is concerned, there seems to be a definite increase of infection in the pregnant cases; and in the second group the difference is not

sufficiently great to be of significance. Certainly there is nothing in these results to suggest that increase of circulating oestrogen diminishes the degree of *P. ovale* infection. The great majority of these women were in the last trimester of pregnancy, when the quantity of oestrogen would have been at its highest and when the stimulation would have lasted for not less than six months. I conclude, therefore, that circulating oestrogen plays no part in determining the degree of infection of the scalp with *P. ovale*.

Survey 4

It has already been suggested that *P. ovale* thrives best in a medium containing sebaceous secretion. This supposition is given support by the findings in nine cases of tinea amiantacea. All these cases showed a dry silvery scaling of the scalp, fine and adherent, in some cases covering most of the hair-bearing area, in others more patchy in distribution. In addition, some cases showed flexural lesions of the seborrhoeic type. *P. ovale* was not found in two cases, was found with difficulty in very small numbers in six, and was classified as P.O. + in the remaining case. It would seem that the excessive dryness of the scalp was a factor responsible for the very low degree of infection with the organism. In parenthesis it should be said that I would agree wholeheartedly with the thesis put forward by Brown (1948) that the disease is due to underlying emotional factors, and I would prefer the title of "neurodermatitis of the scalp" to the outmoded one of tinea amiantacea.

Survey 5

During the course of these investigations 17 cases of psoriasis of the scalp were seen and scrapings taken.

Results.—*P. ovale* was absent in 11 cases, scanty in one case, + in three cases, and +++ in two. Of these last two, one had a very greasy scalp and the other had such a slight degree of scaling that it could be differentiated from ordinary dandruff with some difficulty. In the main, the scalps examined were dry and the scrapings were taken from the centres of obvious and well-demarcated patches of psoriasis. Once again it seemed that the dryness of the lesion and the absence of sebum was the cause of the slight degree of infection with *P. ovale*.

Survey 6

In the past, claims have been made that inoculation of the skin with cultures of *P. ovale* would produce lesions of seborrhoeic eczema. As has already been indicated, the methods used are open to criticism, and conflicting results have been obtained when scrapings from "seborrhoeic" lesions have been examined for the presence of the organism.

In the course of this investigation 16 cases were diagnosed as suffering from seborrhoeic eczema. Eight cases showed generalized flexural lesions involving the scalp, ears, neck, axillae, breasts, umbilicus, perineum, and intergluteal fold. In six scalp scrapings *P. ovale* was absent or scanty in five and + in one. In 20 scrapings from behind the ears and other body areas mentioned, the organism was scanty in one retro-aural scraping and absent in all the others, although a monilia-like organism was present in one specimen taken from an intergluteal lesion. Scrapings taken from four cases of pityriasis circinata of the chest showed the organism to be absent in three cases and scanty in one. In four cases having seborrhoeic eczema of the ears and scalp five scrapings were taken—one showing P.O. ++, one scanty P.O., and three negative.

From the findings in the admittedly rather small number of cases one would not deduce that *P. ovale* was the cause of the disease. Unless secondary infection was present—and cultures invariably produced a pure growth of coagulase-positive *Staphylococcus aureus*—the lesions were red, scaly, and remarkably dry, an observation much in keeping with that of Percival (1936), who comments on the lack of seborrhoea in cases of seborrhoeic eczema.

Discussion

It has been the aim of this investigation to support the thesis that *P. ovale* has nothing to do with the cause of dandruff, seborrhoea, or seborrhoeic eczema. In consequence I would strongly support the conclusions reached by Martin-Scott (1952), which were backed by cultural and inoculation studies.

In the first survey of 200 "normal" scalps one of the most striking findings was the sharp rise in the incidence of dandruff and degree of *P. ovale* infection at puberty. Another point of interest was the greater degree of dandruff and slightly larger number of heavy *P. ovale* infections in the female than in the male. The sudden increases of dandruff and heavy *P. ovale* infection at puberty might lead one to suppose that the two conditions are causally associated, but other factors must be considered, notably the increase of sebaceous activity at that age.

It was noted that of 30 cases with "seborrhoea" of the scalp all except one showed a heavy *P. ovale* infection, and that 38 out of 49 cases with some degree of hair loss showed the same finding. Sabouraud thought that increased sebaceous secretion led to hair loss, and more recently Flesch (1951) has shown that squalene, a normal constituent of sebum, will cause loss of hair when applied to the skin of rabbits. In short, it seems that it is the heavy sebaceous secretion which permits *P. ovale* to flourish in these cases—a reasonable conclusion, as the organism is very lipophilic. The later surveys of nose and eyelids and of various dry scaly conditions of the scalp and body all tend to support this view, and in consequence the increased infection at puberty is to be expected owing to the increased greasiness of the skin at that time.

For additional proof that *P. ovale* does not cause dandruff I would point to the 48 males and 33 females who showed slight or no dandruff in the presence of heavy *P. ovale* infection. In addition it was possible to find comparable degrees of infection on the skin of the nose without any sign of scaling or abnormality of the surface.

This, of course, does not lead us any nearer to understanding the precise cause of dandruff, but I would suggest that it is the normal desquamation of the scalp, similar in every respect to the "invisible" scaling on other parts of the skin caused by the normal replacement of cornified of the hair of the scalp—a suggestion which might seem to derive support from the shorter hair and more frequent scalp-washing in the male, who shows a lower incidence of heavy dandruff when compared with the long-haired female, whose scalp is washed less often lest her "waves" should cease to remain permanent.

The suggestion that androgen increases and oestrogen decreases the degree of dandruff would seem to be unsupported by the findings in the 32 pregnant cases, and also by the greater incidence in the female than in the male. Nevertheless it is difficult to resist the conclusion that endocrine factors must have something to do with the sharp increase at puberty, although I would not agree with Barber's statement that dandruff is rare before the age of 9-10.

This paper, it must be admitted, is largely iconoclastic and offers little constructive suggestion to explain some of the conditions described. However, to attempt to explain the causes of seborrhoeic eczema and neurodermatitis of the scalp would take me far beyond the scope of this investigation, as many factors other than the bacteriology of the scalp would need to be considered. Nevertheless it is hoped that *P. ovale* will no longer be regarded as the major or only cause of the conditions discussed, and, although many of the findings are of a negative type, I have yet to read of any convincing evidence in the shape of inoculation studies which would support the thesis that *P. ovale* is the cause of dandruff or seborrhoeic eczema.

Summary

Some of the problems concerning the relationship of *Pityrosporum ovale* to dandruff and other "seborrhoeic" conditions of the scalp and body are discussed and the literature on the subject is briefly reviewed.

Examination was made of 200 normal scalps and the degree of infection with *P. ovale* was correlated with the degree of dandruff present. From the findings it was considered that there was no evidence to justify the theory that *P. ovale* caused the dandruff. Instead it was suggested that the degree of infection was influenced by the quantity of sebaceous secretion, and that the increased flow of sebum at puberty would explain the rise in the incidence of infection at that age. It was also noted that the amount of dandruff was heavier in the female than in the male.

The suggestion that sebaceous secretion was the main factor influencing the degree of infection with *P. ovale* was supported by the findings in scrapings taken from the skin of the nose when compared with scrapings from eyelids in 20 cases. Further support was given by the findings in nine cases of tinea amiantacea, 17 cases of psoriasis of the scalp, and 16 cases of seborrhoeic eczema of the scalp and trunk. In most of these dry scaly conditions the organism was absent or was found only in small numbers.

The suggestion that oestrogens diminish the degree of dandruff and *P. ovale* infection receives no support from the findings in the 100 male and 100 female normal scalp scrapings. Examination of the scalps of 32 pregnant women, most of whom were in the last trimester, showed a rather greater degree of infection when compared with non-pregnant women of the same age groups.

It is concluded that *P. ovale* is not the cause of dandruff but is a harmless organism on the scalp which thrives best in the medium provided by a heavy flow of sebum.

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The county health department of Cheshire has performed a useful service in publishing *A Cheshire Index*, a booklet listing in alphabetical order and in five sections (a) the county districts and civil parishes, (b) civil parishes with place-names therein, (c) place-names of the administrative county, (d) county boroughs and place-names therein, and (e) place-names outside Cheshire with a Cheshire postal address. In a modestly worded preface the department invites the correction of any error of omission or insertion. Similar lists of the place-names of the other counties in the United Kingdom would be a boon to all those who have to verify the names of villages, hamlets, and district localities in larger towns.

A CASE OF PRIMARY OVARIAN PREGNANCY

BY

R. G. WHITELAW, M.B., Ch.B., M.R.C.O.G.

Formerly Senior Obstetrical and Gynaecological Registrar,
Beckenham Hospital and Beckenham Maternity
Hospital, Kent

Primary ovarian pregnancy is an obstetrical rarity. Courtiss (1942) gave its incidence as 1 in 25,000 pregnancies and, using the figures of the Mayo Clinic, stated that it occurred in about 0.5% of ectopic pregnancies. Eckerson (1941), basing his estimate on the statistics of St. Luke's Hospital, reckoned that it occurred in something like 0.2% of ectopic gestations. Just over 100 cases have been reported in the English language, and a perusal of the relevant British, American, and Dominion obstetrical and gynaecological references leaves one with the impression that some of these may be spurious, as they seem to be backed by inadequate information.

Spiegelberg (1878) established four criteria upon which the diagnosis is to be based. He stated that if a case is to be accepted as one of primary ovarian pregnancy: (1) the Fallopian tube on the affected side must be intact and separate from the ovary; (2) the gestation sac must occupy the position of the ovary; (3) the gestation sac must be connected to the uterus by the ovarian ligament; and (4) ovarian tissue must be found in the wall of the sac. Since the following case seems to comply with these standards, it is submitted as an addition to the existing literature on the subject.

Case Record

A woman aged 37 was admitted on August 13, 1951, complaining of dull aching left-sided pain of some hours' duration. A similar but less severe attack had occurred one week previously, but had passed off in a few hours. Both attacks had been accompanied by nausea and retching, but there was no vomiting. The pain did not radiate and was not aggravated by movement. The last menstrual period had started on June 29.

The patient had been married for 17 years, but had never been pregnant. In 1942 she and her husband had undergone a series of investigations by a "specialist" in infertility. The scope and nature of these investigations were not clearly revealed by the patient, but she was emphatic in stating that no apparent cause for her failure to conceive had been advanced.

At the time of her admission she had been attending regularly at the out-patient department of the Maudsley Hospital, where she was being treated for what she called "nerves." Her history was otherwise without significance.

Examination showed that the patient's general physical condition was good. Her pulse rate was 80 a minute, regular, and of good volume. Her blood pressure was 105/65 mm. Hg. Examination of the cardiovascular and respiratory systems revealed no abnormality. The abdomen moved freely with respiration and there was no rigidity. Some guarding was noted in the left iliac fossa, where tenderness was elicited on deep palpation. No mass was, however, felt by the examining hand. On bimanual examination the uterus was found to be normal in size and consistence and to be acutely anteverted. No palpable mass could be detected, but tenderness was very acute in the left fornix. A presumptive diagnosis of ectopic pregnancy was made and the patient prepared for laparotomy. Two pints (1.1 litres) of cross-matched blood of the appropriate group was held in readiness.

Operation.—Under thiopentone, nitrous oxide, oxygen, and cyclopropane anaesthesia the abdomen was opened through a subumbilical midline incision. The uterus was found to be normal in size and to occupy the position disclosed by vaginal examination. A few tenuous adhesions were found on the posterior uterine wall, but no evidence of gross inflammation or of endometriosis was detected. The right tube and ovary were normal in appearance, as was the left tube. At the site of the left ovary was a tumour, about 2½ cm. in diameter, which appeared to consist of the ovary in addition to an adherent mass of blood clot. There was no free haemorrhage in the peritoneal cavity. Left oophorectomy was performed and the specimen submitted to the pathologist, Dr. J. H. H. Keale, for histological examination. The abdomen was closed in the usual manner, and the patient made an uninterrupted recovery, being discharged from hospital 14 days later.

Pathological Report.—Microscopic examination of the tissue was performed by Dr. Keale, who reported: "A fibrocystic ovary to which was attached a circular mass of tissue fully 2 cm. in diameter containing a small ragged haemorrhage. Contained in the haemorrhage and lying centrally was a small mass of tissue which was considered to be a very early foetus. A section of this circular mass of tissue showed fibrous tissue, and on the inner edge was a haemorrhage with chorionic villi. A section of the ovary proper displayed a few follicular cysts only." The pathologist concluded that the specimen submitted was "an ovarian pregnancy."

The normal appearance of the left tube, the location of the foetal sac at the site of the left ovary, the fact that the mass was connected to the uterus by the ovarian ligament, and the presence of chorionic villi situated in close relation to ovarian tissue, mark this case as satisfying Spiegelberg's criteria and enable one to classify it as a case of primary ovarian pregnancy.

Discussion

The cause of primary ovarian pregnancy has evoked much speculation, but little that is definite is known concerning it. As recently as 1888 Lawson Tait gave it as his opinion that no such condition existed. When, however, irrefutable evidence to the contrary was repeatedly submitted, challenging medical opinion to explain this phenomenon, endometriosis of the ovary was initially invoked as a convenient and plausible basic cause. In the above case (as in many other cases in the literature) there was no evidence of endometriosis on naked-eye examination of the pelvis, and histological examination of the ovary revealed neither endometriosis nor decidual reaction to implantation.

It is known that fertilization and implantation may occur initially in the Fallopian tube, and that the foetal sac subsequently becomes dislodged, to achieve a secondary implantation in the ovary (secondary ovarian pregnancy). It is possible also that even when the tube on the affected side presents a normal appearance it nevertheless is the primary site of implantation in certain cases hitherto classified as primary ovarian pregnancies. Not all cases can, however, be explained away in this fashion, as fastidious



Ovarian mass split to reveal gestation sac of very early foetus.

histologists have in many instances subjected the apparently normal tube on the affected side to serial histological examinations and in the end have been compelled to concede it normal upon the basis of a complete absence of chorionic tissue.

Curtis (1941) suggested that in certain cases the ovum, after becoming fertilized in the Fallopian tube, may "slide downwards to the gaping recently ruptured ovary, there to develop." Other writers, like Mann *et al.* (1941) believe that "the ovum becomes fertilized while remaining in the follicle and develops its sac from contiguous ovarian tissue." Each of these views has the merit of plausibility, and it is not improbable that both processes may occur.

In view of the unfavourable nature of the implantation site it might be supposed that ovarian pregnancies generally would come to an abrupt and early termination. Statistics, however, do not support this view, and Dale (1947) collected from the literature 38 cases in which the pregnancy had proceeded beyond seven months, and from which 12 living infants had been produced.

Lithopaedion formation has been recorded in several cases of ovarian pregnancy, and De Lee (1943) reports an ovarian hydatidiform mole. The coincidence of ovarian pregnancy and eclampsia reported by Pride and Rucker (1942) may, however, claim distinction as a rarity of rarities.

Many writers have stressed the relatively slight danger of alarming haemorrhage in ovarian pregnancy as compared with the tubal variety, and the above case in this respect conforms to type. Indeed, it stands out in my experience as one of the very few cases of ectopic pregnancy in which the administration of a blood transfusion would have been completely without justification.

Summary

The relative rarity of primary ovarian pregnancy is stated, with statistical support.

Spiegelberg's criteria of primary ovarian pregnancy are quoted and a case is reported which seems to satisfy these criteria.

Various views on the aetiology of primary ovarian pregnancy are mentioned, with brief comment.

The unexpectedly high proportion of viable infants resulting from ovarian pregnancy is mentioned.

The relative infrequency of severe haemorrhage attendant upon this type of ectopic gestation as compared with tubal pregnancy is stressed.

I am indebted to Mr. Douglas M. Lindsay for permission to report this case, which occurred in his unit at Beckenham Hospital.

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DELAYED CHLOROFORM POISONING IN OBSTETRIC PRACTICE

BY

R. L. LUNT, M.B., M.R.C.O.G.

Senior Registrar, Royal Berkshire Hospital, Reading

Cases of delayed chloroform poisoning in obstetric practice have been reported by numerous writers. The outcome in many of the cases was fatal. Nine of the 10 cases reviewed by Gibberd (1935) were fatal. Stander (1932) reports a mortality of 80% in five cases. This figure is regarded as too pessimistic by Sheehan (1940), since his last six cases recovered and two of them were very severe. Clinical histories of three patients who developed delayed chloroform poisoning are here briefly described.

Case 1

The patient, aged 24, was admitted to hospital on January 10, 1947, following a difficult forceps extraction under chloroform anaesthesia at home 48 hours previously. This was her first confinement and followed a normal antenatal period. The duration of labour was 83 hours. The food and fluid intake had been insufficient during this time, and the patient had experienced troublesome vomiting.

On admission she was drowsy and slightly jaundiced. There was no vomiting. Her blood pressure was 130/85 and her temperature 99.8° F. (37.7° C.). Prophylactic penicillin had been given since delivery. There was no liver tenderness or enlargement. Shortly after admission she became very restless and cried out as if in pain. This was associated with muscle-twitching. Periods of extreme restlessness occurred during the next three days, and on occasion she became almost maniacal. The jaundice deepened during this time. No vomiting occurred and sips of fluid were taken. Her condition then gradually improved, and a slow, steady recovery was made.

Retention of urine before and after admission into hospital necessitated catheterization. The urine output was always satisfactory. A bacteriological examination of the urine showed a *Bact. coli* infection, and the cervical swab yielded a growth of haemolytic streptococci. The blood culture was negative. Pyrexia persisted for several days after admission, but responded to penicillin and sulphonamide therapy.

Intravenous dextrose therapy was given on admission and continued for five days. In each 24 hours two litres of 5% dextrose and one litre of 4.3% dextrose in 0.18% sodium chloride were given. Five units of soluble insulin twice a day, 20 ml. of 10% calcium gluconate intravenously, and vitamin B by injections were given each day. Intramuscular paraldehyde was administered when necessary to control the restlessness.

Laboratory Investigations.—On January 11 (third day after delivery) an immediate positive van den Bergh reaction was given by the serum. The indirect van den Bergh reaction was 5.8 units; this increased to a maximum of 10.3 units on January 13. The alkaline phosphatase was 21.4 King-Armstrong units on January 11 and 22.3 on the 15th; it then slowly returned to a normal level. At all times the colloidal gold test showed no precipitation (0). The Takata-Ara reaction did not show a positive result, and the serum thymol turbidity varied between 0 and 3.2 units. Other blood chemistry estimations on January 11 showed the alkali reserve 34 vols. CO₂ per 100 ml., with the chlorides and total protein within normal limits. The blood urea was 108 mg. per 100 ml., and remained raised for several days. On January 15 the blood urea was 104 mg. per 100 ml., and then returned to a normal level. The urine contained bilirubin and urobilin. The Rothera test was negative on all occasions before and after the beginning of intravenous dextrose therapy. The blood-sugar level of 135 mg. per 100 ml. of blood on January 13 was probably influenced by the dextrose therapy.

Reviews

BRONCHOSCOPY AND OESOPHAGOSCOPY

Bronchoesophagology. By Chevalier Jackson, M.D., and Chevalier L. Jackson, M.D. (Pp. 366; 263 illustrations. £3 3s.) Philadelphia and London: W. B. Saunders Company. 1950.

This is a fourth edition, considerably revised and under a new title, of a well-known and very successful book. It is based, essentially, on the fundamental work of Chevalier Jackson senior, whose name will always be associated with the development, organization, and establishment of safe bronchoscopic and oesophagoscopic methods. As a pioneer in this field he is unequalled. His son and co-author carries on his father's good work. The horrid title is defended by the explanation that the book sets out to do more than present the bare bones of endoscopy and tries to give the whole picture of the diseases of the bronchi and oesophagus.

The most important part of the book is the presentation of technical methods. The Philadelphia school of endoscopists, led and inspired by Chevalier Jackson, have justly achieved a world-wide reputation for their efficiency, skill, and dexterity. Your reviewer was privileged, 22 years ago, to work at the Chevalier Jackson Clinic at Jefferson Hospital under the tutelage of Dr. L. H. Clerf, and will be ever grateful for the kindness and proud of the splendid training received. A lasting knowledge can be rapidly obtained when one is taking part in some 100 examinations a week. The memory is still vivid of the effortless and rapid dexterity of technique, especially in removal of foreign bodies. Objects that had perhaps already defeated several attempts at removal elsewhere would be extracted in some two minutes by the stop-watch.

The vast experience of the Philadelphia schools in removing foreign bodies of every conceivable type from the bronchi and oesophagus is unique and probably always will be. In this book the reader can learn from this accumulated experience; he can use it as a textbook or as his reference book when faced with the problem of dealing with a foreign body. An interesting development is the use of the magnet; less attractive is the account of extraction of foreign bodies by external puncture. One wonders also how often the elaborate technique of removing small pins, etc., from peripheral bronchi is really justified. Most of these small foreign bodies are better left alone.

The authors take great care in describing the position of the head and shoulders in introducing the bronchoscope or oesophagoscope, and the necessary alterations during further passage of the instruments. The Jackson contribution in these matters is classic. As my own knowledge rests entirely on what I learnt in Philadelphia I am hesitant about calling attention to the position of the head as depicted diagrammatically in Fig. 30c and other diagrams. It does not seem anatomically possible, if the neck is fully flexed on the trunk, for the head to be hyperextended on the neck. I have always remembered the instruction that for exposure of the larynx the plane of the face should be *parallel* to the plane of the body surface and as much above it as possible. These diagrams showing the head hyperextended will encourage the inexperienced operator to try to introduce the bronchoscope with the head thrown back and the neck not flexed on the trunk. It would be an advantage if diagrams such as this were either replaced by or supported by actual photographs. The numerous photographs of the grouping around the patient at endoscopy do not show the head position clearly.

Incidentally, in all the photographs the members of the team wear their mask with the nose uncovered. Quite apart from the risk of contamination from the operator, there is the grave risk of infection of the operating team by the patient. This also should be altered in future editions. Spectacles are recommended, and a nurse to stand by and change the spectacles as they become soiled. The Negus

face-shield not only gives much more protection, but also dispenses with the need for a nurse to stand by.

Chevalier Jackson's valuable contribution in describing so clearly the various check-valve actions in bronchial obstructive lesions is well known and is fully explained, but the frequent repetition of description and of diagrams illustrating it becomes rather tedious and might with advantage be lessened. Physicians would do well to pay attention to the counsel: "Every medical student should be taught that no physical examination of the chest is complete without listening at the patient's open mouth for a wheezing sound." This invaluable sign often provides more information and in a much shorter time than can be achieved with percussion and the stethoscope.

The account of lung abscess leaves much to be desired, especially the suggestion that acute post-tonsillectomy lung abscess "is a distinct type." The claims for a high degree of success in bronchoscopic therapy are less enthusiastically pressed than in the past—a change that should meet with general approval. The claims of bronchoscopy in diagnosis and examination are ably set out.

The value of examining aspirated bronchial secretions for malignant cells in the diagnosis of bronchial carcinoma is fully presented, but a notable omission is any reference to Dudgeon's wet-film method, evolved at St. Thomas's Hospital, which forms the basis of this investigation. Surely his contribution should be acknowledged.

In describing the dangers of oesophagoscopy more emphasis should be placed on acute perforation of the oesophagus and the need for prompt thoracotomy and closure of the rent by suture. A special account of this disaster and its management should be given. Too much is said of treatment of residual abscess and too little of immediate recognition of the disaster and its reference to a surgeon; many patients with perforations never live to develop a residual abscess.

These criticisms are not meant to be derogatory and are almost trivial in relation to the vast amount of first-class information clearly and authoritatively presented.

There is, however, one big criticism that must be made; it is not meant to belittle, and in some ways it is embarrassing to make it in view of the ripe experience of and the respect due to a pioneer of the quality of the senior author. It is now well over a quarter of a century since the bronchoscopic and oesophagoscopic technique, as described in this book, was established at Philadelphia. It was a triumph of organization and performance, allowing safety and success to be achieved. Very large numbers of pupils have been taught these methods with great advantage to everyone. Yet there has been almost no significant change in the basic technique and in the instruments used. The elaborate head-holding technique, for instance, is a quite unnecessary waste of man-power, and rather pathetic when one sees it slavishly followed by devotees in many places. It seems to be in danger of becoming a traditional ritual indulged in by the disciples of the Jackson school.

The same criticism applies to the bronchoscopes and oesophagoscopes used. These also have remained unchanged throughout the years, presumably because they are thought to have achieved perfection. The jealous guarding of their design is also fast becoming a tradition, for they have been outdated and outmoded by other instruments just as the motor-cars of the same vintage have been replaced by later and more efficient models. The continued, unquestioned acceptance of these obsolete instruments by the devotees is somewhat remarkable. If this state of affairs continues much longer, the Jackson type of bronchoscope and oesophagoscope will attain a dignity due to custom and usage only comparable to that of a sacramental weapon or staff. Sooner or later the break will have to come unless it is to remain as unchanged as Holy Writ.

The bronchoscopes are very wasteful of space. The wall is unnecessarily thick compared with the lumen, and even the effectiveness of this is further encroached upon by the excessive projection of the light-carrier channel. The lip of the instrument is also too big and clumsy, especially in the smaller sizes, when every fraction of a millimetre counts. The Negus type of instrument, which has been used for

many years in Britain and has almost completely displaced the Jackson instruments, has none of these disadvantages; the size and construction are as economical as possible and give a much more generous view and operating space. The objections to the Jackson type of oesophagoscope are less serious, but the Negus type of instrument is similarly much more efficient.

Your reviewer is anxious to repeat that these criticisms are made only with a full sense of the respect due to the great contributions and pioneer work of the Jackson school and are not meant to be unkind or disparaging. The book itself should be familiar to all those, whether thoracic surgeons or physicians or "bronchoesophagologists," who have to deal with the oesophagus and air passages.

R. C. BROCK.

PRACTICAL DERMATOLOGY

Practical Dermatology for Medical Students and Practitioners. By Professor George M. Lewis, M.D., F.A.C.P. (Pp. 328; 99 plates. £1 17s. 6d.) Philadelphia and London: W. B. Saunders Company. 1952.

This is a simple presentation of dermatology for students and general practitioners. It is an admirable book, easy to read, well produced, and excellently illustrated in black-and-white. With no more than six pages of introduction the author gets into the heart of his subject, discussing with much common sense the various groups of dermatological ills in a manner that any doctor can understand. Though the introduction deals with the special features of dermatology, it is mostly devoted to the taking of an adequate history, performing a thorough physical examination (not limited to the skin), and verifying clinical assessments by laboratory tests.

There is a pleasing and judicious use of heavy type to emphasize the essentials in each paragraph. The balance and proportion of the work are excellent, and there is no section that falls short of this high standard. The presentation of psoriasis and the summary of the problem of eczema are admirable. There is also a section on the acute specific fevers. Only very occasionally is the variation of American from British experience felt, as in the presentation of tuberculosis and erythema nodosum and the scant attention to chilblains. The section on fungous diseases is particularly good and there is here a warning against excessive treatment.

The author is clearly a sound and experienced physician, and there are few criticisms to be made of his work. He does not mention the course and prognosis of dermatitis herpetiformis, the fact that black hairy tongue often results from sucking penicillin lozenges, or that ichthyosis may respond to large doses of vitamin A. The treatment of rosacea is perhaps a little inadequate, but these are small points. How true are such injunctions as that "sympathetic listening, allowing the patient to ventilate his problem, is often an important part of treatment," and that "acne should be taken seriously and the patient treated with sympathy and understanding." In the account of pyoderma there is a warning against the use of antibiotics in a routine fashion; each case should be treated on its merits.

This is a most important and valuable addition to the literature and is just the type of work which the student and practitioner require.

J. T. INGRAM.

CHEMICAL INDUCTION OF CANCER

Chemical Induction of Cancer. By George Wolfe, B.Sc., D.Phil. Foreword by Professor Alexander Haddow. (Pp. 250. 17s. 6d.) London: Cassell and Co. 1952.

This work is a general compilation of all that is known on the induction of cancer by substances of known constitution. Professor Alexander Haddow in his introduction says: "So far as concerns the experimental reproduction of the disease and the understanding of the biological process involved, no more useful or more succinct general account can be recommended than that in the pages which follow," and the reviewer could not improve on this statement.

The book can be recommended for the general medical and biological reader who wishes to have exact information on this subject. Very wisely, the author begins with a readable general account of the structure of condensed carbon ring compounds; it will certainly be useful to the general reader. He then, through subsequent chapters, reviews the various types of compounds with carcinogenic activity, and discusses in other chapters their possible mode of action, effects on enzyme systems, and their metabolism in the body. The work is well indexed and will be valuable in any medical or biological library.

E. C. DODDS.

MOLLUSCIDES

Molluscicides. By Alan Mozley, D.Sc., Ph.D., F.R.S.Ed. (Pp. 88; illustrated. 9s.) London: H. K. Lewis and Co. 1952.

This manual should be of interest to readers who wish to learn the main facts about molluscicides and how they are applied. The author outlines their importance in controlling diseases of man and animals caused by trematode parasites and discusses their toxicity (to organisms other than snails), the preliminaries to application, and the different methods of applying them. Three kinds of molluscicides are recognized—those of vegetable origin, synthetic organic substances, and inorganic salts. The fruits of some species of *Balanites*, *Swartzia*, and *Sapindus* contain saponins which are toxic to snails. The roots and rhizomes of *Derris* spp. and the leaves and flowers of *Tephrosia* spp. also contain molluscicidal substances. The author thinks that neither these nor the synthetic organic substances—the latter are the subject of much research at present in America—include the ideal molluscicide. He favours the salts of copper, especially the sulphate and the carbonate, but considers that members of the other two groups may be used advantageously in conjunction with copper salts.

In four appendices the author describes briefly the life cycles of *Schistosoma* and *Fasciola*; gives directions for finding snails and examining them for infection; reports a field experiment conducted by himself in Southern Rhodesia; and gives practical instructions for treating a pond, pool, tank, or swimming bath with copper sulphate.

J. J. C. BUCKLEY.

RHEUMATIC DISEASES

Rheumatic Diseases: Diagnosis and Treatment. By Eugene F. Traut, M.D., F.A.C.P. (Pp. 942; 192 illustrations. £7 10s.) London: Henry Kimpton. 1952.

This is an ambitious and well-produced volume intended to review the whole field of the rheumatic diseases. It is produced by a group of physicians working in and around Chicago, but appears in places to reflect their personal preferences and prejudices rather than, as is their avowed intention, current world opinion. There are indeed very few references to work published outside the United States. Examples of these personal views will be found in the advocacy of vaccine treatment, the statement that gold salts cannot be recommended as a safe therapy, and the importance still placed on focal infection. The arrangement and nomenclature of the chapters will also prove rather puzzling to English readers; for example, although Chapter 3 is entitled "Psychologic Factors in Rheumatoid Arthritis," there is no separate chapter on adult rheumatoid arthritis, nor on osteoarthritis, although these entities are naturally well covered, incidentally, in the text.

This is one of those books that one feels would have been a great deal better if the editor had been content with half its present size. It is nevertheless a valuable acquisition for the rheumatologist's library, since it provides an interesting and somewhat unusual viewpoint of the subject and is extremely well illustrated.

W. S. C. COPEMAN.

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FIRST WORLD CONFERENCE ON MEDICAL
EDUCATION

As has already been announced in this *Journal*¹ the First World Conference on Medical Education will be held in London in August of this year, under the presidency of Sir Lionel Whitby, Vice-chancellor of Cambridge University; the deputy president is Professor W. Melville Arnott, of Birmingham University. The Chancellor of the University of London, the Secretary of State for Scotland, and the Ministers of Education and Health for England and Wales have kindly agreed to act as patrons. Elsewhere in this issue (p. 503) we give details of the programme.

The work of the Conference will be carried on in the four principal sections meeting simultaneously throughout the week, under the chairmanship of the four vice-presidents of the Conference: Dr. Victor Johnson, Director of the Mayo Foundation, Sir A. T. Mudaliar, of the University of Madras, Professor Alberto Hurtado, of the University of San Marcos, Lima, and Professor René Sand, of the University of Brussels. They will be in charge respectively of the following sections: "Requirements for Entry into Medical School," "Aims and Content of the Medical Curriculum," "Techniques and Methods of Medical Education," and "The Teaching of Preventive and Social Medicine." Doctors from many countries have already accepted invitations to speak at the Conference, which promises, therefore, to provide a real opportunity for an international exchange of views on the important topic of medical education.

The World Medical Association initiated the Conference, and it is being held under its auspices, the British Medical Association, as a member of the W.M.A., acting as the host organization and making itself responsible for the local arrangements. The World Health Organization has joined with the W.M.A. in sponsoring the Conference and has a

special interest in the fourth section of the programme—"The Teaching of Preventive and Social Medicine." The C.I.O.M.S. (Council of International Organizations of Medical Sciences) has also been of great help to the Organizing and Programme Committees, as, too, has the I.A.U. (International Association of Universities).

In the conception and planning of the Conference, therefore, three international organizations under the W.M.A. have taken an active part and will continue to do so; it is hoped the outcome will be of value to those responsible for medical education in different parts of the world. Limitations of time and money will unfortunately make it difficult for medical educators from far distant countries to be present in London in August, but there will be as wide a representation as is possible in the circumstances. The three official languages of the meetings will be English, French, and Spanish, and simultaneous translation will be available in every session. The Conference will be open to members of the medical profession and also to non-medical teachers who may have a special interest in some of the subjects of the programme.

The general theme of the Conference is undergraduate medical education, and no attempt will be made to go beyond this into discussions on post-graduate education—which one of these days may well be the subject of another congress. As the titles of the themes given in the programme may suggest, the aim will be to concentrate on principles and methods rather than on the minutiae of the medical curriculum. It would, in fact, be impossible to try to draw up in August this year the details of a curriculum which would satisfy even the different medical schools of Britain. The title of Sir Lionel Whitby's Presidential Address, "The Challenge to Medical Education in the Second Half of the Twentieth Century," provides the keynote of the meeting. In the programme there are, of course, certain well-worn themes of medical education, and it is hoped that the principal speakers at the Conference will not hesitate to challenge some of the conceptions that traditionally lie behind these. There will, too, be discussion on themes that are new, or at least new in relation to present medical curricula in the various countries. In the section "Requirements for Entry into Medical Schools," schoolmasters and medical men will exchange views on the subject "General Education in an Age of Science." The type of human being the future doctor will be will depend to a large extent on the kind of education he has

at the secondary school stage. Reports on medical education so often pay lip service to the need for a broad education in the humanities, and then we see our ancient universities in this country insisting that a boy or a girl should pass the First M.B. before going, for example, to Oxford or Cambridge. This often forces the schoolboy into specialization in the basic sciences, and the schoolmaster, with the examination hurdle in mind, finds it difficult to provide an education that will fit the boy to be an intelligent citizen of the world. The programme, too, suggests a different approach to the First M.B. itself in providing for a discussion on "The Teaching of the History of Science" and of "The Scientific Method," and on "The Introduction to the Social Sciences." The Conference may decide that room could, or even should, be found for such subjects at the First M.B. stage, and this could be done if the student was less burdened with memorizing a large number of facts and formulae in order to protect himself against the unkind tricks the examiner may play on him. In the second section of the Conference surgeons and physicians will take a prominent part in the discussions on the teaching of anatomy and physiology, and the movement towards a new conception of this is shown in the title "The Integration of Physiology and Anatomy as a Single Subject in the Medical Curriculum." The title "Science is Measurement" in the premedical phase of the curriculum suggests that the Programme Committee would like to see some continuation of the teaching of mathematics so as to prepare the student for an introduction in the Second M.B. period to medical statistics.

Recent reports on undergraduate medical education stress that its aim is to produce an educated doctor and not any one particular type of doctor. Indeed, if we are to maintain and substantiate our claim to be a learned profession the teaching of medicine must be imbued with the university ideal. If the foundations are well and truly laid on the basis of principle and method, then the other things will be added with no great difficulty, whether the qualified doctor is to go into general practice, specialist practice, research work, teaching, or administration. Nevertheless, the majority of medical students will, after qualification, go into the most strenuous branch of medicine—that of general practice. The Programme Committee has therefore arranged for discussions on "The Undergraduate and General Practice," "Teaching in the Home," and "The Home Setting in Medical Education," these three subjects being dealt with in different sections. It is hoped general practitioners

will take an active part in the open discussion on these, as well as on other subjects. One morning will be given to a review of visual aids in medical education, and to supplement this the Film Committee of the B.M.A. expects to arrange a demonstration of visual aids in the intervals between the morning and afternoon sessions during the week.

August has its disadvantages as a month in which to hold a conference, but it is a month in which medical teachers can take a busman's holiday without leaving their students in the lurch. Many distinguished medical men are coming from various parts of the world to say their piece and to listen and perhaps learn from others. Apart from the work of the sections, they will welcome the opportunity of meeting their colleagues from other countries, and in particular from Britain. Time and money inevitably limit the number of persons who can be specially invited to speak, but time has been allowed for open discussion of each subject in each section. It is hoped that as many as possible of the teaching staffs in Britain will find it possible to attend at least part of the Conference so that they can meet and welcome their colleagues from abroad. The W.M.A. itself is anxious that the "practising physician," as, so to say, the consumer of medical education, will also seek to make his voice heard in the debates in the four main sections of the Conference.

RESPIRATORY FUNCTION

It has been said that science is measurement. But this is only partially true, for there is much that is merely qualitative description and reasoning in the content of science. Nevertheless, when a body of knowledge passes from the qualitative to the quantitative stage notable advances occur. Quantitative study of respiratory function is a case in point. The problem in this field is not only what to measure but also the assessment of the significance and relationship of the many measurements which can be made. In hardly any other branch of human physiology is it possible to amass so many figures in so short a time. Many investigators have tended to confine their observations more or less exclusively to one particular variable of respiratory activity. There have been those who have measured static volumes of the lungs, others have concentrated on rates of mixing, while the more sophisticated have realized the paramount importance of ventilation-perfusion relationships. Other workers have appreciated the indissoluble partnership between the circulatory and respiratory

¹ *British Medical Journal*, 1952, 2, 480.

systems and have brought to the study of pulmonary function the cardiac catheter and all its possibilities of pressure-flow measurements in the heart and lungs.

All this new knowledge is not exclusively a matter of academic science but of vital importance to patients. The obliteration of the tuberculous cavity and the removal of the neoplasm necessitate profound structural alterations of the respiratory system. Such questions as, "What is his respiratory function at present?" and, "How can we control this disease with a minimum loss of respiratory function?" arise continuously in thoracic medicine. It is only by the careful study of pulmonary function before and after various operations and other therapeutic procedures that the answers to the latter question will be obtained. An accurate answer is as important as a good histopathological report on the biopsy specimen. Dr. K. W. Donald in the two articles we have published in this and last week's *Journal* has given a most helpful, and much-needed, survey of respiratory function and reviewed the relative value of many different methods of investigation. All aspects of respiratory function are subservient to the efficient exchange of oxygen and carbon dioxide between blood and atmosphere. Spirometric studies alone have obvious limitations, and Donald recommends beginning with ventilatory studies, proceeding as experience is gained to arterial blood studies, and ultimately to consideration of ventilation-perfusion relationships. He also emphasizes that the effect of lung disease on the right heart is a relatively unexplored subject which would repay investigation with clinical rewards.

Donald's paper makes it plain that respiratory physiology is a matter which closely concerns the clinician. A sound knowledge of cardio-respiratory physiology adds greatly to clinical acumen and the correct interpretation of physical signs. As a result of recent physiological studies the physician is now able to recognize interference with oxygen diffusion in the lungs with tolerable certainty. The dangers of carbon-dioxide narcosis in oxygen tents have also been pointed out to the previously unsuspecting clinicians. The grave import of even slight cyanosis with a normal cardiac output and blood count is another urgent clinical matter: such patients may have an arterial blood saturation below 50% at a time when there is still doubt whether significant cyanosis is present. Many of these measurements require the presence of the patient in the laboratory, and it is now time to regard such investigations with something more than the usual good-tempered indul-

gence towards a few pioneering back-room boys. Clinicians investigating thoracic disease might well consider devoting as much personal attention to the assessment of respiratory function as they do to the discussions with the pathologist, to radiological screening, and to surgical operation. Physiological studies cannot be established and made useful in a short time. Practice and experience in their application, in constant association with clinical medicine, are required before rich dividends are likely. British workers in this field have no grounds for complacency. The main recent developments in both theory and practice have occurred in the United States. It is an illuminating experience to go from centre to centre there and see how extensive physiological studies are made on patients with respiratory disease and how such studies condition and improve the clinical work. For many years now radiology and morbid anatomy have been the predominant tools of clinical investigators in this country. Essential as these are, clinical physiology should now play its full and equal part in the practice of thoracic medicine and surgery.

A JOURNAL AND ITS READERS

Under this title the Editor of the *New England Journal of Medicine* recently observed¹ that "the most prominent feature of any journal is its original papers," and that, "obviously, few papers will be of universal interest to all the Journal's readers." He quotes with approval the comment of the Editor of *Science* that a journal is not so much what "its editors would like it to be, as what its contributors make it." And so it is with the *B.M.J.* In attempting to carry out the first object of the B.M.A.—"to promote the medical and allied sciences"—the *Journal* follows the sound tradition of putting first things first, and in an art and science practised by a learned profession the first things are contributions to knowledge, contributions, in the nature of things, varying in importance and interest to the generality.

Clifford Allbutt said in 1919 that medicine was becoming less of an art and more of an applied science. What would he have said to-day? Those of our readers who are at the peak or over of middle age must find the pace of medical research fast and furious, and the expression of it in the printed pages of medical literature tough going. What appears in the *B.M.J.*, and in other similar journals, is but a reflection of work in progress; it represents the results of investigations made by medical men into

¹ *New Engl. J. Med.*, 1952, 247, 577.

the causes and effects of disease and into the conditions of health. In these investigations there can scarcely be a science whose aid is not brought in to help to solve the problems of medicine; and so the language of medicine becomes scientifically ever more polyglot, and the tools it uses have to be applied with ever greater precision. It is more difficult than before for the "average" doctor (if there is such a person) to keep up to date, or even, on occasion, to understand the scientific ins and outs of a medical paper: indeed, it is probably easier for his medical student son or daughter. But that is the penalty of progress in medical science. As the Editor of the *New England Journal of Medicine* stresses, "a function of a journal such as this is to present the results of original investigations and observations in any field that pertains to medicine." The *B.M.J.* is a "journal such as this," and with its circulation in the region of 78,000 copies weekly goes to all kinds of doctors in all parts of the world. It is not a journal for general practitioners, or consultants, or public health officers, or laboratory workers. It is a journal which aims at representing the best of British medicine in order to "promote the medical and allied sciences." It tries to provide each week something for everybody, not everything for somebody.

The general practitioner, it is true, is specially catered for in the "Refresher Course" series and in "Any Questions?" But it may be questioned whether the multiplication of journals for general practitioners is a healthy tendency in medical journalism. It is a tendency which has behind it the assumption that the general practitioner is intellectually inferior to his colleagues, that for him medicine is somehow a different kind of profession than it is for others, that medical science in the making is something from which he should avert his eyes as being beyond his understanding. This tendency, carried to its limit, would make medical science and research esoteric mysteries into which the G.P. would not be initiated. We can think of nothing that would in the long run be more detrimental to the prestige and welfare of the G.P., or more harmful to medicine.

A journal such as the *B.M.J.* tries to put before its readers the whole of medicine, not just parts of it. It can do this because all medical men have had the same basic training and intellectual discipline; all are members of a learned profession. No reader should, we suggest, expect to find something of special interest to him on every page or, indeed, in every section of the *Journal*; any more than he

should expect to find something of special interest to him in every section, say, of *The Times*. To those who find the substance of some original articles hard to digest we can but offer apologies on behalf of modern medicine, the hard taskmaster of us all and in the last resort provider of the matter which fills these pages.

THROMBO-ANGIITIS OBLITERANS

Buerger regarded thrombo-angiitis obliterans as a specific inflammatory disease of unknown cause leading to progressive obliteration from the periphery of the vessels of the leg, occurring before the age of 40, affecting mainly Jews, and sometimes causing also a migrating thrombo-phlebitis. Subsequent recognition of other causes of vascular occlusion in the same age group has led to difficulties in diagnosis which are outlined by Dr. R. L. Richards elsewhere in this issue. As he points out, it is now agreed that Buerger's disease has no special predilection for the Jewish race. Nor is venous thrombosis a pathognomonic sign, for Lisa, Magiday, and Hart¹ found it in 19 of 53 limbs amputated for arteriosclerosis. Even the specificity of the pathological findings has been questioned by Boyd and his colleagues,² though most authorities do regard the histological changes as distinct from those seen in other forms of occlusive vascular disease.

Remarkably few cases with histological proof have been recorded, and analysis of the clinical features of large series of cases, whose true pathological basis is often in doubt, has done little to clear up the difficulties in diagnosis. Of Richards's 85 cases, 22 had the diagnosis proved pathologically, but unfortunately he has not analysed these separately. The diagnosis has been disproved in two of the other cases, and Luke's experience³ suggests that many more may not in fact be examples of Buerger's disease. Luke made histological examinations of leg arteries from 19 patients in whom a diagnosis of thrombo-angiitis obliterans had been made on clinical criteria similar to those adopted by Richards, and was able to confirm the diagnosis in only four cases.

Richards states that one of the two criteria which remain reliable indications for a diagnosis of thrombo-angiitis obliterans is the constant association with tobacco smoking. Telford,⁴ however, refers to undoubted cases in men who had never smoked. The traditional view that heavy smoking predisposes to the development of the disease is based almost entirely on clinical impressions. Harkavy, Hebal, and Silbert⁵ found positive skin tests to extracts of tobacco smoke in 83% of 68 patients with Buerger's disease and in only 10% of 107 controls. Sulzberger⁶ found positive skin

¹ *J. Amer. med. Ass.*, 1942, 118, 1353.

² *J. Bone Jt Surg.*, 1949, 31B, 325.

³ *Canad. med. Ass. J.*, 1947, 58, 377.

⁴ *Lancet*, 1957, 1, 549.

⁵ *Proc. Soc. exp. Biol. (N.Y.)*, 1932-3, 30, 104.

⁶ *J. Amer. med. Ass.*, 1934, 102, 11.

⁷ *British Medical Journal*, 1951, 2, 1007.

tests to tobacco extract in 78% of 24 patients with Buerger's disease; of his controls, 36% of 95 smokers and 16% of 58 non-smokers gave positive tests. However, almost as high a percentage of the patients with Buerger's disease gave positive tests to other allergens, and the results of the skin tests cannot be regarded as strong evidence of a special association between the disease and smoking. Shepherd⁷ appears to have established that cigarette smoking leads to constriction of peripheral vessels, so that patients with all forms of arterial insufficiency should certainly try the effect of giving up smoking. But a properly devised statistical investigation is needed before a history of heavy smoking from a patient with occlusive vascular disease can be regarded confidently as a point in favour of the diagnosis of thrombo-angiitis obliterans.

INTRINSIC FACTOR

Ever since the pioneer experiments of Castle¹ research workers have striven to purify and identify the "intrinsic" and "extrinsic" factors. Within recent years extrinsic factor has been identified as vitamin B₁₂,² but the exact nature of intrinsic factor is still undetermined. Nevertheless much is known about the properties of intrinsic factor, and recent work in the U.S.A. has led Glass and his co-workers^{3,4} to suggest that one of the components of gastric mucin, "glandular mucoprotein,"⁵ might be identical with it, or at least be the main carrier of intrinsic factor in human gastric juice. Certainly the similarities in behaviour from the laboratory point of view between glandular mucoprotein and intrinsic-factor-containing material are close. Moreover, glandular mucoprotein has been shown to be absent from, or present only in traces in, gastric juice from patients with pernicious anaemia.⁴ The American workers found that daily oral doses of 50-75 mg. of glandular mucoprotein given with 30 µg. of vitamin B₁₂ usually sufficed to produce optimal haematological responses in patients with pernicious anaemia.

In the opening pages of this issue Drs. A. L. Latner and C. C. Ungley, with their associates, describe work which has been proceeding in Britain on rather similar lines. Normal gastric juice was ultrafiltrated, freeze-dried, and finally reconstituted in a concentration 150-200 times stronger than the original. The concentrates were submitted to filter-paper-strip electrophoresis. Liquid from segments of the filter-paper strips was then tested for B₁₂-binding activity by microbiological assay and also for haemopoietic activity when given to patients with pernicious anaemia as a single oral dose, together with 50 µg. of vitamin B₁₂. Two peaks of B₁₂-binding and haemopoietic activity were demonstrated as a result of electrophoresis of the gastric-juice concentrates; one was on the cathode side and the other on the anode side of the starting point. The material from the anode

peak was more active haemopoietically, and Latner and Ungley state that this material contained either a mucoprotein or a mucopolysaccharide. They claim also that the material at the cathode peak, although containing more mucoprotein, had less intrinsic-factor activity.

Thus important progress in the identification of intrinsic factor has been made both in the United States and in this country. Neither group of workers claim, however, that they have isolated intrinsic factor in a pure form. Have these advances a practical bearing on the treatment of pernicious anaemia? Enough human gastric juice will never be available for human intrinsic factor to be prepared on a commercial basis, but if intrinsic factor could be extracted economically from animal stomachs in a sufficient degree of purity, then the taking of perhaps a few milligrams of the material with a still smaller amount of vitamin B₁₂ in the form of a small capsule would be a way of treating pernicious anaemia which would be most convenient from the patient's point of view. On the other hand, crystalline vitamin B₁₂ is now readily available at a low price, and if given intramuscularly in sufficient dosage at two- or four-weekly intervals it provides a highly effective method of treatment. It has, too, the advantage over oral therapy that the patient necessarily remains under the doctor's personal supervision.

CHLOROFORM IN OBSTETRICS

In November, 1847, Professor James Young Simpson first used chloroform to relieve the pains of childbirth. Three months later the first death due to it was reported. Later the scientific papers, conferences, and commissions of the mid-Victorians clearly showed their concern at the death rate associated with so promising a drug. In the twentieth century we are still trying to find safer substitutes. But at least the causes of death have been clarified: they fall into three groups.

The first comprises cases of sudden cardiac arrest during light anaesthesia. The condition may be due to either ventricular fibrillation or ventricular arrest. Despite ideal conditions, there were four cases of ventricular arrest in Waters's series¹ of 1,000. His patients would have died had not all the facilities for resuscitation been available. Many will think these figures are enough to condemn the use of chloroform outside highly organized operating-theatres, and especially in the patient's own home. The second group of fatal cases comprises those of gradual cardiac and peripheral circulatory failure in the deeper planes of anaesthesia. This complication is easily recognized nowadays and can be treated promptly with oxygen and lowering of the head. The third group is of cases where liver failure occurs two to three days after the administration. Elsewhere in this issue Mr. R. L. Lunt describes three cases of jaundice in the puerperium following the use of chloroform for the delivery. Waters concluded that

chloroform caused only slightly more liver dysfunction than other anaesthetic agents. It is probable that the combination of the factors described by Mr. Lunt with the metabolic derangement resulting from any anaesthetic is more important in the causation of liver failure than any specific anaesthetic drug.

No single agent has been found with all the advantages of chloroform, although there are many which, when combined, give better results with greater safety. Chloroform has therefore lost its place in the anaesthetic room and operating-theatre to linger in its original domain—the home of the woman in labour. Here a single drug which is portable, non-inflammable, potent, and reliable is ideal, but if the risk of using chloroform in domiciliary obstetrics is not justified then safe and convenient substitutes must be provided. For intermittent analgesia the combination of pethidine and nitrous oxide and air supervised by the midwife is fairly satisfactory. The adoption of a safe automatic trichlorethylene inhaler for use by the midwife would improve the service she could give her patient.² For forceps delivery and other manoeuvres, when there are no fires or naked flames, ethyl chloride followed by ether on an open mask is a good and safe anaesthetic. Fires can sometimes be extinguished, but when this is not possible, or when lighting is dependent on gas or oil, or in great urgency, intravenous thiopentone in small dosage can be given and anaesthesia maintained with trichlorethylene and air. This technique should be used only if the administrator is confident that he can maintain a good airway and treat apnoea by controlling the respiration with a simple inflator.

GREASE ON THE SKIN

The skin is a self-sterilizing surface. *Streptococcus pyogenes* does not survive very long on it, and some other pathogenic bacteria are apt to die out. Ringworm has been known to clear spontaneously at puberty when the secretion of fungicidal fatty acids increases, while adult hair is protected against infection by its covering of such fatty compounds. It is the semi-fluid surface grease or sebum from the sebaceous glands which gives this protection, and the body produces 1-2 g. daily, half of it on the scalp.¹ This is enough to give a layer 0.7 µ thick, which would be visible in histological sections of skin if the usual preparative methods did not dissolve it off. The layer is not evenly spread over the whole body surface, being most noticeable on nose and forehead and over the shoulders, while in the ear and on the glans penis it is modified as cerumen and smegma respectively. Although attempts to study it have been going on for over 40 years, recent biochemical techniques, in particular new methods for microanalysis, are now making possible the study of the sebum from a single individual, or even from a single patch of his skin. It is hoped that differences or changes will be noted not only in various skin diseases but in general metabolic disorders, throwing fresh light on the

obscurities of fat metabolism. In the meanwhile results are already affecting the treatment of skin infections.

Sebum from the skin of the forearms has been chiefly investigated so far. It is dissolved off by plunging the arm into a jar of acetone and holding it there for three minutes. Each arm yields about 50 mg. of sebum; the skin so exposed secretes a new layer of normal thickness in about two hours.² Analysis of the dissolved material³ shows it to be a fatty mixture: 50% is neutral fat (triglyceride or other ester), 5% cholesterol, 30% free fatty acid, and the rest hydrocarbon, including 5% squalene (C₃₀H₅₀), a substance previously found in shark liver oil and yeast and also in the lipid of ovarian dermoid cysts. What function this and the other hydrocarbons serve on the skin surface is a physiological mystery. Squalene with its six double bonds has a slight resemblance to carotene and part of vitamin A. Applied pure to the skin of rabbits and guinea-pigs, it causes a reversible baldness, but whether it plays any part in human alopecia is unknown.⁴ It is noteworthy that sebum contains no vitamin A or D, in spite of their associations with skin physiology, and vitamin E is probably also absent.⁵

About one-third of normal sebum is free fatty acid, and that is the fraction responsible for repelling bacterial or fungal attack. There are two types of acid involved. One-third of the total consists in saturated fatty acids like the stearic acid of ordinary body fat but about half the molecular size. Whereas stearic acid has seventeen carbon atoms in a chain, the sebum saturated acids have only seven, nine, eleven, or thirteen. They are antagonistic to *Microsporon audouini*, a ringworm fungus, and are now sold for therapeutic use. The other two-thirds of the fatty acids are unsaturated, and are bactericidal, particularly oleic acid. Squire and his co-workers² have shown that the self-sterilizing power of the skin depends on these acids and on the maintenance of dryness. Streptococci and micrococci disappear from the skin in a few minutes under these conditions; *Staph. aureus* goes slowly, while *Bact. coli* and *Ps. pyocyanea* are resistant and remain unharmed. Corynebacteria, mycobacteria, and *H. pertussis* are also fatty-acid sensitive. On the other hand Dr. F. A. Whitlock concludes in an article on another page that *Pityrosporum ovale* is a harmless organism on the scalp and thrives in a heavy flow of sebum. Burtenshaw,⁶ in a review of the earlier work on this subject, pointed out that individuals differ in the bactericidal power of their skins. Another factor influencing individual variations in skin pathology is the presence of moisture, which impairs the bactericidal efficiency of the fatty acids; and stagnant damp in interdigital clefts and skin folds helps to explain their vulnerability to infection.

Two practical conclusions result. One is that skin dressings should be non-absorbent but permeable for evaporation. Nylon, which is unwettable, is much to be preferred² to the ordinary cotton gauze, which becomes damp and wets the skin under it. The other is that cleaning of the skin for vaccination and the like is best done with soap and water, which never removes more than a quarter of the protective sebum,³ while ether and acetone on the contrary wash it all off and leave the skin bare for over an hour afterwards.

¹ Amer. J. med. Sci., 1929, 178, 748.

² Gardner, F. H., Harris, J. W., Schilling, R. F., and Castle, W. B., J. Lab. clin. Med., 1949, 34, 1502.

³ Fed. Proc., 1951, 10, 50.

⁴ Science, 1952, 115, 101.

⁵ Glass, G. B. J., Boyd, L. J., and Svigals, C. S., Bull. N.Y. med. Coll., 1950, 13, 15.

¹ Chloroform, A Study after 100 Years. Wisconsin, U.S.A.: University of Wisconsin Press, 1950.

² See leading article in British Medical Journal, 1953, 1, 443.

¹ Cameron, G. R., and Short, R. H. D., in MacKenna, R. M. B., Modern Trends in Dermatology, p. 54. London: Butterworth, 1948.

² Ricketts, C. R., et al., Clin. Sci., 1951, 10, 89.

³ MacKenna, R. M. B., et al., J. Invest. Derm., 1950, 15, 33.

⁴ Fiesch, P., and Hunt, M., Arch. Derm. Syph. (Chicago), 1952, 65, 261.

⁵ Festerstein, G. N., and Morton, R. A., Biochem. J., 1952, 52, 168.

⁶ In MacKenna, R. M. B., Modern Trends in Dermatology, p. 158. London: Butterworth, 1948.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

TACHYCARDIA

BY

CRIGHTON BRAMWELL, M.D., F.R.C.P.

Professor of Cardiology, Manchester University

Palpitation is a very common symptom, and, since it is often due to tachycardia, the various causes of this disorder merit careful consideration. It is convenient to classify cases of tachycardia in two main groups—those in which the tachycardia is due to simple acceleration of the normal sinus rhythm and those in which it results from the incidence of some abnormal rhythm.

I. ACCELERATION OF THE NORMAL SINUS RHYTHM

Before enumerating various conditions responsible for this type of tachycardia brief reference must be made to certain physiological principles bearing on the subject.

The cardiac reserve is a measure of the extent to which the heart is capable of raising its output to meet the oxygen requirements of the body during physical exertion, and, since the output per minute is the product of the output per beat and the heart rate, the smaller the increase in stroke volume the greater must be the increase in heart rate to achieve an equivalent increase in output. Comparative physiology provides an interesting illustration of the relation of heart rate to stroke volume. Animals capable of prolonged and severe exertion have slower pulses than sedentary animals. For example, the resting pulse rate of the hare, an exceedingly athletic animal, is under 70, while that of its cousin, the rabbit, a sedentary creature, which seldom strays far from its burrow, is over 200. To compensate for this difference in pulse rate, the hare's heart, relative to its body weight, is three times as big as the rabbit's. It seems to be a general law throughout all warm-blooded animals, both birds and mammals, that those with big hearts have slow pulses and vice versa.

The increase in pulse rate produced by exercise and the time taken to return to the resting rate following exercise have been widely employed in attempting to assess cardiac efficiency. The test employed by National Service medical boards in the examination of recruits was to place one foot on a stool about 18 in. (45 cm.) in height and to raise the body 20 times in 60 seconds. In healthy subjects in good physical training the pulse should return to the resting rate within one minute of the cessation of exercise.

We may now consider certain conditions in which physical exertion causes excessive tachycardia.

In many types of heart disease the stroke volume of the heart is reduced and, consequently, to increase output the heart has to beat faster than in health. But, short of actual disease, tachycardia on exertion may be due simply to physical unfitness resulting from obesity, excessive smoking, lack of exercise, and other causes; in patients with organic heart disease physical unfitness will add to their disability.

The term "effort syndrome" was coined by Lewis in the first world war to describe a condition in which the response of the circulatory and respiratory mechanisms to exertion was excessive in subjects without disease of either heart or lungs. In these patients the ability to perform muscular work is decreased and mild exertion causes breathlessness, palpitation, and other symptoms; the increase in the heart rate after exercise is greater than in health, and it takes longer for the pulse to return to its resting rate. It is now recognized that purely psychogenic factors are responsible

for many of these cases, but a similar clinical picture is seen in patients convalescent from an acute illness such as influenza.

In addition to exertion, emotion may induce tachycardia, in fact clinically it would probably be true to say that nervousness is the most common cause of tachycardia. Many perfectly healthy people are scared at the mere thought of a medical examination, especially when their fate may be determined thereby, while others become unpleasantly heart-conscious when called upon to get up and make a speech. One of my patients, a keen bridge player, told me that this lack of control proved most disconcerting, for whenever she picked up a particularly good hand her heart always started to race and consequently her murmur became audible to her opponents and gave the show away.

During the war National Service medical boards referred many recruits for a second opinion on account of persistent tachycardia. Was the tachycardia physiological or was it pathological? In point of fact it was generally due to fear of being rejected. When, in addition to tachycardia, the recruit had a systolic murmur, as was often the case, for overaction of the heart may produce such a murmur, an especially careful search for other signs of heart disease was indicated. In these recruits the possibility of thyrotoxicosis had to be considered, but even in the absence of thyroid enlargement or exophthalmos the diagnosis rarely presented much difficulty.

Acceleration of the normal sinus rhythm may be due to many other causes, but those mentioned above—namely, heart disease, physical unfitness, the effort syndrome, thyrotoxicosis, and nervousness—are clinically the most important when the patient's principal complaint is palpitation.

II. TACHYCARDIA CAUSED BY AN ABNORMAL RHYTHM

This type of tachycardia may occur either in paroxysms or as an established disorder. In paroxysmal tachycardia the heart rhythm is regular and the rate generally between 140 and 240 per minute. The paroxysm is, in fact, nothing more or less than a long series of premature beats with no intervening normal cycles, and, as in the case of premature beats, the ectopic focus from which the paroxysm arises may be either supraventricular or ventricular.

Supraventricular Paroxysmal Tachycardia

This type of paroxysm often occurs in people in whom there is no evidence of organic heart disease. Provided the paroxysm is not prolonged, it is not dangerous, but it may be very distressing and even alarming to the patient. Unlike tachycardia due to simple acceleration of the normal sinus rhythm, which arises in response to some obvious physical or nervous stimulus and abates when that stimulus is removed, these sudden bouts of tachycardia start abruptly at any time and for no apparent reason; not infrequently the attacks seem to be associated with a digestive disturbance, but whether this is a causal factor or not it is difficult to say.

Since we rarely have the opportunity of actually observing an attack, the diagnosis has generally to be based on the patient's description of his symptoms. The most characteristic feature is the abrupt transition from the normal to the rapid rate of beating, but not infrequently the paroxysm

is preceded by a short bout of irregular heart action due to extrasystoles (Fig. 1). Patients sometimes say that the attack terminates equally suddenly with a "thump." This is due to the forcible beat following the long compensatory pause which precedes the re-establishment of normal rhythm. In other cases the heart slows down gradually and imperceptibly. Unlike nervous tachycardia, the rate is unaffected by change of posture. The duration of paroxysms varies from a few minutes to a few days, or occasionally longer, but in most cases it lasts from two to twelve hours. When the attack is of long duration acute cardiac dilatation and congestive heart failure may supervene.

The disability experienced during an attack varies greatly in different individuals. In addition to palpitation, some

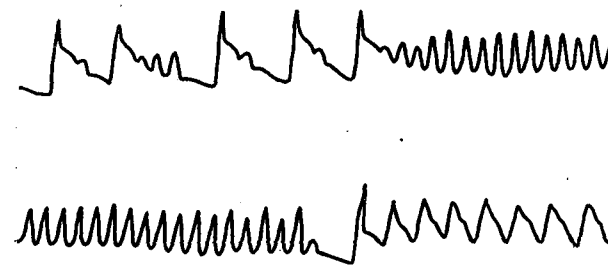


FIG. 1.—Sphygmogram showing short paroxysm of tachycardia, preceded by a period of irregular heart action, due to extrasystoles, and followed by normal rhythm. Note forcible beat following end of paroxysm.

patients complain of anginal pain due to coronary ischaemia, others suffer from manifestations of cerebral anaemia, such as dizziness or even actual syncope. I have, however, occasionally met with patients in whom the disorder of rhythm produced so little subjective disturbance that they were able, admittedly with difficulty, to carry on their normal occupations.

Attacks may terminate in vomiting, and can sometimes be aborted by inducing vomiting by tickling the back of the throat; pressure on the carotid sinus or on the eyeball will sometimes stop an attack; but, although these various tricks are worth trying, none of them is infallible. Fortunately most attacks stop spontaneously. In prolonged attacks, quinidine sulphate by mouth is the most useful remedy: 6 gr. (0.4 g.) should be given two-hourly for five doses, and a similar amount on two successive days if the attack persists. Intravenous quinidine should be used only in cases of exceptional urgency. Full digitalization (1 mg. of digoxin intravenously, followed by 0.5 mg. six-hourly) is sometimes successful in cases which fail to respond to quinidine. Of the cholinergic drugs, which have been used in prolonged attacks, methacholine ("amechol," "mecholyt"), 10–20 mg. subcutaneously, is the most reliable, but is apt to cause unpleasant side-effects. Recently procaine amide has been employed as an alternative to quinidine, but a difference of opinion still exists regarding the relative merits of these two drugs. Oral administration is apt to produce nausea and vomiting, and ventricular fibrillation has been reported when procaine amide was given intravenously. Some workers have reported favourably on intramuscular injection. It is said to be more effective in the ventricular than in the supraventricular type of paroxysm.

Ventricular Paroxysmal Tachycardia

Ventricular can be distinguished with certainty from supraventricular paroxysmal tachycardia only by the electrocardiogram, but its presence may be suspected clinically from the fact that, whereas the latter commonly occurs in an otherwise healthy subject, the former is generally asso-

ciated with serious heart disease. It may occur as a complication of acute coronary occlusion or may be initiated by mechanical stimulation in the course of surgical operations on the heart or cardiac catheterization, so that when performing such manipulations it is customary to give the patient quinidine or procaine amide as a prophylactic measure. In view of its seriousness, this complication should be regarded as a medical emergency requiring immediate admission to hospital, and its treatment hardly comes within the scope of the present article.

Auricular Fibrillation

This arrhythmia may be either permanent or paroxysmal. Paroxysmal auricular fibrillation is a not infrequent precursor of the established condition in patients with rheumatic or degenerative heart disease. Less commonly the paroxysms recur at more or less regular intervals over periods of years in apparently healthy subjects. The gross irregularity of the heart's action during the attack is generally obvious to the patient and will suffice to distinguish the condition from paroxysmal tachycardia.

In paroxysmal fibrillation the change from normal rhythm to fibrillation may prove most distressing to the patient, and one of my medical colleagues who suffered from such attacks, though otherwise his heart seemed to be perfectly normal, tells me that the sense of increased well-being when, after many years, he became a permanent fibrillator was quite remarkable. When attacks recur frequently continuous digitalization is indicated, in order to control the ventricular rate during the paroxysms. Quinidine, 3 gr. (0.2 g.) twice a day, may reduce the frequency of attacks, but often it has little beneficial effect.

Established auricular fibrillation is generally associated either with advanced rheumatic or degenerative heart disease or with thyrotoxicosis, but it has in rare instances been reported to follow an electric shock or other forms of trauma.

Uncontrolled fibrillation is easily recognized by the fact that it is the only type of tachycardia associated with grossly irregular heart action. From time to time two or more beats follow each other in very rapid succession. When this happens the ventricle contracts before it has had time to fill with blood. Such beats are ineffective on account of the small output of the heart, and only a very feeble pulse wave (Fig. 2), or it may be no pulse wave at all,

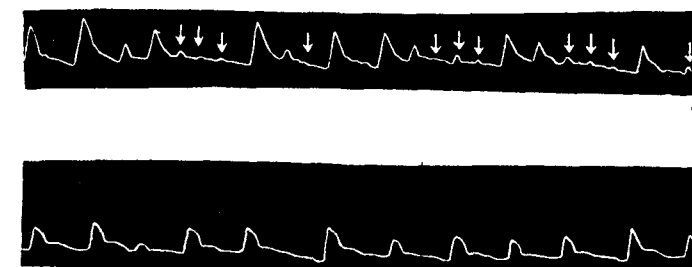


FIG. 2.—Sphygmogram from a case of auricular fibrillation. Upper record, before treatment, showing complete irregularity and a large number of very small pulse waves (marked with arrows). Lower record, after treatment with digitalis, showing greater uniformity in rhythm and form of pulse, all but one of the small ineffective beats having been eliminated. (Reproduced from *The Approach to Cardiology* by permission of Oxford University Press.)

reaches the periphery. Thus the heart rate, as counted with the stethoscope at the apex, is greater than the pulse rate at the wrist, the difference between the two counts being known as the "pulse deficit." The larger the number of ineffective beats the greater is the pulse deficit and the more unproductive work is the heart called upon to perform. It is merely tiring itself out to no purpose. Thus in untreated fibrillation tachycardia is largely responsible for the development of heart failure, the benefit derived from treatment with digitalis being due chiefly to control of the ventricular rate.

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Failure to control the tachycardia is usually explained by inadequate dosage. Practitioners are apt to be unduly frightened of digitalis intoxication, which, in my experience, more often results from an excessive maintenance dose given over a prolonged period than from overdosage during the initial stage of digitalization. Patients vary greatly in their tolerance for digitalis, and it is therefore undesirable to use massive doses except in emergency: 3 gr. (0.2 g.) of the powdered leaf given eight-hourly will usually suffice to control the ventricular rate within 24 hours, and thereafter a maintenance dose of 1 to 2 gr. (0.065 to 0.13 g.) generally proves adequate; sometimes even smaller doses suffice. In an emergency 1 mg. of digoxin may be given intravenously.

The most obvious signs of digitalis intoxication are excessive slowing of the heart, nausea, vomiting, and bigeminal heart action, in which every normal beat is followed by an extrasystole. It is important to distinguish between the nausea due to overdosage with digitalis and that due to congestion of the gastric mucous membrane resulting from circulatory stasis in cases of heart failure, since the latter condition is attributable to inadequate control of the tachycardia, which can be relieved only by increasing the dose of digitalis. Likewise, bigeminal heart action is by no means always due to digitalis intoxication, and is not an indication for withdrawing the drug unless it is associated with bradycardia or other toxic manifestations.

When fibrillation is of recent origin, or persists after subtotal thyroidectomy, an attempt should be made to restore normal rhythm with quinidine, 6 gr. (0.4 g.) two-hourly for five doses, repeated if necessary. It is, however, only in those cases in which the disability is attributable to the abnormal rhythm rather than to the associated myocardial or valvular disease that quinidine therapy is indicated. In cases of old-standing heart disease there is a risk of embolism, and the patient is likely to derive more benefit from control of the tachycardia with digitalis.

Auricular Flutter

Flutter is closely related to fibrillation and, like fibrillation, may occur either in paroxysms or as an established condition. It is most often associated with either rheumatic or degenerative heart disease. In this disorder the auricle beats regularly at a rate of about 300 per minute and the ventricle usually responds at half that rate.

Clinically, therefore, auricular flutter may be suspected in cases of regular tachycardia when the pulse rate is in the neighbourhood of 150 per minute, and confirmation may be obtained by noting venous pulsation in the neck at double this rate or slowing of the pulse when pressure is applied to the carotid sinus; but the diagnosis can be established with certainty only by the electrocardiogram, which is distinctive.

Under the influence of digitalis the ventricular rate may be reduced to a quarter of the auricular rate or the heart's action may become irregular, the ventricle responding to every second, third, or fourth auricular impulse. Provided 4:1 heart block is maintained auricular flutter will *per se* cause no appreciable disability, but occasionally a 1:1 ventricular response develops, either spontaneously in untreated cases or in the course of treatment with quinidine, and unless promptly controlled may lead to acute cardiac dilatation.

If a patient with auricular flutter is fully digitalized the flutter will often be converted to fibrillation, and subsequently normal rhythm may supervene. Similarly a transient stage of auricular flutter may be observed before normal rhythm is restored when a patient with auricular fibrillation is treated with quinidine.

Next Refresher Course Article.—"Medical Aspects of Air Travel," by Sir Harold E. Whittingham.

COLLEGE OF GENERAL PRACTITIONERS

Eleven additional general practitioners from different parts of the British Isles have been elected to the Foundation Council of the College. Until the first annual general meeting, to be held in the autumn, the Foundation Council will consist of:

G. F. Abercrombie (London).	R. M. S. McConaghey (Devon).
<i>Chairman.</i>	J. G. Ollerenshaw (Yorkshire).
G. O. Barber (Essex).	R. J. F. H. Pinsent (Birmingham).
J. Cottrell (Lincolnshire).	F. M. Rose (Lancashire).
D. G. French (Staffordshire).	<i>Deputy Chairman.</i>
Annis C. Gillie (London).	Richard Scott (Edinburgh).
H. K. Glyn Hughes (London).	I. D. Grant (Glasgow).
J. M. Henderson (Perthshire).	G. Simpson (Cambridge).
W. V. Howells (Glamorgan).	G. Swift (Hampshire).
D. M. Hughes (Carmarthen).	A. Talbot Rogers (Kent).
J. H. Hunt (London), <i>Honorary Secretary.</i>	G. I. Watson (Surrey).
	J. C. Young (Belfast).

Foundation Membership.—By February 12 1,600 general practitioners had joined the College.

Reprints of Steering Committee's Report.—These will be sent to anyone on request.

Plans of Surgeries.—The College is collecting plans and photographs of up-to-date surgeries, consulting-rooms, dispensaries, waiting-rooms, etc. During the past few years many doctors have spent much time and thought in adapting, or building anew, such premises for single or group practices. It is hoped to provide a centre where plans, and perhaps scale-models, of these projects can be collected and studied, so that young doctors may benefit from the experience of others. As this collection grows it will be freely available to any doctors, architects, or builders who may wish to consult it. Will general practitioners who have recently adapted old houses to their practice needs, or who have built new premises, please send to the Secretary (at 14, Black Friars Lane, London, E.C.4) plans and photographs, with a note to indicate the special features of the buildings and of the practices concerned?

CANCER EDUCATION IN CHELSEA

The Borough of Chelsea's Cancer Education Committee held a public meeting on February 17 at Chelsea Town Hall. The meeting was attended by the Mayor of Chelsea, representatives of various interested bodies, and some 200 members of the public. Alderman G. L. TUNBRIDGE presided. He said that the Chelsea Cancer Education Committee had been formed in 1949 when the Borough Council was asked what it was doing about cancer education. Since then the Committee had produced 12 informative leaflets for lay people.

Mr. R. W. RAVEN, F.R.C.S., then gave a brief address in which he described an investigation carried out by the Chelsea Committee with the aid of a questionnaire. Of the people questioned, 17% believed that cancer is infectious, 27% that it is incurable, and another 20% that it is of doubtful curability; nearly all thought that a careful programme of education would be useful. The object of cancer education, said Mr. Raven, was to substitute knowledge and confidence for ignorance and fear. There were already about 15 cancer education committees at work in Britain, and these should be increased. The population would have to be covered in stages: special attention should be given to teaching district nurses and health visitors—their combined number being nearly 20,000—student nurses, welfare and social workers, who could then disseminate information among lay people. Later a more direct approach by leaflets, lectures, films, and carefully written newspaper articles would be possible. Mr. Raven ended his address by outlining a five-point programme for cancer control.

There then followed a film entitled "Time is Life," and a period for questions. Dr. J. BROWNING ALEXANDER moved the vote of thanks.

FIRST WORLD CONFERENCE ON MEDICAL EDUCATION

LONDON, AUGUST 24-29, 1953

The First World Conference on Medical Education will be held in London at B.M.A. House this year from August 24 to August 29, under the auspices of the World Medical Association. The President is Sir Lionel Whitby and the Deputy President Professor W. Melville Arnott. The first day of the Conference, Friday afternoon, and Saturday morning will be in Plenary Session. Details of the programme are printed below. (A leading article on the Conference appears on page 494.)

Section A: Requirements for Entry into Medical School

Vice-President: Dr. VICTOR JOHNSON, of the Mayo Foundation

Time	Tuesday, August 25	Wednesday, August 26	Thursday, August 27	Friday, August 28
9.45 a.m. to 1 p.m.	General Education in an Age of Science	History of Science Teaching Scientific Method Science is Measurement	Biology Fundamental to Study of Medicine How Much Chemistry and Physics? Introduction to the Social Sciences	Use and Value of Intelligence and Aptitude Tests Method and Value of Interview Examination and Discussion Group
3 to 6 p.m.	Requirements for Entry into Medical Schools	Excursion	Selection of Students	Plenary Session

Section B: Aims and Content of the Medical Curriculum

Vice-President: Sir ARCOT MUDALIAR, of the University of Madras

9.45 a.m. to 1 p.m.	Anatomy for the Doctor Physiology for the Doctor Integration of Physiology and Anatomy as a Single Subject in the Curriculum	The Aim of the Medical Curriculum Introductory Clinical Course Teaching Psychological Medicine	Teaching Medicine and Surgery as One Discipline Teaching Minor Surgery The Doctor, the Midwife, and Obstetrics	The Undergraduate and General Practice The Balanced Curriculum
3 to 6 p.m.	Pathology—the Basic Clinical Science Pharmacology and the New Therapeutics Medical Statistics and the Design of Experiment	Excursion	Paediatrics a Branch of Medicine The Place of the Specialties in the Curriculum Is an Intern Year Necessary?	Plenary Session

Section C: Techniques and Methods of Medical Education

Vice-President: Dr. A. HURTADO, of the University of San Marcos, Lima

9.45 a.m. to 1 p.m.	The Hospital - bedside Teaching of Medicine Teaching Surgery at the Bedside and in the Theatre Teaching in the Out-patient Department or Polyclinic	Visual Aids in Education One-way Observation Screen The Moving Picture in Medical Education The Still Picture	The Lecture and Group Discussion Medical Education and the Full-time System The Place of the Text-book in Teaching	Methods of Testing Knowledge
3 to 6 p.m.	Teaching in the Home The Clinico-pathological Conference The Laboratory in Teaching Experimental Medicine	Excursion	Library and Reference Services The Museum in Teaching The Students' Clinical Society	Plenary Session

Section D: Preventive and Social Medicine

Vice-President: Professor RENÉ SAND, of Brussels

9.45 a.m. to 1 p.m.	Present Status of the Teaching of Preventive and Social Medicine	The Teaching of Epidemiology Demography and Vital Statistics The Teaching of Medical Genetics	The Teaching of Social Psychology Social Environment and Individual Illness The Home Setting in Medical Education	The Teaching of Nutrition Housing Integration of the Teaching of Social Medicine in the Medical Curriculum
3 to 6 p.m.	Social Medicine as an Academic Discipline Teaching Social Medicine in the Pre-clinical Period Social Medicine in the Clinical Period The Need for Reorientation of Teaching	Excursion	The Teaching of Occupational Health The Use of Student Health Services in the Education of the Student Infant and Child Care as a Medico-social Problem	Plenary Session

Reports of Societies

HYPOTENSION IN ANAESTHESIA

On February 4 the Sections of Anaesthesia and Surgery of the Royal Society of Medicine discussed "Low Pressure Anaesthesia in Surgery." Professor F. A. R. STAMMERS (Birmingham) was in the chair.

Methonium Compounds

Dr. J. B. WYMAN (London) said that in addition to lowering blood pressure methonium compounds might also protect the patient from shock and prevent established shock from becoming irreversible. At the Westminster Hospital methonium drugs had been used at first only in cases subject to excessive blood loss, or in those in which blood loss impeded the surgeon. Later their use had been extended, and the technique had now been applied in 1,037 operations. He stressed the excellence of the working conditions for the surgeon, the steadiness of the patient's general condition during operation, and the remarkably good recovery afterwards. The patient was protected from trauma as well as from blood loss. The main theoretical objections to hypotension were the risk of dangerously reducing the blood supply to the vital organs and the possibility of vascular accidents. Thrombosis was probably no more liable to occur, and this might be because the linear rate of blood flow was not altered. Cerebral thrombosis had occurred in only one patient, a man with advanced hypertension. There had been two cases of cardiac arrest precipitated by some asphyxia during the operation. However, despite these fatalities, he thought that patients with a cardiac lesion did better than they would with ordinary anaesthesia, and that, once under control, the blood pressure and pulse rate remained remarkably steady. Possibly the damaged heart worked better against decreased peripheral resistance. A patient who had had a previous coronary thrombosis was liable to have another whether or not a methonium compound was used.

Post-operative haematoma was rarely troublesome once the surgeon was accustomed to the technique and tied off all slightly bleeding vessels. Renal complications were few, and the only example of renal failure had been in a patient with Ellis type 1 kidneys, who died two weeks after the operation. Oliguria had occasionally occurred. No major disturbance of liver function had been seen.

Of the five deaths, two were due to the underlying disease and three to faulty technique. A high standard was essential, and the penalties of failure were heavy. Despite his earlier remarks about patients with cardiac lesions doing better, Dr. Wyman mentioned that there might be a depression of the S-T interval in some of the E.C.G. leads for a few days after operation, and that this indicated a certain amount of cardiac ischaemia.

After the operation a head-down position was used for a few hours. He did not recommend the use of methylamphetamine, and he thought that phenylephrine (U.S.P.) was in some respects better. Slow recovery of the blood pressure was sometimes due to dehydration and delayed excretion of the hypotensive drug. The difficulties due to prolonged action of methonium compounds might be overcome by the use of "Arfonad (Ro2-222)," which had a very short-lived effect. From his own experience Dr. Wyman suggested that the future of these drugs might lie as much in the prevention of shock during major surgery as in the provision of an ischaemic field.

Mr. ROBERT COX (London) spoke as a surgeon who had worked with Dr. Wyman and who had no experience of other methods of producing hypotension. The diminished blood loss was sometimes most striking: as examples of blood loss in different operations performed with and with-

out this technique he cited: thyroidectomy 30 and 260 ml., radical mastectomy 32 and 690 ml., prostatectomy 30 and 560 ml., and pelvic evisceration 160 and 1,150 ml. With proper care in general surgery there did not seem to be an increased incidence of reactionary haemorrhage or haematoma formation, and there had been no evidence of an increase in embolism or in renal or hepatic complications. On return to the ward regular blood-pressure readings were taken. Morphine should be given if the patient was restless, otherwise the restoration of blood pressure might be delayed. The extra post-operative attention was compensated for by the lesser need for transfusions. The ward sisters thought that the patients were unusually well after operation, and this opinion was shared by everyone who dealt with the cases.

High Spinal Block

Dr. J. GILLIES (Edinburgh) spoke of high spinal block in which postural adjustment was the main factor in determining the fall in blood pressure and the primary means of restoring it in an emergency. Briefly reviewing the mechanisms involved in the various methods of inducing hypotension, he said that in arteriotomy blood flow and bleeding were reduced more by virtue of the vasoconstrictive response than by the drop in blood pressure. However well controlled, this state came very near to being pathological. Total sympathetic paralysis, by either extradural or subarachnoid block, caused generalized vasodilatation. By appropriate positioning, pooling of blood in dependent parts and a marked degree of hypotension could be achieved. Loss of fluid from the skin ceased during the sympathetic paralysis, and as the motor block did not affect the upper intercostal and phrenic nerves respiration remained spontaneous and a reliable guide to the state of the medulla. In autonomic blockade by methonium compounds the effects were complex, and this might explain why the results were less predictable. Spinal block was a more certain method of producing hypotension for a definite period of time. While all three methods had been used in Edinburgh, he would deal only with a series of 802 operations in which high spinal block had been applied. The patients were poor risks undergoing surgery for vascular diseases. This provided a severe test for a method which in 1946 was considered a reckless procedure. In abdominal surgery high spinal block was chosen as much for its other advantages of muscle relaxation and sensory blockade as for its hypotensive effect, although the latter could be of help in cases where, owing to the nature of the lesion, much bleeding might be expected.

Most of the avoidable mortality had occurred in the first half of the series. Two patients died during operation, one owing to mechanical limitation of pulmonary ventilation and anoxia, the other following a small dose of thiopentone which abolished spontaneous respiration and lowered arterial pressure still further. The few patients who died of cerebral vascular accidents had all had similar trouble in the past, and the technique was now contraindicated in such cases. One patient died of reactionary haemorrhage. There had been three non-fatal reactionary haemorrhages. Seven patients had cerebral vascular accidents (six of these were hypertensives, five of whom had a previous history of such trouble). There was only one case of coronary thrombosis with cardiac arrest in a patient with previous angina. Cardiac arrest occurred in one other patient as a result of asphyxia. Immediate cardiac massage was successful in both cases. Oliguria was noted in three patients, a figure which was in no way significant. A low head of pressure to the kidney did not seem to matter so long as there was vasodilatation and an undiminished volume flow. Post-operative ischaemia of the limbs occurred in 7 of 222 lumbar sympathectomies, and one limb was lost.

In 782 patients with no severe pre-operative cerebral vascular episode only two had developed such troubles

Correspondence

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

Smoking and Lung Cancer

SIR,—It would seem, according to some of the critics of our conclusion that "tobacco smoking is a factor in the production of carcinoma of the lung" (for example, Professor R. D. Passey, February 14, p. 399), that we ourselves based that conclusion in part—and even largely—upon the observation that over the last 50 years cigarette smoking and the recorded mortality from lung cancer have risen together. In fact our conclusion is based upon evidence that is *entirely* independent of that time correlation. The time correlation was, of course, our starting point—it suggested that smoking was a factor worth investigating. But having applied that stimulus it ceased to have any interest whatever for us until our epidemiological inquiry was over and had *alone* led us to the conclusion we have quoted above.

That epidemiological approach and the results it gave are also, perhaps, being underestimated by Professor Passey and others. In drawing our conclusions we were not dealing with a handful of uncontrolled patients, nor making light-hearted suggestions, such as those he quotes about breast cancer and Edwardian corsets, based upon a few clinical impressions and a vivid imagination. We set about a most carefully designed survey, a survey that took in, all told, nearly 5,000 patients, was carried out in Greater London and four provincial cities, and occupied nearly five years. Evidence based on 1,465 lung cancer patients and 1,465 carefully matched controls does, we submit, carry some weight. In view, however, of the emphasis that has been placed, quite wrongly in our view, upon the correlation in time we might perhaps remind the reader briefly of the salient features of that survey. We have endeavoured to bring all its important results together in one single table, given below (for details of the absolute numbers, which vary according to the items, and for technical tests of significance, etc., the reader must see Doll and Hill (*British Medical Journal*, December 13, 1952, p. 1271).

The Proportion of Patients Interviewed who were Noted to have Given Characteristics

Section A. Equalities

	Characteristic	Carcinoma of the Lung Patients	Control Patients
1	Sex		
2	Age		
3	Places of interview (5 areas)		
4	Occupations		
5	Social class (males) number falling in classes I and II	15%	17%
6	Social class (males) number falling in class V	17%	16%
7	Number with previous residence near a gas works	23%	22%
8	Number with different forms of heating in living room for 30+ years:		
	Coal fire	86%	85%
	Gas fire	14%	15%
9	Number with previous history of asthma, chronic nasal catarrh, pleural effusion, or pulmonary tuberculosis	17%	15%
10	Regular users of petrol lighters	43%	41%
11	Number of smokers who said they inhaled	65%	67%
12	Smokers of mainly hand-rolled cigarettes	21%	19%
	Users of one of 4 main named brands of cigarettes	57%	57%
	Users of mixed brands	34%	32%
	Regular users at some period of Turkish cigarettes	4%	5%
13	Number of male snuff-takers, occasionally or regularly	3%	4%
14	Number of non-smokers amongst women in the provinces	57%	57%

* In two occupational groups—miners and policemen—there was a relative deficiency of cancer cases.

later, whereas in 20 with a history of severe cerebral accident before operation 9 developed them later. Similarly in 784 patients without severe myocardial disease there was no subsequent coronary thrombosis, whereas in 18 patients with severe myocardial damage there was one post-operative coronary thrombosis. Spinal cord damage occurred in two others, and this was a serious matter. In expert hands, however, this complication should reach a low irreducible minimum.

Contraindications to inducing hypotension were (1) myocardial disease; (2) arteriosclerosis, whether local or generalized; (3) a history of previous cerebral vascular accident; (4) anaemia, chronic pulmonary disease, congestive heart failure, and other conditions affecting oxygen transport; and (5) malignant hypertension. The *only* indication for hypotension was when its advantages to the patient and the surgeon were definite and were likely to outweigh the accepted risks.

Discussion

Mr. GEOFFREY PARKER (London) said he had been prejudiced against the use of methonium compounds at first, but was now 'happier about them. The bloodless field made it wonderfully easy to demonstrate all the steps in an operation such as prostatectomy. Dr. C. T. BARRY (Edinburgh) said that with methonium compounds he had had 8 deaths in 212 cases. He thought a high spinal was more reliable. Four of his eight fatalities had been due to severe paralytic ileus. Dr. R. F. WOOLMER (Bristol) said that vasoconstriction was Nature's way of combating shock, and yet the opening speaker had advocated methonium in the treatment of established shock. He thought that the exponents of this method were confusing "shock-shielding" with "shock-hiding." Dr. M. H. A. DAVISON (Newcastle), after considerable experience, had abandoned the methonium drugs. He pointed out that the opening speakers had recorded three deaths on the table in less than 2,000 cases, whereas there had been only one such death in the last 60,000 cases at his hospital. He emphasized, too, the very real risk of cerebral damage in many cases. Dr. A. R. HUNTER (Manchester) described the limited use of hexamethonium in neurosurgery, chiefly to make the impossible possible. The method was mainly of value with angiomas, aneurysms, and vascular meningiomas. Some patients had prolonged hypotension, and a few had shown intolerance by developing venous congestion in the operative field. There was also a significant increase in post-operative vomiting. Dr. P. R. BROMAGE (Chichester) said that in the presence of complete afferent blockade from the operation site eosinophil counts suggested that the adrenocortical response was delayed until the effects of the block had worn off. In the arteriosclerotic subject the electroencephalogram showed delayed return of normal alpha rhythm after profound hypotension.

Dr. GILLIES, in reply to a question by Mr. N. E. Tanner on whether the induction of hypotension was indicated in the surgery of portal hypertension, said that he did not consider the method suitable. The hazards of bleeding in such patients were great. With reference to Dr. Barry's remarks on paralytic ileus he quoted a personal communication from Dr. F. Holmes, at Edinburgh, reporting 19 non-fatal cases of paralytic ileus in 155 orthopaedic operations (mostly on the hip) in which hexamethonium had been used. Dr. Davison's emphasis on possible cerebral damage was important, although Nilsson's observations were on few cases and all effects were transient. With spinal block anything above 10 degrees head-up must be considered dangerous. The head-down position should never be much below horizontal, otherwise a dangerous congestion might ensue.

Dr. WYMAN congratulated Dr. Davison on his long series of cases without a death on the table. He felt, however, that such events were largely unpredictable and that such a satisfactory experience could be purely due to chance. Contrary to Dr. Bromage, he thought that there was a normal eosinophil response to operation.

Observed Proportions of Patients with Given Characteristics
Section B. Inequalities

	Characteristic	Carcinoma of the Lung Patients	Control Patients
1	Number of men who were non-smokers: Greater London, 1948-9 Greater London, 1950-1 Bristol, Cambridge, Leeds Newcastle	0.3% 1.0% 1.3% 0.0%	4.2% 4.2% 4.4% 5.3%
2	Number of women who were non-smokers: Greater London	30% 54%	
3	Number of men smoking 25 cigarettes or more daily (or the equivalent in pipe tobacco): Greater London, 1948-9 Greater London, 1950-1 Bristol, Cambridge, Leeds Newcastle	26% 26% 24% 21%	13% 16% 11% 12%
4	Number of women smoking 25 cigarettes or more daily: All areas	11% 1%	
5	Number who started smoking before the age of 20: Men Women	80% 29%	77% 24%
6	Number who had given up smoking for more than 10 years: Men Women	1% 1%	4% 4%
7	Number of male smokers who, as a rule, smoked cigarettes only Number of male smokers who, as a rule, smoked pipes only	74% 4%	69% 7%
8	Number of male cigarette smokers who had used cigarette holders occasionally or regularly	5%	12%
9	Number of males who had chewed tobacco occasionally or regularly	3%	5%
10	Number of men aged 45-74 smoking 25 ciga- rettes or more daily (standardized rate): Patients with carcinoma of the lung Patients wrongly diagnosed as lung cancer Patients with other respiratory diseases Patients with other forms of cancer Patients with other diseases	24% 11% 11% 13% 14%	
11	Number with previous history of: Chronic bronchitis Pneumonia	17% 17%	11% 10%

In the upper part of the table, Section A, we set out the principal characteristics in which our carcinoma of the lung group did *not* differ appreciably from the control patients—that is, those patients whom we took into the inquiry as a standard of comparison. To limit the possible variables, the design of our survey deliberately made them equal in sex, age, place of interview, and, largely, in hospital of admission. It will be seen that they have also revealed themselves to be remarkably alike in other characteristics—their social class and their occupations, their residence near a gas works, their heating in the home, their previous history of certain respiratory diseases. In relation to smoking they do not differ in their use of petrol lighters, of hand-rolled cigarettes, of different brands of cigarettes; they do not differ in the habit of inhaling. With these striking equalities—particularly in some aspects of smoking—it would seem to us to be unreasonable to argue that either our controls or our cases are biased, and therefore not comparable, or that the information given by the two groups is not equally reliable.

How, then, can we explain the picture given by Section B of our table? Here we have brought together the various ways in which the carcinoma of the lung patients *do*, as a group, differ from the control patients. They include significantly fewer non-smokers and a marked excess of relatively heavy smokers in both sexes, with, in men, a consistency in time and space that is striking; they include more persons who started smoking earlier in life and fewer who have given up; they include relatively more cigarette smokers and fewer pipe smokers; they include fewer users of cigarette-holders and fewer chewers of tobacco. In short, broadly speaking, they differ radically in the *amount* of tobacco they have smoked, and they differ, it seems probable, in the *way* they have smoked. Other groups of patients do not reveal this difference in the amount smoked—including, be it noted, a group originally, but wrongly, diagnosed as carcinoma of the lung. It is the privilege of the lung cancer group to be so marked. The only exception lies in the equality of non-smokers amongst the few

women we observed in the provinces (as shown in Section A).

The two groups are also different, Section B shows, in their previous history of chronic bronchitis and pneumonia. We give reasons in our paper for supposing that this comparison may be fallacious, though we do not wholly dismiss it. Chronic bronchitis is held by many to be related to smoking. There is also some evidence (not included in the Table) that the carcinoma patients had passed more of their lives in urban areas, which is consistent with Stocks's work on the urban/rural incidence rates. Basically, then, it is the contrast between Section A and Section B of our Table that leads us to the belief that tobacco smoking is of aetiological importance in lung cancer.

This evidence, we repeat, is quite independent of the time correlation. No critic has offered any alternative explanation of it that carries conviction—and indeed the only one that has been put forward at all is that subjects with a particular constitution may be prone both to smoking heavily and to carcinoma of the lung. We have put forward our own interpretation and belief—that the figures simply mean what they show.

Professor Passey and Dr. Gallop ask, If the reported increase in lung cancer is due to tobacco smoke, how does it come about that there is no increase in the incidence of cancer in other parts of the respiratory tract, such as mouth, tongue, and pharynx, which suffer a greater exposure to the smoke and for a longer time? There are, however, analogies for such events, however curious they may appear to be. For instance, in nickel refining in South Wales it is well known that some undetermined carcinogenic agent, acting in the first quarter of the present century, produced a gross excess of cancer in two sites, and two sites only—the ethmoid and the lung. Why not the mouth, the tongue, and the pharynx? Similarly, no excess in any site but the lung has followed the exposure of the Schneeberg miners. A declining cancer rate in the buccal cavity is, in fact, consistent with the hypothesis put forward by some that cancer in these sites is related to the prevalence of pipe-smoking.

We made perfectly clear in our paper that we did not believe that *all* cases of lung cancer were due to smoking—indeed, we called that a most unlikely event and pointed out that we had observed certain cases who had never smoked. One of us (R. D.) has, indeed, elsewhere attempted to calculate from our data the death rates of men and women non-smokers, and on the assumptions made those death rates did not differ materially (Milroy lectures, in the press). We need hardly point out that with *far* more women than men non-smokers in the population a relatively greater proportion of deaths in women must be of non-smokers—though their death rate among them might still be negligible. The difference in past tobacco consumption between the sexes is, it appears to us, quite capable of providing the main explanation of the present sex ratio of mortality. Trade statistics show that of the total tobacco consumption of the country 25 years ago only 2.5% was smoked by women. We do not believe that Dr. Shera need invoke sex hormones as a factor.

Professor Passey suggests that the only "satisfactory solution of the problem would be the study of a large group of smokers in comparison with an equally large group of non-smokers." This we are endeavouring to make in our observations of the mortality amongst those doctors who told us their smoking habits some 15 months ago—but we hardly like to appear impatient.

Finally, he asserts that "when doctors disagree it is bad for the patient." We might remind him that in the past they often have disagreed. They disagreed when Lord Lister endeavoured to introduce antiseptic measures. It was bad for the patient. Quite often he died.—We are, etc.,

RICHARD DOLL.
A. BRADFORD HILL.

London, W.C.1.

SIR,—There are certain points in the letter of Professor R. D. Passey (February 14, p. 399) which I feel require some comment. Professor Passey suggests that the "immeasurably greater degree" of ability to diagnose cancer of the lung is as closely related to the increase in lung cancer as between cigarette smoking and the increase of lung cancer. Surely Professor Passey cannot seriously suggest that in the past 10 years the ability of medical practitioners to diagnose cancer of the lung as a cause of death has markedly changed. If there was some social reason for the increase in the number of certifications—that is, reluctance of doctors to certify cancer as a cause of death—then this should be reflected in the certifications of death of all other forms of cancer. Deaths from cancer of the trachea and bronchus have risen from 4,815 in 1940 to 11,241 in 1950, an increase of 133%. Certified deaths from cancer of the large intestine have risen only from 9,809 in 1940 to 10,153 in 1950. This trifling increase of 3.5% would seem to dispose of the idea that there has been any marked increase in the x-ray diagnostic facilities. The second point was that no carcinogen had yet been found in tobacco smoke, but it was stated in Professor Bradford Hill's article that carcinogen has been demonstrated in tobacco tar.

A mere correlation in time between the increase of tobacco smoke and cancer of the lung would indeed be a highly fallacious premise on which to base any argument as to the aetiology of the one against the other, but what the survey shows is that a much larger number of persons who suffer with cancer of the lung smoke cigarettes than would be accounted for by chance. It is certainly true that in the past many theories as to the causation of carcinoma have been proved false by later experiment, but a statistical survey of this type is one of the most potent methods of distinguishing facts from fancy—that is, in the demonstration that residence near a gas works is of no import and the non-carcinogenic properties of the cigarette lighter.

Finally, Professor Passey states that we do not know how many of the 68 women smokers who suffer with carcinoma would, in fact, have suffered from this disease had they not smoked, but, applying the figures of relative risk in table XII, it would appear that this figure would have been under 10. Professor Bradford Hill's article may not have proved that carcinoma of the lung is caused by tobacco smoking, but it has put the matter in so grave a doubt that any reasonable person would need to receive very strong weight of evidence before dismissing the matter as of no account. No single survey, even one so carefully planned and carried out, could be said to prove so important a subject, but it certainly does make it of the utmost importance that further research be pressed forward with the greatest celerity.—I am, etc.,

London, W.8.

H. BINYSH.

SIR,—Your publication of "A Study of the Aetiology of Carcinoma of the Lung," by Dr. R. Doll and Professor Bradford Hill (December 13, 1952, p. 1271), which was followed by a television programme on smoking, and much Press publicity, including front-page banner headlines in at least one daily paper, have resulted in great and justifiable public alarm about the ill-effects of smoking. A conference has been hurriedly called for the purpose of planning further and more extensive research on this subject. Let us have this, by all means. Let us make assurance doubly sure. But extensive research, well planned and carried out, is extremely time-consuming, and must not be made an excuse for our neglecting to take immediate steps to safeguard the public from this grave and rapidly increasing malady.

Your leading article (December 13, 1952, p. 1299) implied that the association between smoking and cancer of the lung was virtually proved, in so far as statistics can prove anything. The second limb of Doll and Hill's investigation

confirmed the conclusions of their first, and the whole confirmed those of Wynder and Graham,¹ and of other investigators. A long-nurtured suspicion, born of extensive clinical observation, has thus been subjected to repeated large-scale investigations by independent investigators of high standing, and has been shown to be well founded. Its validity is therefore proved beyond all reasonable doubt, although I appreciate that many smokers are, understandably, not reasonable when there is a threat to their supplies of tobacco, and are certain to cast doubts, including "phony" ones, on the validity of such utterly unacceptable findings. But this should not be allowed to deter or delay us in the performance of our duty, which is clearly to call on the nation to stop smoking now, voluntarily in the first instance. I realize that the psychological and financial repercussions would be enormous. But even more enormous, in my view, would be the upsurge in the national health and morale. Tobacco smoking is a disease in its own right—a drug addiction—and well worth curing even if it did not predispose to any other affection.—I am, etc.,

Wallasey.

LENNOX JOHNSTON.

REFERENCE

¹ J. Amer. med. Ass., 1950, 143, 329.

"A Thorough Overhaul"

SIR,—We in this partnership are concerned over the increasing number of requests we have from National Health Service patients for a "thorough overhaul," or, as they frequently put it, a "medical." While we agree with the desirability of this and have not as yet turned any such requests down, we are getting a little apprehensive at the increasing frequency of these requests, due, we have no doubt, to the many health articles in the popular magazines and the sometimes horrifying programmes on the radio and television. This is certainly going to become an acute problem, because, if such examinations are not done as thoroughly as those for life assurance purposes, they are not only useless but may be dangerous.

We should like to ventilate this question and ask how our colleagues elsewhere deal with it.—We are, etc.,

RONALD COLDREY.
D. R. W. BURBURY.

G. A. F. QUINNELL.
G. E. P. KELLY.

Teignmouth.

The College of General Practitioners

SIR,—It is evident from the letter of Drs. J. P. Denny, C. H. Highfield, D. L. Isaac, and A. Murphy (February 7, p. 333) that my previous communication (January 24, p. 219) has been misunderstood. In order to eradicate any false impressions, I would be grateful for the opportunity to answer a few of the points which they make.

First, it is not quite fair to speak of a *fait accompli* being presented to the profession. The steering committee has considered the views offered to it by members of the profession, and Dr. Denny and his co-writers had every opportunity to submit theirs. The committee has now gone a stage further and made some *provisional* arrangements for the establishment of the College and has given it a *provisional* constitution. In its report it makes it quite clear that a general meeting will be held in 1953, at which a new council will be elected by the full body of members, the provisional constitution will be reviewed, and the by-laws will be submitted for amendment and confirmation. A second general meeting will be held in 1954, when the same procedure will be followed. Such an arrangement can hardly be called undemocratic.

The fact that more than 1,500 general practitioners have joined the new college in its first five weeks has shown indisputably that there is a real need for it. Those who have not yet enrolled are not necessarily opposed, and many, I am informed, are still joining daily. This degree of support from practitioners immediately after the birth

of their college, with its enthusiastic reception from many other quarters, has been far more encouraging than even its most ardent supporters had expected.

The steering committee clearly states in its report that the new college is for *all* general practitioners who care to join it. None are excluded, and it is quite untrue to state, as Dr. Denny and his colleagues have done, that the college is only for a few enthusiasts and not for all. Furthermore, it is not one of the aims of the college to "dispense distinctions" under its present constitution. If eventually it is decided to institute a diploma, it will be for the profession as a whole to accord it the value which it deserves.

The B.M.A. has, I believe, welcomed this venture and recognizes the college as a body complementary, and not antagonistic, to itself. This should allay any fears that a new negotiating body has arisen to interfere with existing work in this field.

After three years the Royal College of Obstetricians and Gynaecologists had 276 members; after five years the American Academy of General Practice, a highly successful and useful organization, had enrolled 15% of the general practitioners of the United States; in its first five weeks our new College of General Practitioners has made a truly remarkable start, and its future success is assured.—I am, etc.,

Sheffield.

H. H. PILLING.

SIR,—I much appreciate the kind reference of Dr. J. P. Denny and others (February 7, p. 333) to my letter (January 24, p. 218) and want to dispel some doubts expressed about my meaning. Regarding the increasing deterioration of the status of general practice in the past decade, the profession will welcome from the College of General Practitioners any help in our attempts to "stop the slide." I did not venture the opinion that the college was necessary in addition to existing efforts; but the exigency presents a great opportunity for the new college to show its mettle.

Is the doctor's prestige, *vis à vis* his specialist confrères, synonymous with worth, as my correspondents assume? Prestige means influential status judged by worldly standards, and it is the fall of this that we lament. Whereas the sustained concurrent efforts of doctors to serve their patients' vital needs despite degrading conditions enhance our esteem for their worth—moral or academic. But, "trying to cope," they are losing touch seriously with the specialists. Consultations are fewer; at those in the patient's home the absence of the general practitioner is often accepted; patients are commonly introduced to the out-patient clinic with but scrappy notes. Scamped procedure is foreign to healing. It also impresses the public unfavourably. A cold formality is supplanting the good fellowship that made a consultation an event in pre-war practice. *Spiritus intus alit*. Not only was discussion stimulating but, writing from personal experience, the young consultant gained much from the shrewd dicta of the family doctor and his way of handling the patient. Incidentally, the quiet decorum of the occasion inculcated respect among patient and relatives.

When the consultant-general-practitioner bond weakens, the doctor's prestige—within his profession, too—diminishes. I tried to emphasize in my letter how indispensable the directive influence of the general practitioner has become for the patient to derive full benefit from the cluster of specialists now available in the N.H.S. The family doctor should not only invoke but also co-ordinate their services and play the nuclear role in the clinical cell. It is our duty among our clientele to acclaim him *primus inter pares*. The warning words of Dr. F. H. Young in his address on pulmonary tuberculosis (February 7, p. 287) illustrate how needful this function is. Unless the general practitioner is in charge, the patient is apt to fall between two stools—medicine and surgery—and "the best laid schemes o' mice and men gang aft a-gley."

Let the profession give due prominence to this major responsibility of the general practitioner. Such a signal from the "technicians" is due to convince both the public and the Ministry of Health that the bad conditions in general practice are converting the patient's "guide, philosopher, and friend" into a health "official."—I am, etc.,

Bristol.

A. WILFRID ADAMS.

Acute Labyrinthitis

SIR,—In reference to the article by Dr. W. L. Burrowes on "Acute Labyrinthitis" (November 29, 1952, p. 1182), we have during the last year seen many cases of labyrinthitis, although most have not been as severe as those reported. The attacks were frequently associated with other symptoms of influenza, and we feel that, when it occurs alone, the labyrinthitis is possibly caused by an influenza virus of low virulence.

With respect to treatment, we added potassium iodide 3 gr. (0.2 g.) to a simple sedative mixture such as the following: ammon. brom. 3 gr. (0.2 g.), sodii brom. 3 gr. (0.2 g.), tinct. nux vom. 4 min. (0.24 ml.), sp. chloroform. 10 min. (0.6 ml.), inf. gent. co. ad $\frac{1}{2}$ oz. (15 g.). Patients will often be improved within 24 hours even in quite severe cases.—We are, etc.,

Burwood, Australia.

JOHN MALCOLM.
SYDNEY L. CHURCHWARD.

Malignancy in Undescended Testis

SIR,—Mr. Eric Coldrey's case of malignant tumour in an undescended testis (February 7, p. 335) is remarkable not only for the extraordinary size of the growth but also for the association with a marked degree of hypospadias. Since the earliest times of cancer research the frequency of association between developmental disturbances and malignancy has been observed and has given rise to various theories on cancer origin. I myself investigated a case of evolutionary anomaly connected with carcinoma which may be worth recording, particularly, as Mr. Coldrey says, as malignant changes with imperfect migration of the testis are very uncommon.

A woman aged 30 was admitted to a gynaecological clinic in a state of complete unconsciousness. A prominent malignant tumour was located in the right inguinal area, spreading considerably. It was inoperable. The patient had always been in good health, but had never had a period. Her body was well proportioned and completely female, with excellently formed breasts and female hair distribution. Only the axillary region was hairless. On examination, however, I found complete absence of a uterus, the vagina ending blindly. From this syndrome I made a diagnosis of error of sex and cancer of a cryptorchid testis in a case of male pseudohermaphroditism. The patient died four days later, and the findings at necropsy confirmed the diagnosis. The patient had never had a doubt of being a woman. The anomaly must have started at an extraordinarily early stage of embryonic life, resulting in such a complete form of pseudohermaphroditism accompanied by the secretion of oestrogen quite excessive in a male.—I am, etc.,

London, N.W.3.

HANS BAB.

The General Practitioner and Mass Radiography

SIR,—Dr. F. A. Nash, Mr. B. Benjamin, and Dr. T. J. Lee describe (February 7, p. 304) the facilities offered to general practitioners by the South-west London Mass X-ray Service. This was the subject of favourable comments in your annotation (p. 322). I would like to add my appreciation of the above article and say how experience in Newcastle-upon-Tyne has shown that rapid x-ray facilities of this kind are greatly appreciated. Such a scheme has been in operation in Newcastle-upon-Tyne since 1944. The following Table gives some particulars of this. It will be seen that the numbers of doctors' patients attending have risen considerably since the scheme started.

Dr. W. H. Dickinson, the first medical director of this mass x-ray unit, was responsible for the inception of the scheme; I have only continued the work since his retirement in April, 1952. At first practitioners were requested to send a note with the patient, and a printed letter form

Year	Total Attending	Recalled for 2nd Examination	Requiring Investigation or Observation
1944	754	196	45 or 6%
1946	457	25	65 " 14.5%
1947	348	54	25 " 7%
1948	2,625	570	238 " 9%
1949	1,985	385	119 " 6%
1950	3,486	601	236 " 6.5%
1951	4,503	793	313 " 7%
1952	6,959	842	516 " 7.5%

was sent back to the general practitioner. Now they are supplied with cards and envelopes, and the report upon the miniature film is typed or stamped upon the card, which goes back to the general practitioner. No elaborate analysis of the patients' symptoms has been kept. In 1949, 44 cases referred by general practitioners were found to have active pulmonary tuberculosis, in 1950 81, and in 1951 86, giving an average of 2% compared with 0.2% from routine x rays done in the unit. With the consent and approval of the general practitioner concerned, patients with other abnormal shadows, including probable cardiac lesions or conditions other than tuberculous, were referred to the cardiovascular department or the thoracic unit in the Newcastle General Hospital, where the mass radiography unit is based.

As the mass radiography unit is mobile, the amount of general-practitioner work is affected by the amount of time that it is away from its base, but when it is not away special sessions are arranged on one afternoon and evening per week for general practitioners' cases.—I am, etc.,

Newcastle-upon-Tyne.

GEORGE HURRELL.

SIR,—Your annotation on "The G.P. and Mass Radiography" (February 7, p. 322) seemed to attribute to us the suggestion that all mass x-ray units should concentrate entirely on the examination of minor symptom cases sent by doctors. We did not express any views about the uses to which existing mass x-ray units should be put. We did estimate that a comprehensive general-practitioner x-ray service could be provided if the units in large towns concentrated entirely on such cases. In fact, we are in agreement with your annotator's views on the importance of the other duties of the mass x-ray teams. The question of the relative values of different methods of using these units is an important and separate issue, but we did not deal with it in our paper (February 7, p. 304).

Since our paper was written the South-west London Mass X-ray Centre has been opened to provide for the needs of general practitioners. This centre now serves 400 doctors, who are sending 200–300 patients a day for examination. This increase in referrals by general practitioners at a time when they are immensely busy indicates that they value the service.—We are, etc.,

F. A. NASH.
B. BENJAMIN.
T. J. LEE.

London, S.W.17.

Measurement of Tissue Components Radiologically

SIR,—We are pleased to learn from the letters of Dr. E. A. Miskin and Dr. Frank Falkner and Miss Sylvia Wisdom (January 31, p. 275) that some consideration had been given to the geometry of their tube-shift technique, although withheld from the original publication. We wonder, however, if Dr. Miskin, Dr. Falkner, and Miss Wisdom are agreed as to the scope and limitation of the method, for whilst Dr. Falkner and Miss Wisdom write: "Our method is intended for measurement of tissues in such parts of limbs as the upper arm, calf, thigh, etc., in both infant and adult," Dr. Miskin writes: "In the method as applied, and as recommended for *child* study . . ." We have never denied that the shift method may be mathematically accurate for children's calves, but with limbs of diameters up to, say, 6 cm. an anode film distance of only 120 cm. may be regarded as teleradiography with an error of less than 3%.

We were misquoted as recommending an exposure of 1 second at 15 mA in radiographing infants. This was not our intention. However, should we be asked for a practical solution, an exposure of $\frac{1}{4}$ second at 15 mA with an anode film distance of 120 cm. would be a suitable starting point for the smaller patients with whom short exposures are necessary. This compromise (which has been tested in our departments) is put forward as but one of many alternatives, as it is not possible to discuss this subject at length in these columns. The advantages of this method are: (1) only one 15 mA apparatus is required; (2) the exposure time is the minimum these sets will allow; (3) errors due to focal spot size, photographic quality, motion blurring, measurement of tube-shift and anode film distance, subjective errors and calliper errors are far less important; and (4) tissue proportions can be read directly from a normal film rather than calculated indirectly from a film which looks like Clapham Junction in a fog.—We are, etc.,

B. C. H. WARD.
G. N. WEBER.

London, S.E.3.

Effect of Isoniazid on Glucose Tolerance Tests

SIR,—In view of the figures published by Dr. G. R. W. N. Luntz and Mr. S. G. Smith (February 7, p. 296) of the effect of isoniazid on glucose tolerance tests, the attached small series may be of interest.

Between April and June, 1952, six non-diabetic patients suffering from active bilateral pulmonary tuberculosis—Case 3 also had a gastro-enterostomy—received isoniazid in doses of 200–250 mg. daily. At first this was given in 50-mg. doses distributed throughout the 24 hours, but later in doses of 100–150 mg. twice daily. Plasma levels of isoniazid were not determined. Blood sugar estimations (Folin and Wu) were carried out in the fasting condition and one hour after the ingestion of 50 g. of glucose before isoniazid therapy was started, and thereafter at weekly intervals. The series is thus comparable with Dr. Luntz's controls.

Case		Blood Sugar in mg./100 ml.					
		Before Isoniazid	Weeks after Isoniazid				
			1	2	3	4	5
1	Fasting	86	96	77	88	88	64
	1 hr. after glucose	148	124	91	112	104	76
2	Fasting	82	104	108	73	92	
	1 hr. after glucose	136	120	145	86	96	
3	Fasting	116	108	108	96	84	
	1 hr. after glucose	192	128	144	224	136	
4	Fasting	96	92	105	77	84	
	1 hr. after glucose	104	120	140	69	112	
5	Fasting	64	68	60	88	64	
	1 hr. after glucose	96	88	84	96	80	
6	Fasting	80	68				
	1 hr. after glucose	120	132				

We draw no conclusions from this small series, but the results do not appear to confirm Dr. Luntz's findings of raised blood sugar levels in non-diabetics receiving isoniazid.—We are, etc.,

J. A. KEEPING.
M. W. HUTCHINGS.

London, W.10.

School Dental Service

SIR,—Dr. F. G. Hardman (February 14, p. 401) cannot see why dental nurses should be considered a menace. The dental profession is happy to employ auxiliaries in the shape of technicians, receptionists, secretaries, surgery assistants, and oral hygienists. It objects to a new type of auxiliary who will perform surgical operations on living tissues. The analogy with nurses and the medical profession is false. Nurses do not normally administer anaesthetics, perform minor surgery, or use local analgesia, with or without supervision.

The dental profession still has "Dentists 1878" on the Register, and nearly 30% of its ranks are "Dentists 1921." It is liable to have "Dentists 1953" in service until A.D. 2028, even if the so-called "experiment" is judged a failure.—I am, etc.,

Birmingham.

C. N. JEFFRIES.

Kindness to Patients

SIR,—I read with great interest your leading article (January 31, p. 264) and the letter from Dr. Guy Roworth (p. 271) explaining his valuable idea of having a leaflet in the wards. I suggest, however, that, in addition, "conditioning" of the patients should start before they enter the hospital, and for this purpose I sent a leaflet some time ago to the King's Fund in the hope that hospitals would send it out with the card of admission. This leaflet sought to explain the domestic details and relationships which exist in the life of a hospital ward and to simplify the details of routine which sometimes cause anxiety at first to new patients. I understand it was turned down by the nursing committee.—I am, etc.,

York.

MALCOLM DONALDSON.

Surgery of the Heart

SIR,—You gave us a very kind and good leading article (February 14, p. 383) on our recent follow-up of 200 patients with morbus caeruleus (p. 349).

Your comment that we said nothing about similar patients with direct operations might be interpreted as disapproval of Mr. Brock's operation. We should, perhaps, have concluded our paper by saying that we are hoping to produce a similar follow-up in the very near future of the patients who have had valvotomy and infundibular resection, but these operations started about a year later, and we wanted the follow-ups to be as comparable as possible.—We are, etc.,

MAURICE CAMPBELL.

D. C. DEUCHAR.

London, S.E.1.

Intercourse after Syphilis

SIR,—Your expert, in his reply (February 7, p. 348) to the comments of Dr. P. A. Clements and Dr. T. E. Osmond on his original reply to a question (January 10, p. 115), does not seem to have been very fortunate in his choice of Pariser¹ for support of his contention that *S. pallida* is not found in the semen of an uncured syphilitic person. Study of Pariser's paper inclines one strongly to agree with the criticism of it by that very sane syphilologist, Dr. Joseph V. Klauder, who is reported at the end of Pariser's paper as having said in the discussion thereof:

"Unfortunately these studies do not offer a laboratory test to discover when the seminal fluid no longer harbors the organism. Fournier showed some years ago that the seminal fluid may transmit the disease before the appearance of the chancre. I recently observed a patient with an extra-genital chancre, there were no lesions on the genitalia. He infected his wife through the seminal fluid, since she presented a chancre of the cervix soon after the appearance of her husband's extra-genital chancre. If Dr. Pariser continues his studies I would suggest that he concentrate pooled specimens of seminal fluid from the same patient by partial evaporation in order to inject the entire residue into a rabbit's testicle."

But why does your expert rely, as apparently he does, on the alleged absence of *S. pallida* from the pure semen as secreted in the testicle? What does it matter whether the fluid emitted in sexual intercourse picked up *S. pallida* in the testicle or in the urogenital canal? Does your expert think that seminal fluid could infect only through the ovum? This question of the precautions that are necessary after treatment for early syphilis is highly important. It is all very well to be optimistic when the penalty of mistaken judgment is not borne by the expert, but for the

kind of people who matter to the country a syphilitic infection is psychologically, if not physically, a life sentence and I suggest one should be sure of one's facts before airily telling a syphilitic patient that he can do something which might pass the disease to his consort. Proof of a negative in this matter demands most scrupulous and exacting tests, and, until we have evidence that early syphilis is always eradicated by the usually prescribed course, the precautions and the after-treatment observation should be as severe as they ever were.—I am, etc.,

London, S.W.1.

L. W. HARRISON.

REFERENCE

¹ *J. Invest. Derm.*, 1942, 5, 311.

"Pilot" Tube for Bottles of Blood

SIR,—From time to time there is discussion in hospitals about the wastage of donor blood. It has been pointed out that the practice of cross-matching bottles of blood which are not subsequently needed can be made less wasteful if each bottle is accompanied by a "pilot" tube of the same blood, so that the main bottle need not be opened until it is actually needed. Two chief objections to this practice are made—that study of films to exclude the presence of organisms in the blood must be made with the bottle itself, and that a pilot tube may be detached from its parent bottle or wrongly labelled.

To the first of these objections there is, no answer, except that there are few laboratories where routine tests for infected blood are made. The second objection can be met by a method of incorporating the pilot tube in the bottle. I have devised a method which does not necessitate any alteration in the existing bottles. In place of the flat rubber disk covered by the aluminium cap at present used, a deep rubber stopper with an upper flange closes the neck of the bottle. Through an opening in this stopper a 10-ml. test tube fits tightly so that its top is flush with the top of the stopper. After the bottle has been filled a small quantity of blood is run through the tube of the taking set into this pilot tube, which is already in place in the stopper. Finally, the aluminium cap with its rubber disk is screwed firmly down to seal off the pilot tube. The accompanying diagram shows the stopper and tube in place and the cap closed. With this method the bottle and the tube are independently sealed, and there is no possibility of the pilot tube becoming separated from its parent bottle.—I am, etc.,

Northampton.

E. A. J. ALMENT.

Treatment of Threadworms

SIR,—Patients with hookworm disease often have an intense and persistent craving that compels them to eat earth and mud. Is it possible that the ancylostoma, in order to satisfy its own needs, influences the host in some subtle manner to supply the soil or mineral that it requires?

Children who harbour threadworms are reputedly always hungry, especially for sweets and sugar, and this is commonly taken by mothers and the laity as a diagnostic sign of the disease. Is this another example of a similar effect by a worm? This was the theory, admittedly erroneous, that suggested it may be possible to eradicate threadworms by altering the diet in such a way as to deny them the food they desired and thus starve them.

Obituary

HAROLD BALME, O.B.E., M.D., F.R.C.S.

Dr. Harold Balme, who died in London on February 13 at the age of 74, contrived, with conspicuous success, to live a life full of interest to himself and of great benefit to his fellow men. Towards the end of his professional life he became a leading authority on rehabilitation.

Harold Balme was born in London on May 28, 1878, the son of Mr. Paul Balme, and received his medical education at King's College and King's College Hospital. He won the Worsley scholarship in 1898, and in the course of his studies he won the Warneford, Leathes, and Todd prizes in medicine. As his aim was to become a medical missionary, he also studied divinity and won the Barry Prize. The outbreak of war in South Africa in 1899, however, upset his plans temporarily, for, like many others of his generation, he responded to the call for volunteers, and from 1900 he served with the Imperial Yeomanry Field Hospital, being awarded the war medal with three clasps. After the war he returned to London, and qualified by taking the M.R.C.S., L.R.C.P. in 1903. He then held the posts of resident medical officer at the London Medical Mission and clinical assistant at the Royal Eye Hospital and at King's College Hospital, and in 1905 he obtained the F.R.C.S. In the following year he went to China as a medical missionary at Taiyuanfu, in the Shansi province. In 1913 he was appointed professor of surgery in Cheeloo University (formerly known as the Shantung Christian University) at Tsinan and superintendent of the University Hospital, later becoming dean of the medical school. He became president of the University in 1921 and chairman of the first Council on Medical Education in China and president of the Council on Higher Education. His services to the profession in China were recognized by his election as an honorary member of the National Medical Association of China. He was elected also an Associate of King's College. A record of his experiences and his work is to be found in his book, *China and Modern Medicine: A Study in Medical Missionary Development*. Dr. Balme relinquished his appointment as president of the Cheeloo University in 1927 and returned to England to engage in consultant practice. In the following year he graduated M.D. at Durham University.

During the last war he worked in the Emergency Medical Service and became medical superintendent first of the Haymeads Hospital at Bishop's Stortford and later at Pinderfields Hospital, Wakefield. Before the war there was very little in the way of an organized service to help the disabled return to work, and of course as the war went on the need for such a scheme grew greater. Balme became one of the first to work in this field, and his services were recognized by his appointment as O.B.E. in 1942. Later on during the war he became the Ministry of Health's adviser on rehabilitation, and he brought to that task the same enthusiasm and energy he displayed in everything else he undertook. In 1944 he wrote a booklet for the British Council entitled *The Unfit Made Fit*. After the war he became consultant adviser on rehabilitation to the United Nations, the World Health Organization, and the United Nations International Children's Emergency Fund, work which took him to many European countries. Last September he was in Sweden directing the group training course

was noticed that the patients who suffered from threadworms were either children or pregnant women in both of whom the diet was a low-protein high-carbohydrate one as compared with that of the general population. These patients were therefore treated by altering the diet so as to decrease the carbohydrate and starch and increase the protein and fat. Sugar was eliminated as far as possible, starchy foods were reduced, and meat, fish, eggs, and butter were given in increased amounts. For example, the usual breakfast of cereal and sugar, bread and jam, was replaced by one of bacon and egg with bread fried in fat. The amount of milk was not changed. A mild laxative was used once or twice a week but was later given up as unnecessary. The results were consistently and entirely satisfactory, complete cure being achieved in about two weeks, and relapses did not occur while the patient was on this adult type of diet. During twenty years of busy general practice I treated a great number of patients with threadworms by this method with unvarying success, and I am convinced that dietary measures are simpler, more efficacious, and preferable to treatment by vermifuges and enemata.

Confirmatory evidence of the link between diet and threadworms will be provided by older obstetricians, who will remember the prevalence of this infection in those pregnant women who avoided protein because of its supposed injurious effect on their kidneys compared with its absence since the modern high-protein low-carbohydrate diet has been adopted. Some explanation is required to account for threadworms being predominantly a disease of childhood, for surely everyone is equally liable to infection. From my experience it would seem that the presence and persistence of threadworms in a patient depend on the chemistry of the bowel contents which makes the environment favourable for their growth, and that this is to a great extent dependent on the diet.

I should be interested to learn if threadworm infection is more prevalent in Great Britain since the reduction in the consumption of meat, or has this been replaced by adequate protein from other sources?—I am, etc.,

IVON HAYES.

Melbourne, Australia.

The British X-ray and Radium Protection Committee Valedictory

SIR,—A disturbing series of deaths amongst early workers with x rays led a small group of their surviving colleagues in 1921 to formulate some rules which would prevent a continuance of such casualties. Thus was born the British X-ray and Radium Protection Committee. The late Sir Humphry Rolleston consented to become its first chairman. Under him, and largely financed by him, the first memorandum was issued in July of that year and the first detailed report followed in 1923. The code was welcomed by all classes of radiological workers and formed the basis for similar recommendations in most countries of the world and for subsequent international recommendations.

Towards the end of the war the Medical Research Council set up a Committee on the Medical and Biological Applications of Nuclear Physics. Its subcommittees, and particularly the Tolerance Doses Panel, under the chairmanship of Professor Mayneord, produced a large series of papers dealing with the fundamental data upon which protection measures for all those dealing with sources of ionizing radiations could be formulated. With the passing of the Radioactive Substances Act, a statutory committee came into existence. Whilst the Medical Research Council groups are concerned with the research aspects, the statutory committee has a duty in respect of regulations and licences, and is concerned with codes of practice over the whole extensive field now to be covered. In these circumstances the British X-ray and Radium Protection Committee, which, despite its lack of any statutory authority, had attained international status, had lost its *raison d'être*. A final meeting was held in September, 1952.

The passing of a committee through which Great Britain set a pattern for the world would seem to be a landmark that deserves record. At the suggestion of its last chairman, this letter is signed by the two surviving members of the 1921 meeting.—We are, etc.,

CUTHBERT ANDREWS.
SIDNEY RUSS.

London.

on the rehabilitation of the adult disabled, and in the previous May he was present at the opening by the President of the Austrian Republic of the rehabilitation and training centre at Tobelbad, near Graz, a centre which Dr. Balme himself described in an article published in this *Journal* on November 15, 1952.

During his work in China Dr. Balme published many articles on a variety of medical subjects, including one with the intriguing title, "Intussusception Through the Neck of an Opium Lamp-glass Shade" (*China Medical Missionary Journal*, 1907). After his return to London he wrote a book on *The Relief of Pain* (1936), and another entitled *A Criticism of Nursing Education, with Suggestions for Constructive Reform*. In the writing of this book his experience as a member of the council of the Royal College of Nursing stood him in good stead.

Dr. Balme married Miss Hilda E. Carr, of Carlisle, in 1910, and she survives him, together with their only son, who is principal of the University College of the Gold Coast.

Dr. C. F. HADFIELD writes: Dr. Harold Balme's great administrative ability was put to a severe test when in 1939 he was appointed medical superintendent of the Haymeads E.M.S. Hospital at Bishop's Stortford. An initial difficulty was that this was an office which had never previously existed, and still apparently did not exist. Haymeads was an infirmary rather than a hospital and so had no medical superintendent, its medical needs being served from outside by a local practitioner. All real control was in the hands of the local and county council authorities. The buildings were old and inconvenient, there being only two wards in any way approaching modern standards. There was not even a dispensary of any kind. From such beginnings Dr. Balme succeeded in threading his way through a network of local customs and established routine, and so laying the foundations of what quickly developed into a really well-equipped and modern hospital of some 800 beds. One secret of his success was the manner in which he speedily obtained the loyal support of his medical staff. This staff had been collected from a variety of sources, and at the start most of its members were quite unknown personally to himself or to each other. By means of friendly contacts, and almost daily staff consultations, he quickly converted it into a homogeneous, friendly, co-operative, and, it may be claimed, efficient unit.

Professor JOHN KIRK writes: To remember Harold Balme is like contemplating a giant tree in the forest, a monarch supreme, and pre-eminent among its kind. Those of us who were privileged to know him in his China days will always count that experience as one of the gladdening and enriching episodes of our lives; here was a man endowed with intellectual gifts of the highest order, possessing outstanding medical skill, and having powers of administration and leadership which marked him out in any company. Yet, when one has recognized and said all that, one feels that one has completely failed to describe the true greatness of Harold Balme. As one seeks to account for the impression he made on his colleagues and friends, one realizes that springing up in him and overflowing from him was an exuberance of spiritual freshness and buoyancy which pervaded all his life and made even an occasional meeting with him a tonic of happiness. It was in China that I knew him best, and there the effect of his life upon his Chinese colleagues and students was just as sure and noticeable as upon those of his own race. One of my early impressions was of discovering his fluency in the Chinese language and his ability to give lectures on surgery in the Shantung medical school which were not only completely intelligible but eagerly appreciated by his students. As a medical missionary in planning and in action he was alike superb. He was not only a skilled clinician, but his compassion flowed continuously from his heart to his fingertips. He was an eloquent and convincing speaker and a

gifted writer. With statesmanlike vision he grasped the truth that for the West to extend the benefits of modern medical science to China without at the same time giving her a medical profession enlightened and inspired by the Christian faith was to discharge only half of the obligation. Thus medical education in an atmosphere like that of the Shantung Christian University won and held the utmost loyalty and energy of his mind and heart. The world does not often see men like Harold Balme, and though our sense of sorrow at his passing is inevitable our deep sense of thankfulness for his life overwhelms the sorrow.

RANSOM PICKARD, C.B., C.M.G., M.D., M.S.
F.R.C.S.

We record with regret the death of Colonel Ransom Pickard, the well-known ophthalmic surgeon, at his home at Exeter on February 9 at the age of 85.

Ransom Pickard, who was born on May 18, 1867, received his medical education at St. Bartholomew's Hospital, qualifying in 1889 and graduating M.B. in the same year. He won the gold medal in medicine and gained first-class honours in forensic medicine and honours in obstetrics. After qualifying, he held appointments as ophthalmic house-surgeon at St. Bartholomew's Hospital and clinical assistant at Moorfields Hospital. Between 1891 and 1893 he obtained the B.S. with first-class honours, the F.R.C.S., the M.D., and the Cambridge D.P.H. Having acquired all these distinctions, Pickard elected to live at Exeter, where after a few years in general practice he established himself as a consultant ophthalmologist, being elected to the staff of the West of England Eye Infirmary. He acquired a great reputation, both locally and nationally, as an ophthalmic surgeon, and from 1934 to 1936 he was president of the Section of Ophthalmology of the Royal Society of Medicine. One of his special interests was glaucoma, and he published several papers on this and other eye diseases. His hospital work was all-important to him, but it was inevitable that one who took such pains with his patients should build up a large consulting practice, and his reputation spread far and wide. His character and ability soon brought him into prominence in civic affairs, and he was sheriff of Exeter in 1906-7 and mayor in 1926-7. He took a great interest in the University College of the South-west, of which he became a vice-president.

In the first world war he served in the R.A.M.C., and was placed in command of the 1st Wessex Field Ambulance, which he had helped to raise. He went to France immediately war broke out, and later was promoted to colonel and appointed A.D.M.S. of the 48th Division, with which he served in Northern Italy. He was five times mentioned in dispatches, and for his services he was appointed C.M.G. in 1916 and C.B.E. in 1919. He also received the Italian Croce della Guerra. During the last war he served as chairman of the local medical war committee.

A member of the British Medical Association for 58 years, Pickard served as one of the honorary secretaries of the Section of Ophthalmology when the Association held its Annual Meeting at Exeter in 1907, and he was a vice-president of the same Section at Portsmouth in 1923. He was president of the South-western Branch of the Association in 1927-8, and was also on the Ophthalmic Committee for some years.

Pickard developed a great love for the West England, and for Devon in particular. At one time he was a keen mountaineer, but as the years went by he took his exercise in the form of long country

on which his wife usually accompanied him. He was a past president of the Devon Archaeological Exploration Society, and in 1947 he published a monograph on *The Population and Epidemics of Exeter in Pre-Census Times*. A lifelong Methodist, he was a non-smoker and teetotaler, but was never one to thrust his personal views upon others. In 1912 he married Miss Mabel Lucy Childe, and the sympathy of all his many friends will go to his widow. By Colonel Ransom Pickard's death Exeter has lost a fine citizen and the medical profession a worthy and distinguished member.

Sir HOLBURT WARING, Bt., C.B.E., M.S., F.R.C.S.
We are indebted to Mr. R. W. RAVEN for the following appreciation:

The death of Sir Holburt Waring, whose obituary notice was published in last week's *Journal* (p. 456), diminishes further the number of those outstanding men who played such an important part in guiding and developing British surgery during the first half of this century. Each in his particular way made an important contribution. Few have possessed like him such ability in so many fields, or the clear vision which penetrates so far into the future and the deep convictions providing the motive force for action. He was a dominant figure for many years, and time was granted him after retirement to see many of the results of his labours. As one of those privileged to receive his early surgical training from Sir Holburt, may I offer my tribute to his memory? His old house-surgeons cannot fail to look back with gratitude upon the time we worked for him, when the fundamental principles of surgery were instilled into us and our habits of thought and reactions were consolidated. He set a high standard without leniency and his methods were a ritual. How much we admired his wonderful hands as we watched him examine a patient or assisted him at operations. What a depth of surgical knowledge and experience there was to draw from. In his home we also probed beneath the surface and found a deeper feeling and a friend. He was always greatly interested in the problems of cancer, and his book *The Surgical Treatment of Malignant Disease* is full of his mature surgical wisdom.

Sir WILLIAM DOUGLAS, G.C.B., K.B.E.

The many friends of Sir William Douglas, Permanent Secretary to the Ministry of Health from 1945 to 1951, will have heard with great regret of his death on February 17. He was 62 years of age. We are indebted to Sir WILSON JAMESON for the following appreciation:

When Sir John Maude retired from the office of Permanent Secretary to the Ministry of Health in 1945, most of the preparatory work for the proposed National Health Service had been done. A Bill had been drafted and might well have been presented to Parliament had not the war in Europe come to an end and a Labour Government taken the place of the wartime Coalition. Who was to be the new Parliamentary Secretary? The appointment was nearly as important as that of the new Minister. The choice fell upon Sir William Douglas (Willie Douglas to all his Civil Service contemporaries), and he rather unwillingly left the Ministry of Supply for what he knew would be something of a political storm centre for the next few years. Douglas was a born negotiator. He was attractive in appearance and persuasive in speech. He was in his element as chairman of a conference. No matter how awkward the question put to him or how unpleasant the decision he had to impart, he would give his tie a twist and his head a shake, and the situation would be dealt with in such a way as to cause the least possible ill-feeling. Though he was at times sorely tried by the protracted arguments and discussions with the various sections of the medical profession prior to the appointed

day, he always retained his good humour and his debonair manner. He was a good friend to the doctors, as members of the B.M.A. know very well. I myself could not have wished for a kinder or more helpful colleague. Unlike his predecessor, he rarely put pen to paper. His business was to see people and to talk to them, not to draft letters or memoranda. All his drafting was done for him, and he was fortunate in having such able assistants.

As one would expect, Douglas had lots of friends. He was a good golfer, and no Civil Service golf meeting was complete without him. It was strange, too, how often official business took him north when an international was staged at Murrayfield. He had made all his plans for a happy and useful retirement and had just got well into his stride when his fatal illness overtook him. The Ministry of Health and the medical profession were fortunate in having his help during those critical five years.

Dr. A. ESMEE RUCK was brutally murdered at her home in Kenya on the night of January 24, together with her husband, Mr. Roger Ruck, and their only child, Michael, aged 6 years. Adeline Esmee Ruck, better known to her colleagues by her maiden name of Esmee de Smidt, was born at Cambridge in July, 1920, the only child of Captain F. P. G. de Smidt, a member of the medical profession who had a distinguished career as a bacteriologist, and who served in the Colonial Medical Service in Kenya from 1926 to 1936, when ill-health caused his retirement. Esmee de Smidt was educated at the Limuru Girls' School and at the Kenya High School, and graduated M.B., Ch.B. from the University of Capetown in 1943, thus becoming the first woman pupil of a school in Kenya to graduate in medicine. In 1945 she was appointed a temporary medical officer in Kenya, serving in the Native Civil Hospital, Nairobi, and working chiefly among the children of the Kikuyu tribe. The children, for whom she had a real affection, made up the majority of the patients in the overcrowded ward in which she laboured. A year later she had to give up the work when she became herself a mother. In 1947 she took the D.P.H. at Capetown and returned to Kenya, where in recent years she had conducted a dispensary for Africans in the farming area in which she and her husband had settled. Dr. Ruck had a winning way which tended superficially to cloak her fine intellect. Though never robust in health, she accepted the reverses of life with fortitude and devoted herself to her profession, to her husband, and to their only child. While fully conscious of the danger which surrounded her home, she felt it her duty to remain there and was looking forward to restarting the dispensary for Africans in a few months' time, when her son was due to leave for a boarding-school. That the three should be deliberately and savagely killed in one night is a tragedy indeed for Kenya. Dr. Ruck is mourned by her professional colleagues of all races. She is survived by her invalid widowed mother, to whom our deepest sympathy is extended. —F. J. W.

With the death of Dr. W. W. HORTON on February 4, within a few days of his 95th birthday, one of the few remaining links with the Edinburgh of the 'seventies has been severed. Born on February 10, 1858, Wilfred Winnall Horton was educated at Shrewsbury and at the University of Edinburgh, which he entered in 1875. He graduated M.B., C.M. in 1880, and proceeded M.D. four years later. After holding appointments at a number of mental hospitals, Dr. Horton was in general practice, first in the U.S.A. and then for 20 years at Malvern. In 1915 he entered the R.A.M.C. and was attached to the Gloucestershire Regiment. On being invalided out of the service in 1917 he became medical superintendent of Wye House, a private mental hospital at Buxton, and remained there for 22 years, retiring at the age of 81. On the rare occasions he talked about his early days, Dr. Horton would describe his student years as being a time of transition, especially in surgery.

His reminiscences were full of interest. He had seen operations performed in a carbolic spray produced by a steam kettle; he knew Cunningham as an able demonstrator in anatomy and Huxley as a temporary lecturer—"interesting, but far above the heads of the students most of the time." He remembered James Spence operating in an old frock-coat kept for the purpose and scorning Lister's newfangled antiseptic methods; Lister himself, lecturer in clinical surgery, a revered figure; and finally Joseph Bell, extramural lecturer in surgery, who entertained the students by displaying his remarkable powers of observation and was afterwards immortalized by Conan Doyle in the person of Sherlock Holmes. Dr. Horton was much loved by his patients, both in general practice and in mental hospital work, and he stood for all that is best in the profession to which he belonged for over 70 years.

Dr. E. A. BARTON, a well-known general practitioner in Kensington before his retirement, died at University College Hospital on February 10 at the age of 89. Born on July 12, 1863, the son of the late Dr. A. B. Barton and a nephew of Mr. Berkeley Hill, a surgeon at University College Hospital, Edwin Alfred Barton, who was educated at Harrow, was originally intended for the Army, but he decided to follow in his father's footsteps and studied medicine at University College Hospital, where he qualified in 1887. While holding an appointment as house-physician he had under him as clerks such men as Leonard Hill, George Murray, of Newcastle-upon-Tyne, who became notable for his work on the thyroid, and Herbert Tilley, later well known as a throat specialist. Subsequently he obtained the coveted post of outdoor obstetric assistant. In his book *A Doctor Remembers* he described the dirt, squalor, and drunkenness which were then rife in the districts around University College Hospital. After further hospital work he went into partnership with an elderly doctor in Kensington Square in 1890, and remained in practice in Kensington for 40 years, retiring in 1930. On the outbreak of war in 1914 he offered his services to University College Hospital, where he became anaesthetist to out-patients. Later he became medical officer to the hospital's child welfare department. Dr. Barton had many outside interests, being a keen photographer and fisherman, and a vice-president of the Flyfishers' Club. In addition to the book mentioned above, he wrote *Essentials of Infant Feeding* (1925), *Chalk Streams and Water Meadows* (1933), *Running Water* (1944), and *An Album of the Chalk Streams* (1946). Some years ago he contributed a sincere and impressive article entitled "Death and Euthanasia" to the *University College Hospital Magazine*. He married Margaret E. Pittis in 1895, and she, with their daughter, survives him.

Medical Notes in Parliament

Medical Research in Scotland

The Hospital Endowments (Scotland) Bill was given a second reading in the House of Lords on February 18.

The EARL OF SELKIRK explained that it was based on the recommendations of the Hospital Endowments Commission, which was established to prepare schemes for the regulation of endowments transferred to hospital boards of management under the National Health Service (Scotland) Act. The Commission had recommended that part of these funds should be devoted to research, under an independent trust, and it was estimated that about £120,000 a year would be available for the purpose. There was a wide measure of support for the scheme in Scotland. The Chairman of the Commission, Sir Sydney Smith, had borne in mind that adequate funds must be available to provide reasonable amenities at individual hospitals, and had said that even when a research fund had been provided the hospitals would be reasonably catered for.

The Bill set up the trust, and empowered the Endowments Commissioners to transfer funds to it. The Chairman and members of the trust would be appointed by the Secretary of State, and would probably number about seven. The trust would be able to receive also legacies and gifts. They were to consult an advisory committee, which in the first instance would be the Advisory Committee on Medical Research under the chairmanship of Sir Edward Appleton, Principal of Edinburgh University. This body had links with the Medical Research Council, so that as far as possible there would be no overlapping or difficulty, and information would be circulated as widely as possible.

LORD INMAN attached particular importance to money given for definite purposes being used for those purposes if at all possible, and to the importance of consultation with other research bodies to avoid overlapping.

LORD KINNAIRD asked if the trustees would be able to consider applications for grants for research work in hospitals outside the National Health scheme, and instanced the research work on tuberculosis at two hospitals near Aberdeen run by the Scottish branch of the British Red Cross.

The EARL OF SELKIRK said that it was implicit in the Bill that funds given for specific purposes should not be diverted to uses antagonistic to the donors' intentions. It was clear from the report of the Endowments Commission that there would be adequate funds available for the hospital management boards. The total capital of the funds was about £13m. The purpose of the Bill was to enable the trustees to assist any medical purpose that might be brought to their attention if they thought it worthy of assistance. It mattered not whether the establishment concerned was connected with the National Health Service or was a private hospital, a university, or any other organization, if they considered it most useful to promote a particular type of research.

Proprietary Medicines

Mrs. JEAN MANN asked on February 17 about the amount spent in prescriptions in 1950, 1951, and 1952 on slimming tablets, and what researches the Scottish Office had made to satisfy itself as to the value of these tablets in reducing obesity.

Commander T. D. GALBRAITH replied that detailed information was not available. He had no reason to think that doctors were prescribing drugs which were not of value when taken under medical supervision, in cases where weight reduction was necessary on medical grounds.

Mrs. MANN referred to a report that £400,000 had been spent on slimming tablets, and asked the Minister to confirm whether the tablets really slimmed or merely curbed the appetite.

Commander GALBRAITH replied that "dextrodine," to which Mrs. Mann referred, was quite an effective drug for slimming when used under medical supervision, and slimming was not the only purpose for which it was prescribed.

Mrs. MANN also asked on February 17 what number of patients had transferred from doctors who refused to prescribe advertised proprietary drugs to others who would do so, and if the Secretary of State would protect doctors from this form of pressure.

Commander GALBRAITH told her that no statistics were available. Various forms of publicity had emphasized that it was for the doctor, not the patient, to decide what was to be prescribed, and he looked to the doctors to support one another in this matter.

Dr. EDITH SUMMERSKILL and Mr. A. BLENKINSOP questioned the Minister of Health on February 19 about the prescribing of proprietary medicines, Dr. Summerskill asking whether the Minister's attention had been drawn to the report of the Comptroller and Auditor-General with regard to the heavy prescribing of expensive proprietary drugs, and what action he proposed to take in order to reduce this expenditure in future.

Mr. IAIN MACLEOD replied that all doctors had been urged to help to keep this cost down by prescribing standard drugs wherever appropriate and by not prescribing proprietary drugs which were advertised direct to the public. In the last resort it was in the power of the doctors themselves to help most in this considerable problem, and he was sure that he could count on them to do so. He was considering what further steps could be taken.

Civil Service M.O.s

Dr. A. D. D. BROUGHTON asked the 'Chancellor of the Exchequer why he had not raised the salaries of Civil Service medical officers to conform with the increase in remuneration granted to general medical practitioners under the Danckwerts award. Mr. J. A. BOYD-CARPENTER, the Financial Secretary, who replied, referred him to Mr. Butler's statement last July, to the effect that Mr. Justice Danckwerts's award was confined solely to the remuneration of general practitioners in the National Health Service and had no wider application.

Dr. BROUGHTON pointed out that these medical officers, who performed their responsible duties very efficiently, had been affected like everyone else by the rise in the cost of living. Would the Treasury reconsider the question of revising their salary scales to bring them into line with their professional colleagues in other branches of medicine?

Mr. BOYD-CARPENTER said the salaries of Government servants were kept under constant review. The present scale of salaries of these officers was that recommended by the Howett Committee, which reported as recently as August, 1951.

Toxic Sprays

Sir RALPH GLYN asked the Minister of Agriculture on February 19 whether he would consider issuing immediate circulars to the county agricultural committees advising that no spraying of weeds or any crops with dinitroorthocresol should be carried out without reference to the committees; and whether he would amend the Agriculture (Poisonous Substances) Act to necessitate obtaining a licence before poisonous sprays could be used on land, in view of the damage that was being done to insects, birds, and animals as the result of the application of these chemical substances to large tracts of agricultural land; and whether he would set up a committee, not altogether composed of chemists, to report on the results, during 1952, of the spraying of poisons to destroy noxious weeds.

Sir THOMAS DUGDALE replied that he had no power to require prior notification of spraying, but he was keeping a careful watch on developments. The long-term solution to the problem was the production of equally effective sprays that were not toxic to wild life. Research into this and other aspects was continuing under the supervision of the Agricultural Research Council. He was asking Professor Zuckerman and his Working Party on Precautionary Measures against Toxic Chemicals used in Agriculture to consider the general question of effects on wild life, when they had completed their present study of possible risks to the consumer.

After the Floods

Mr. T. C. PANNELL commented in the debate on the floods on February 19 on Ministry of Health administration. Many people, he said, had lost spectacles, dentures, and surgical appliances, but there seemed to be no clear knowledge whether there would be free replacement. There was also the question of prescription charges.

Mr. HAROLD MACMILLAN, Minister of Housing and Local Government, referring to this in his reply, said that during the emergency period the Minister of Health had used the Nelson technique and turned a blind eye to the giving of prescriptions without charge, and the supplying of artificial teeth or spectacles, perhaps without authority. It would be wise to leave the matter there.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 7 (No. 5) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	16	0	12	0		24	2	14	0	0
Dysentery ..	286	29	117			490	56	78	3	
Encephalitis, acute	4	0	1	0		5	0	0	0	
Enteric fever: Typhoid ..	2	1	0	0	2	5	0	1	1	1
Paratyphoid ..	15	0	0	0	0	6	0	0	0	
Food-poisoning ..	76	11		0		94	6		0	
Infective enteritis or diarrhoea under 2 years ..				11	29				7	29
Measles* ..	31,494	1661	292	92	294	3,386	50	319	160	43
Meningococcal infection ..	45	2	14	1	4	31	1	17	2	2
Ophthalmia neonatorum ..	42	4	5	0		30	2	9	0	1
Pneumonia† ..	2,338	199	253	34	9	1,005	55	308	11	1
Poliomyelitis, acute: Paralytic ..	20	3		0	2	17	3		1	2
Non-paralytic ..	6	0				8	1			
Puerperal fever‡ ..	260	31	13	1		257	46	8	1	2
Scarlet fever ..	1,545	58	270	43	52	1,320	109	241	16	31
Tuberculosis: Respiratory ..			158	31				157	35	
Non-respiratory ..			30	1				25	4	
Whooping-cough ..	2,571	131	204	44	134	2,652	83	345	120	53

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	1	0		0	0
Dysentery ..	0	0		0		2	1		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	10	0	0	0	1	18		1	0	2
Influenza ..	446	89	2	2	2	47	9		3	0
Measles ..		0	0	0	0		0		0	0
Meningococcal infection ..		0	0				0			
Pneumonia ..	667	138	21	20	9	341	59		18	9
Poliomyelitis, acute	3	0			1	4	0			
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis: Respiratory ..	150	27	15	1	8	170	20	21	4	6
Non-respiratory ..										
Whooping-cough ..	3	0	0	0	1	4	0		0	0
Deaths 0-1 year ..	291	42	33	10	9	275	25	38	10	17
Deaths (excluding stillbirths) ..	8,252	1,545	601	142	177	6,938	1,008	837	168	216
LIVE BIRTHS ..	7,155	1,037	876	202	389	7,457	1,117	857	208	329
STILLBIRTHS ..	179	28	19			185	22	26		

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

Vital Statistics

Births and Marriages in 1951

In England and Wales there were 677,529 live births in 1951, giving a birth rate of 15.4 per 1,000 population.¹ This was a decrease of 0.4 from the rate for 1950, when there were 697,097 live births. The average rate for the years 1936-40 was 14.7 per 1,000. There were 32,771 illegitimate live births, comprising 4.8% of the total number of live births. Stillbirths numbered 15,985; this gave a rate of 23 per 1,000 total live and stillbirths—the same as for the previous three years.

There were 360,624 marriages. This figure gives a rate of 16.4 persons married per 1,000 population. A feature of these marriages was their peak in March. Over 21% of the year's marriages were celebrated in that month. The nearest approach to this was in 1950, also in March, when the figure was 14%. These peaks of incidence are much influenced by the date of Easter and of the end of the income-tax year.

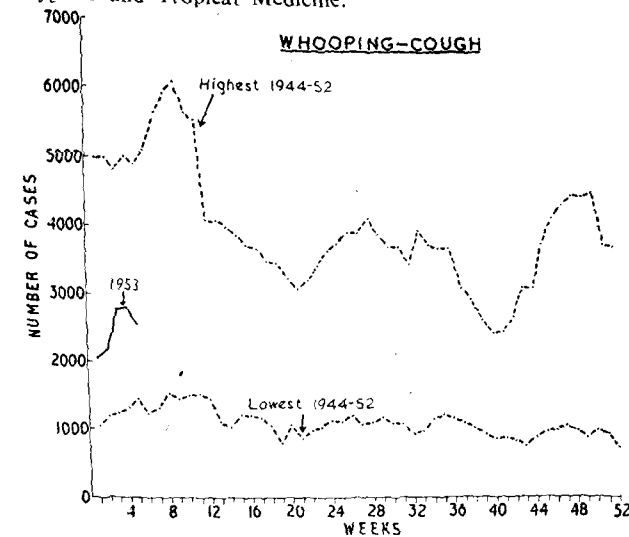
The number of new petitions for divorce rose from 29,729 in 1950 to 38,382 in 1951. (The facilities provided by the Legal Aid and Advice Act, 1949, became available from October 2, 1950.) The number of dissolutions and annulments of marriage made absolute was 28,767. Of these, 2,970 related to marriages of less than five years' duration, 9,063 to marriages of 5 to 10 years' duration, 7,011 to marriages of 10 to 15 years' duration, 4,047 to marriages of 15 to 20 years' duration, and 5,676 to marriages of 20 years and over. In 9,895 cases there were no children of the marriage, in 9,678 cases there was one child, and in 5,197 cases there were two children.

50,339 confinements took place within eight and a half months of marriage, and of these 35,997 occurred within six and a half months of marriage.

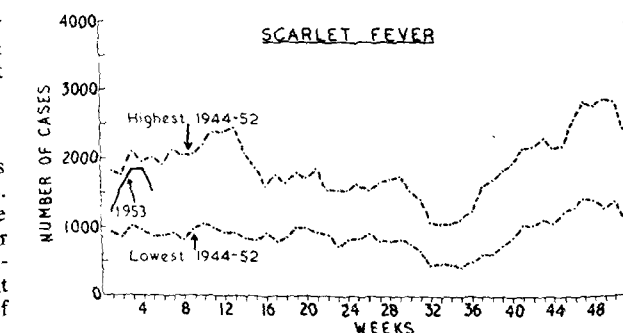
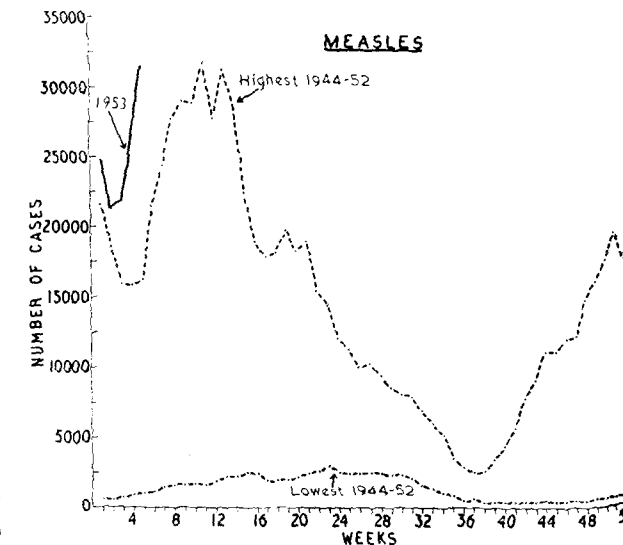
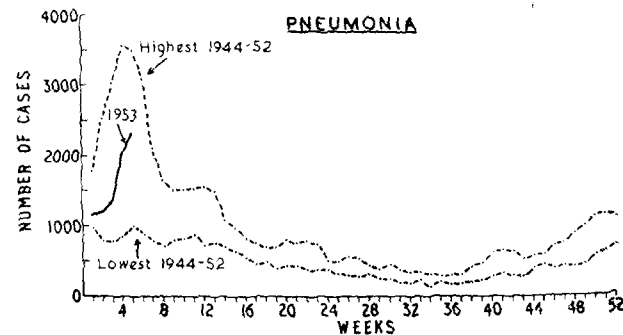
Under the Legitimacy Act, 1926, 2,596 births originally registered as illegitimate were re-registered as legitimate on the subsequent marriage of the parents. This is the lowest number in any year since the operation of the Act.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ————, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



¹Registrar-General's Statistical Review, 1951, Tables, Part II. Civil. H.M.S.O. 5s.



Infectious Diseases

In England and Wales during the week ending February 7 notifications of measles increased by 5,034, from 26,460 to 31,494, and acute pneumonia by 309, from 2,029 to 2,338; while decreases of 305 were recorded for scarlet fever, from 1,850 to 1,545; 228 for whooping-cough, from 2,799 to 2,571; and 149 for dysentery, from 435 to 286.

The largest rises in measles notifications during the week were 577 in Surrey, from 908 to 1,485; 358 in Kent, from 1,082 to 1,440; 313 in Derbyshire, from 733 to 1,046; and 235 in Hertfordshire, from 640 to 875. The largest decrease in the incidence of scarlet fever was 44 in Yorkshire West Riding, from 185 to 141. The largest fluctuations in the trends of whooping-cough were a rise of 39 in Yorkshire West Riding, from 239 to 278, and a fall of 48 in Wiltshire, from 63 to 15. 16 cases of diphtheria were notified, 8 fewer than in the preceding week; 4 cases were notified in Wales compared with none in the previous week.

15 cases of paratyphoid fever, 8 more than in the preceding week, were notified. The rise was mainly contributed by Wales, where 11 cases, 10 more than in the previous week, were notified. The chief centre of infection was Caernarvonshire, Bangor M.B., 6.

26 cases of acute poliomyelitis were notified during the week; these were 2 fewer for paralytic and 1 fewer for non-paralytic cases than in the preceding week. The largest returns were Somersetshire 4 and London 3.

The largest returns for dysentery were Lancashire 65 (Liverpool C.B. 19, Oldham C.B. 10); Lincolnshire 37 (Grimsby C.B. 30); London 29 (Chelsea 6); Yorkshire West Riding 24 (Barnsley C.B. 15); Essex 22 (East Ham C.B. 19); and Middlesex 19 (Edmonton M.B. 13).

The deaths from influenza in the great towns numbered 446, being 133 more than in the previous week. 61% of the deaths were registered in London and the south-east region.

Influenza

There were 530 deaths from influenza in the great towns of England and Wales in the week ending February 14. This is an increase of 84 over the previous week's total of 446. The northern half of the country experienced a greater increase than the southern, though the majority of the deaths (274) occurred in London and the south-east. First claims on the Ministry of National Insurance were falling in London and the south, but showed a moderate rise in the north. Since the beginning of the year there have been 1,544 deaths from influenza in the great towns compared with 237 in 1952 and an estimated 6,460 in 1951.

Week Ending February 14

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,515, whooping-cough 2,238, diphtheria 24, measles 32,359, acute poliomyelitis 17, dysentery 320, paratyphoid fever 6, and typhoid fever 4.

The measles notifications constitute the highest weekly total to be recorded since notification was made compulsory in England and Wales in 1940.

Medical News

N.H.S. Estimates.—The cost of the Health Service in Britain for the next financial year (1953-4) is estimated at £416,480,360. This is a reduction of over £22m. on the estimates for the current year.

Royal College of Surgeons in Ireland.—The time-honoured Charter Day Dinner of the Royal College of Surgeons in Ireland was held on February 14 in the Large Hall of the College. Some 180 Fellows and their guests attended. Before the dinner Sir Gordon Gordon-Taylor was admitted to the Honorary Fellowship of the College by the President, Mr. Michael Burke. In presenting Sir Gordon for admission Mr. William Doolin, the Secretary of the Council, described his name as already "almost a legend, intimately associated with certain of the less frequent, more daring, not to say heroic, procedures in modern surgery." They welcomed him, too, as a Scotsman, for that "subtle blend of Celtic qualities which so often puzzle the Sassenach—the high courage and temper of the Highlander and the sentimental humour of the Lowlander." At the dinner, the toast of "Our Guests" was proposed by Mr. Ian Fraser, Vice-President, and was replied to by Sir Gordon in a characteristically graceful speech. The toast of "The College" was proposed by Dr. Edward Freeman, P.R.C.P.I., and was responded to by the President, Mr. Burke.

Surgeons' Hall of Fame.—The International College of Surgeons is planning a Surgeons' Hall of Fame at its Chicago headquarters to commemorate illustrious surgeons and their work. A large mansion has been acquired for the purpose, and a board of 12 trustees, of whom Sir Zachary Cope is one, has been appointed. An electoral college, composed of representatives from all over the world, will decide which surgeons are to be honoured in the Hall. The International College of Surgeons has about 10,000

members, drawn from 71 nations; about half its membership is from the United States. The College was founded in 1935 by Dr. Max Thorek in Geneva, and in 1940 moved to America.

Local Medical Societies.—Recent meetings have included the following: *Manchester Medical Society.*—On January 13 three short papers were read to the Section of Surgery on "Continuous Scoline for Relaxation in Abdominal Surgery" (Dr. M. Swerdlow), "The Effects of X-ray Contrast Media in the Arterial Circulation" (Mr. R. P. Jepson), and "Pneumomediastinum following Block Dissection of the Neck" (Mr. H. F. Smith). On January 14 Professor L. J. Witts read a paper on "Ulcerative Colitis" to the Sections of Medicine and Pathology. During it he referred to an M.R.C. therapeutic trial of cortisone, which it was hoped would eventually settle whether cortisone was indicated in that disease. Hospitals from five regions were co-operating in the trial. *Devon and Exeter Medico-Chirurgical Society.*—On January 15 Mr. C. C. Jeffery gave an address on "The Closed Treatment of Fractures of the Forearm." On February 5 Dr. C. J. Fuller read a paper drawing attention to a small group of cases in which dysphagia is associated with lung complications. There was always an oesophageal anomaly of some kind, and pulmonary infection occurred by spilling over of oesophageal contents. *Liverpool Medical Institution.*—On January 22 a pathological meeting was held. Dr. A. H. Cruickshank described a case of Chiari's disease; Dr. K. McCarthy read a short paper on "Generalized Vaccinia," in which he described a rare and fatal case in a child who had no globulin in her serum, failed to develop neutralizing antibodies, and had a persistent viraemia up to her death seven weeks after vaccination; Dr. M. K. Alexander described a fatal case of the Stevens-Johnson syndrome with fibrinoid necrosis of the arterioles in the stomach, liver, and spleen. On February 12 Mr. Ronald Edwards gave an address on "The Present Position of the Surgery of the Heart and Great Vessels." *Chelsea Clinical Society.*—On February 10 there was a discussion on the importance of leisure, opened by Mr. John Betjeman, and continued by Sir Heneage Ogilvie and Mr. Gilbert Harding. *North of England Obstetrical and Gynaecological Society.*—On February 20 there was a joint discussion in Liverpool with the *North-western Tuberculosis Society* on "Tuberculosis and Pregnancy." The opening speakers were Dr. G. S. Erwin and Dr. S. J. Barr.

Journal of Clinical Nutrition.—The first number of a new international journal on nutrition, the *Journal of Clinical Nutrition*, has now appeared from America. With Dr. S. O. Waife as its chief editor, it numbers Sir Edward Mellanby, F.R.S., and Dr. A. P. Meiklejohn among its corresponding editors. It will be published bi-monthly at a sterling subscription rate of 55s., post free, Messrs. Baillière, Tindall & Cox being the agents for it in the Commonwealth. Success for the new venture probably depends on the journal's ability to live up to its name. Lately, in some journals on nutrition, there has been a tendency for contributions on agricultural subjects to outnumber those with a medical bias. The new periodical could usefully help to restore the balance.

William Hyde Award.—Dr. Richard Scott has recently received the William Hyde Award for 1951, valued at £300, for his work with students at Edinburgh. The award is made from funds provided by the Nuffield Foundation in memory of the late Mr. William Hyde, who played a prominent part in the establishment of the Nuffield Provincial Hospitals Trust. Dr. Scott is physician in charge of the Royal Dispensary, Edinburgh, which is now used as a teaching general practice.

Emergency Bed Service: Applications and Admissions.—During the seven days ending February 23 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 1,472, of whom 84.29% were admitted. The yellow warning was cancelled from February 19, and the white warning was issued the same day.

Dr. C. E. Dent, reader in medicine in the University of London, is visiting the Universities of Florence and Rome for a week from March 3 under arrangements made by the British Council. He is to speak on chromatography.

Mr. John Foster, senior clinical lecturer in ophthalmology at Leeds University, has been invited to lecture at the University of Barcelona and at the Triennial Congress of Ophthalmology at Buenos Aires in April.

The closing date for applications for the **Anglo-French Exchange Bursaries** described recently in this column (see January 17, p. 169) is March 31.

COMING EVENTS

C.M.F./M.E.F. Physicians Reunion Dinner will be held on March 28 at Simpson's-in-the-Strand, with Dr. D. Evan Bedford in the chair. Further information can be obtained from Dr. A. Willcox, 59, Harley Street, London, W.1.

Laboratory Animals Bureau Congress.—The Sixth Laboratory Animals Bureau Congress is to be held at the Royal Veterinary College, London, N.W.1, on March 27 and 28. The congress, which will consist of three sessions, will be opened by Sir Harold Himsworth, and the chairmen at the three sessions will be Professor S. P. Bedson, F.R.S., Dr. R. Lovell, and Professor R. E. Glover respectively.

NEW ISSUES

British Journal of Ophthalmology.—The next issue (Vol. 37, No. 3) will be available in a week's time. The contents include: CENTRAL AREOLAR CHOROIDAL SCLEROSIS. A. Sorsby and R. P. Crick. CENTRAL SENILE AREOLAR CHOROIDAL SCLEROSIS: A HISTO-PATHOLOGICAL STUDY. Norman Ashton. SPECTRAL SENSITIVITY CURVES AND THE ABSORPTION OF LIGHT BY THE OCULAR MEDIA. R. A. Weale. OCULAR REACTION TO LENS PROTEIN: A PRELIMINARY STUDY. F. W. Law. QUANTITATIVE STUDY OF VISUAL AFTER-IMAGES. C. A. Padgham. MANDIBULO-FACIAL DYSOSTOSIS. A. H. Briggs. SCLERAL RESECTION—LAMELLAR OR PENETRATION? C. Dee Shapland. JOHN DALTON, F.R.S., D.C.L., LL.D., CAPTAIN JOSEPH HUDDART, F.R.S., AND THE HARRIS FAMILY. HISTORICAL NOTES ON CONGENITAL COLOUR BLINDNESS. I. W. Czerar and J. A. Ross. INTRA-OCULAR OPERATIONS IN EGYPT. A. M. Girgis. INJURY SIMULATING CONGENITAL ANOMALY. L. Staddon-Cook.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

Details in this column are necessarily brief. Further information and tickets where required (marked ●) should be obtained from the institution concerned.

Monday, March 2

INSTITUTE OF NEUROLOGY.—5 p.m., Professor R. W. Russell: Comparative Study of the Effect of Electric Shock Convulsions on Behaviour. **MEDICAL SOCIETY OF LONDON.**—8.30 p.m., Lettsomian Lecture by Dr. E. R. Cullinan: Some Disorders of the Liver and Bile Passages.

Tuesday, March 3

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor E. P. Sharpey-Schaefer: Causes of Hypotension in Man. **INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. S. Thomson: Animal Diseases, etc. **WEST END HOSPITAL FOR NERVOUS DISEASES.**—5.30 p.m., Dr. G. Parsons-Smith: Neurological demonstration.

Wednesday, March 4

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Animal Parasites in Dermatology. **INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.**—5.30 p.m., Dr. B. Larsen (Denmark): Occupational Deafness, Including Some Remarks on Auditory Fatigue and Adaptation. **INSTITUTE OF UROLOGY.**—At St. Paul's Hospital, W.C., 4.30 for 5 p.m., Dr. C. Dukes: Pathology of Calculous Disease. **LIVERPOOL MEDICAL INSTITUTION.**—At Manchester University, 5 p.m., joint meeting with Manchester Medical Society. Dr. E. N. Chamberlain: Rheumatic Carditis; Retrospect and Prospect; Mr. J. H. Hughes: Gastroscopy: a Retrospective Evaluation. **MIDLAND MEDICAL SOCIETY.**—At Birmingham Medical Institute, 8.15 p.m., joint meeting with Midland Counties Veterinary Association. Deficiency Diseases in Animals and Man. **OXFORD UNIVERSITY.**—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Sir James Larnmonth: Reflections on Portal Hypertension.

Thursday, March 5

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor G. W. Pickering: Natural History of Essential Hypertension. **FACULTY OF HOMOEOPATHY.**—5 p.m., Dr. Grace H. Newell: Homoeopathy in Gynaecological Disorder.

INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. J. A. Fraser Roberts: Genetic Background of the Dull Child. **LONDON UNIVERSITY.**—At St. Mary's Hospital Medical School, 5 p.m., Professor P. Mallet-Guy (Lyons): Les Opérations npathiques dans le Traitement des Pancréatites Chroniques Récidivantes (illustrated). **ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.30 p.m., Otolaryngology Lecture by Professor E. C. Dadds: Biochemistry of Endolymph, Perilymph, and Cerebrospinal Fluid. **St. ANDREWS UNIVERSITY.**—At Physiology Department, Dundee, 5 p.m., Dr. G. W. Corner: Embryology of Twins, Triplets, Quadruplets, and Quintuplets. **UNIVERSITY COLLEGE.**—At Physiology Theatre, 4.45 p.m., public lecture by Professor V. B. Wigglesworth, F.R.S.: Chemical Aspects of Insect Physiology.

Friday, March 6

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. H. J. Wallace. **LONDON UNIVERSITY.**—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor G. F. Martian, D.Sc., F.R.S.: Some Aspects of the Metabolism of the Steroid Hormones. **ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS.**—5 p.m., John Shields Fairbairn Memorial Lecture by Mrs. Ruth Graham (Boston, Mass.): Value of Vaginal Smear to the Gynaecologist. **ROYAL MEDICAL SOCIETY, Edinburgh.**—8 p.m., Mr. J. C. Menzies: Obesity. **ROYAL SANITARY INSTITUTE.**—At Town Hall, Keighley, 10 a.m., Dr. H. M. Holt: Educational Aspects of a Clean Food Campaign; Mr. T. Lindsay: Some Practical Effects of a Clean Food Campaign.

Saturday, March 7

MIDLAND TUBERCULOSIS SOCIETY.—At Chest Clinic, 151, Great Charles Street, Birmingham, Professor Thomas McKeown: Inheritance and Environment in Tuberculosis.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—F. J. Hebbert, M.D., F.R.F.P.S., Assistant Physician (Geriatrics), Norwich and East Norfolk Area; G. McD. A. Turner, M.B., Ch.B., Medical Registrar, Newmarket General Hospital. **HENDERSON, WILLIAM GORDON, M.B., Ch.B.,** Junior Lecturer in Bacteriology, London Hospital Medical School. **O'CONNOR, MAURICE F. A., M.Ch., D.P.H., D.L.O.,** Assistant Ear, Nose, and Throat Surgeon, Jervis Street Hospital, Dublin. **SOUTH-WESTERN REGIONAL HOSPITAL BOARD.**—Brenda James, M.B., B.S., D.C.H., Paediatric Registrar, Southmead Hospital, Bristol; Stephanie Saville, M.B., B.Ch., Anaesthetic Registrar, Bath Group of Hospitals; A. Chalmers Fleming, M.B., B.S., Deputy Medical Superintendent, Horsham Hospital, Almondsbury, near Bristol; I. K. Trotter, M.R.C.S., L.R.C.P., D.A. (Part I), Anaesthetic Registrar, Frenchay Hospital, Bristol; W. Lumsden Walker, M.B., Ch.B., D.P.H., D.P.M., Senior Registrar in Psychiatry, Moorhaven Hospital, Ivybridge; C. E. C. Wells, M.B., B.S., M.R.C.P., Medical Registrar, Southmead Hospital; J. N. Hoffman, M.B., B.S., Registrar in Diseases of the Chest, Bristol Clinical Area; S. L. Paton, M.B., Ch.B., Registrar in Orthopaedic and Traumatic Surgery to Mount Gold Orthopaedic Hospital and to Traumatic Centre at the General Hospitals, Plymouth; R. A. Yorston, M.B., Ch.B., Registrar in Ear, Nose, and Throat Surgery to Bath Group of Hospitals.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Gray.—On February 9, 1953, at University College Hospital, London, W.C., to Jean (formerly Leader), wife of Dr. Ian Ramsay Gray, a daughter. **Jennett.**—On February 20, 1953, at the Liverpool Maternity Hospital, to Sheila M. Pope, M.B., Ch.B., wife of Mr. W. Bryan Jennett, M.B., F.R.C.S., a son. **Turner Warwick.**—On January 21, 1953, at the Middlesex Hospital, London, W., to Margaret (formerly Harvey Moore), M.R.C.P., wife of Richard Turner Warwick, F.R.C.S., a daughter.

DEATHS

Brown.—On February 4, 1953, at Woodbridge Hill, Guildford, Surrey, Osmond Hayman Brown, M.R.C.S., L.R.C.P., aged 59. **Browne.**—On February 11, 1953, James M. Browne, M.B., B.Ch., D.O., of North House, Oakley Road, Bromley Common, Kent, aged 83. **Bunting.**—On February 9, 1953, Gerald Lantbery Bunting, M.D., of 16, Pembury Road, Worthing, Sussex, late of Tonbridge and Crowborough. **Cooke.**—On February 3, 1953, at the Radcliffe Infirmary, Oxford, Edward Robert Cecil Cooke, M.C., M.R.C.S., L.R.C.P., of Little Milton, Oxford, aged 66. **Corsellis.**—On February 8, 1953, at Glamis Lodge, Priton-on-Sea, Essex, Ernest Shawe Corsellis, L.R.C.P.&S.I. **Gibson.**—On January 27, 1953, John McCoy Gibson, M.B., B.Ch., D.O.M.S., of Mitcham Lane, Streatham, London, S.W., aged 77. **Grey.**—On February 9, 1953, at Bristol, Harry Grey, M.D., formerly of Edinburgh, aged 83. **Hunt.**—On February 6, 1953, Arthur Douglas Hunt, M.D., of 47, Wellington Road, Bournemouth, and late of Park Grange, Duffield Road, Derby, aged 72. **Jupp.**—On February 8, 1953, at 6, Haven View Road, Seaton, Devon, Edgar Norman Jupp, M.R.C.S., L.R.C.P., aged 77. **Mann.**—On January 30, 1953, in London, Dora Mann (Mrs. Clec), M.D., of 16, Salisbury Place, London, W., and Irwinleigh, Ascot, Berks. **Pain.**—On January 25, 1953, in hospital, Thornhill Coles Pain, L.M.S.S.A., formerly of New Kent Road, London, S.E. **Petty.**—On January 20, 1953, in Buenos Aires, Argentina, Michael Joseph Petty, G.B.E., M.D., F.R.C.S. **Stalkart.**—On January 31, 1953, at Kenilworth, Portsmouth Hill Road, Cosham, Hants, Walter Henry Skinner Stalkart, M.D., F.R.C.S.Ed., Surgeon Rear-Admiral, R.N., retired. **Thornett-Johnson.**—On January 30, 1953, at 22, St. George's Road, St. Margaret's-on-Thames, Middlesex, Marian Thornett-Johnson, F.R.C.S.I. **Wylie.**—On February 4, 1953, at 3, Hillway, Holly Lodge, Highgate, London, N., John Robert Wylie, M.B., B.S., D.M.R.E.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Is Penicillin Alone Enough for Syphilis?

Q.—Is it true that penicillin alone is adequate treatment for syphilis in all stages? If not, what ancillary treatment is advised?

A.—Many series of cases have so far been reported in which penicillin alone has proved to be adequate in the treatment of syphilis. In the small percentage of failures following treatment for primary or secondary syphilis there is much confusion about whether the reappearance of active lesions was due to reinfection or relapse. It is impossible to give a dogmatic opinion at this stage. Most workers in this country continue to give ancillary treatment consisting in one or two ten-week courses of bismuth, or one course of neoarsphenamine and bismuth. The writer gives one course of bismuth only.

The results obtained in neurosyphilis with penicillin combined with fever therapy are no better than with penicillin alone, but better results are claimed in the treatment of interstitial keratitis in young children with the concomitant administration of cortisone.

Diabetic Drivers

Q.—Recent successful police prosecutions of diabetic motor-drivers suffering from hypoglycaemia due to insulin administration have prompted local road haulage depots to enquire whether they should continue to employ as drivers diabetics receiving insulin. (1) What advice should be given to the haulage depots? (2) What is the legal definition of a drug, and is insulin one? (3) What clinical or other criteria should be adopted in deciding whether an individual diabetic should be advised not to drive a car?

A.—(1) Haulage depots should be advised to insist upon a medical examination of applicants for employment as drivers of haulage vehicles; ideally, a periodical re-examination of drivers should form part of the medical arrangements of each firm of contractors. Every applicant for employment as a motor-driver should in the first instance provide evidence from a medical practitioner on his fitness to drive a motor vehicle, and in default should be requested to submit himself to a medical examination by a practitioner nominated by the prospective employer. This examination would be conducted only when the prospective employer was satisfied with the candidate in all other respects: that is to say, the applicant would be appointed subject to passing a medical examination.

(2) There is no comprehensive legal definition of a drug. A drug is regarded as medicine for internal or external administration, and this definition would include insulin.

(3) This question has been to a large extent answered by a recent letter in the *Journal* from Dr. R. D. Lawrence (September 13, 1952, p. 616).

The most important consideration in deciding whether a diabetic is fit to drive a car, is his ability to recognize hypoglycaemia in its earliest stages and to take the necessary steps to remedy it. In addition, he should always take his proper amount of carbohydrate food at the proper time, and never drive without adequate supplies of carbohydrate food in his car. Diabetics who are liable to frequent insulin reactions, and especially those in whom they are liable to occur without adequate warning, should be advised not to drive, both in their own interests and in that of the public.

Chloramphenicol Ointment in Blepharitis

Q.—In the treatment of recurrent blepharitis by chloramphenicol ointment, is there any likelihood of either local sensitivity or drug-fastness developing?

A.—Experience so far has not shown any local reactions to the use of 1% chloramphenicol ointment. As this preparation is not used, and need not be used, for any length of time the possibility of developing drug-fastness hardly arises. There seems to be no valid reason for using chloramphenicol for blepharitis, as this affection is generally due to Gram-positive organisms which respond well to penicillin ointment. No local remedy is completely satisfactory in blepharitis, for the general health is usually unsatisfactory, and recurrences are common unless this receives attention.

Oestrogens for Mumps Orchitis

Q.—Is stilboestrol of value in the prevention and treatment of mumps orchitis? Hoyne, Diamond, and Christian¹ in the U.S.A. originally wrote in favour of it, but Candel² did not seem to think it worth while. Micks³ says of it: "Clinical trials have not yet (1949) been extensive enough to prove or disprove this claim."

A.—Little further work has been carried out on this form of therapy, and none of it is entirely satisfactory. There would appear to be no reason to expect oestrogen therapy to modify the course of a virus infection, and the best preventive measure against orchitis is probably the administration, where available, of convalescent serum or the gamma globulin prepared from it. When orchitis is established, efficient local cooling and support remain the most effective treatment.

REFERENCES

- ¹ Hoyne, A. L., Diamond, J. H., and Christian, J. R. (1949). *J. Amer. med. Ass.*, 140, 662.
- ² Candel, S. (1951). *Ann. intern. Med.*, 34, 20.
- ³ Micks, R. H. (1950). *Essentials of Materia Medica, Pharmacology, and Therapeutics* (5th edition). London.

Implantation of Hormone Pellets

Q.—What is the technique of subcutaneous implantation of hormone pellets? How are the pellets sterilized?

A.—The pellets are supplied already sterilized and each is contained in a sterile sealed tube between plugs of cotton-wool. With the aid of a file the tube is snapped across one of the plugs, which is removed, thereby withdrawing with it any minute particles of glass which may be present. The pellet should not be removed at this stage. Should the pellet become contaminated it may be sterilized by boiling in water in a test tube. The technique of injection is as follows:

Open or Incisional Method.—An incision 1 to 1½ in. (2 to 4 cm.) in length is made in the subcutaneous tissue of the abdominal wall or of the infrascapular region. Strict asepsis is necessary, for sepsis, apart from its usual disadvantages, causes the pellets to be extruded. A small pocket, ½ to 1 in. (1 to 2 cm.) deep, is made by blunt-dissection in the subcutaneous tissue. The pellet is dropped into the pocket from its container and is gently pushed to the bottom with blunt forceps. If more than one pellet is to be implanted several pockets are made and a pellet is inserted into each. The wound is then closed with sutures.

Injector Method.—The injector is a blunt-ended or sharp-pointed trocar and a cannula of a bore just sufficiently wide to take a cylindrical pellet. The skin is cleaned, with a tenotomy knife a small incision is made slightly longer than the diameter of the cannula, and the trocar and cannula are pushed into the subcutaneous tissue at an angle of about 45 degrees. The trocar is withdrawn, and the pellet is dropped into the cannula from the container and gently pushed home with the trocar. If several pellets are to be inserted the position of the instrument should be changed slightly after each insertion so that they are separated from each other. The incision is closed with a suture.

Elliptical Pupils

Q.—Why are the pupils of some animals oval instead of round?

A.—In photography it is usual to reduce the aperture of the lens when it is required either to improve definition or to increase depth of focus. Usually the reduction of the aperture requires a longer exposure to be given because the image formed by the lens has suffered a loss of brightness. If photographs were being taken of objects the contour of which lay in a horizontal, or nearly in a horizontal, plane, then if increased definition or depth were required the usual method would be to use a smaller circular aperture and to increase the exposure as for normal subjects. There is, however, in this case an alternative method available—namely, to use an elliptical aperture with its long axis horizontal. Thus, suppose this to measure 8 mm. long by 2 mm. high, then the definition and depth for horizontal or nearly horizontal lines would correspond to those of a 2-mm. diameter circular aperture, but the light-transmitting power would correspond to that of a 4-mm. diameter circular aperture, since this has the same area as the ellipse. If photographs were wanted of objects with vertical contours, then the correct procedure would be to use an elliptical aperture with its long axis vertical. Similar reasoning applies to the eye, and those animals, like cats, to whom the outlines of tree trunks and the openings in fencing, etc., are important could with advantage have irises with elliptical apertures, the long axis being vertical. On the other hand, those animals, like cows, sheep, or goats, to whom the lie of the land is important could with advantage have the long axis of the ellipse horizontal.

Toxic Effects of Amphetamine

Q.—What toxic effects may arise from prolonged use of dexamphetamine sulphate? I am particularly interested to know whether there is any risk of blood or hepatic changes, chronic dyspepsia, carcinogenesis, and such-like serious effects.

A.—The actions and toxic effects of dexamphetamine sulphate are similar to those of amphetamine sulphate, but the D-isomer is claimed to be effective in smaller dosage. Both substances have been safely used for lengthy periods in narcolepsy or obesity in doses up to 60 mg. daily. The development of psychoses has been reported, as for example in the man of 49 who had taken 250 mg. daily for five years. Reports have also appeared of damage to bone marrow: pancytopenia occurred in a girl of 21, and acute aplastic anaemia in a man of 26 who took 290 mg. during 19 days. Habituation may also occur, though this is probably not very common. Withdrawal symptoms observed included hallucinations, restlessness, and insomnia. These symptoms, together with anorexia, may be expected to follow prolonged administration in most patients. Many of those receiving amphetamine possess personality defects and may be especially prone to exhibit these side-effects. Tachycardia and hypertension have also been reported, but I am not aware of any evidence of carcinogenesis or liver damage from prolonged use of dexamphetamine.

Benign Prostatic Enlargement

Q.—What is the cause of benign enlargement of the prostate?

A.—The exact cause of benign enlargement of the prostate is not known, but it is probably related to hormonal imbalance. This is suggested by the fact that the enlargement begins to manifest itself most commonly at a period when testicular activity begins to decline. Other indications of the close association of testicular hormones with prostatic disease are provided by clinical evidence of the control of prostatic carcinoma by oestrogens and by castration, and the fact that while prostatic disease is quite common in dogs it does not occur in those which have been castrated.

It seems not improbable, therefore, that prostatic disease in man will eventually be treated, or at least prevented, by hormonal therapy, instead of by surgery, but at the present time the results of both androgenic and oestrogenic treatment are disappointing. We seem to be near the mark, but not quite there.

Khellin in Bronchospasm

Q.—Is oral khellin effective in the treatment of bronchospasm? Are there any dangerous toxic effects which contraindicate its use? Is it safe for children?

A.—One of the pharmacological actions of khellin is a marked bronchodilator effect on guinea-pig bronchi.¹ Its clinical effect on humans is variable, but it can relieve bronchospasm, and its effect and that of adrenaline are, to a certain extent, additive. It is much more effective when given parenterally; the onset of its action is delayed and may be prolonged over 24 hours after a single intramuscular injection. The incidence of side-effects after oral use is only slightly lessened by using enteric-coated tablets, and in a recent trial² nausea, anorexia, and vomiting occurred in a high proportion of patients: nausea occurred in 65%—to a prohibitive degree in 32%, and sufficient to necessitate a suboptimal dose in 22%. The difficulty of maintaining an adequate dosage by the oral route limits the value of the drug, and for this reason it is inadvisable to give it to children.

REFERENCES

1. Anrep, G. V., Barsoum, G. S., and Kenawy, M. R. (1949). *J. Pharm. Pharmacol.*, 1, 164.
2. Kennedy, M. C. S., and Stock, J. P. P. (1952). *Thorax*, 7, 43.

NOTES AND COMMENTS

Troublesome Cough in a Child.—Dr. M. C. WATKINSON (Blackburn) writes: With regard to your question and answer on this subject ("Any Questions?" February 14, p. 413), troublesome night cough in children is one of the commonest problems I encounter in the baby clinics here, and I have worked out a rather homely method of treatment which rarely fails to be effective and which may help the doctor who made inquiry about the condition. First, I advise the mother to give drinks of lemon and honey (home prepared) to the child throughout the day and a spoonful of honey to be sucked slowly just as the child is going to bed. The bedroom window should be closed at least an hour before bedtime and kept closed during the night. Also, if possible, the room should be warmed by a small electric fire for 45 minutes or so before putting the child to sleep. The menthol rubbing ointments applied to chest and throat after the warm bath are helpful too. With my own children I find that this combination of therapies is usually sufficient, but if we hear the cough start during the night we switch on the electric heater for about half an hour, and as the room warms up again the cough ceases. Where, despite these measures, cough persists and is troublesome, I prescribe syrup of codeine phosphate according to Young's formula and using 2 drachms (7 ml.) as the adult dose. I did this at first with great trepidation after reading the Refresher Course article on "Acute Bronchitis" (*British Medical Journal*, 1951, 1, 827). I find, however, that, as the author of the article stated, codeine is quite well tolerated by even small children. Certainly I should use it in preference to chloramphenicol.

Correction.—Mr. H. K. McCOMB writes: With regard to your report in the medico-legal column (February 21, p. 461) concerning an action for negligence against "the surgical registrar" of Mayday Hospital, I would point out that there is more than one surgical registrar at that hospital.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London*. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London*. B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

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ISONIAZID IN THE TREATMENT OF PULMONARY TUBERCULOSISSECOND REPORT TO THE MEDICAL RESEARCH COUNCIL BY THEIR
TUBERCULOSIS CHEMOTHERAPY TRIALS COMMITTEE*

In February, 1952, the Medical Research Council appointed their Tuberculosis Chemotherapy Trials Committee to plan a clinical trial of isonicotinic acid hydrazide (isoniazid) in pulmonary tuberculosis. Selected hospitals were invited to co-operate, and the first patient started treatment on March 29, 1952. The trial is still continuing and has expanded steadily. The number of participating hospitals now stands at 52, and more than 1,100 patients are undergoing, or have undergone, prescribed courses of treatment and observation.

The trial was designed so that monthly progress reports on each patient could be collected, and the accumulated information reviewed, from week to week. This continual review of results in a large number of patients has not only facilitated early publication of reports, but also enabled the Committee to stop the allocation of some treatments and to introduce others during the course of the trial.

The first report of the Committee was published on October 4, 1952 (Medical Research Council, 1952). It compared the value of isoniazid with that of streptomycin + P.A.S. in the treatment of pulmonary tuberculosis, in a series of 331 patients after three months' observation and treatment. The report suggested that over this period isoniazid lay within the same range of efficacy as streptomycin + P.A.S. It demonstrated, however, a frequent and rapid development of bacterial resistance to the drug and showed that this was a serious problem, since it affected the response to treatment.

The present report studies the effects of streptomycin combined with isoniazid; it compares this treatment with those investigated in the first report—namely, streptomycin + P.A.S. and isoniazid alone. The progress of a total of 364 patients who were treated for three months is now presented. They were divided at random on entry to the trial into three series receiving one or another of the three treatments.

The list of the 40 hospitals which have contributed cases for this analysis, and the names of the co-operating clinicians, bacteriologists, and pathologists, are given at the end of the report. The bacteriologists and pathologists formed a laboratory subcommittee under the chairmanship of Professor R. Cruickshank. The trial was co-ordinated by Drs. Marc Daniels and Wallace Fox, of the Council's Tuberculosis Research Unit; Dr. Fox and Dr. Ian Sutherland (of the Council's Statistical Research Unit) analysed the present results and prepared the report. X-ray assessments were made by

*Members of the Committee: Sir Geoffrey Marshall (chairman), Professor J. W. Crofton, Professor R. Cruickshank, Dr. Marc Daniels, Dr. J. E. Geddes, Professor F. R. G. Heaf, Professor A. Bradford Hill, Dr. J. V. Hurford, Dr. D. A. Mitchison, Dr. W. D. M. Paton, Dr. J. G. Scadding, Dr. Norman Smith, Dr. P. D'Arcy Hart (secretary).

Dr. L. G. Blair. The isoniazid used throughout the trial has been supplied as "nydrazid" by E. R. Squibb and Sons.

1. PLAN AND CONDUCT OF THE TRIAL

The plan and conduct of the trial have already been described in the first report and some points are dealt with more fully there.

1. General

When a patient has been accepted for the trial, treatment is allocated by the Tuberculosis Research Unit from confidentially held prearranged lists based upon random sampling numbers.

After admission to the trial and a preliminary week of observation, all patients are kept under observation for six months. During the first three months the prescribed treatment is followed for every case. During the second three months Group 3 cases (see later description of groups) remain on the same treatment. For other cases the clinician is free to undertake any treatment he wishes.

At the end of the first, second, and third month of treatment, clinical progress reports for each patient on standard forms are sent to the Tuberculosis Research Unit. At six months the clinicians send a final progress report and a full case summary.

The information is scrutinized as soon as it is received, and the most important items from the clinical progress reports are entered on special cards. Information for each patient is thus accumulated, and with these cards regular analyses of results are carried out. Laboratory data are kept separately by the bacteriologists and pathologists, and are called in as required (see Section III of this report).

2. Type of Case

Before acceptance into the trial, basic requirements for all cases were laid down as follows:—At the start of treatment: (1) Tubercle bacilli must have been demonstrated: there must be either a positive direct smear from a sputum specimen taken within the previous two weeks, or a positive culture derived from a specimen taken not more than two months previously. (2) The tubercle bacilli must not, so far as is known, be streptomycin-resistant or P.A.S.-resistant. (3) The patient must not have had more than 15 g. streptomycin and/or 300 g. P.A.S. within the previous three months, and not more than 3 g. isoniazid at any time (this last requirement was added soon after the start of the trial). (4) The patient must not be undergoing pneumoperitoneum, nor have any form of collapse therapy for the lung requiring treatment. (For fuller criteria see the first report.)

Twelve cases (3%) did not conform entirely to the bacteriological requirements, but are nevertheless included in the clinical analysis. In none of these patients was the diagnosis in doubt, and for most of them it had been established bacteriologically either before or after starting treatment, though not within the stipulated period. These cases have, however, been excluded from the bacteriological analysis (see Section III).

Cases satisfying the above requirements were admitted to the trial in one of three main disease groups: (1) acute rapidly progressive pulmonary tuberculosis believed to be of recent origin; (2) other forms of pulmonary tuberculosis considered suitable for chemotherapy; (3) chronic forms of pulmonary tuberculosis expected to make only a limited response to streptomycin + P.A.S.

Under these three headings eight subgroups were defined as follows: (1A) Bilateral lesions; age 15-30. (The definition of this subgroup corresponds to that of cases admitted to the earlier chemotherapy trials, 1946-52.) (1B) Bilateral lesions; other ages. (1C) Predominantly unilateral lesions; all ages. (2A) Chronic cases with a recent exudative lesion. (2B) Primary tuberculosis with manifest recent lesions diagnosed not more than six months previously. (2C) Other forms. (3A) Patients who have previously had, in all, not more than 15 g. streptomycin and/or 300 g. P.A.S. and/or 3 g. isoniazid. (3B) Other patients who have had some chemotherapy, but not more than 15 g. streptomycin and/or 300 g. P.A.S. within the previous three months, and/or 3 g. isoniazid. It was realized that there would be some overlap between Groups 2 and 3, as well as between the subgroups of Group 2.

EVOLUTION OF THE TRIAL

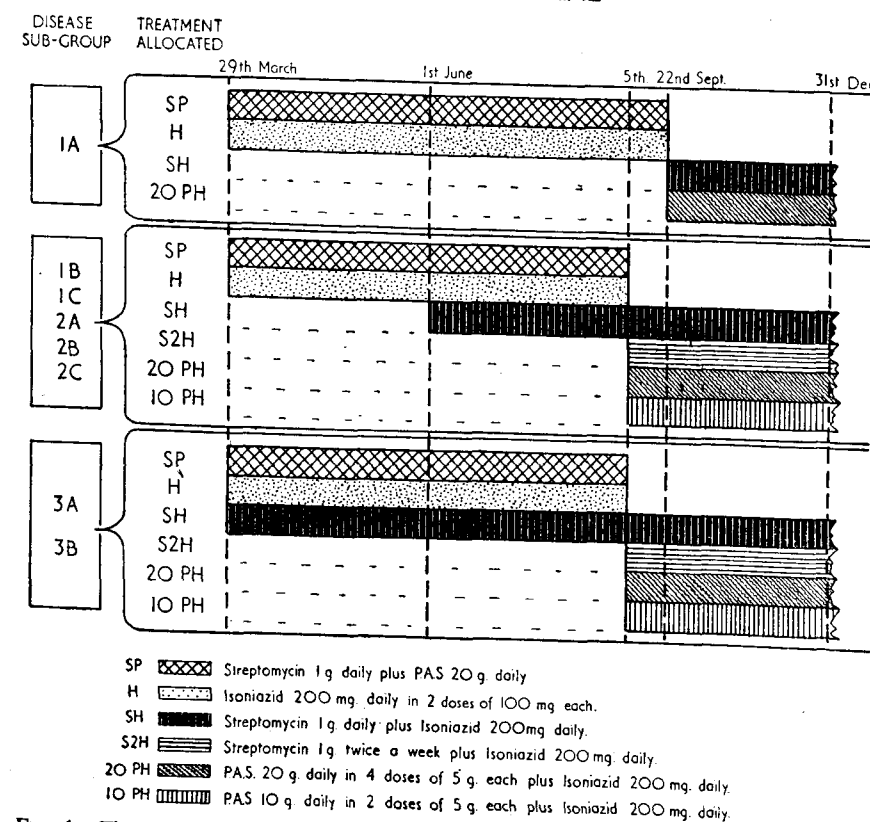


FIG. 1.—The treatments allocated in each disease subgroup from the start of the trial to the present time, showing the period of allocation of each treatment.

3. Intake of Cases

Group 1 cases are selected by a central panel of clinicians; cases in Groups 2 and 3 are, in the main, selected by the clinicians in the co-operating hospitals from the patients already under their care.

4. Treatment

The dosage of each drug used was as follows:—*Streptomycin* (not dihydrostreptomycin): 1 g. daily, in one intramuscular injection. (Children under 15: 15 mg. per kg. of body weight daily, up to a maximum of 1 g.) *P.A.S.*: 20 g. of the sodium salt daily, in four doses, by mouth. (Children under 15: 1 g. per 3 kg. of body weight daily, up to a maximum of 20 g.) *Isoniazid*: 200 mg. daily, in two doses of 100 mg. given 12-hourly, by mouth. (Children under 15: 3 mg. per kg. of body weight daily, up to a maximum of 200 mg.)

5. Evolution of the Trial

The large number of cases and the continual analysis of the results have enabled the Tuberculosis Chemotherapy Trials Committee to introduce new treatments and to stop allocating other treatments during the course of the trial, and so to study fresh problems in the application of isoniazid as they arose. The trial has thus proceeded in several stages. The time-table has been complicated by the fact that for several reasons the new treatments have not been introduced at the same time in each of the disease subgroups of the trial. Subgroup 1A and Group 3 have followed patterns different from those of the other groups. Fig. 1 illustrates this complex time-table, and the following paragraphs should be read in conjunction with this figure.

When the trial began on March 29, 1952, the first problem was to decide whether isoniazid was an effective drug when compared with the best chemotherapy known at that time—namely, streptomycin + P.A.S. Accordingly, two treatments—streptomycin + P.A.S. (SP) and isoniazid (H)—were allocated concurrently, and at random, to cases in all disease groups.

In view of the development of bacterial resistance to other anti-tuberculosis drugs when given alone, it was decided from the outset to study also the results of combining isoniazid with another effective drug. A third treatment, streptomycin + isoniazid (SH), was therefore introduced at the start of the trial in Group 3, in which the cases (by definition) were expected to make only a limited response to streptomycin + P.A.S. In this way fundamental bacteriological information would become available as soon as possible.

As the trial proceeded there was growing evidence concerning the frequent development of bacterial resistance to isoniazid when given alone. The Committee therefore decided to introduce the SH treatment throughout the trial (except in subgroup 1A) from June 1, while continuing a concurrent allocation of cases to SP and H. Although the three treatments were allocated at random as

before, it was arranged, without the knowledge of the clinicians, that rather more patients should be admitted to the SH series than to either of the other two, because of its potential importance.

The cases in subgroup 1A (acute rapidly progressive tuberculosis of recent origin, bilateral and between the ages of 15 and 30) were of special importance since they corresponded by definition to those in all the previous Medical Research Council tuberculosis chemotherapy trials. The aim of the Committee was to have a sufficiently large number of cases in this subgroup to enable a clear-cut comparison to be made between isoniazid alone and each of the treatments allocated in the earlier trials. For this reason the two treatments SP and H were allocated in this subgroup from the start of the trial until September 22, by which date 99 cases had been admitted, and the Committee had decided from the bacteriological information then available that it was unjustifiable to continue to allocate isoniazid alone. From this date onwards, two other treatments were adopted for subgroup 1A—namely, SH and 2O PH (20 g. P.A.S. daily + isoniazid 200 mg. daily). (See Fig. 1.)

By the beginning of September, 1952, the numbers of patients who were on the SP and H treatments in other subgroups were adequate; also, the bacteriological analysis for the first report, although incomplete, suggested that isoniazid resistance was a serious problem affecting clinical progress. From September 5 onwards, therefore, the allocation of cases to SP and H was stopped throughout the trial (except, as stated above, in subgroup 1A). As it was essential to concentrate upon combined therapy with a view to the prevention of drug resistance, three new treatments were introduced in addition to SH (streptomycin 1 g. daily + isoniazid 200 mg. daily)—namely, S2H (streptomycin 1 g. twice weekly + isoniazid 200 mg. daily), 2O PH (20 g. P.A.S. daily + isoniazid 200 mg. daily), and 1O PH (10 g. P.A.S. daily + isoniazid 200 mg. daily). The trial of these four treatments is still proceeding.

The first isoniazid report (Medical Research Council, 1952) compared the progress after three months' treatment of all the SP and H cases admitted to the trial before June 1, 1952. (During this period 38 Group 3 cases were allocated to the SH treatment; but, because this number of very chronic cases was considered to be inadequate for the assessment of clinical results, no comparison was then made with the Group 3 cases allocated concurrently to SP and H.)

The clinical section of the present report analyses the progress after three months' treatment of all the 364 cases which were admitted concurrently to the three treatments SP, H, and SH—that is, all the Group 3 cases allocated between March 29 and September 5, and all cases in the

other disease groups (except subgroup 1A) allocated from June 1 until September 5 (see Fig. 1). The progress of the SH patients is compared with that of the SP and also of the H patients. Direct comparison between the SP and the H patients (numbering more than 500 since the start of the trial) is not made here, but will be the subject of a further report.

The bacteriological section of the present report analyses the tests for tubercle bacilli in the sputum and the development of drug resistance for the same group of 364 cases.

6. Total Number of Patients in the Present Analysis

Table I sets out the number of cases according to treatment, and shows that, of the 364 cases, 102 have been treated with streptomycin + P.A.S., 120 with isoniazid, and 142 with streptomycin + isoniazid. (Of the Group 3 cases, 29 SP and 40 H were included in the first report but appear again in the present analysis, since they were admitted concurrently with 38 SH patients. Subgroup 1A does not appear in the present analysis, since the SH treatment was not allocated concurrently with the SP and H treatments in this subgroup. Consequently, whereas Group 1 of the first report included cases in all three subgroups, Group 1 of the present report includes cases in 1B and 1C only.)

II. CLINICAL PROGRESS

1. Exclusions

Before detailing the clinical exclusions it should be pointed out that Table I and the clinical analysis include approximately 20 patients who were found to have had streptomycin- or P.A.S.-resistant organisms at the start of treatment, although this was not known when they entered the trial. Because their response to treatment may have been affected by this, it would have been desirable to exclude these cases from the clinical analysis. This has not been done because a few P.A.S. sensitivity tests are still pending. A subsidiary analysis has shown no evidence that the conclusions drawn below are in any way affected by the retention of these cases for the time being.

The totals in Table I do not include 39 cases which were admitted concurrently with the 364 but subsequently excluded for the following reasons:

- The 7 cases in Group 2B were excluded (3 SP, 2 H, and 2 SH). This group was too small and too different from the others to justify its retention.
- Five cases were excluded before treatment was started: 1 patient died before admission to hospital (SH); 2 patients refused admission to hospital (1 SP, 1 H); 1 patient refused treatment (SP); 1 patient, although admitted, did not start treatment as no positive sputum could be obtained (H).

TABLE I.—Number of Cases Treated Concurrently with SP, H, and SH

		Treatment			All Cases
		Streptomycin Plus P.A.S.	Isoniazid	Streptomycin Plus Isoniazid	
Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	1B. Bilateral; under 15 years and 31 or more	4	7	10	21
	1C. Unilateral; all ages	21	19	27	67
	Total	25	26	37	88
Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy	2A. Chronic with recent spread	14	13	24	51
	2C. Other forms (excluding primary disease)	24	31	32	87
	Total	38	44	56	138
Group 3: Chronic forms of pulmonary tuberculosis expected to make only a limited response to chemotherapy	3A. Very little previous chemotherapy	12	15	14	41
	3B. Some previous chemotherapy, but not recently	27	35	35	97
	Total	39	50	49	138
All cases		102	120	142	364

(iii) Twenty-seven cases were excluded after treatment had begun:

- 1 patient was found to have had four months' chemotherapy up to within a month of entering the trial (H);
- 1 patient was found to have a carcinoma of the bronchus, proved on biopsy (H);
- 3 patients were given the wrong treatment in error (2 SP, 1 SH), 2 having SP+H for one month, the third having SP+H for two months;
- 6 patients discharged themselves against medical advice (1 in the first month, 3 in the second, and 2 in the third) (4 SP, 1 SH, 1 H);
- 11 patients had severe toxic reactions attributed to streptomycin (6 SH, 5 SP);
- 2 patients had severe toxic reactions attributed to P.A.S. (2 SP);
- 1 patient was found to be pregnant and this was considered by the clinician in charge a contraindication to streptomycin (SH);
- 2 changes of treatment were necessary in the first month—namely, in 1 H case which showed gross spread radiologically and in which streptomycin was added because the patient was considered at risk of death in the absence of this treatment (the radiographic appearances remained unaltered in the next two months), and in another H case which deteriorated clinically but not radiographically and in which streptomycin+P.A.S. was added after four weeks.

It will be seen that there were 13 exclusions because of drug intolerance—11 to streptomycin (5 SP and 6 SH) and 2 to P.A.S. Although many patients intolerant to streptomycin or P.A.S. can be desensitized, these exclusions for drug intolerance must be considered a defect of therapy with streptomycin or with P.A.S. when compared with isoniazid, for in no case was there any interference with the prescribed regime of isoniazid due to toxicity, whether the isoniazid was taken alone or in combination. Against these 13 exclusions there is one exclusion representing a definite failure of isoniazid therapy, and one in which clinical deterioration was reported.

One patient whose treatment was changed from H to SH at the end of the second month has been included throughout as an H patient.

2. Toxicity

Toxicity of Streptomycin and of P.A.S.—Apart from the 13 cases referred to in the previous paragraph, in which

treatment had to be stopped, there were some slighter toxic reactions to streptomycin in patients on the SP and SH treatments and to P.A.S. in patients on the SP treatment. These reactions were sometimes troublesome and worrying, but did not interfere unduly or more than temporarily with the prescribed regime of chemotherapy. Nevertheless, toxic reactions to streptomycin must be accepted as a defect of the combination streptomycin + isoniazid as of the combination streptomycin + P.A.S.

Toxicity of Isoniazid.—There have been no reports of serious toxicity from isoniazid in any of the trial patients, with the dosage used, over a period of three months, and there is nothing further to add, at this stage, to the information presented in the previous report.

3. Condition on Admission

Table II shows the condition of patients before the start of treatment as reflected by their general condition (assessment by the clinician in charge), temperature, sedimentation rate (Westergren 200 mm. reading at one hour), and the extent of cavitation on x-ray film (as estimated by an independent radiological assessor, unaware of the treatment of any case). It can be seen that, judging by the factors listed, the SP, H, and SH cases, both in Group 1 and in Group 3, have a reasonably similar distribution of severe and less severe illness. In Group 2, however, the SP patients appear to have been on the average rather more ill than the SH and H patients. For the totals of all groups the three treatment series are comparable.

4. Results at the End of Three Months

In the following sections, after a general note on the low mortality, a comparison is made between the progress of the patients on streptomycin + isoniazid (SH) and that of patients on streptomycin + P.A.S. (SP). This is followed by a comparison of the progress of patients on streptomycin + isoniazid (SH) and the progress on isoniazid (H) alone.

Mortality.—There were four deaths among the 364 cases (1.1%) during the three months of treatment; two in 102 SP patients, one in 120 H patients, one in 142 SH patients. One SP patient (in Group 3A), who died 14 days after the start of treatment, suffered clinically from chronic bronchitis and emphysema, and cannot be regarded as having died from tuberculosis; the H patient (in Group 2C) died from

TABLE II.—Condition on Admission of SP, H, and SH Cases

	Treatment	Total	General Condition			Average Evening Temperature in Pre-treatment Week*				Sedimentation Rate (Westergren 200 mm. Reading at 1 Hour)				Extent of Cavitation†			
			Good	Fair	Poor	Afe- brile	Under 99°F.	99- 99.9° F.	100° F. or more	0-10	11-20	21-50	51 or more	Nil	1- plus	2- plus	3- plus
			No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %
Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SP	25 100	3 12	11 44	11 44	6 24	7 28	7 28	5 20	2 8	0 0	8 32	15 60	3 12	11 44	8 32	3 12
	H	26 100	6 23	10 38	10 38	8 31	8 31	9 35	1 4	1 4	1 4	10 38	14 54	7 27	7 27	5 19	7 27
	SH	37 100	4 11	20 54	13 35	5 14	13 35	13 35	6 16	0 0	5 14	18 49	14 38	5 14	16 43	14 38	2 5
Group 2: Other forms of pulmon- ary tuberculosis suit- able for chemotherapy	SP	38 100	7 18	17 45	14 37	10 26	14 37	6 16	8 21	3 8	7 18	13 34	15 39	10 26	9 24	9 24	10 26
	H	44 100	16 36	17 39	11 25	24 55	11 25	6 14	3 7	7 16	10 23	17 39	10 23	17 39	11 25	13 30	3 7
	SH	56 100	18 32	31 55	7 12	24 43	19 34	9 16	4 7	8 14	12 21	24 43	12 21	19 34	17 30	16 29	4 7
Group 3: Chronic forms of pul- monary tuberculosis expected to make only a limited response to chemotherapy	SP	39 100	13 33	14 36	12 31	21 54	15 38	3 8	0 0	6 15	10 26	14 36	9 23	6 15	6 15	17 44	10 26
	H	50 100	10 20	26 52	14 28	28 56	17 34	3 6	2 4	3 6	13 26	21 42	13 26	5 10	6 12	19 38	20 40
	SH	49 100	16 33	19 39	14 29	24 49	13 27	9 18	3 6	11 22	4 8	21 43	13 27	5 10	8 16	16 33	20 41
All cases	SP	102 100	23 23	42 41	37 36	37 36	36 35	16 16	13 13	11 11	17 17	35 34	39 38	19 19	26 25	34 33	23 23
	H	120 100	32 27	53 44	35 29	60 50	36 30	18 15	6 5	11 9	24 20	48 40	37 31	29 24	24 20	37 31	30 25
	SH	142 100	38 27	70 49	34 24	53 37	45 32	31 22	13 9	19 13	21 15	63 44	39 27	29 20	41 29	46 32	26 18

* A patient was considered afebrile if every evening temperature in the pre-treatment week of observation was below 99° F. (37.2° C.).
† Assessment on a single film taken before treatment started. Tomograms were not taken into account.

congestive cardiac failure the day after starting treatment. These two cases do not represent a failure of treatment, in contrast to the other two patients—one on SP, the other on SH (from Groups 3A and 3B)—who died of their tuberculous disease 32 days and 22 days respectively after the start of treatment; both were very ill on admission to the trial.

5. The Comparison between SH (Streptomycin + Isoniazid) and SP (Streptomycin + P.A.S.)

General Condition.—Change in the clinical condition was assessed by the physician in charge of the patient. It represents an overall impression of the patient's progress, being based on the clinical observations, the patient's appearance, and his feeling of well-being (or lack of it). Table III shows that on each treatment a considerable percentage of patients improved—87% of 142 SH patients and 75% of 102 SP patients. This difference just attains statistical significance at the 5% level, due mainly to the experience in Group 3. In this group of very chronic cases, 51% of

39 SP patients showed 1-plus (moderate) improvement, and none had 2-plus (considerable) improvement; in the 49 SH patients the corresponding figures are 49% and 22%. In Group 1, the acute rapidly progressive disease, all the 25 SP patients and 36 of the 37 SH patients improved clinically.

Weight Changes.—The weight changes for the three-months period are set out in Table IV, and here the SH patients have benefited strikingly compared with the SP patients. The difference in the average weight gains for the totals (6.1 lb. and 13.0 lb.—2.8 and 5.9 kg.), and also that for each disease group, is statistically highly significant. Of the 136 SH patients, 82% gained 7 lb. (3.2 kg.) or more and 42% gained 1 stone (6.3 kg.) or more. The corresponding figures for the 97 SP patients are 45% and 13%. It is noteworthy that the acute (Group 1) cases on both treatments have fared better than the less acute cases, and that in this group, too, the SH patients have benefited more than the SP patients. Of 36 SH patients 61% have gained 1 stone or more, compared with 32% of 25 SP patients. Of

TABLE III.—General Condition at the End of the Third Month Compared with General Condition on Admission

	Treatment	Total	Improvement		No Change	Deterioration		Death
			2-plus	1-plus		1-minus	2-minus	
		No. %	No. %	No. %	No. %	No. %	No. %	No. %
Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SP	25 100	12 48	13 52	0 0	0 0	0 0	0 0
	H	26 100	13 50	10 38	3 12	0 0	0 0	0 0
	SH	37 101	18 49	18 49	1 3	0 0	0 0	0 0
Group 2: Other forms of pulmon- ary tuberculosis suit- able for chemotherapy	SP	38 101	12 32	19 50	6 16	0 0	1 3	0 0
	H	44 99	12 27	27 61	3 7	1* 2	0 0	1 2
	SH	56 99	21 37	31 55	4 7	0 0	0 0	0 0
Group 3: Chronic forms of pul- monary tuberculosis expected to make only a limited response to chemotherapy	SP	39 100	0 0	20 51	16 41	1 3	0 0	2 5
	H	50 100	7 14	25 50	15 30	2 4	1 2	0 0
	SH	49 100	11 22	24 49	13 27	0 0	0 0	1 2
All cases	SP	102 101	24 24	52 51	22 22	1 1	1 1	2 2
	H	120 101	32 27	62 52	21 18	3* 2	1 1	1 1
	SH	142 100	50 35	73 51	18 13	0 0	0 0	1 1

* One patient changed treatment from H to SH at the end of two months, and is included here.

TABLE IV.—Weight Changes in the First Three Months.

	Treatment	Total Weighed	Weight Gain				No Change	Weight Loss		Average Gain in Weight per Patient (lb.)
			21 lb. or More	14-20 lb.	7-13 lb.	Less than 7 lb.		Less than 7 lb.	7 lb. or More	
			No. %	No. %	No. %	No. %		No. %	No. %	
Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SP	25 100	2 8	6 24	11 44	3 12	1 4	2 8	0 0	10.2
	H	26 101	9 35	8 31	6 23	2 8	1 4	0 0	0 0	17.3
	SH	36 101	14 39	8 22	11 31	2 6	0 0	1 3	0 0	16.6
Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy	SP	36 100	1 3	3 8	11 31	9 25	3 8	7 19	2 6	4.9
	H	43 100	10 23	17 40	11 26	4 9	0 0	0 0	1† 2	15.6
	SH	54 101	9 17	14 26	23 43	6 11	1 2	1 2	0 0	13.1
Group 3: Chronic forms of pulmon- ary tuberculosis expected to make only a limited response to chemotherapy	SP	36 102	1 3	0 0	9 25	20 56	2 6	2 6	2 6	4.6
	H	50 100	0 0	12 24	17 34	16 32	1 2	3 6	1† 2	8.1
	SH	46 100	4 9	8 17	21 46	11 24	0 0	1 2	1 2	10.2
All cases	SP	97* 99	4 4	9 9	31 32	32 33	6 6	11 11	4 4	6.1
	H	119* 101	19 16	37 31	34 29	22 18	2 1	3 3	2†† 2	12.8
	SH	136* 100	27 20	30 22	55 40	19 14	1 1	3 2	1 1	13.0

* For three other SP patients and five SH patients the weight changes are not available. Also two SP patients, one H patient, and one SH patient had died † One patient included here lost 11½ lb. in two months, was too ill to be weighed at three months, and died the following day.
‡ One patient changed treatment from H to SH at the end of two months, and is included here.

the total of 61 acute cases on SP or SH, only 4 (7%) have failed to gain some weight.

Temperature.—In the present analysis a patient was considered to be initially afebrile if the evening temperature was below 99° F. (37.2° C.) on every day of the week of preliminary observation. The same definition applied to the last week of the third month of treatment. Table V sets out the number of patients who were febrile in the pre-treatment week, but afebrile at three months. The patients are grouped according to the initial level of pyrexia. In a total of 88 febrile SH patients, 82% were afebrile at three months, compared with 76% of 63 SP patients. There is also little difference between the three disease groups; the figures for Group 1, the acute cases, were 81% of 32 SH patients and 84% of 19 SP patients. In none of these comparisons is there a statistically significant difference.

Of 53 SH patients who were afebrile in the pre-treatment week (not shown in the table) 6, or 11%, had a low-grade pyrexia at three months (an occasional evening temperature above 99° F.). The corresponding figures for the SP patients were 4 out of 37, also 11%.

Sedimentation Rate.—Table VI sets out the number of patients with an initially elevated blood sedimentation rate (B.S.R., Westergren) which was lowered after three months' treatment. Of 101 SH patients with an initial B.S.R. of 21 or more, 45% fell to normal (10 or less) in three months; the corresponding figure for 73 SP patients was only 21%. This difference is statistically highly significant. When the initial B.S.R. was 51 or more the rates were normal at three months in 18% of 39 SH patients, and in only 5% of 38 SP patients. The B.S.R. rose from an initially normal level in 4 of 19 SH cases and 3 of 10 SP cases (not shown in the table).

Radiographic Changes in First Three Months.—Table VII sets out the radiographic changes at the end of three months' treatment. The assessments were made by an independent reading of full-plate chest x-ray films by a radiologist unaware of the treatment in any case. (Since the radiographic reading was intended as a comparative measure of x-ray change and not as an absolute assessment, it was considered that the readings of a single radiologist could be fairly accepted for assessing the relative merits of

TABLE V.—Number of Cases Febrile in the Pre-treatment Week who were Afebrile at the End of the Third Month

	Treatment	Average Evening Temperature in the Pre-treatment Week						All Cases Febrile in the Pre-treatment Week	
		Under 99° F.		99° F.-99.9° F.		100° F. or More		Total	Afebrile at Three Months
		Total	No. Afebrile at Three Months	Total	No. Afebrile at Three Months	Total	No. Afebrile at Three Months		No. %
Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SP H SH	7 8 13	5 7 12	7 9 13	7 5 12	5 1 6	4 1 2	19 18 32	16 13 26 84 72 81
Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy	SP H SH	14 11 19	12 9 16	6 5 9	4 4 6	8 3 4	3 3 2	28 19 32	19 16 24 68 84 75
Group 3: Chronic forms of pulmonary tuberculosis expected to make only a limited response to chemotherapy	SP H SH	14 17 13	11 10 12	2 3 8	2 1 8	0 2 3	0 0 2	16 22 24	13 11 22 81 50 92
All cases	SP H SH	35 36 45	28 80 26 72 40 89	15 17 30	13 87 10 59 26 87	13 6 13	7 54 4 67 6 46	63* 59* 88*	48 76 40 68 72 82

* Two SP patients, one H patient, and one SH patient who died are excluded from this table.

TABLE VI.—Number of Cases with a Raised Sedimentation Rate in the Pre-treatment Week whose Sedimentation Rate was Normal at the End of the Third Month

	Treatment	Sedimentation Rate in the Pre-treatment Week						All Cases with Initial Sedimentation Rate of 21 or More	
		11-20		21-50		51 or More		Total	B.S.R. of 0-10 at 3 Months No. %
		Total	No. with B.S.R. 0-10 at 3 Months	Total	No. with B.S.R. 0-10 at 3 Months	Total	No. with B.S.R. 0-10 at 3 Months		
Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SP H SH	0 1 5	0 1 5	8 10 18	3 4 14	15 14 14	0 4 2	23 24 32	3 13 8 33 16 50
Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy	SP H SH	7 9 12	4 5 8	13 17 24	8 4 17	15 10 12	2 3 3	28 27 36	10 36 7 26 20 56
Group 3: Chronic forms of pulmonary tuberculosis expected to make only a limited response to chemotherapy	SP H SH	10 13 4	7 6 2	14 21 20	2 6 7	8 12 13	0 0 2	22 33 33	2 9 6 18 9 27
All cases	SP H SH	17	No. %	35 48 62	No. %	38 36 39	No. %	73* 84* 101*	15 21 21 25 45 45
		23	11 65		13 37		2 5		
		21	12 52		14 29		7 19		
			15 71		38 61		7 18		

* For two other H patients the sedimentation rates at three months are not available. Also one SP and one SH patient had died.

TABLE VII.—Changes in Radiographic Appearances in First Three Months

Treatment	Total	Improvement			No Change	Deterioration			Death
		3-plus	2-plus	1-plus		1-minus	2-minus	3-minus	
	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	
Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin									
SP	25 100	2 8	10 40	6 24	7 28	0 0	0 0	0 0	0 0
H	26 101	2 8	8 31	8 31	5 19	1 4	2 8	0 0	0 0
SH	37 100	9 24	12 32	10 27	5 14	1 3	0 0	0 0	0 0
Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy									
SP	38 101	4 11	10 26	14 37	9 24	0 0	0 0	1 3	0 0
H	44 101	3 7	10 23	17 39	10 23	2 5	1† 2	0 0	1 2
SH	56 100	8 14	20 36	11 20	17 30	0 0	0 0	0 0	0 0
Group 3: Chronic forms of pulmonary tuberculosis expected to make only a limited response to chemotherapy									
SP	39 100	1 3	5 13	13 33	18 46	0 0	0 0	0 0	2 5
H	50 100	0 0	4 8	13 26	28 56	4 8	0 0	1* 2	0 0
SH	49 100	1 2	4 8	16 33	25 51	2 4	0 0	0 0	1 2
All cases									
SP	102 100	7 7	25 25	33 32	34 33	0 0	0 0	1 1	2 2
H	120 100	5 4	22 18	38 32	43 36	7 6	3† 2	1* 1	1 1
SH	142 100	18 13	36 25	37 26	47 33	3 2	0 0	0 0	1 1

* This patient had 2-minus deterioration at two months, was too ill to be x-rayed at three months, and died the following day.

† One patient included here had 2-minus deterioration at two months, changed treatment from H to SH, and still had 2-minus deterioration at 3 months.

different treatments.) In assessing improvement or deterioration three degrees were allowed—namely: 1-plus, 2-plus, and 3-plus, and 1-minus, 2-minus, and 3-minus. In total, the SH and SP groups both contain 64% who showed radiographic improvement. The improvement was more than 1-plus in 38% of SH patients and in 31% of SP patients. (In Group 1, the acute group, 2-plus or 3-plus improvement was seen in 57% of SH cases and 48% of SP cases.) In all there was radiographic deterioration in 3 patients, and one death on streptomycin + isoniazid, and one deterioration and two deaths of patients on streptomycin + P.A.S. The differences between the two treatments are not statistically significant.

Summary of the Comparison of SH and SP

In general condition the SH patients fared rather better than the SP patients, but only among the chronic cases was the difference more than very slight. It must be remembered that assessment of general condition is to a considerable extent influenced by a knowledge of all the other observations of the patient's progress, such as the B.S.R., weight changes, and temperature. The weight gains in all three disease groups were strikingly better for patients on the SH treatment than on the SP treatment. The SH combination also proved much the more effective in lowering the B.S.R. On the other hand, the two treatments had very similar effects on the temperature, and, most important, there were no significant differences in the radiographic response.

6. The Comparison between SH (Streptomycin + Isoniazid) and H (Isoniazid)

General Condition.—Comparing streptomycin + isoniazid with isoniazid alone, it was found in regard to general condition that the response of the patients to each treatment was very similar. Table III shows that 87% of the SH patients improved, compared with 78% of the H patients. Again the response of Group 1 cases is particularly satisfactory.

Weight Changes.—Table IV shows that the average gain in weight for 136 SH patients was 13.0 lb. compared with an average gain of 12.8 lb. for 119 H patients. In each of the three disease groups the two treatments show little difference. The very chronic cases (Group 3) have, however, fared less well on either treatment than the other two groups. The close similarity in weight gain of the

SH and H patients indicates that the important factor in these striking increases is either the presence of isoniazid or the absence of P.A.S.

Temperature.—Of 88 pyrexial SH patients 82% became afebrile, compared with 68% of 59 H patients (Table V). The greatest disparity is in the very chronic cases of Group 3, where the difference attains statistical significance. In the other groups it is not important.

Sedimentation Rate.—The SH treatment has proved more effective than isoniazid alone in lowering the B.S.R. (Table VI). In 101 SH patients with an initial B.S.R. of 21 or more there was a fall to normal (10 or less) in 45%. For 84 H patients the figure was only 25%, giving a statistically highly significant difference. The difference is apparent in all three disease groups.

Radiographic Changes in First Three Months.—Table VII shows that of 142 SH patients 64% improved radiographically, compared with 54% of 120 H patients. Moreover, 38% of the SH patients showed 2-plus or 3-plus improvement, compared with 22% of the H patients. This superiority of the SH treatment, which is apparent over the whole range of the x-ray assessment, is statistically highly significant. Taking the acute Group 1 alone, 57% of the SH patients showed 2-plus or 3-plus improvement, compared with 38% of the H patients. In total, 3 SH patients deteriorated radiographically and one died, compared with 11 deteriorations and one death on H alone. (All 3 SH deteriorations and 7 of the H deteriorations were slight.) The SH treatment has thus shown itself to be more effective radiographically than isoniazid alone.

Summary of the Comparison of SH and H

The SH treatment was more effective than H in lowering the blood sedimentation rate and also in improving the radiographic appearances, and was slightly more effective in lowering the temperature of pyrexial patients. The two treatments were very similar in their effect on the general clinical condition and on weight, both producing striking improvement.

III. BACTERIOLOGY

The Laboratory Subcommittee (chairman, Professor R. Cruickshank) has been responsible for prescribing uniform laboratory techniques and procedures for the centres. A detailed description and discussion of these procedures will be published later as part of a further report.

The first report on the trial (Medical Research Council, 1952) gave as much bacteriological information as was then available on the presence of tubercle bacilli in the sputum during treatment with streptomycin+P.A.S. and with isoniazid. An analysis of isoniazid-sensitivity tests at one, two, and three months demonstrated that isoniazid resistance developed frequently and rapidly; this resistance was shown to affect clinical progress.

The present section analyses the bacteriology of cases treated, concurrently, with streptomycin+isoniazid (SH), streptomycin+P.A.S. (SP), or isoniazid alone (H). These are the same patients as those reported on clinically in Section II. The bacterial content of the sputum of the patients is compared after one, two, and three months of treatment. The development of bacterial resistance to streptomycin is studied for the patients treated with SH and with SP, and the development of resistance to isoniazid in patients treated with SH and with H. Because of the time needed to obtain results of cultures from sputum specimens and to complete drug-sensitivity tests on those cultures, the present analysis omits results pending at two and three months for a small percentage of cases.

1. Exclusions

For the clinical section of this report, it was decided to retain in the analysis only those patients who completed three months' treatment or who died after starting treatment. The procedure adopted for this bacteriological section has been different from that for the clinical section; the results of all available complete tests at one, two, and three months have been used. Thus any complete tests from the small number of patients withdrawn from the clinical analysis have been included—provided they had been treated for at least one month.

On the other hand, 16 patients whose clinical progress is reported have been excluded entirely from the bacteriological analysis. It was laid down that all cases at the start of treatment must be bacteriologically positive for tubercle bacilli (see p. 521). For 12 cases (4 SP, 4 H, 4 SH) the records show that no tubercle bacilli had in fact been seen or isolated from pre-treatment specimens, although positive results were obtained subsequently on one or more occasions from 4 of them. All 12 have been excluded from the bacteriological tables. It should be emphasized that there was no doubt of the clinical diagnosis, and in

fact for most of these cases a positive bacteriological test had been obtained, though not within the prescribed pre-treatment period.

Four other cases (2 SP, 2 SH), all from one small centre, have been excluded because the recording of the bacteriological information was manifestly unsatisfactory.

2. Bacterial Content of Sputum

Sputum collected during the pre-treatment week, and subsequently at monthly intervals, or more often, was examined by direct microscopy and by culture. Where there was no sputum, material from laryngeal swab or gastric lavage was cultured.

The procedure for taking specimens varied considerably from centre to centre. Many centres adhered simply to the minimum requirements for the trial—namely, a single specimen taken each month; in others, specimens were taken much more often. There was evidence that in some centres examinations were made more frequently for patients on some treatments than on others.

In analysing this varied material two important points had to be observed. One was to assess the results as nearly as possible at one, two, or three months after the start of treatment. The other was to ensure that no apparent advantage or disadvantage accrued to a particular treatment merely because numerous or few examinations had been made on those patients allocated to it.

To meet these requirements it was decided to assess the presence or absence of tubercle bacilli each month from the results of single complete examinations of specimens, one from each patient, collected on a date as near as possible to, or exactly at, one, two, and three months after the start of treatment. A test was regarded as incomplete, and was ignored, unless a culture result was available. No result was included for a given month if the date of collection of the nearest specimen examined lay more than 7 days on either side of the appropriate date. Where there was more than one complete test within this period of 15 days, that on or nearest to the appropriate date was chosen, to avoid bias. Table VIII of the present report is therefore not comparable with Table VIII of the first report, in which the "most positive" of the results obtained at any time during each month was recorded.

TABLE VIII.—Presence of Tubercle Bacilli at Single Examinations made at Monthly Intervals

	Treatment	Total Patients Examined		"Positive" Direct Examination†		"Scanty Positive" Direct Examination**		Direct Examination Negative and Culture Positive; or Laryngeal Swab Positive		Direct Examination and Culture Negative; or Laryngeal Swab Negative	
		No.	%	No.	%	No.	%	No.	%	No.	%
At 1 month	SP	91	99	33	36	14	15	14	15	30	33
	H	107	100	37	35	20	19	26	24	24	22
	SH	131	99	39	30	23	18	27	21	42	32
At 2 months	SP	89	100	21	24	8	9	16	18	44	49
	H	110	99	28	25	20	18	30	27	32	29
	SH	132	100	17	13	22	17	27	20	66	50
At 3 months	SP	83	100	16	19	8	10	13	16	46	55
	H	101	101	30	30	11	11	23	23	37	37
	SH	117	100	10	9	11	9	18	15	78	67
By disease group at 3 months:											
Group 1	SP	21	100	3		2		4		12	57
	H	21	100	5		2		3		11	52
	SH	30	100	1		4		4		21	70
Group 2	SP	29	100	4		2		5		18	62
	H	35	100	8		6		5		16	46
	SH	43	100	2		2		8		31	72
Group 3	SP	33	100	9		4		4		16	48
	H	45	100	17		3		15		10	22
	SH	44	100	7		5		6		26	59

All patients were bacteriologically positive before treatment—that is, at least one pre-treatment specimen showed bacilli on direct examination or was positive on culture.

* Defined as follows: only a few clumps of acid-fast bacilli found after five minutes' search.

† Whether culture-positive or negative.

The results at one, two, and three months of the selected single examinations of the sputum for tubercle bacilli are set out in Table VIII. It will be clear from the foregoing paragraphs that, in all the bacteriological tables, each item represents a number of patients for each of whom a single test has been selected (by the method already stated), and not a total of all the tests performed on a smaller number of patients.

The recording of the pre-treatment findings was incomplete and biased, since it favoured positive results. For this reason no comparison is possible with the findings during treatment. The pre-treatment findings have, however, been used to check that the degree of positivity of the three treatment series was comparable at the start of treatment.

For the analysis of data at two and three months results have been included only for the specimens in which at least an eight-week period had elapsed since they were collected (this being the period recommended for the incubation of cultures before regarding them as negative). The results at the second and third months would otherwise have been unduly weighted by "positives," since specimens negative on direct examination and with no culture yet available would not have been included, while specimens directly positive, or with early positive cultures, would have been included.

Results

It will be seen from Table VIII that at the end of one month's treatment the results of the tests were negative both on direct examination and on culture in 33% of 91 SP cases, 22% of 107 H cases, and 32% of 131 SH cases. These differences are not statistically significant.

At the end of the second month the percentages of cases negative both on direct examination and on culture were 49% of 89 SP cases, 29% of 110 H cases, and 50% of 132 SH cases. It will be noted that the percentage had increased under each treatment from one to two months. Further, a definite superiority of the SH and SP treatments over the H treatment had appeared; the benefit to the SH and SP cases when compared with the H cases is highly significant statistically. There is no significant difference between the SH and SP series.

At three months, further increases in the percentages negative both on direct examination and on culture had occurred, the figures being 55% of 83 SP cases, 37% of 101 H cases, and 67% of 117 SH cases; there was by then a tendency for the SH cases to show a benefit over the SP cases, but the difference does not attain significance. The cases on H lagged well behind, the benefit to the SH cases being highly significant. It must again be emphasized that this table presents only findings of single tests and so is not necessarily indicative of "sputum conversion." At the other end of the scale the percentages with a positive direct examination at three months were 19% for the SP cases, 30% for the H cases, and 9% for the SH cases.

3. Sensitivity Tests

Strains isolated from specimens collected before starting treatment, and subsequently at least once a month, were tested for streptomycin sensitivity in the SP and SH patients and for isoniazid sensitivity in the H and SH patients. The technique employed for streptomycin sensitivity was similar to that in previous trials (Medical Research Council, 1948); that for isoniazid sensitivity is outlined later (p. 530).

In addition, as the importance of initial P.A.S. resistance in patients admitted to the SP treatment became apparent, it was laid down that a P.A.S.-sensitivity test should be performed on the earliest culture available (whenever possible from the pre-treatment specimen) for all patients from whom a history of one month or more of treatment with P.A.S. alone was obtained. These tests of P.A.S. sensitivity were performed in two laboratories (see Acknowledgments).

As with the recording of the sputum tests, a sensitivity test for a given month was accepted only if it was performed on a specimen collected not more than seven days before or after the appropriate date. When more than one such result was available the one referring to a specimen taken on or nearest to the appropriate date was selected.

4. Streptomycin Sensitivity

All tests in which the "resistance ratio" is 8 or more are classed as resistant, provided the test organisms grew in 0.5 unit per ml. or more; this latter proviso has been introduced to make allowance for the occasional exceptionally low reading for the standard strain H37Rv (inhibition by 0.06 unit per ml.). Check-tests in the reference laboratory for these few test strains indicated that they were sensitive.

As already stated (p. 521), it was required that at the start of treatment the tubercle bacilli must not, so far as was known, be either streptomycin-resistant or P.A.S.-resistant. The object of this requirement being that if the case was allocated to the SP treatment the effectiveness of chemotherapy should not be hindered by pre-existent resistance to either drug, or, if allocated to the SH treatment, by pre-existent resistance to streptomycin. In fact, for many cases the drug sensitivity was not known until well after the start of treatment, when the results of pre-treatment sensitivity tests had become available. It was then found that in 9 patients (2 SP, 7 SH) the bacilli had been streptomycin-resistant initially. Of these, 7 had a history of treatment with streptomycin, alone or in combination with P.A.S., prior to the trial. The other 2 patients are of particular interest, since neither had had any previous chemotherapy and yet both had initially streptomycin-resistant organisms (ratio 8); they are referred to again in the Discussion. These 9 patients are excluded from the following analysis of the development of streptomycin resistance under the SP and SH treatments. The 7 SH patients are referred to again in the section on isoniazid sensitivity, as it was particularly important to investigate whether their bacilli developed resistance to that drug.

There were 3 other patients (2 SP, 1 SH), in whom the streptomycin-sensitivity tests were equivocal. Although the resistance ratio was 4 in two of them, and only 2 in the third, the test organism was inhibited in a concentration of 2 units per ml. in one case, and had grown in 2 units per ml. in the other two (and was not tested further). There was therefore a suggestion that the strains might be resistant. It did not seem correct to class these strains either as initially sensitive or as initially resistant, and these patients too have been excluded from the analysis. The strains from one of the two "doubtful" SP cases remained doubtfully resistant at both one and three months, with sensitivity tests still showing growth in 2 units per ml. (not tested further). Strains from the other patient were resistant (ratio 8) at one month, doubtfully resistant at two and three months, and resistant (ratio 64) at four months. Both these patients gave a previous history of having had streptomycin alone. The SH patient with a doubtfully resistant test initially had no previous history of chemotherapy and gave a definitely sensitive test at two months.

For almost all (95%) of the remaining patients it was established that the organisms were streptomycin-sensitive at the start of treatment. No information was forthcoming for the remaining 5% (7 SP, 4 SH) for technical reasons, such as failure of the primary culture (despite a positive direct test) or of the subculture to grow; for these cases it has been assumed that the organisms were sensitive to streptomycin. Of these 11 patients, 5 on SP and 2 on SH had never had any previous chemotherapy, and a third SH patient had never had streptomycin previously.

* Defined as the ratio of the lowest concentration of streptomycin completely inhibiting growth of the test strain to the corresponding figure for the standard strain (H37Rv).

Results

It is obviously very important to compare the relative effectiveness of the P.A.S. and of the isoniazid in the SP and SH treatments respectively in preventing the emergence of streptomycin resistance. Table IX presents the results of the streptomycin-sensitivity tests after one, two, and three months' treatment with SP or SH (after excluding patients known to be streptomycin-resistant at the start of treat-

ment). The figures in the column headed "culture positive, no sensitivity result available" usually represent failure of a subculture to grow, contamination of the culture, or overheating (incubator fault). For a few of the cases at two and three months in this column, the sensitivity result was still pending at the time of analysis.

TABLE IX.—Results of Streptomycin Sensitivity Tests in SP and SH Cases, Excluding Those Found to be Streptomycin-resistant on Entry to Trial

	Treatment	Total Patients with Culture Examined (a)	Culture-negative (No Sensitivity Test Possible)	Culture-positive but No Sensitivity Result Available	Patients Culture-positive with Sensitivity Tests				Total Resistant		
					Total Results Available (b)	Sensitive	Moderately Resistant (Ratio 8 to 99)	Strongly Resistant (Ratio 100 or More)	No. (c)	(c) as % of (b)	(c) as % of (a)
At 1 month	SP	86	37	2	47	46	1	0	1	2	1
	SH	124	45	4	75	74	1	0	1	1	1
At 2 months	SP	84	49	4	31	30	1	0	1	3	1
	SH	124	68	4	52	50	1	1	2	4	2
At 3 months	SP	78	53	8	17	13	2	2	4	24	5
	SH	109	82	8	19	17	2	0	2	11	2
By disease group at 3 months:											
Group 1	SP	21	14	4	3	3	0	0	0		
	SH	30	23	2	5	5	0	0	0		
Group 2	SP	29	19	4	6	6	0	0	0		
	SH	41	30	3	8	7	1	0	1		
Group 3	SP	28	20	0	8	4	2	2	4		
	SH	38	29	3	6	5	1	0	1		

ment). The figures in the column headed "culture positive, no sensitivity result available" usually represent failure of a subculture to grow, contamination of the culture, or overheating (incubator fault). For a few of the cases at two and three months in this column, the sensitivity result was still pending at the time of analysis.

Table IX shows that at one month a streptomycin-resistant culture was obtained in one out of 47 culture-positive SP cases (2%), compared with one out of 75 culture-positive SH cases (1%). At two months the corresponding figures were one out of 31 culture-positive SP cases (3%), and 2 out of 52 similar SH cases (4%). At three months there were 4 resistant cultures from 17 culture-positive SP cases (24%) (2 of them moderately and 2 strongly resistant); the corresponding figure was 2 from 19 positive SH cases (11%) (both moderately resistant). When the incidence of streptomycin resistance is expressed by a percentage of the total number of patients for whom cultures were examined (whether culture-positive or negative—that is, (c) expressed as a percentage of (a) in Table IX)—the figures at three months are 4 out of 78 SP patients (5%) and 2 out of 109 SH patients (2%). None of these differences is statistically significant.

On the main question—namely, the prevention of streptomycin resistance by the administration of isoniazid with the streptomycin (SH)—the figures in Table IX at three months, though small, are highly suggestive. They indicate that the addition of isoniazid in a dosage of 200 mg. a day is highly effective—indeed, of the same order of effectiveness as 20 g. of sodium P.A.S. a day (or, when less was given, as large a dose of P.A.S. a day as the patient could tolerate).

Streptomycin-sensitivity tests are already available, in addition, at four months for 7 SH patients who had continued on the combination, though at a reduced dosage of streptomycin (1 g. three times a week), during the fourth month. All 7 tests showed that the cultures were sensitive. One of the patients had yielded a resistant strain at a low level (ratio 8) at three months.

5. P.A.S. Sensitivity

The figure of 4 streptomycin-resistant strains from 17 culture-positive SP patients with sensitivity tests at three months does not seem to represent the usual experience of strepto-

mycin resistance after this period of treatment with streptomycin 1 g. daily plus P.A.S. 20 g. daily. In the present series this high figure is in part related to previous chemotherapy with P.A.S. alone. Evidence will be presented in a further report, as well as in a detailed article from one of the co-operating centres, to show that the administration of P.A.S. alone for periods of more than a month is an important factor in the development of streptomycin resis-

6. Isoniazid Sensitivity

The technique was in brief as follows: a loopful of bacterial suspension from a young primary culture on egg medium was spread on each of a series of egg-medium slopes containing graded concentrations of isoniazid of 0, 0.2, 1, 5, 10, and 50 µg. per ml.; a culture of H37Rv was treated similarly in parallel. Both sets of slopes were read at two weeks and at four weeks, and each slope was recorded at each reading in one of five categories: "confluent growth," "innumerable discrete colonies," "100–20 colonies," "less than 20 colonies," "nil." The experience gained since the publication of the first report has served to confirm the satisfactory nature of the criteria of sensitivity recorded in that report, and there appears to be no reason to introduce any modification. A small number of colonies continue to be observed occasionally on isoniazid-containing medium bearing cultures of the test organism, both before and during treatment, as well as of the standard organism, even in concentrations of isoniazid of 10 µg. per ml. This occurrence justifies the earlier decision that such sparse growths should be ignored in assessing the emergence of resistance during treatment. Accordingly, in the analysis of isoniazid resistance, readings of "less than 20 colonies" are classified with "no growth." This endpoint has proved very satisfactory from the point of view both of reading the tests and of interpreting the results. A culture is designated "resistant" when growth of 20 or more colonies is observed at four weeks in concentrations of 1.0 µg. isoniazid per ml., or higher, and "of doubtful resistance" in cases of such growth in a concentration of 0.2 µg. per ml., but not more. As before it was found that the development of colonies is often incomplete after two

weeks' incubation, and the results analysed in Table X are derived solely from the four-week reading.

The 7 SH patients known to have streptomycin-resistant organisms at the start of treatment have been excluded from Table X. It was suspected that the behaviour of their organisms in regard to the development of isoniazid resistance under SH treatment might well differ from that of

even more impressive; whereas 33 resistant strains were isolated from a total of 93 H patients (35%), only 3 isoniazid-resistant strains were isolated from 109 SH patients (3%) (growth at 1, 5, and 50 µg. per ml. respectively). Again, the benefit to the SH treatment is highly significant.

There is therefore a striking difference between the incidence of isoniazid resistance in patients on isoniazid

TABLE X.—Results of Isoniazid Sensitivity Tests in H and SH Cases, Excluding Those Found to be Streptomycin-resistant on Entry to Trial

	Treatment	Total Patients with Culture Examined (a)	Culture-negative (No Sensitivity Test Possible)	Culture-positive but No Sensitivity Result Available	Patients Culture-positive with Sensitivity Tests								Total Resistant		
					Total Results Available (b)	Sensitive	Doubtful	Resistant					No. (c)	(c) as % of (b)	(c) as % of (a)
								No Growth at 0.2 µg. per ml. Not at 1	Growth at 1 µg. per ml. Not at 5	Growth at 5 µg. per ml. Not at 10	Growth at 10 µg. per ml. Not at 50	Growth at 50 µg. per ml.			
At 1 month	H	102	27	2	73	58	7	3	0	0	2	3	8	11	8
	SH	124	45	3	76	67	6	3*	0	0	0	0	3	4	2
At 2 months	H	105	38	4	63	17	14	7	6†	0	3	16	32	52	30
	SH	124	68	2	54	46*	3	5	0	0	0	0	5	9	4
At 3 months	H	93	36	4	53	11	9	6	6†	6	15	33	62	13	35
	SH	109	82	4	23	18	2	1	1	0	1	3	3	13	3
By disease group at 3 months:															
Group 1	H	21	11	0	10	3	1	0	0	0	3	3	6		
	SH	30	23	1	6	6	0	0	0	0	0	0	0		
Group 2	H	33	15	4	14	3	3	2	1	0	5	8	1		
	SH	41	30	2	9	7	1	0	0	0	1	1	8		
Group 3	H	39	10	0	29	5	5	4	5†	3	7	19			
	SH	38	29	1	8	5	1	1	1	0	0	2			

* One result was obtained from a guinea-pig culture.

† One of these cultures showed growth at 5 µg. per ml., but was not tested at higher concentrations.

patients with initially streptomycin-sensitive organisms; it is shown below that this was so. In order that Table X should present data for comparable groups, 5 H patients whose bacilli were subsequently found to be streptomycin-resistant before treatment were also excluded, although for these patients there was no *a priori* expectation that resistance to streptomycin would influence the development of resistance to isoniazid under that drug alone. These 5 H cases are also considered separately below.

Results

Table X sets out the results of the isoniazid-sensitivity tests at one, two, and three months in H and SH cases (after excluding patients known to be streptomycin-resistant at the start of treatment). Of 80 isoniazid-sensitivity tests on positive cultures from H patients before treatment, there had been 5 "doubtful" and no "resistant" strains. Examination of 100 SH patients' cultures before treatment also yielded 5 "doubtful" and no "resistant" strains.

At one month, from 73 culture-positive H patients with sensitivity results, 8 resistant cultures (11%) (5 at a level of 10 µg. per ml. or higher) and 7 doubtfully resistant cultures (10%) were obtained; 76 similar SH patients yielded 3 instances of isoniazid resistance (4%, all resistant at the lowest level) and 6 of doubtful resistance (8%). The differences are suggestive, but not statistically significant.

At two months, resistant cultures were obtained from 32 (52%) of 63 culture-positive H patients (half of these growing at 50 µg. per ml.), and another 14 patients (22%) yielded doubtfully resistant strains. The corresponding SH results from 54 culture-positive patients were 5 resistant cultures (9%) and 3 doubtful (6%); again resistance was at a low level (growth at 1 µg. per ml. but not 5). The benefit to the SH treatment is highly significant statistically.

At three months, the proportion of resistant strains from patients on isoniazid alone had increased to 33 (62%) from 53 culture-positive patients, compared with only 3 (13%) of 23 positive SH cultures. When the incidence of isoniazid resistance is expressed as a percentage of the total number of patients for whom cultures were examined (whether culture-positive or negative—that is, (c) expressed as a percentage of (a) in Table X), the difference at three months is

alone and in those having the combination isoniazid + streptomycin. The combination largely prevents the development of isoniazid resistance.

Turning now to the 7 SH patients in whom streptomycin-resistant strains were isolated before treatment, 4 had produced isoniazid-resistant strains at the end of three months. The other 3 were culture-negative at three months, but one was known to have had sensitive strains at two months, and another at both two months and four months. Although the numbers are very small, they suggest that this group of patients is behaving more like a group treated with isoniazid alone than a group treated with the combination streptomycin + isoniazid. In other words, patients with streptomycin-resistant organisms are not protected from the development of isoniazid resistance by the SH treatment.

Of the 5 H patients with streptomycin-resistant organisms initially, the bacilli of 1 were also isoniazid-resistant before treatment. In this case the organisms grew at 1 but not 5 µg. per ml. in the pre-treatment test. The organisms showed the same degree of resistance at one, two, and five months, but at four months growth occurred in the 5 µg. per ml. tube; the culture was negative at three months. This strain was non-pathogenic to guinea-pigs and mice, and therefore appears to be non-virulent (this case will be reported later). Of the strains from the other 4 patients, one was resistant at three months and one sensitive. The other two patients were culture-negative at three months, but had resistant organisms at four months (the culture from one had been doubtfully resistant at one month). The behaviour of these four cases is in keeping with the behaviour of the rest of the H cases.

Isoniazid-sensitivity tests are also available at four months for 8 patients who had continued on streptomycin + isoniazid, in full dosage in one, but with a reduced streptomycin dosage of 1 g. three times a week in 7. Of these 8 patients, 4 had isoniazid-sensitive organisms (including the patient on daily streptomycin), one was doubtful, and 3 were definitely resistant (growth in 5, 10, and 50 µg. per ml. respectively). The strain from one of the 3 resistant cases was known to have been resistant at two months. There were no sensitivity tests available on the

other 2 between one month, when sensitive organisms were found, and the resistant results at four months, and they may well have developed resistance before the fourth month. Clearly this experience beyond three months' treatment with streptomycin + isoniazid indicates the need for a most careful evaluation in the light of further results when they become available.

When the data are complete it will be important to determine whether, when the bacilli of patients on streptomycin + isoniazid become resistant to one of the drugs, they become resistant to the other as well. The results of streptomycin- and isoniazid-sensitivity tests at three months in SH cases given in Tables IX and X have been derived from 23 patients. Results of isoniazid-sensitivity tests were available for all 23, whereas the results of streptomycin-sensitivity tests were available for only 19. No conclusions can be drawn from this limited information, but the findings were as follows:

Isoniazid sensitivity at 3 months	Resistant Doubtful Sensitive	Streptomycin Sensitivity at 3 Months		
		Resistant	Sensitive	Test Pending
1	0	1	16	2

IV. DISCUSSION

In the design of the present trial there were two main departures from the plan of the earlier Medical Research Council trials of chemotherapy in pulmonary tuberculosis. One was the decision to increase the range and scale by including several different types of case, and by enlisting the co-operation of a large number of hospitals. The other arose from the realization that a rapid intake of cases would make it imperative to review the results continually if clinical material was not to be wasted, and if the best forms of treatment were to be introduced without undue delay. A system of monthly progress reports for each patient was therefore set up, and the continual analysis permitted the early publication of a report in which the effects of streptomycin + P.A.S. were compared with those of isoniazid alone (Medical Research Council, 1952).

Even before the publication of this first report it had become apparent that the effects of the combination streptomycin + isoniazid should also be studied, and this treatment was introduced from June 1, 1952, in all three disease groups of the trial, concurrently with the treatments already mentioned. As further knowledge about the effectiveness and limitations of the new drug accumulated, the trial was modified again in order to study exclusively the value of combining isoniazid with other anti-tuberculosis drugs. The trial therefore differs from earlier clinical trials because it has developed on a flexible pattern and has been modified to study fresh problems in the light of information it has itself yielded. This flexibility is one of the most valuable characteristics of the present trial, since it enables much more information to be gained from the available clinical material.

The present observations relate to 364 patients suffering from pulmonary tuberculosis and treated for three months—142 with streptomycin + isoniazid, 102 with streptomycin + P.A.S., and 120 with isoniazid alone. These three treatments were allocated concurrently and at random. The results at the end of three months are summarized in Table XI and also in Figs. 2 to 8. The analysis shows that over this limited period streptomycin + isoniazid is superior to streptomycin + P.A.S. in lowering the sedimentation rate and in increasing body weight, and rather better in improving the

general condition. The two treatments have a similar effect upon pyrexia, upon the presence of tubercle bacilli in the sputum, and, most important, upon radiographic appearances. Streptomycin + isoniazid, compared with isoniazid alone over a three-month period, is found to be considerably more effective in lowering the sedimentation rate, in suppressing tubercle bacilli in the sputum (confirming the findings of Dye, Lynch, and Brees, 1953), and also in improving the radiographic appearances. It is slightly more effective in resolving pyrexia. The two treatments produce equally striking improvements in general clinical condition and in weight.

TABLE XI.—Summary of Comparisons of Streptomycin Plus Isoniazid with Streptomycin Plus P.A.S., and with Isoniazid Alone, at the End of Three Months' Treatment

	Streptomycin Plus Isoniazid %	Streptomycin Plus P.A.S. %	Isoniazid %
General condition:			
Improvement 2-plus	35	24	27
" 1-plus	51	51	52
No change	13	22	18
Deterioration	0	2	3
Death	1	2	1
Weight:			
Gain 14 lb. (6.35 kg.) or more	42	13	47
" 7-13 lb. (3.2-5.9 kg.)	40	32	29
" less than 7 lb., or no change	15	39	20
Loss	3	15	4
Temperature:			
Afebrile at 3 months (febrile at start)	82	76	68
Sedimentation rate:			
Fall to normal from 21 or more in 3 months	45	21	25
Radiograph:			
Improvement 2-plus or 3-plus	38	31	22
" 1-plus	26	32	32
No change	33	33	36
Deterioration	2	1	9
Sputum:			
At 3 months: Direct positive	18	29	41
Positive culture only	15	16	23
Negative	67	55	37
Isoniazid sensitivity:			
At 3 months: Sensitive	78	—	21
Doubtful	9	—	17
Resistant	13	—	62

See the text for the streptomycin-sensitivity results, and Figs. 2-8 for the numbers of patients on which these percentages are based.

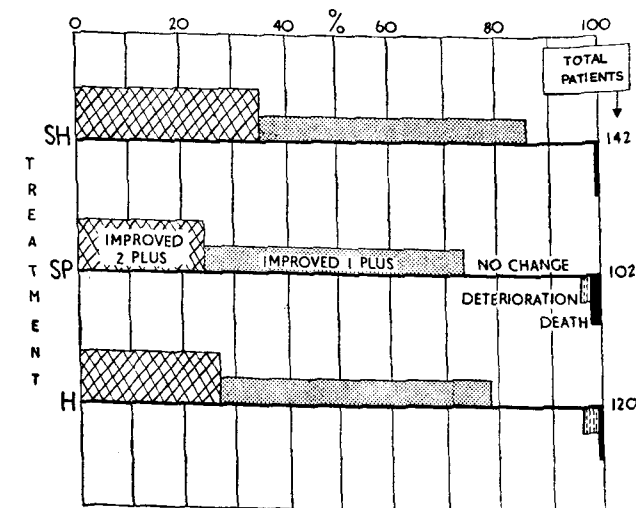


FIG. 2.—Changes in general condition in the first three months in the three treatment series. Each category of response is expressed as a percentage of the total patients.

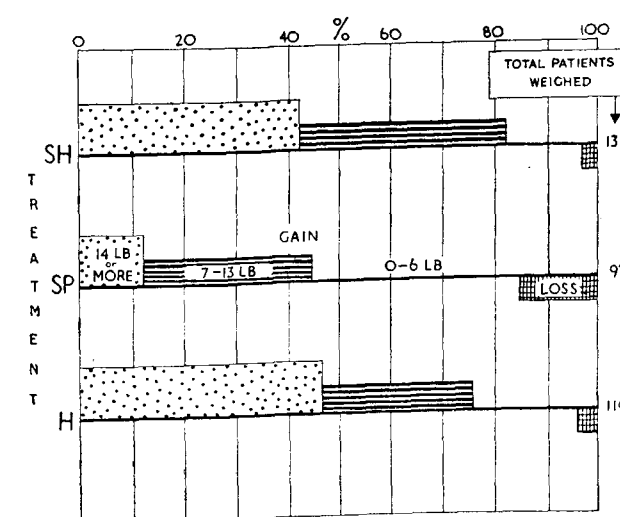


FIG. 3.—Weight changes in the first three months in the three treatment series. Each category of response is expressed as a percentage of the total patients weighed.

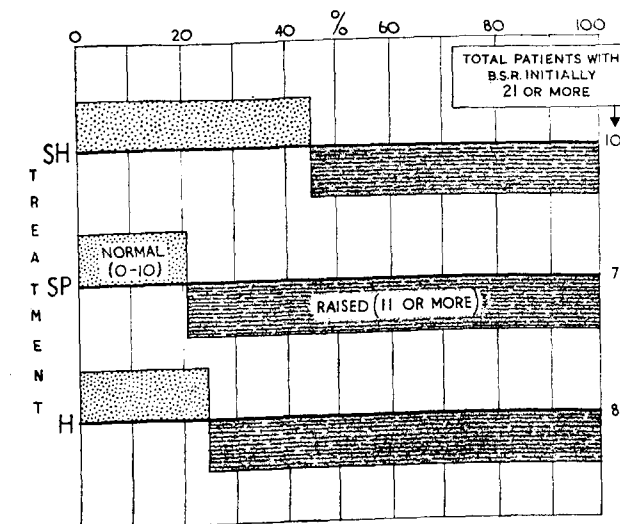


FIG. 5.—Sedimentation rate at three months in patients with a sedimentation rate of 21 or more pre-treatment. The response is expressed as a percentage of the total patients with initially raised B.S.R.

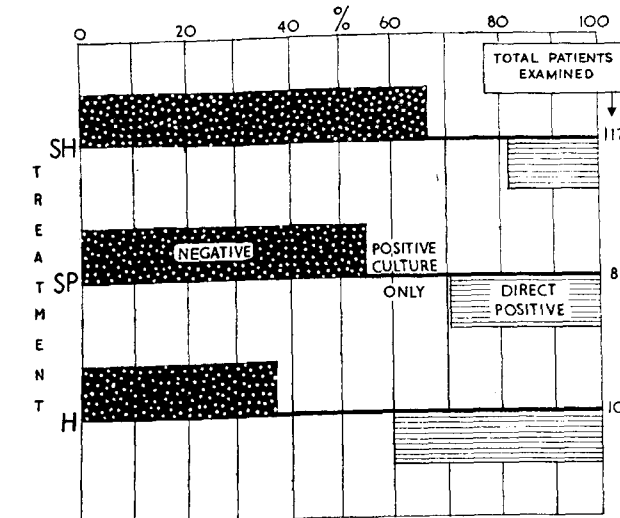


FIG. 7.—Presence of tubercle bacilli at a single examination at three months. The results are expressed as percentages of the total patients examined.

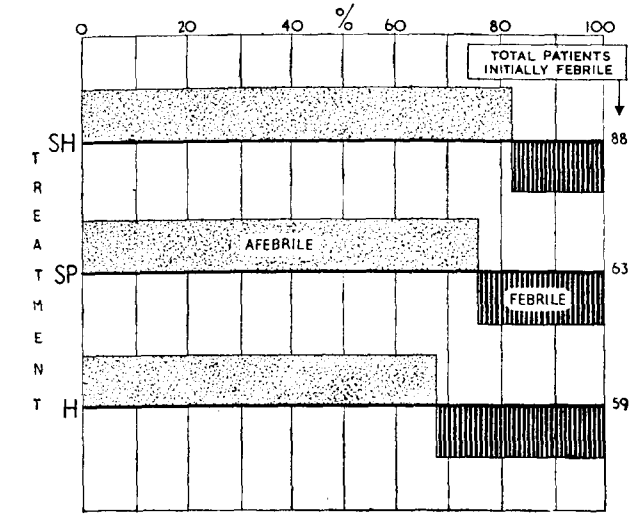


FIG. 4.—Temperature at three months in patients febrile during pre-treatment week. The response is expressed as a percentage of the total patients initially febrile.

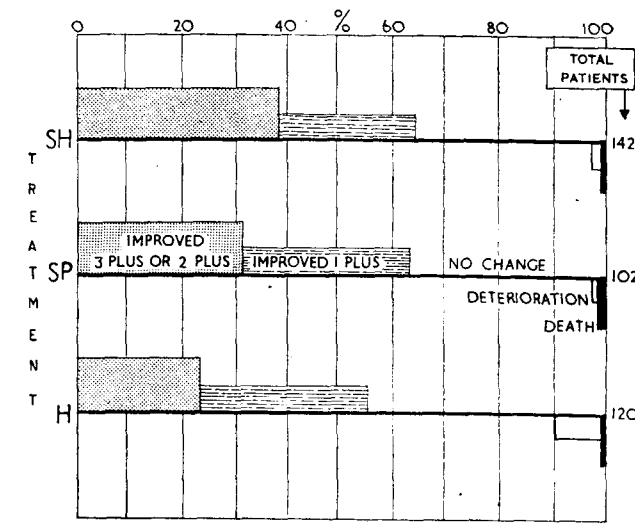


FIG. 6.—Changes in radiographic appearances in the first three months. Each category of response is expressed as a percentage of the total patients.

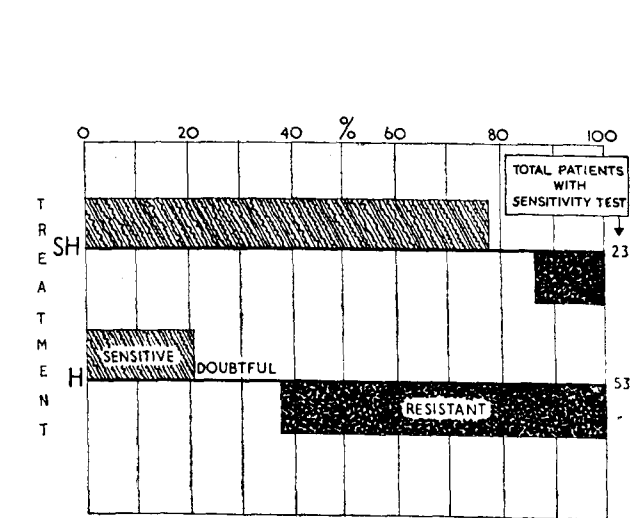


FIG. 8.—Isoniazid sensitivity in SH and H patients at three months. The results are expressed as percentages of the total patients with sensitivity tests.

Although there has been virtually no toxicity from isoniazid with the dosage used, its combination with streptomycin suffers from the disadvantage of toxic reactions to the streptomycin. In the present series such reactions were severe enough to lead to withdrawal of the patient from the trial in 4% of cases (6 out of 148). On the other hand, streptomycin + isoniazid produces far fewer side-effects than streptomycin with P.A.S. in a dosage of 20 g. daily, and is also less unpleasant for the patient. Summarizing, it may be concluded that over a three-month period streptomycin 1 g. daily + isoniazid 200 mg. daily is clinically the most effective anti-tuberculosis chemotherapy yet investigated in this trial, although its superiority to streptomycin 1 g. daily + P.A.S. 20 g. daily is not great.

An important defect of the use of isoniazid by itself is the frequent and rapid emergence of bacterial resistance to the drug. In the present series of patients treated with isoniazid alone, 11% of cultures positive at one month were resistant, 52% of those at two months, and 62% of those at three months. The corresponding figures for the patients treated with streptomycin + isoniazid were only 4% isoniazid-resistant cultures at one month, 9% at two months, and 13% at three months. Moreover, when, with the combined drugs, isoniazid resistance did develop, the average level of this resistance was much lower than for patients on isoniazid alone. The administration of streptomycin 1 g. daily with isoniazid 200 mg. daily therefore lessens considerably the proportion of cases in which isoniazid-resistant strains, particularly those of high resistance, emerge over a three-month period. The very limited information on isoniazid resistance available at four months for these patients is, however, a little disquieting. If, with larger numbers, a substantial incidence of resistant strains appears, it will be important to assess what part, if any, is played by reducing the dosage of streptomycin in the fourth month.

It must be remembered that an increasing proportion of bacteriological specimens from patients on each of the three treatments studied here was found to be negative on culture as treatment proceeded, and consequently fewer and fewer sensitivity tests could be performed. Because of this, it can be argued that the figures quoted above, expressing the resistant strains as a percentage of the positive cultures on which sensitivity tests were performed, do not give an entirely fair picture of the development of resistance; they omit the culture-negative patients, some of whom will be permanently negative. An alternative presentation of the findings is that at three months 33 resistant cultures were obtained from a total of 93 of the patients on isoniazid alone (35%), compared with only 3 from a total of 109 of the patients on streptomycin + isoniazid (3%). On the other hand, these percentages give an unduly favourable impression of the incidence of resistance at three months, partly because not all the culture-negative patients will be permanently negative, and partly because a few sensitivity tests are still pending at three months. A true measure of the incidence of isoniazid resistance at three months in patients not permanently negative probably lies somewhere between 62% and 35% for those on isoniazid alone, and between 13% and 3% for those on streptomycin + isoniazid.

Of 7 patients on streptomycin + isoniazid whose organisms were initially streptomycin-resistant, 4 yielded cultures resistant to isoniazid at three months.

The behaviour of this small group of patients is more akin to that of patients on isoniazid alone than to that of patients on streptomycin + isoniazid. In other words, if a patient's organisms are streptomycin-resistant initially, the combination streptomycin + isoniazid apparently affords no protection against the risk of the development of isoniazid resistance.

For the patients treated with streptomycin + isoniazid it is also important to know whether the combined therapy prevents the emergence of bacilli resistant to streptomycin. The analysis has shown that this is so. At three months, two streptomycin-resistant strains were isolated from 19 positive cultures (11%); these two strains were obtained from a total of 109 patients (2%). The true incidence of streptomycin resistance at three months in patients not permanently negative probably lies between these two percentages. The corresponding figures for isoniazid resistance in the same patients were 13% and 3%. Thus, the combination streptomycin + isoniazid appears to be as effective for three months in preventing the development of streptomycin resistance as of isoniazid resistance. The very limited information on streptomycin sensitivity available at four months for patients on the combination is satisfactory. However, it will be appreciated that, if isoniazid resistance should prove to be a problem at four months, there is a risk that streptomycin resistance may also emerge after a delay of one or two further months if treatment with streptomycin + isoniazid is continued.

For a period of three months streptomycin + P.A.S. and streptomycin + isoniazid are of the same order of effectiveness in preventing the development of streptomycin resistance. However, evidence, which will be presented later, has emerged in the course of the trial that the administration of P.A.S. alone carries with it a serious risk that P.A.S. resistance will develop; if it does, and the patient is subsequently treated with streptomycin + P.A.S., the combination no longer provides protection against the development of bacillary resistance to streptomycin. These findings are particularly important because the use of P.A.S. alone is still regarded by many clinicians as an acceptable treatment for pulmonary tuberculosis. The conclusion of the Therapeutic Trials Committee of the Swedish National Association against Tuberculosis (1952), that P.A.S. alone "should be given in cases where a moderate effect is wanted for a rather long time," seems unwarranted in view of these bacteriological findings.

The lessons to be learnt from these apparently complicated findings concerning the development of bacterial resistance are simple, and are as follows:

(1) *None of the three drugs, isoniazid, streptomycin, or P.A.S., should be used by itself in the treatment of pulmonary tuberculosis.* Equally, no new drug should at first be used by itself, except in clinical trials carefully planned to ascertain its bacteriological qualities as well as its clinical efficacy.

(2) *To give a combination of two of these drugs to a patient whose organisms are already resistant to one of the two appears to be tantamount to giving the other alone, and so is equally undesirable. It is therefore essential, whenever possible, to test the drug sensitivity of a patient's organisms before a course of chemotherapy is started, so that any unsuitable combination of drugs may be avoided and a potentially effective combination for that patient used instead.*

(3) The procedures for the assessment of drug resistance are at present slow and not always satisfactory, and many clinicians, when confronted with an ill patient, will not wish to risk further deterioration before instituting some form of chemotherapy. *A careful scrutiny of the history of previous chemotherapy, with particular regard to any drug which has been given alone, may warn the clinician of possibly unsuitable combinations, but such information cannot be regarded as a substitute for sensitivity tests, which should always be undertaken as soon as possible.*

(4) Even in newly diagnosed cases it is no longer safe to assume that the tubercle bacilli are fully sensitive; since the start of the present trial 4 out of 279 previously untreated patients whose bacilli were tested for initial streptomycin sensitivity (1%) have been found to have organisms resistant to streptomycin; there is evidence that these cases may have been infected with resistant strains. (A full report will appear later.) With the increasing use of anti-tuberculosis drugs the present low risk of becoming infected with drug-resistant bacilli may well increase. *If, therefore, chemotherapy must be initiated for a newly diagnosed case in the absence of sensitivity results, the clinician should inquire into previous chemotherapy and the results of sensitivity tests in any known contact before deciding upon a treatment combination.*

(5) There is, in fact, a great need for simple, reliable, and speedy techniques both for the culture of tubercle bacilli and for the determination of their sensitivity to chemotherapeutic agents. In the meantime it is recommended that every patient with pulmonary tuberculosis, if still bacteriologically positive on completing a course of chemotherapy, should have further sensitivity tests performed as a routine. This information would then be available if more chemotherapy is required at a later date, or should one of the patient's contacts develop the disease. However, the possibility that a drug-resistant strain may be replaced by a sensitive variant after the cessation of treatment must be kept in mind.

Finally, the Committee has obtained convincing evidence that streptomycin 1 g. daily + isoniazid 100 mg. twice a day is a highly effective combination of drugs when used for a period of three months in the treatment of pulmonary tuberculosis. On none of the clinical or bacteriological criteria was the combination inferior to streptomycin 1 g. daily + P.A.S. 5 g. four times a day over this period; in two respects—namely, in lowering the sedimentation rate and in fostering weight gain—it was decidedly superior. Nevertheless, the slender evidence on bacterial resistance which is available after four months' treatment is not entirely reassuring. In view of the short period of observation it is certainly not yet possible to assess the final place of streptomycin + isoniazid in the chemotherapy of pulmonary tuberculosis. The evaluation will depend to a considerable extent upon the clinical and bacteriological findings in patients treated with this combination of drugs over a longer period of time, in comparison with streptomycin + P.A.S. and other forms of chemotherapy.

The trial is continuing, and at present two different dosages of streptomycin and two of P.A.S. are being used, each in combination with isoniazid. These investigations are indispensable in determining the most effective ways in which isoniazid should be used in the treatment of pulmonary tuberculosis.

V. SUMMARY

As part of a clinical trial of isoniazid (isonicotinic acid hydrazide) in the treatment of pulmonary tuberculosis, 364 patients from 40 hospitals were studied; 142 were treated with streptomycin (1 g. daily) + isoniazid (100 mg. twice a day), 102 with streptomycin (1 g. daily) + P.A.S. (sodium salt, 5 g. four times a day), and 120 with isoniazid (100 mg. twice a day) alone. When submitting a case the physician did not know which treatment the patient would receive, this being determined by random allocation. The present report analyses the results at the end of three months' treatment and observation.

Three main groups were observed: Group 1, acute rapidly progressive disease of recent origin (excluding, from this report, bilateral disease between the ages of 15 and 30); Group 2, other forms suitable for chemotherapy; Group 3, chronic disease considered unlikely to respond to chemotherapy.

On admission, the three treatment series had a similar distribution of patients with severe and less severe illness.

At the end of three months, the general condition of the majority of patients had improved, but in this respect the differences between the three treatment series were small. The average gains in weight during the period were 13 lb. (5.9 kg.) for those on streptomycin + isoniazid (SH), 6 lb. (2.7 kg.) for those on streptomycin + P.A.S. (SP), and 13 lb. for those on isoniazid (H) alone.

The temperature of febrile patients fell to normal in 82% of SH, 76% of SP, and 68% of H cases. In patients with a sedimentation rate of 21 or more before treatment, the rate fell to 10 or less in 45% of those on SH, compared with only 21% on SP and 25% on H.

Changes in radiographic appearances were independently assessed by a radiologist unaware of the treatment of any patient. Two-plus or 3-plus improvement was seen in 38% of SH, 31% of SP, and 23% of H cases. There was little difference, over the whole range of response, between patients on SH and SP, but the patients on these treatments responded better than those on H. There were three radiographic deteriorations and one death on SH, one deterioration and two deaths on SP, and 11 deteriorations and one death on H.

The proportions of patients bacteriologically negative, both on direct examination and on culture, at a single examination at three months, were 67% for the SH series, 55% for SP, and 37% for H.

It is concluded, judging solely from the results at three months, that streptomycin + isoniazid, with the dosages used, is clinically the most effective of the treatments studied, although its superiority to streptomycin 1 g. daily + P.A.S. 20 g. daily is not great. A full evaluation must await a longer period of observation.

Bacillary resistance to isoniazid was found in 62% of culture-positive H patients tested at three months, compared with only 13% for similar SH patients. Bacillary resistance to streptomycin was found in 11% of these SH patients at three months. Thus the combination streptomycin + isoniazid, with the dosages studied, is as effective for three months in preventing the development of streptomycin resistance as of isoniazid resistance. Further, for three months the SH treatment is as effective as the SP treatment in preventing the emergence of bacilli resistant to streptomycin.

Patients with organisms initially streptomycin-resistant were apparently not protected from the risk of development of isoniazid resistance by the SH treatment;

patients with organisms initially P.A.S.-resistant (who had had prior treatment with P.A.S. alone) were not protected from the risk of development of streptomycin resistance by the SP treatment. Thus none of the three drugs, isoniazid, streptomycin, or P.A.S., should be used by itself, nor should two of them be used in combination for a patient whose organisms are already resistant to one of the pair. Whenever possible, the drug sensitivity of a patient's organisms should be assessed before chemotherapy is started, to avoid an unsuitable combination of drugs; and also on its completion, in case more chemotherapy is required later.

There is a great need for simple, reliable, and speedy techniques for the culture of tubercle bacilli and for the determination of their sensitivity to chemotherapeutic agents.

The trial was designed so that it could be modified to study fresh problems in the light of information it had itself yielded; at present the effects of two different dosages of streptomycin and two of P.A.S., each in combination with isoniazid, are under investigation.

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Dr. E. H. Bailey, Southern Group Laboratory, supplied culture medium where desired. Dr. D. A. Mitchison's laboratory, Postgraduate Medical School of London, served as reference laboratory for drug-resistance tests. Some of the P.A.S. sensitivity tests for the Scottish centres were undertaken by Dr. A. T. Wallace.

The above cannot be a comprehensive list of all the doctors who have contributed to the results reported here, nor has it been possible to name the many laboratory technicians who have done detailed and valuable work. The Tuberculosis Chemotherapy Trials Committee expresses its thanks to all members of hospital staffs who have assisted in the investigation, particularly for their willing response to the urgent requests for information for inclusion in this report.

The Research Committee of the Scottish Tuberculosis Association has been of considerable assistance in initiating the trial in Scotland. The Edinburgh team is in receipt of a research grant from the Royal Victoria Hospital Tuberculosis Trust. Figs. 1 to 8 were drawn by Miss S. Treadgold and Miss P. Carter of the Department of Medical Illustration, Guy's Hospital.

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M. CANIS RINGWORM AND LOSS OF SCHOOLING

BY

BERNARD A. THOMAS, M.D., B.Sc., D.P.H.
Dermatologist, Royal Gwent Hospital

Cases of ringworm of the scalp produced by the two commonest pathogens, *Microsporum canis* and *M. audouini*, continue to be grouped together as one condition from the point of view of treatment. This is unfortunate. *M. canis* ringworm differs from the *M. audouini* type in being amenable to simpler measures of treatment and in being less contagious. Further, it can be demonstrated that there is no valid reason for excluding *M. canis* cases from school. In the treatment of *M. audouini* ringworm, x-ray epilation is unquestionably the correct procedure, and if it is not carried out the child may continue with the complaint until puberty is reached. As the technique of epilation improves, so do the risks inherent in its use diminish.

In common with others treating ringworm of the scalp, I have experienced the following difficulties. There has been an occasional case of incomplete regrowth of hair; cases in which a marked inflammatory reaction resulted, necessitating incision of sterile abscesses (Fig. 1); and cases in which the first epilation failed to eradicate the infection. Occasionally an anaesthetic has been necessary in toddlers. After x-ray epilation a good regrowth of hair has taken six months in boys and up to a year in girls.

Scalp ringworm caused by *M. canis* need never be treated by x-ray therapy, the following measures of treatment being effective in all cases. The scalp is clipped and the hair kept short, a linen cap is worn constantly, and a simple fungicidal ointment is applied daily. The mildest fungicides are effective, and Whitfield's ointment is adequate. Far stronger fungicides and rubefacients are tried from time to time in cases of *M. audouini* ringworm, but, as yet, no completely effective application has been found. There is no justification for their use in *M. canis* ringworm.

Sharp (1951) described his treatment of 120 cases of *M. canis* ringworm of the scalp (*M. audouini* ringworm is extremely rare in Australia). He used fungicidal treatment only, and the average time taken for cure was 13 weeks. In the subsequent discussion it was apparent that many dermatologists still use x-ray epilation in *M. canis* cases simply because by this method it is possible to get the child back to school in about six weeks.

Distinction Between Types

M. canis and *M. audouini* ringworm cases may be distinguished with reasonable accuracy clinically but only with certainty on culture. It is essential to know which type is endemic locally. For many years a focus of *M. audouini* scalp ringworm has existed in the Blackwood area of Monmouthshire, but practically none of this type of ringworm has been encountered in Newport, 12 miles distant. Of the ringworm cases in the Blackwood area, 91 out of 94 cases have been of *M. audouini*, and in the Newport area out of 32 cases only one has been produced by *M. audouini*.

There are other factors which enable one to make a clinical diagnosis of *M. canis* ringworm. Local tissue reactions are usually more pronounced and there may be erythema, papulation, or even kerion. This distinction, however, is not entirely reliable, and, exceptionally, *M. audouini* cases produce inflammatory reactions (Fig. 2). There is usually a history of an infected puppy or kitten

with which the patient has come in contact. The frequency of tinea circinata in *M. canis* ringworm is well known (Fig. 3). Beare and Cheeseman (1951), describing 1,004 cases occurring in Northern Ireland between May, 1949, and July, 1950, refer to greater brilliance and longer duration of Wood's light fluorescence in *M. audouini* infections. By applying these tests they were able to diagnose correctly 97% of their 71 *M. canis* infections before the results of culture were available.

Epidemiology

While there is abundant evidence that *M. canis* infections are caught direct from animals, it is rarely possible to demonstrate direct contagion from child to child. In the 27 cases dealt with in Table I, six animals were known to be responsible for 11 cases. Five of the animals were kittens, which were destroyed.

In other cases some association with a domestic animal was invariable, but this alone is not proof of an animal source of contagion. The possibility of one animal being responsible for multiple cases must not be lost sight of, and

TABLE I.—Analysis of *M. canis* Scalp Ringworm Cases

Case No.	Age (yrs)	Date First Seen	Date Discharged	Prior Absence from School	School*	M. Canis Type	Contacts
1	12	24/10/50	19/12/50	3 days	A Mixed B Girls	Orange	Siblings
2	9	24/10/50	12/3/51	2 "	"	"	"
3	3	24/10/50	19/12/50	3 weeks	A Infants	Citric	Cousins
4	5	27/11/50	19/3/51	1 week	A "	"	Infected by kitten
5	7	27/11/50	23/4/51				
6	10	12/12/50	2/4/51		1 Mixed	"	
7	6	15/12/50	2/4/51		1 "	"	
8	6	19/12/50	11/6/51	6 weeks	C Infants	"	Siblings
9	5	22/1/51	16/4/51	7 "	D Boys	"	Infected by kitten
10	8	22/1/51	16/4/51	9 "	D "	"	
11	7	23/1/51	23/4/51	20 "	E Junior	"	
12	7	31/1/51	10/4/51	6 "	F Boys	Orange	Infected by kitten
13	9	26/2/51	23/4/51	6 "	G "	Citric	"
14	6	12/3/51	11/6/51	6 "	D Infants	Orange	
15	7	4/6/51	30/7/51	3 "	2 "	"	
16	4	27/8/51	13/1/52	Nil	H "	Citric	
17	6	17/8/51	Left district	8 weeks	I Mixed	"	
18	7	27/8/51	22/10/51	12 "	J "	Orange	
19	8	24/9/51	5/11/51	6 "	2 "	Non-pigmented	Siblings
20	9	22/10/51	8/2/52	4 days	K "	"	Infected by dog
21	4	22/10/51	8/2/52	1 week	K Mixed	"	
22	7	22/10/51	8/2/52	2 weeks	L Infants	"	Infected by same dog
23	11	12/11/51	17/3/52				
24	6	2/12/51	18/12/51	8 "	1 "	Orange	
25	9	4/2/52		2 "	2 "	"	
26	11	8/2/52	3/3/52	Nil	3 Mixed	"	
27	9/12	3/3/52				Non-pigmented	

* Lettered schools = Newport County Borough; numbered schools = Monmouth County.



FIG. 1.—Unusual scalp reaction following x-ray epilation in a case of *M. audouini* ringworm.

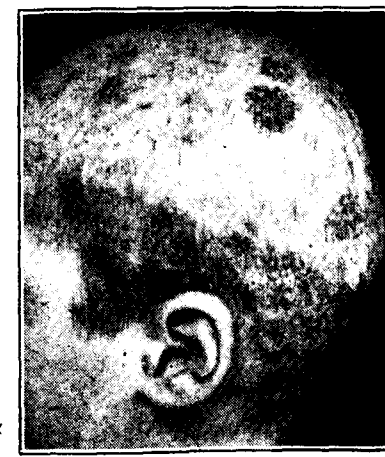


FIG. 2.—Case of *M. audouini* ringworm with exceptional degree of reaction, shown as crusting and papulation.

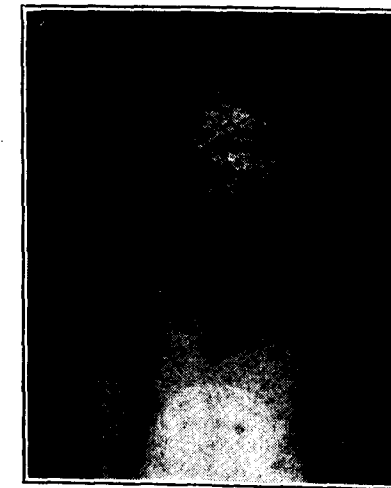


FIG. 3.—Typical *M. canis* infection of scalp with multiple small lesions on glabrous skin of neck.

with some reluctance because the disease is of such a long-term nature as to result in the loss of a high percentage of a child's school career. The cases were of the *M. audouini* type, and the average period of absence from school was assessed as 180 days if the treatment was by ointment and manual epilation. If x rays were used an effort was made to have the children back in school in three weeks after irradiation.

Carslaw (1951) treated 208 cases of tinea tonsurans, all mainly *M. audouini* type, and found that the 104 children of school age were able to return to school in an average of 45 days.

It is usual to discuss the period of treatment and surveillance but to overlook the period of absence from school before special treatment is sought. In the children dealt with in Table I this period varied between 1 day and 20 weeks. A variety of excuses, mostly unsatisfactory, were offered, but the fact remained that some children, with either type of microsporiasis, managed to evade both school and clinic, while at the same time mixing with siblings at home and playmates in the street. The mean loss of schooling before attending clinic in these cases was 33 days. This figure must be added to the 91 days of surveillance when estimating the average loss of schooling which would have been entailed by the attack of scalp ringworm had the children been excluded. It would thus have amounted to 124 days. (Holiday periods have not been deducted from these figures.)

National Survey

In order to assess the incidence of scalp ringworm in England and Wales a questionnaire was circularized to 104 major education authorities. The results are summarized in Table II. The following facts emerged.

(a) *Prevalence*.—There was a rise in incidence towards the end of the last war and in the immediate post-war years, but this seems to be subsiding again. That scalp ringworm is a problem only of the minority of regions is shown by the fact that in 63 areas the number of cases occurring annually is now either very low or nil. In Table II the

TABLE II.—Summary of Replies to Questionnaire Received from 91 Major Education Authorities. Both *M. canis* and *M. audouini* Types of Scalp Ringworm are Included

		Exclusion from School		Recent Annual Case Incidence				
		Total	Conditional	0-10	11-20	21-30	31+	
County councils	29	23	6	16	5	3	5	
County boroughs	62	58	4	47	6	4	5	
Total	91	81 (89%)	10 (11%)	63	11	7	10	

figures quoted refer to the last year for which full information was available, and is usually 1951, although 1950 is taken in a few instances. As examples, Bristol had 131 cases, Liverpool 82, Newcastle-upon-Tyne 136, Northumberland 65, Reading 48, Durham 58, and Monmouthshire 42 in 1951.

(b) *Routine Culture*.—Some 42 authorities (46.1%) stated that cultures from infected hairs were taken as a routine. Particulars were not usually available, however, because the patients were dealt with in the dermatological departments of hospitals. Where information was obtainable it was shown that in the county boroughs *M. canis* was predominant in 12, *M. audouini* in 7, and the infections were mixed in 4. In county areas *M. canis* was preponderant only in 2, whereas *M. audouini* was found in 10, 3 areas showing a mixture.

(c) *Exclusion from School*.—This is rigidly enforced for all types of scalp ringworm by 89% of authorities. Four county boroughs and five county councils allow some relaxation of this rule, but in none of these areas is ringworm common. The usual condition insisted upon is that the lesions are capable of being adequately covered by some form of headwear. In one district single cases are excluded, but if several children are infected simultaneously

they are allowed to attend school with head coverings. Exclusion was enforced in all the localities where *M. canis* is the endemic infection.

Present Investigation

The number of *M. canis* cases in Newport was only 14 between 1945 and 1950, but at the end of the latter year the incidence rose sharply. It was decided to allow all children with *M. canis* ringworm to return to school immediately, provided that certain precautions were observed. The precautions consisted in the wearing of a linen covering or a cap, the use of the ointment provided, and the weekly attendance at the ringworm clinic. The school health authorities willingly co-operated in this plan. Few objections were raised from any quarter. Parents were gratified that their children were able to continue at school, and satisfaction was felt at the clinic because regular weekly attendance was ensured. A solitary complaint was expressed from one child, who felt self-conscious about his headgear.

Details of the plan were as follows. At the first visit of the child to the ringworm clinic a decision was made regarding the probable nature of the dermatophyte and a specimen for culture was taken. A printed list of instructions was then handed to the parent with a promise that if clipping was adequately carried out and the other instructions were followed the child would be allowed to return to school. At his next visit to the clinic a certificate was issued stating that the child was suffering from a type of ringworm of low infectivity, that progress was now satisfactory, and that it was perfectly in order for him to continue at school.

The scheme was put into operation in February, 1951, and a careful note made of the school from which any subsequent case came and also of the subtype of *M. canis* involved.

Results

The results of the experiment are set out in Table I. By studying the type of organism, the time lapse between cases, and the school involved, it was possible to determine whether the infection had been propagated to another child. In fact, not one case of direct infection followed the return to school of any of the 24 children. It would have been well within the bounds of possibility for coincidental infections with the same type to occur in a school, but even this seems not to have taken place during the period under review.

Case 14 attended the same school group as Cases 9 and 10, but a different organism was involved. Case 25 was in the same school group as Cases 15 and 19, but none of these children was infected at the same time. No new case in a schoolchild has been reported in Newport for four months.

Discussion

The main consideration in scalp ringworm is the loss of schooling brought about, especially in the scholarship year. With the common childish complaints, such as the acute specific fevers, the period of absence usually is only a matter of weeks, but with ringworm it may be a matter of months. Efforts to avoid this loss of tuition merit serious attention. In localities where *M. canis* is the exclusive dermatophyte there need be no interruption in school attendance because of ringworm.

The possibility of allowing children with active ringworm to attend school has been raised before. In the annual reports of the Chief Medical Officer of the Board of Education (1927, 1933) it is stated that in rural areas where x rays are not available the child's hair must be clipped short, appropriate ointment applied, and a linen cap worn, and in such circumstances affected children may be allowed to attend school. No distinction in types of cases is made here, and, from my survey, little use has been made of this concession, particularly as x rays have become more generally available. Whether it would be profitable to allow *M. audouini* cases in school is a matter of conjecture and one which is being

It is not possible to calculate accurately the number of cases of *M. canis* ringworm excluded from school in one year, but the figure must be high. Apart from the question of contagion, with which I have dealt, there can be no objection to these children being in school, because no subjective illness is produced in ringworm. The risk of child-to-child contagion is slight anyway, and it is virtually impossible if simple precautions are taken.

Summary

The importance and methods of distinguishing between *M. canis* and *M. audouini* scalp ringworm are indicated.

Some epidemiological considerations regarding *M. canis* ringworm are presented.

The role of microsporum ringworm as a cause of loss of schooling is discussed.

The results of a survey of the incidence of ringworm in the areas of the major education authorities of England and Wales are tabulated and analysed.

An experiment, carried out in Newport, where the scalp ringworm is almost exclusively of the *M. canis* type, and in Monmouthshire is described. Twenty-four children were allowed to continue at 19 schools, the exclusion rule being waived. In no case was the infection propagated.

The conclusion is reached that children with *M. canis* ringworm should neither be treated by x-ray epilation nor be excluded from school.

My thanks are due to Dr. David Lawrence, medical officer of health for Newport, for permitting me to carry out this investigation and for co-operating so helpfully. Also to Dr. Jacqueline Walker, of the Department of Medical Mycology, London School of Tropical Medicine and Hygiene, for carrying out the culture and identification of the fungi.

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FIELD TRIALS OF NEW ANTIMALARIALS IN WEST AFRICA

BY

LEONARD J. BRUCE-CHWATT, M.D., M.P.H.
D.T.M.&H.

AND

H. M. ARCHIBALD, M.B.E., M.B., Ch.B.
(Malaria Service, Medical Department, Nigeria, B.W.A.)

The value of new antimalarials has not always been assessed in the field in comparison with other similar drugs, and specific claims for one or another of the new compounds are difficult to judge when each has had only a limited number of clinical tests. Differences which are known to exist between geographical strains of malaria parasites justify comparative field trials in many tropical areas.

The present difficulties in carrying out chemotherapeutic tests of new compounds in temperate climates on cases of induced malaria and/or on non-immune

volunteers increase the value of properly designed field trials in areas where indigenous malaria is common.

There has been little investigation, especially in tropical Africa, of the value of "camoquin" and pyrimethamine ("daraprim") in comparison with older antimalarials. The present paper reports on results of a chemotherapeutic trial of these drugs and of two other antimalarials, chloroquine sulphate ("nivaquine") and a new compound of the acridine series named "azacrin."

This last drug is a 2-methoxy-6-chloro-9-(5'-diethyl-amino-2'-pentyl) amino-3-aza-acridine dihydrochloride synthesized recently by Messrs. Ward, Blenkinsop and Co. jointly with Messrs. Howards and Sons, Ltd. The first laboratory tests against *Plasmodium gallinaceum* in chicks and *P. berghei* in mice have shown that this compound, given by the mouth, possesses good schizonticidal activity at a dose of 25 mg./kg. in chicks and at a dose of 5 mg./kg. in mice. Its toxicity for experimental animals was found to be low. No data on toxicity of this drug to man being hitherto available, it was taken as a precautionary measure by one of us before using it in field trials on children. The daily dose of 0.4 g. taken for five days having produced only minor side-effects (nausea), it was decided to use this drug for a field trial.

Present Investigation

The method of investigation was that developed by one of us (Bruce-Chwatt, 1951) and subsequently used in the first field trials of pyrimethamine (Archibald, 1951). This method is based on a preliminary selection of an adequate group of African schoolchildren, 5-10 years of age, all naturally infected with malaria. After the administration of a suitable therapeutic dose of the drug to be tested, daily blood examinations of each child are carried out. The parasite rate, parasite density, and any other malarimetric indices are calculated for each group from the results of daily examinations.

Blood slides (thin and thick film) were stained with Giemsa, and parasite rates and counts were based on the examination of thick films. Parasite counts were made from the parasite leucocyte ratio, and the number of parasites per c.mm. was calculated. No film was declared negative before the examination of at least 200 thick-film fields. Parasite density indices were computed as previously described (Bruce-Chwatt, 1951). The speed of decrease of the initial 100% parasitaemia of each group to the lowest level was used as a criterion of the comparative therapeutic activity of the investigated drug against the specific parasite.

For the purpose of the present trial 120 schoolchildren 5-10 years of age were selected after a preliminary investigation and divided into five groups. The first four groups were treated with chloroquine sulphate, pyrimethamine, camoquin and azacrin respectively. The fifth group was not given any drug and represented the control. The administration of each drug was invariably made under our personal supervision.

In the chloroquine sulphate group the drug was given in two different regimens. One-half received 0.75 g. (3 tablets) in a single dose on D day; the other half received 0.75 g. (three 0.25-g. tablets) on D day as a single dose, followed by 0.25 g. (1 tablet) on each of the two following days. In terms of chloroquine base the total dosage was 0.45 g. and 0.75 g. respectively.

The pyrimethamine group also received two different dosages of the drug. One-half had a single dose of 25 mg. (1 tablet) on D day, and the other half had 25 mg. on D day followed by the same dose on the next day. The camoquin group received one dosage only—0.4 g. (2 tablets) as a single dose on D day. The azacrin group was given 0.2 g. (2 tablets) on D day followed by 0.1 g. (1 tablet) on each of the two following days. The dosage of the four drugs is half the usual adult dose. The average age of the

children was 7.6 years. Apart from the preliminary selective examination every child was examined on D day immediately before the administration of the first dose and then on days D+1, D+2, D+3, D+4, D+7, and D+10. The results of the trial are shown in the Table.

Results of Comparative Field Trials of Four Antimalarial Drugs

Group and Day	No. of Cases	<i>P. falciparum</i>					<i>P. malariae</i>	
		Trophozoites			Gameto-cytes			
		No.	%	Density Index	No.	%	No.	%
Chloroquine sulphate I (0.75 g. single dose):								
D	15	15	100	3.14 (47/15)	0	0	4	26.6
D+1	13	11	84.5	1.62 (21/13)	2	15.4	0	0
D+2	15	0	0	0	4	26.6	1	6.7
D+3	15	0	0	0	2	13.3	0	0
D+4	14	0	0	0	1	7.2	0	0
D+7	12	0	0	0	1	8.3	0	0
D+10	13	0	0	0	2	15.4	0	0
Chloroquine sulphate II (1.25 g. in 3 days):								
D	18	18	100	3.00 (54/18)	1	5.6	1	5.6
D+1	18	14	77.8	1.95 (35/18)	0	0	0	0
D+2	18	3	16.7	0.33 (6/18)	1	5.6	0	0
D+3	18	0	0	0	3	16.7	0	0
D+4	16	0	0	0	1	6.2	0	0
D+7	17	0	0	0	1	5.9	0	0
D+10	16	0	0	0	3	18.7	0	0
Pyrimethamine I (25 mg. single dose):								
D	15	15	100	2.81 (42/15)	1	6.7	1	6.7
D+1	15	10	66.5	1.67 (28/15)	0	0	0	0
D+2	14	1	7.1	0.07 (1/14)	3	21.4	2	13.4
D+3	15	0	0	0	3	20.0	0	0
D+4	13	0	0	0	4	30.8	0	0
D+7	14	0	0	0	5	35.7	0	0
D+10	14	0	0	0	4	28.5	0	0
Pyrimethamine II (50 mg. in 2 days):								
D	17	17	100	3.70 (63/17)	1	5.9	2	11.7
D+1	17	12	70.5	2.12 (36/17)	3	17.6	2	11.7
D+2	17	1	5.9	0.06 (1/17)	5	29.5	1	5.9
D+3	17	0	0	0	2	11.7	0	0
D+4	16	0	0	0	6	37.4	0	0
D+7	15	0	0	0	2	13.3	0	0
D+10	15	0	0	0	4	26.6	0	0
Camoquin (0.4 g. single dose):								
D	28	28	100	3.2 (90/28)	5	17.8	3	11.7
D+1	23	15	65.0	1.52 (35/23)	2	8.7	1	4.0
D+2	27	1	3.7	0.04 (1/27)	6	22.2	0	0
D+3	26	0	0	0	5	19.3	0	0
D+4	27	0	0	0	6	22.2	0	0
D+7	27	0	0	0	4	14.8	0	0
D+10	27	0	0	0	4	14.8	0	0
Azacrin (0.4 g. in 3 days)								
D	12	12	100	3.8 (44/12)	4	33.3	1	0.09
D+1	11	6	54.5	1.0 (11/11)	2	18.2	1	0.09
D+2	12	1	8.3	0.08 (1/12)	4	33.3	1	0.09
D+3	11	0	0	0	2	18.2	1	0.09
D+4	5	0	0	0	2	40.0	0	0
D+7	10	0	0	0	3	30.0	0	0
D+10	11	0	0	0	3	27.3	0	0
Control:								
D	15	15	100	2.8 (42/15)	2	13.3	1	6.6
D+1	14	11	78.2	2.7 (30/11)	1	7.1	1	7.1
D+2	15	14	93.0	2.6 (37/14)	2	13.3	1	6.6
D+3	14	11	78.2	2.0 (22/11)	2	14.2	1	7.1
D+4	11	11	100	1.49 (16/11)	3	27.2	0	0
D+7	13	10	77.8	2.1 (21/10)	2	15.4	1	7.7
D+10	13	13	100	2.2 (29/13)	2	15.4	2	15.4

Discussion

These results show that all four drugs are very good schizonticides for *P. falciparum*. There seems to be relatively little difference between the speed with which in a selected group of African children each drug reduces the parasite rate for trophozoites of *P. falciparum* from 100% to 0 (clearance time).

The comparative clearance time of trophozoites of *P. falciparum* in each of the tested six groups was found to be as follows: chloroquine sulphate (dosage I), 1.78 ± 0.41 days; chloroquine sulphate (dosage II), 1.95 ± 0.39 days; pyrimethamine (dosage I), 1.74 ± 0.26 days; pyrimethamine

(dosage II), 1.77 ± 0.24 days; camoquin, 1.69 ± 0.43 days; azacrin, 1.58 ± 0.42 days.

The clearance time found in this investigation for chloroquine is very close to the 1.80 days found for this drug in one of our first trials (Bruce-Chwatt, 1951). It was thought at first that the clearance time obtained in this type of trial with chloroquine is longer by about half a day when compared with figures quoted by investigators whose reports were based on clinical trials in East Africa (Handfield-Jones, 1949), in Tunisia (Durand, Schneider, and Dupoux, 1949), in Indo-China (Canet, 1950). Our average figures for the chloroquine clearance time of asexual parasitaemia due to *P. falciparum* are, however, almost identical with 1.84 days reported from India by Chaudhuri, Chakravarty, Rai Chaudhuri, and Poti (1952), and very close to 2 days observed by Singh and Kalyanum (1952).

In our present investigation camoquin appeared to have a faster action than any of the other drugs, except azacrin. This was somewhat unexpected, since in Bertagna's (1951) summary of information on camoquin the reported clearance time of asexual parasitaemia due to *P. falciparum* had a range between 24 and 120 hours, with an average duration of 53 hours, or 2.25 days. This is also the figure reported more recently by Mein (1951) from Brazil.

The camoquin clearance time of *P. falciparum* parasitaemia observed by us is slightly longer than 1.25 days reported by Hoekenga (1951) from Honduras, 1.2–1.4 days found in Bolivia (Villarejos, 1951), or 1.4–1.6 days reported by Singh and Kalyanum (1952) from India.

The clearance time for *P. falciparum* obtained with pyrimethamine is 1.74 days. This is close to the results obtained by the French workers in Tunisia (1.25 days) and in Indo-China (1.56 days) (Schneider, Canet, and Dupoux, 1952). In the Gambia, however, work by McGregor and Smith (1952) produced slower clearance times in cases of clinical *P. falciparum* malaria treated with pyrimethamine in doses different from those used in the present investigation. The clearance time in infants treated by them with an average dose of 2–4 mg. was 2.82 days even when two infants who failed to respond to therapy are excepted. In a similar series of young children it was 2.57 days, and in a small series of adults, it was 2.25 days.

None of the four antimalarials is an effective direct gametocide for *P. falciparum*, since the crescents persist in the peripheral blood for at least 10 days after the administration of the drugs and show no obvious and constant morphological changes.

In the camoquin series, in which gametocytes of *P. falciparum* were already present in the blood, there was little evidence of any gametocidal action. The observation supports the results quoted by Bertagna (1951) and by Mein (1951), and is in marked contrast to the findings of Singh and Kalyanum (1952), who found that 40% of their crescent carriers were cleared within six days.

Infections with *P. malariae* were too few and of a generally too-low density to obtain series of malariometrical data comparable with series of *P. falciparum*. Nevertheless it seems that chloroquine and camoquin have a more marked action on *P. malariae* (clearance time 1.2–1.3 days) than either pyrimethamine or azacrin (clearance time 2 days and 3 days respectively).

Two infections with *P. ovale* mixed with *P. falciparum* disappeared within 24 hours after the administration of camoquin and azacrin.

Of the four drugs used in the present trial pyrimethamine was tolerated best and no complaints of headache, nausea, or vomiting were made by any children who took it.

Chloroquine sulphate was also well tolerated, though two children complained of nausea after taking a single dose of three tablets. Four children out of 23 given camoquin complained of headache and nausea within four hours of taking 0.4 g. Azacrin was well tolerated in a single dose of two tablets (0.2 g.), but three tablets caused nausea, pain in the stomach, and vomiting in 7 out of 10 children.

It must be emphasized however, that some children had had little or no food in the morning when the drugs were administered and that the side-effects noted might have been less frequent if the drugs had been given after a meal.

Summary

Field trials with chloroquine sulphate, pyrimethamine, camoquin, and azacrin (an amino-aza-acridine) were carried out on 120 African schoolchildren with a subclinical natural infection with *P. falciparum* and *P. malariae*.

All four antimalarials have proved to be good schizonticides. The clearance time of parasitaemia due to trophozoites of *P. falciparum* was shortest with azacrin (1.58 days) and camoquin (1.69 days) and followed by pyrimethamine (1.84 or 1.77 days) and chloroquine sulphate (1.78 or 1.95 days). None of the four drugs shows any direct gametocidal action.

It appears that chloroquine sulphate and camoquin have a more marked action on *P. malariae* than either pyrimethamine or azacrin.

Our thanks are due to Dr. S. L. A. Manuwa, Inspector-General of Medical Services, Nigeria, for permission to publish this paper.

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AN ASSESSMENT OF CHLOROPHYLL AS A DEODORANT

BY

JOHN C. BROCKLEHURST, M.D.

(From the Department of Materia Medica and Therapeutics, University of Glasgow, and Stobhill General Hospital, Glasgow)

Between 1943 and 1950 many claims were made in published articles for the beneficial effect of water-soluble chlorophyll in stimulating the growth of granulation tissue and accelerating epithelization of skin ulcers. The work of Moss and his colleagues (1949) cast doubt on the validity of these claims. In 1951 the Council on Pharmacy and Chemistry of the American Medical Association could find no evidence that water-soluble chlorophyll stimulated granulation and healing beyond the normal rate.

Many reports also noted a deodorant property in chlorophyll when applied to skin ulcers. More recent workers have claimed that the alleged deodorant action of chlorophyll is effective against all kinds of body smells when the substance is taken orally. Such claims have received the widest publicity in the lay press. On the other hand, the *Journal of the American Medical Association* (1951) questions whether chlorophyll does in fact have deodorant properties at all.

The present communication presents the results of a number of *in vitro* experiments designed to determine

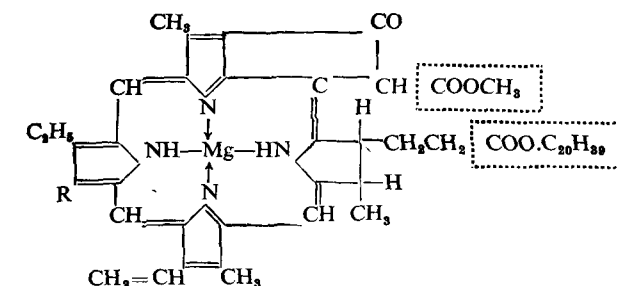
the effect of chlorophyll on a number of odours. Some clinical experiences with the drug are also recounted.

Full summaries of the earlier work with chlorophyll have appeared in recent leading articles in the *British Medical Journal* (1952) and the *Lancet* (1952). It is therefore unnecessary to review the literature again here. It may be noted, however, that all published findings of the action of chlorophyll as a deodorant have depended on the olfactory sense of the observer. Not only is the sense of smell notoriously inconstant from one observer to another, it is also apt to fluctuate in the one observer in different circumstances. Of all the human senses the sense of smell is the most easily affected by suggestion.

Chemistry

As there are various types of chlorophyll, a brief comment is required on the chemical composition of the substance used in these experiments.

Chlorophyll is extracted from plants (especially nettles, spinach, and alfalfa) with alcohol or acetone. This substance, which has the formula shown below, is oil-soluble



Chlorophyll formula. R = CH₃ (chlorophyll-a) or CHO (chlorophyll-b). Ester groups indicated by dotted boxes.

but not water-soluble. It has been described (*Lancet*, 1952) as "a system of four pyrrole rings pivoted on a central magnesium atom," and the formula is similar to that of haem, in which the pyrrole rings pivot in similar manner on an iron atom. Treatment of this substance with acid removes the magnesium atom. The magnesium atom is also easily displaced by other metals—for example, copper.

Treatment with alkali (hydrolysis) splits off the two ester groups shown in the diagram. The resulting substance is a salt of the dicarboxylic acid chlorophyllin. The sodium and potassium salts of this acid are soluble in water and constitute the active principles of the so-called water-soluble chlorophylls (Mitchell, 1952). The therapeutic substance called chloresium was defined by the Council on Pharmacy and Chemistry (1951) as consisting chiefly of the copper complex of the sodium and potassium salts of chlorophyllin. This is the substance used in those published trials in which the nature of the chlorophyll was disclosed. More often, proprietary preparations were used, and no information was supplied about their chemical composition.

In the present experiments the substance hereafter called chlorophyll solution A consists chiefly of sodium copper chlorophyllin, and is made up in a solution containing 1 g. in 10 ml. The substance called chlorophyll solution B is a crude commercial preparation of water-soluble chlorophyll intended for use as colouring matter. Solution C is a proprietary preparation intended for use as an atmospheric deodorant, and is exposed to the atmosphere by means of a wick. Solution D is a proprietary water-soluble preparation sold for dispensing purposes. It is reported to contain 12.5% water-soluble chlorophyll.

Experiments

The principle of the first experiments is the same as that used by Alstead (1942) in assessing the deodorant properties of activated carbon. Methylmercaptan gas (one of the substances contributing to the odour of the gas normally present in the lower bowel) is evolved by adding 5N solution of

sodium hydroxide to crystals of thiourea sulphate (Fig. 1). To obtain as near standard conditions as possible in consecutive experiments, constant quantities of the reagents are used (3.5 g. of thiourea sulphate and 5 ml. of 5N NaOH). The flask containing the reagent is kept in a water-bath at a constant temperature of 65° C. Nitrogen is bubbled through the flask at a constant rate of flow so that the inert gas carries mercaptan through the rest of the apparatus. The gas passes through two bell-jars, securely clamped together, where it comes into intimate contact with a screen of filter paper soaked in chlorophyll solution. The filter paper is arranged around a baffle (Fig. 1).

After passing through this part of the circuit the gas bubbles through test-tubes containing N/10 solution of iodine. Any mercaptan passing over combines with iodine to form colourless hydriodic acid. Thus the time taken to decolorize a standard quantity of iodine solution can be used as a measure of the amount of mercaptan passing over. Alternatively, after some, but not all, of the iodine has combined with mercaptan, a back-titration with N/10 sodium thiosulphate solution indicates the amount of iodine remaining unchanged, and by difference the amount of mercaptan which has reacted with the iodine solution.

Experiment 1

The circuit was set up as in Fig. 1. To the filter paper around the baffle was added 2 ml. of either water or chlorophyll solution A. The whole circuit was filled with mercaptan. New reagents were then added for producing mercaptan. The iodine indicator was added and the gas passed across the circuit for 20 minutes. In this way as nearly similar quantities of mercaptan as could be obtained were exposed to water or to chlorophyll. By back-titrations at the end of the experiment the amount of iodine which had been reduced was noted.

The results were as follows: (1) water, 2 ml. on filter paper—12.6 ml. iodine solution reduced; (2) chlorophyll 2 ml. on filter paper—14.6 ml. iodine solution reduced; and (3) chlorophyll, 2 ml. on filter paper—18.5 ml. iodine solution reduced. These findings show at once that chlorophyll has not removed or altered all the mercaptan exposed to it. Indeed, more mercaptan has passed across when exposed to chlorophyll than when exposed to water.

Experimental error is obviously too great to allow of exact quantitative comparison. The source of error was thought to lie in the existence of a large dead space resulting from the use of bell-jars, and accordingly this was eliminated in experiment 2.

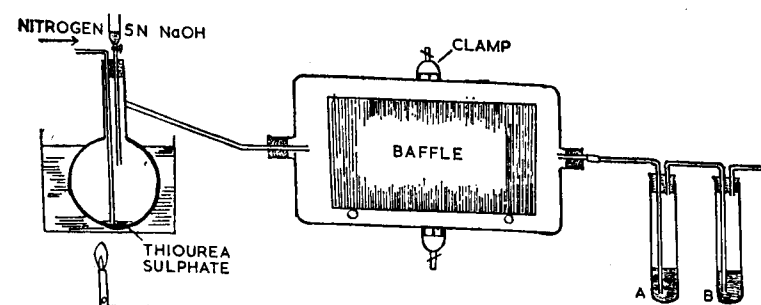


FIG. 1.—A and B=Test-tubes containing iodine, used as an indicator.

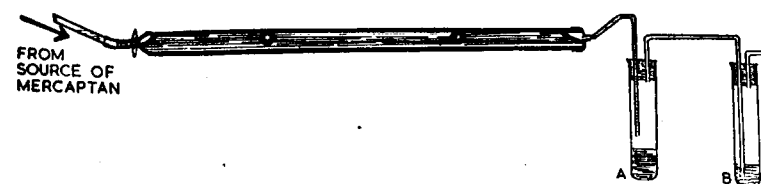


FIG. 2.—A=Test-tube containing chlorophyll solution, and used as a trap to collect froth from the burette. B=Test-tube containing iodine, used as an indicator.

Experiment 2

The apparatus is shown in Fig. 2. An ordinary 25-ml. burette is filled with the substance to be tested. It is tilted slightly off the horizontal so that bubbles of gas slowly traverse the column of fluid. The gas then passes to the test-tubes. The first test-tube, which also contains a measured volume (10 ml.) of the chlorophyll solution being tested, acts as a trap. Chlorophyll solution has a low surface tension, and bubbles of gas passing through it tend to carry the solution forward as foam. This is caught in the first test-tube. The second test-tube contains 5 ml. of iodine solution. The time taken for decolorization of successive tubes of 5 ml. of iodine is noted.

The reading from the first tube of iodine is always the highest, as mercaptan is soluble in water. The first reading is therefore a measure of the solubility of mercaptan in the solutions used. These were as follows:

Water	..	..	..	34 minutes
Chlorophyll solution A (a)	..	..	..	34 "
" " (b)	..	..	..	35 "
Chlorophyll solution C	..	..	..	36 "

After decolorization of this first tube of 5 ml. of iodine, fresh reagents for production of mercaptan were added and notes were made of the times taken to decolorize a second and then a third test-tube, each containing 5 ml. of iodine. The results obtained on two different days were as follows:

First Test.—Rate of flow of nitrogen carrying mercaptan across=8 bubbles a minute.

Time to decolorize 5 ml. iodine			
Water (i)	..	..	4 minutes
" (ii)	..	..	6½ "
Chlorophyll solution A (i)	..	..	4 "
" " (ii)	..	..	7 "

Second Test.—Rate of flow of nitrogen=4 bubbles a minute. (N.B., reduced rate of flow.)

Time to decolorize 5 ml. iodine			
Chlorophyll solution A (i)	..	..	7½ minutes
" " (ii)	..	..	22½ "
Chlorophyll solution C (i)	..	..	6 "
" " (ii)	..	..	22 "

Thus, regarding chlorophyll solution A as a standard, it will be seen that there is no difference in the time taken for a constant amount of mercaptan gas to pass through solutions of chlorophyll A and C and water. Furthermore, the times taken for such solutions and water to become saturated with mercaptan are the same. It is obvious, therefore, that intimate exposure of mercaptan gas to the action of chlorophyll solution, as described above, did not reduce the volume of the gas.

Experiment 3

This experiment involves the use of very much smaller quantities of mercaptan and of other odorous vapours, and exposes these to chlorophyll for much longer periods. This method depends on the reliability of the observer's olfactory sense and is open to criticism on that account. Such criticism, however, as has already been noted applies equally to all who have made positive claims for the deodorant value of chlorophyll.

The apparatus is shown in Fig. 3. The bell-jar stands on a ledge in a water-bath so that there is a complete water seal. A filling funnel from which N/2 sulphur acid is run in; B is a shallow dish containing N/2 sodium hydroxide saturated with

methylmercaptan. By mixing equal quantities of acid and base methylmercaptan gas is liberated. The filter paper (C) stands clear of the water in a petri dish soaked with chlorophyll or other substance under trial.

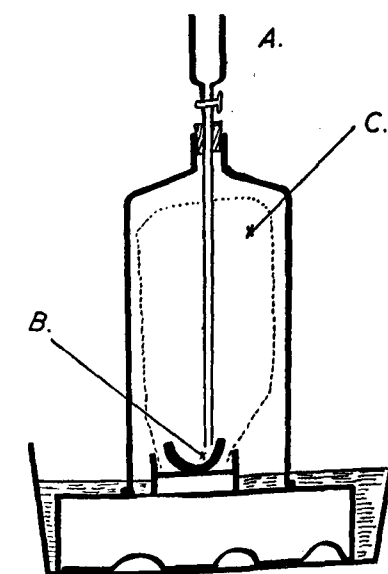


FIG. 3.—A=Filling funnel (N/2 H₂SO₄). B=Dish containing mercaptan in N/2 NaOH. C=Filter paper soaked in chlorophyll.

with acid liberates very approximately 30 mg. of methylmercaptan, or 130 ml. of the gas. In two cases tablets of chlorophyll, marketed for oral use, were crushed and suspended in water (one tablet per ml.), and this suspension was exposed to the gas.

Source of Smell	Substance under Trial	Quantity	Duration of Exposure	Result (Smell +/-)
Methylmercaptan: 30 mg. ..	Water (control)	3 ml.	12 hours	+
	"	3 "	13 "	+
	Chlorophyll solution A	2 "	12 "	+
	"	3 "	12 "	+
	"	3 "	14 "	+
	"	3 "	16 "	+
	Water (control)	3 "	14 "	+
	Chlorophyll solution A	3 "	14 "	+
	"	3 "	15 "	+
	Suspension of "chlorophyll tablets"	3 "	12 "	+
Meth-ether: 4 ml. ..	Water	2 "	28 "	+
	Chlorophyll solution A	0.5 "	22 "	+
	"	4 "	47 "	+
	"	4 "	25 "	+
	"	4 "	36 "	+
	"	4 "	36 "	+
Syrup of garlic: 5 ml. ..	Water	1 "	12 "	+
	Chlorophyll solution A	1 "	12 "	+

* In this case the smell of mercaptan was not detected. There was, however, a very strong smell of chlorophyll, which may have masked it.

This experiment, which involved exposure of small quantities of mercaptan, ether, and syrup of garlic in a small enclosed space for long periods of time to filter paper soaked in various chlorophyll preparations, showed a possible complete deodorant effect in only one case, and because of the presence of a strong smell of chlorophyll on that occasion it can hardly be regarded as being significant. It is concluded from this experiment that chlorophyll when exposed in this way to an odour does not remove the odour from the air.

Experiment 4

(a) Three jars were set up containing, respectively, 4 ml. of concentrated solution of chlorophyll; 4 ml. of dilute solution of chlorophyll; and 4 ml. of water. To each was added one drop of perfume. On smelling the jars subsequently no difference could be detected between them. In each case all the liquid evaporated within 14 days. The smell of the perfume persisted strongly in all the jars even after five months. A similar experiment, using slices of onion instead of perfume, showed no difference after 24 hours. The smell was so offensive that the experiment then had to be abandoned.

(b) Stopped test-tubes containing 10 ml. respectively of water, chlorophyll solution A, and solution C were set up for 72 hours, with 10 ml. of a solution of mercaptan in water added to each. At the end of this time there was a strong smell of mercaptan from each tube. It was also noted that the tube containing solution C (a preparation of chlorophyll which is perfumed) yielded the smell of mercaptan after standing for 72 hours, but on being shaken the smell of the perfume emerged and masked the smell of mercaptan fairly effectively. This was noted on several occasions, and suggests that the apparent deodorant property of such a preparation is due to substitution of a smell which is stronger but more pleasant than that which it is desired to eliminate. This experiment was repeated, using a smaller quantity (1 ml.) of mercaptan solution. Instead of adding chlorophyll solutions, however, plugs of cotton-wool were inserted at the upper part of each tube. These were then saturated respectively with (1) chlorophyll solution A; (2) chlorophyll solution A evaporated to dryness; (3) powdered activated carbon; and (4) a control of plain cotton-wool. After 24 hours the smell of mercaptan was perceptible in all the tubes. After a further 24 hours the smell was perceptible from all tubes except that containing activated carbon.

(c) A series of four stopped test-tubes was set up containing (1) 5 ml. of syrup of garlic and 4 ml. of chlorophyll solution A; (2) 5 ml. of syrup of garlic and 4 ml. of chlorophyll solution D; (3) 5 ml. of syrup of garlic alone; and (4) 5 ml. of chlorophyll solution A alone. The smell of garlic was present in all tubes except the fourth whenever the contents were smelled—at intervals from one day to one month after setting up. (The test-tubes were left in an ordinary warm room during all this time.)

Clinical Trial

The following simple *in vivo* tests were performed:

(a) A patient incontinent of urine and faeces was being nursed in a special bed which gathered the excreta direct into a receptacle. This patient was given three-day courses of (1) chlorophyll solution A, 400 mg. daily; (2) proprietary chlorophyll tablets, 400 mg. daily; and (3) periods with no chlorophyll. The days on which particular courses were given were not known to the observer. Each morning the odour of the receptacle containing the night's collection of urine was noted. This characteristic and unpleasant odour of urine was present every day no matter whether chlorophyll was being given or not.

(b) *Asparagus Test.*—It is well known that in many people the urine develops a characteristic odour within an hour or two of eating asparagus. One of the earliest and widely quoted observations on the alleged deodorant action of chlorophyll is one by Westcott (1950), who stated that oral administration of chlorophyll before taking asparagus prevented the appearance of this odour in the urine. A colleague in this hospital who consistently detects the asparagus odour in his urine after eating this vegetable decided to test Westcott's findings. In the 24 hours preceding the meal he swallowed 48 100-mg. tablets of a proprietary water-soluble chlorophyll in doses of 6-12 tablets at intervals of four hours. He then took his meal, which included an average serving of asparagus. Some two hours later the urine which he passed smelled strongly of the volatile substances of asparagus, and the odour was readily

detected in further specimens of urine passed about 12 hours later. It is concluded that, in this observer, chlorophyll in doses at least 25 times greater than those usually recommended was valueless in preventing the characteristic smell of the urine following ingestion of asparagus. It was also noted that the smell of the faeces was unaffected by this large dose of chlorophyll.

I have confirmed these findings in similar manner, and have also found that the oral administration of 800 mg. of chlorophyll daily for a week did not remove the odour of urine, faeces, or axillary perspiration.

So much has been made of the alleged deodorant effect of chlorophyll on the urine of persons who have eaten asparagus that it would be helpful if a large number of doctors would themselves repeat this simple experiment. The experience would be in the best tradition of the advice offered to Jenner by John Hunter.

Conclusions

Exposure of methylmercaptan gas in a closed system to water-soluble chlorophyll did not reduce the amount of gas passing over to an indicator, compared with a control.

Exposure of small quantities of methylmercaptan gas to water-soluble chlorophyll in a closed system for up to three days did not remove the smell of mercaptan.

Mixtures of water-soluble chlorophyll and various strong-smelling solutions did not remove the smell of these solutions even after exposure for one or more months.

Clinical trials are reported in which the smell of urine, faeces, sweat, and of urine after ingestion of asparagus was not removed after taking large numbers of chlorophyll tablets.

I should like to thank Professor J. W. Cook, F.R.S., for the use of many facilities in the Department of Chemistry, University of Glasgow, also Professor Stanley Alstead and Dr. D. Gibson for many helpful suggestions.

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The Faculty of Ophthalmologists has for some time been considering the desirability of standardizing reading types used for testing vision. Suggestions from many sources have been studied and the final recommendations of the Council of the Faculty have been embodied in a memorandum by Mr. F. W. Law (*Brit. J. Ophthalmol.*, 1952, 36, 689). The Council's recommendations for a standard test of near vision are that: (1) "Times Roman" type shall be used, with "standard" spacing; (2) suitable passages of literature shall be selected, and a different passage used for each type; (3) specimens of printing in 5, 6, 8, 10, 12, 14, 18, 24, 36, and 48 point type shall be used, starting with the smallest [1 point = 1/72 in.]; (4) a few isolated words in lower-case letters shall be printed in each size; (5) near acuity shall be recorded by the letter N, followed by a number indicating type-face size—for example, N.5, N.8, etc.; (6) the test shall include a facsimile of a Snellen distance chart reduced to 1/17 normal size and used at 35 cm. distance, the result being recorded as a "Snellen equivalent"—for example, N=6/9; (7) the test may also include reproductions or actual portions of familiar types in everyday use; (8) near test types shall be reproduced on sheets about 9 × 6 in. (23 × 15 cm.); (9) the print shall be on dead-white matt-surface cartridge paper or board, and the latter may be varnished to increase durability.

CAPACITY OF A CATIONIC EXCHANGE RESIN ("ZEO-KARB 225") IN VIVO

BY

PAUL FOURMAN, M.D., M.R.C.P.

With the technical assistance of ALISON SHEPHERD and BARBARA SEIBERT

(From the Nuffield Department of Clinical Medicine, Oxford)

Cationic exchange resins are insoluble powders which will exchange cations on the same principle as the familiar water softeners. The exchange obeys the law of mass action, and mixtures of cations combine with the resin *in vitro* in proportions determined by equilibrium constants (MacIntyre and Jordan, 1951). *In vitro* the affinity for monovalent ions follows the order $K > Na > NH_4 > H$. The affinity for divalent ions is greater than for monovalent ions. The resins have been given in the H or NH_4 form to prevent absorption of Na from the bowel in patients with oedema or ascites and in patients with hypertension (McChesney, Dock, and Tainter, 1951; Greenman and others, 1951). The resins give off H or NH_4 in exchange for Na; H or NH_4 is absorbed combined with acid, and Na is excreted in the faeces combined with resin. The resin takes up K and other cations as well, and the depletion of cations may result in acidosis. To minimize these complications the resin has been given partly combined with K.

Most of the information available is on the effects of carboxylic exchange resins. In the course of work on experimental depletion of potassium we have obtained data on the effects of a sulphonated polystyrene resin, "zeo-karb 225," on the absorption of K, Na, Mg, Ca, and P with a normal diet in man. Though these data are incidental to another investigation and give information of limited scope, we think it may be useful to report them now that a pharmaceutical preparation of zeo-karb 225 has become available ("kationium"). Additional information was derived from studies of three patients who were receiving only small amounts of sodium in their diet.

Procedure

There were three experiments—F.1, W., and F.2—on two normal subjects, F. and W. The H form of the resin was given in F.1 and the NH_4 form in W. and F.2. The dose of resin was 60 g. daily for eight days, followed by 90 g. daily for eight days in F.1 and F.2 and 90 g. daily for four days in W. (These doses are two or three times what is likely to be given therapeutically.) The diets contained, per day, Na, 180–220 mEq; K, 31–38 mEq; Mg, 12–22 mEq. The composition of the diet in each experiment was constant. Resin was given with meals; added sodium was given between meals. The faecal excretion of N, P, Ca, K, Na, and Mg and the urinary acidity and ammonia were measured. Other details are available in a previous publication (Fourman, 1952).

In addition three patients were studied: a woman (A.) with intractable cardiac oedema; a man (M.) with cirrhosis of the liver, ascites, and oedema; and a woman (P.) with hypertension but without oedema or other evidence of heart failure. The patients received resin in a dose of 20, 30, or 45 g. daily while taking a diet which contained less than 20 mEq of Na a day. The faecal excretion of Na was measured in periods of seven or twelve days while the resin was given in the NH_4 form and also while it was

TABLE I.—Effect of Resin on Daily Faecal Loss of Cations (mEq) in Consecutive Periods of Four Days

Form of Resin: Experiment:	H				NH_4							
	F.1				W.				F.2			
	Na	K	Mg	Sum	Na	K	Mg	Sum	Na	K	Mg	Sum
Period:												
Control ..	8.2 8.8	9.9 8.6	2.4 6.9	20 24	5.4	7.2	5.7	18*	3.2 7.4 6.0	5.5 8.9 6.5	6.4 12.1 7.6	15.1 28.4 20.1
Resin, 60 g.	103 121	40.9 51.2	5.7 15.9	150 188	106	72.2	10.8	189*	126 132	61.1 56.3	11.3 12.0	198 200
.. 90 ..	139 156	47.6 63.3	12.3 15.9	199 235	169	78.6	10.3	258	149 192	64.3 88.5	9.0 17.8	222 298
Recovery ..	21.2 8.3	17.6 9.7	24.7 12.8	64 31					26.9 13.8 3.1	21.2 9.1 7.9	9.6 12.1 18.5	58 35 30
Diet ..	223	38	22		212	36	12		181	31	13	

* Eight-day period.

given in the NH_4 form with K salts added to the treatment or in the K form as prepared in the laboratory. Potassium salts were given between doses of resin and not with resin.

Effect of Resin on Different Ions

In the experiments the resin took up Na, K, and Mg (Table I), but not Ca (Table II). Absorption of phosphate was possibly enhanced (Table II).

The proportions of Na, K, and Mg in the faeces were remarkably similar for the different doses of resin and in

the different experiments (Table III). The mean ratio of Na:K:Mg was approximately 11:5:1. It seems likely that these proportions represented an equilibrium mixture of Na, K, and Mg for the diet provided, where the intake of Na was liberal. The amount of Na taken up by the NH_4 resin was about 2 mEq/g. and slightly more than twice that of K. The uptake of K exceeded the dietary intake. The amount of Mg taken up was small compared with the two other ions, but constituted a large proportion of the dietary intake.

In the patients who were receiving a low intake of Na, the amount of Na taken up by the resin was small and equivalent to only 0.7 mEq/g. When K was given in addition, either as K salts or as the K form of resin, the amount of Na taken up was even smaller (Table IV). The amounts of Na taken up per g. of resin were again similar for the different doses of resin given.

The number of data is small and the agreement may be fortuitous; but the results suggest that the equilibrium between resin and Na depends on the cation content of the diet and not on the dose of resin, for the range of doses given.

Capacity of Resin in Vivo

The capacity of the H and NH_4 forms of resin *in vitro* differs because the NH_4 form has a lower moisture content (10% as opposed to 30%). Thus, while the same weights of both forms of resin were given, the effective dose of the NH_4 form was about 130% of that of the H form. The following estimates of capacity are based on the weight of resin given.

The capacity of the H resin *in vitro* is 2.5 mEq/g. (*Lancet*, 1950). The capacity of the NH_4 resin *in vitro* was estimated as 3.3 mEq/g. (calculated from the N content, on the assumption that all the N was present as NH_4). An estimate of the capacity of the resin *in vivo* was obtained from the increase in faecal excretions of cations when resin was given. The capacity calculated in this way from data in Table I was 2.4 mEq/g. for the H form and 2.8 mEq/g. for the NH_4 form in both experiments in which this form was given. These are minimum estimates of the capacity of the two forms of resin, because some resin was excreted with cation after the marker for the end of the resin period had appeared in the faeces (cf. Table I), and because not only of the increase in faecal cation but also the cations normally present in faeces may have combined with the resin.

Another estimate of the capacity of the NH_4 resin *in vivo* was given by the change in faecal N when the NH_4 resin was given. In W. there was an increase of faecal N while the resin was given, equivalent to 0.4 mEq of NH_4 per g. of resin; this suggests that 2.9 mEq of NH_4 per g. of resin was exchanged. This estimate corresponds well with the one above of 2.8 mEq/g. In F.2 the faecal N did not increase, so that in this experiment all the NH_4 , or 3.3 mEq/g. of

TABLE II.—Effect of Resin on Daily Faecal Loss of Ca and P (mg.) in Consecutive Periods of Four Days

Form of Resin: Experiment:	H		NH_4			
	F.1		W.		F.2	
	Ca	P	Ca	P	Ca	P
Period:						
Control ..	720 574	540 420	1,012	544*	402 845 500	344 712 443
Resin, 60 g.	495 673	360 378	515	362*	472 296 372	362 372
Resin, 90 g.	580 454	289 268	976	240	416 588	220 356
Recovery ..	797 881	566 676			550 776 1,146	380 731 792

* Eight-day period.

TABLE III.—Percentage of Na, K, and Mg in Faeces During Administration of Resin

Form of Resin: Experiment:	H		NH_4			
	F.1		W.		F.2	
	60	90	60	90	60	90
Na ..	66.3	68.0	56.1	65.5	64.8	65.3
K ..	27.2	25.6	38.2	30.5	29.5	29.3
Mg ..	6.4	6.5	5.7	4.0	5.8	5.1
Mean						

TABLE IV.—Faecal Na per g. of Resin in Patients on Low-sodium Diets

Case	Duration of Faecal Collection	Dose of Resin	Faecal Na (mEq/g. of Resin)		Amount of Added K (mEq)
			Without K Added to Treatment	With K Added to Treatment	
M.	12 days	20 g.	—	0.25	84 (as mist. pot. cit.)
A.	7 ..	30 ..	0.87 0.67	0.28	90 (resin given in K form)
P.	7 ..	45 ..	0.73 0.59	0.16 0.18	120 (as KCl)
Mean uptake of Na (mEq) per g. of resin			0.7	0.2	

Medical Memorandum

Jejunal Diverticulitis with Diverticular Concretion

In an exhaustive review of the complications of acquired diverticulosis of the jejunum and ileum, Milnes Walker (1945) pointed out that in no case of jejunal diverticulitis had a concretion ever been found in an inflamed diverticulum, a fact suggesting that such concretions do not predispose to inflammation. I have found only one case of concretion formation reported since 1945, and this occurred in an uninfamed diverticulum. It was reported by Klidjian (1946).

The case recorded below therefore seems unique in that a concretion was found in a jejunal diverticulum which was the site of acute diverticulitis. It is also of interest because simple local excision of the diverticulum was practicable, which is unusual in cases of jejunal diverticulosis.

CASE REPORT

A housewife aged 60 was admitted to hospital on July 18, 1949, complaining of nausea and abdominal pain. The pain had started thirty hours previously as periumbilical colic,

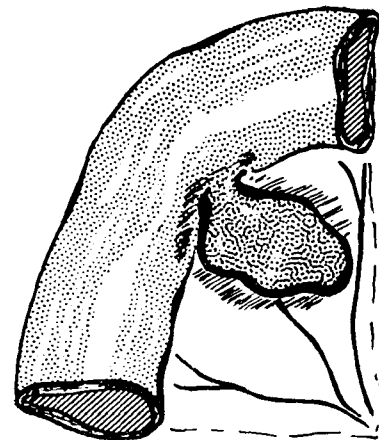


Diagram illustrating the operative appearance. The inflamed diverticulum, with contained concretion *in situ*.

and had been continuously present since, increasing in intensity until it became "as bad as labour pains." It was accompanied by a feeling of abdominal distension, right-sided soreness, and a little lumbar back-ache. No previous history of any abdominal upset could be obtained.

Examination showed great tenderness of peritoneal type above and to the right of the umbilicus, and also high right-sided tenderness on rectal examination. Bowel sounds were present. The temperature was 100.2° F. (37.9° C.). The tongue was heavily coated. Although a provisional diagnosis of acute appendicitis was made mental note was taken that the clinical picture did not seem entirely typical of that condition.

Operation.—A right lower paramedian incision was made under general anaesthesia. Some free fluid was present, and some distance below the duodeno-jejunal flexure there was a hard movable rounded mass, about the size of a golf ball, attached to the mesenteric aspect of the small gut. When withdrawn from the incision the mass proved to be an inflamed solitary diverticulum of the jejunum containing a concretion or enterolith 1 in. (2.5 cm.) in diameter. The diagram shows how this diverticulum presented on the left-hand aspect of the mesentery at a point on the jejunum 2 ft. (61 cm.) below the duodeno-jejunal flexure. In spite of the inflammatory oedema in the related part of the mesentery and nearby jejunal wall, and because of the narrow neck, diverticulectomy and jejunal repair, using two layers of catgut sutures and an omental graft, were easily accomplished without any narrowing of the jejunal lumen. The appendix was removed too, but it looked entirely normal. No other abnormality could be found in the abdomen, and in particular there were no other diverticula.

Convalescence was uneventful, and the patient was discharged home with the wound healed on the ninth post-

operative day. She was seen and re-examined six months after the operation, when she reported fit and well, and said that she had been able to dispense with the laxatives she had previously found necessary.

COMMENT

The diverticulum had only a very thin and tenuous muscle coat, and seemed a typical acquired (rather than a congenital or cyst-like) diverticulum, which lay in close relationship to the left branch of one of the vasa recta. The contained concretion completely filled the lumen. Fusiform in shape, it was about 1 in. (2.5 cm.) long, of hard consistence, and brownish yellow in colour. By a misfortune it was lost on the way to the laboratory and so never came to analysis, but I believe that it probably was a bile-acid enterolith of the type described by Armitage, Fowweather, and Johnstone (1950).

Diverticula of the small intestine are comparative rarities, and those containing concretions are very rare indeed. Orr and Russell (1951) reported a series of 13 cases of jejunal diverticulosis, but they do not record concretion formation in any; nor did Edwards (1939), in his classical series of 16 cases. In addition, in the series of 122 cases of jejunal and ileal diverticulosis reported from the Mayo Clinic, Benson, Dixon, and Waugh (1943) do not mention concretion formation. Milnes Walker (1945) was able to find only four previously recorded cases of concretion formation in jejunal diverticula. In three of these the concretions had caused acute intestinal obstruction. He reported a case in which an inflamed ileal diverticulum had been found to contain a concretion, and noted that several other authors had reported cases of concretion formation in duodenal diverticula. Soon afterwards Klidjian (1946) reported his case, in which severe melaena had been caused by haemorrhage from a jejunal diverticulum containing a large concretion of unspecified type.

It would therefore seem that the present case of jejunal diverticular concretion is only the sixth reported, and in fact it is the only one in which a concretion has been found in an inflamed jejunal diverticulum.

It is a pleasure to thank Mr. D. M. Sutherland, under whose care this case was admitted, for much help and encouragement, and I am indebted to Dr. Robert Ollerenshaw, and Mr. Kilshaw, of the department of medical photography at the Manchester Royal Infirmary, for the illustration.

A. F. ROBINSON, F.R.C.S.,
Surgical First Assistant,
Manchester Royal Infirmary

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A new quarantine station will be put into service at Jeddah, the port of Mecca, for the pilgrimage season of 1953 (Year of the Hegira, 1372). The Government of Saudi Arabia is completing its construction and the World Health Organization is helping to equip and staff it. It will replace the old station of Kamaran, situated on an island in the southern part of the Red Sea, where, between the two world wars, up to 100,000 pilgrims were handled during one year (1926-7). The station at Jeddah comprises a quarantine station for the accommodation of persons under observation, a communicable diseases hospital, a general hospital, and a laboratory. On several occasions in the past the pilgrimage to the holy places in the Hedjaz has been the cause of serious epidemics, notably of plague and cholera. At its own request, the Government of Saudi Arabia is responsible for the new station under the International Sanitary Regulations.

Reviews

ABDOMINAL SURGERY

The Management of Abdominal Operations. Edited by Rodney Maingot, F.R.C.S. (Pp. 1,256; 532 illustrations in 328 figures. £6.) London: H. K. Lewis and Co. 1953.

The appearance of this remarkable volume forms an epoch in the history of modern surgery. It records the experiences and the achievements of 33 of the acknowledged leaders in British surgery, set out with lucidity, brevity, and candour. Much that is to-day accomplished with almost routine facility would 20 years or even 10 years ago have been utterly impossible, and it is doubtful if any other art can show such solid and continuous progress.

It is remarkable that just one-third of the book is devoted to considerations which are essentially physiological—a striking contrast to the atmosphere of anatomy in which we surgeons were trained in another epoch. To-day the surgeon must have this knowledge, but the human brain does not expand, and one wonders how long he can carry such a burden and whether we must not in the future achieve some division of responsibility.

The contents of the book are so good and so varied that no review could possibly do them justice. We can only mention the really fine articles by Maingot on the stomach and on the biliary tract, by Norman Tanner on gastric haemorrhage and perforation, and by Borrie on the oesophagus and the cardia. But standing above everything else is the great essay by Gordon-Taylor on abdominal injuries in warfare and in civil life, an essay which really makes history and which only its author could have written.

HENRY SOUTTAR.

HANDBOOK OF OBSTETRICS

A Modern Practice of Obstetrics. By D. M. Stern, M.B., B.Ch.(Cantab.), F.R.C.S., F.R.C.O.G., and C. W. F. Burnett, M.D.(Lond.), F.R.C.S., F.R.C.O.G. Line drawings by Susan M. Robinson. (Pp. 248; 140 illustrations. £1 15s.) London: Baillière, Tindall and Cox. 1952.

This book, intended for medical students, is based on the writers' experiences at the West Middlesex Hospital. It is rather smaller in size than the average undergraduate text-book but is in no way a "synopsis." In order to keep it concise, pure anatomy and physiology have been entirely omitted, while, according to the preface, normal and common abnormal conditions have been emphasized and the rarer complications but briefly mentioned.

The authors have aimed "to write upon the subject from a new aspect" and avoid the repetition of unsubstantiated statements which sometimes "have found their way from the pages of one textbook to those of another." In this they have largely succeeded, although it may be thought that a few clinical myths have in fact been perpetuated, such as the alleged predisposition of the elderly primigravida to the uterine inertia. Again, on some controversial topics the authors' opinions, dogmatically expressed, will not meet with general acceptance. For example, their preference for face-to-pubes delivery with Kielland's forceps in persistent occipito-posterior cases, their view that uterine inertia commonly recurs, their approval of a laterally placed episiotomy, and their condemnation of all mucus extractors are all matters which will provoke criticism.

Because of the omission of the basic sciences the uninitiated student may sometimes be bewildered when confronted with a new term (for example, "diagonal conjugate") without explanation—even though there is an appended glossary of terms. Despite the promise contained in the preface, the balance between common and uncommon conditions is not always well preserved. Most of the normal and important abnormal conditions are adequately described, yet ante-partum haemorrhage—surely

an important subject—receives only a brief description and is altogether oversimplified. On the other hand, space is given to the mention of some rare conditions such as the Chiari-Frommel syndrome.

The book is well written and "readable." It is produced in an unusual format—larger in page size than is the custom and printed in double column—and is a refreshing break-away from the traditional students' handbook. There are numerous line drawings, most of which are clear and explanatory. Each chapter is headed by an apt Shakespearean quotation and clearly divided by subheadings. Pleasing features are the inclusion of an appendix on "Obstetrical Terms Defined" and another (3½ pages of double column) on "Etymology." There are few printers' errors, although page 156 contains a mistake, and on page 189 two diagrams are incorrectly labelled.

Such criticisms as are advanced are not intended to detract from the considerable merits of this book. It is a welcome production and can be recommended to readers wanting a short textbook that is "different."

MOSTYN P. EMBREY.

LOCAL ANALGESIA

Local Analgesia: Abdominal Surgery. By R. R. Macintosh, D.M., F.R.C.S.Ed., D.A., and R. Bryce-Smith, B.M., B.Ch., D.A. Illustrated by Miss M. McLarty. (Pp. 94; 88 figures. £1 2s. 6d.) Edinburgh and London: E. and S. Livingstone. 1953.

The introduction of curare and other specific relaxants of muscle has tended to obscure methods of local analgesia in abdominal surgery, for a single intravenous injection is easy to give and is more rapid in its effects than infiltration and multiple nerve blocks. Nevertheless, as the authors of this excellent monograph point out, local analgesia still has its place, not only for abdominal surgery but in the diagnosis and treatment of many diseases. The recent introduction of lignocaine ("xylocaine") has stimulated interest in local techniques, since this drug has a rapidity of onset and reliability greater than other agents in concentrations of equal toxicity.

The various methods are described in sufficient detail for practical use, and the vagueness so annoying in many books of this nature is avoided. The illustrations are prolific, well drawn, and often in colour—features now associated with publications from the Nuffield Department of Anaesthetics. No mention could be found of the use of hyaluronidase as an aid to the successful blocking of deep nerves, which the reviewer has found valuable (though the authors can justly retaliate by saying that his knowledge of anatomy is not up to the Oxford standard). The printing, paper, and binding are first class, but the price is distressingly high.

C. LANGTON HEWER.

HAZARDS OF ATOMIC ENERGY

Biological Hazards of Atomic Energy. Edited by A. Haddow. Being the papers read at the Conference convened by the Institute of Biology and the Atomic Scientists' Association, October, 1950. (Pp. 235. £1 15s.) Oxford: The Clarendon Press. 1952.

Between these covers will be found a series of papers delivered by experts to their peers. Fortunately for the general reader the experts were of many branches, so that usually the content is not so abstruse as to be really difficult: the wind was tempered for other lambs of the same flock. As for the medical reader, it may be hoped that he will be effectively impressed with the possible dangers of atomic energy, but also with the possibility of escaping them by adopting a technique or ritual no more complicated than that used in aseptic surgery. Pochin's article on the clinical use of radio-iodine is an excellent description of such a technique. Another useful piece of evidence is Marley's report on 51,077 weekly monitoring films at Harwell; only 77 exceeded 0.2 r, and none at all were over 3 r. Clearly, then, safety can be and should be attained, but equally

clearly no one should expose himself or others to any risks at all unless he has learnt in a proper school how to avoid them.

Loutit's article on possibilities of protection against massive doses of ionizing radiation holds out hope that something more than shielding may be attainable when the fundamental action on tissues is better understood. Neary's contribution, which clearly indicates the nature of the hazards associated with the dangerous tools now put into doctors' hands, should certainly be studied. The geneticists have their say, and arrive at results which bear a gloomy aspect; nevertheless, the warning they give should be noted. As Mather says, "It is our plain duty to avoid all unnecessary and unjustifiable radiation of the germ line."

For all those engaged in work with radiation sources this book is one that should always be within reach and constantly consulted.

E. ROCK CARLING.

SEWAGE DISPOSAL

Small Sewage Disposal System (with special reference to the Tropics). By O. J. S. Macdonald, M.D. (Pp. 300; 92 illustrations. 20s.) London: H. K. Lewis and Co. 1952.

As the author of this book points out, there was previously no single volume recording the range of small sewage-disposal systems suitable for rural areas. He therefore describes the methods which he has proved to be satisfactory under ordinary conditions of use in the Tropics. He includes an account of almost every type of latrine or sewage-disposal installation which may be set up in sewerless areas for the individual house or for small communities numbering up to 200 persons, and discusses its advantages and disadvantages.

In the first part of the book the author considers problems of construction and practice. After three general introductory chapters he writes on domestic and communal water-borne systems using septic tanks, the purification and disposal of the effluent, the pour-flush latrine and aqua privy, pit and bucket latrines, and the maintenance of disposal systems. The second part of the book is on the nature of sewage, its biological treatment, and the principles involved in the design and functioning of septic tanks. There are two chapters listing, with descriptions, the many different designs of septic tank and aqua privy which have been adopted by sanitary authorities and experts in various parts of the world.

This is an extremely practical volume which may be strongly recommended to medical officers, sanitary engineers, and sanitary inspectors working in rural areas, particularly of the Tropics. The descriptions are lucid, and are accompanied by nearly 300 drawings in which dimensions and constructional details are given. Bills of quantities prepared by an engineer are provided in the case of the more popular systems, and costs in Ceylon are recorded. In fact, the author has included almost every item of information which anyone may require on the choice, construction, or maintenance of a small sewage-disposal installation.

T. H. DAVEY.

SOCIAL PSYCHIATRY

Social Psychiatry. By Maxwell Jones, M.D., M.R.C.P.(Ed.), D.P.M., et al. (Pp. 186. 18s.) London: Tavistock Publications, Ltd. 1952.

Dr. Maxwell Jones and his six collaborators describe the development and realization of an idea—from its first beginnings in a unit for the treatment of effort syndrome during the war, and later in a unit for the rehabilitation of returned prisoners at the end of the war, to the present Industrial Neurosis Unit at Belmont Hospital. The purpose of this unit, as its name implies, is the treatment of neurotic patients who are partly or completely disabled. In fact, many of them have been unable to work for years, and some have few prospects of returning to work under any but sheltered conditions.

The idea which inspired Dr. Jones, and through him his staff, was that of creating a society in which these social misfits might enter and actively participate. The central problem was morale; merely submissive co-operation on the part of the patient was not enough, and he had to be induced to enter into the spirit of the community life provided for him. This has been the rationale behind the various techniques which have been developed—for example, group discussions to which patients contribute both in providing their own problems and in advising on those of others, and "psychodrama," in which the same themes, in playlets written and acted by patients, receive a more dramatic and stimulating form.

It seems needless to add that there are many other aspects to the work done at this centre at Belmont—investigation along normal psychiatric lines, the testing of intelligence and assessment of employability, a work programme with workshops and physical training, the social study of the patient's private world, and liaison with the rehabilitation officers of the Ministry of Labour. The final aim is to get the patient back into satisfactory working life, and a happier life personally. In view of the fact that the treatment of chronic neurosis is exceedingly difficult and discouraging, a figure of 44% of patients making sound adjustments after discharge must be regarded as very satisfactory.

ELIOT SLATER.

CARDIOVASCULAR DISEASES

Clinical Progress in Cardiovascular Disease. Edited by Herrman L. Blumgart, M.D. Modern Medical Monographs. (Pp. 143. \$4.50.) New York: Grune and Stratton. 1952.

In December, 1950, the American journal *Circulation* started a new monthly feature: "Clinical Progress." These critical reviews of important subjects have been well received, and several of them are now presented together in book form. The subjects chosen include atherosclerosis, the management of acute cardiac emergencies, surgery for mitral stenosis, the management of cardiac patients in relation to surgery, and emotion and the circulation.

The chapter on atherosclerosis, to which Louis Katz, Ancel Keys, and John Gofman contribute, will be widely acclaimed. The relationship of certain classes of serum lipoprotein (Sf 12-100) to atherogenesis can no longer be disputed, and it is clear that the serum cholesterol has only indirect bearing on the disease, depending on its relationship to the lipoprotein classes mentioned. Each of the contributors presents independent evidence that a diet low in total fat influences atherogenic activity favourably, the nature of the fat, whether animal, vegetable, or cholesterol-bearing, being unimportant. But much more than this is discussed—for example, the part played by hypertension, sex, vascular injury, and lipotropic substances. There is little doubt that a vast amount of work on this grave disease is gradually bearing fruit, and it may not be long before atherosclerosis can be in some measure controlled.

The account of the management of acute cardiac emergencies by de la Chapelle and Rose is didactic and practical. The advice is orthodox except in recommending intravenous digoxin in preference to aminophylline in cases of acute left ventricular failure. The surgical treatment of mitral stenosis is discussed by E. F. Bland. He traces the history of this great surgical achievement admirably, but surveys the present situation less well. The management of cardiac patients in relation to surgery is described by A. C. Ernstene, the effect of emotion on the circulation by Mark Altschule. Both these chapters are sound so far as they go.

Just what finally decided the editor to choose these five contributions out of the 20 reviews so far published in *Circulation* is not clear. The reasons given are pertinence to significant problems of current interest and practical usefulness. Personally I should be content, and honoured, with a reprint of the article on atherosclerosis.

PAUL WOOD.

BRITISH MEDICAL JOURNAL

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STREPTOMYCIN AND ISONIAZID

The series of clinical trials organized by the Medical Research Council to test chemotherapeutic agents in tuberculosis has been notable not only for the results achieved but also for the advance in technique which has enabled questions to be answered in a matter of months that with former methods would have taken years. By analysing the results as the trial progressed it was possible to publish¹ the first report on the use of isoniazid in pulmonary tuberculosis only six months after starting the trial and a second important report, published this week in our opening pages, only five months later. Great credit is due to the many clinicians and bacteriologists who have worked almost anonymously and who have contributed so much. With such widespread team-work it is almost invidious to mention names, but a special tribute must be accorded to Dr. Marc Daniels, the chief co-ordinator of all these trials since their inception. His death earlier this week is a grievous loss to the Medical Research Council and to British medicine.

The present report gives the results of three months' treatment of 364 patients suffering from pulmonary tuberculosis of different degrees of severity. Of these, 142 were treated with streptomycin 1 g. daily and isoniazid 100 mg. twice a day, 102 with streptomycin 1 g. daily and sodium *para*-aminosalicylate (P.A.S.) 20 g. daily, and 120 with isoniazid 100 mg. twice a day alone. Over this period streptomycin and isoniazid, given together, were superior to streptomycin and P.A.S. in their effect on weight gain and blood sedimentation rate, and rather more effective in improving general condition. There was no significant difference in the effect on pyrexia, sputum-conversion, or the radiographic appearances. Comparison of streptomycin and isoniazid with isoniazid alone, over the same period, showed that the combined treatment was much more effective in lowering the sedimentation rate and improving the radiograph. It was slightly more effective in returning the temperature to normal. The effect on general condition and on weight was similar with both treatments.

The tests for sensitivity of the tubercle bacilli to the drugs are as important as the results of the different treatments. Positive cultures from patients treated with isoniazid alone showed drug-resistant

¹ *British Medical Journal*, 1952, 2, 735.

tubercle bacilli in 11% of the cultures after one month's treatment, in 52% after two months', and in 62% after three months'. When streptomycin was added, isoniazid-resistant bacilli were obtained in only 4% of positive cultures at one month, 9% at two months, and 13% at three months. The difference is even more impressive when negative cultures are taken into account. After three months' treatment isoniazid-resistant bacilli were obtained from 35% of patients treated on isoniazid alone, compared with only 3% of patients treated with streptomycin and isoniazid. Naturally it is not known what percentage of patients with negative cultures may be harbouring undetected resistant bacilli. When a comparison was made of the emergence of streptomycin-resistant organisms in the two groups on combined treatment, no great difference was found after one or two months' treatment. Expressed as a proportion of positive cultures, 2% were resistant at one month with streptomycin and P.A.S., compared with 1% for streptomycin and isoniazid; at two months the figures were 3% and 4% respectively. At three months 24% of positive cultures were resistant to streptomycin in the group treated with streptomycin and P.A.S., compared with 11% of cultures in the group treated with streptomycin and isoniazid. Expressed as a percentage of patients treated, this looks less formidable: resistant organisms were isolated from 5% of those treated with streptomycin and P.A.S. compared with 2% of those on streptomycin and isoniazid. The percentage resistant in the streptomycin-P.A.S. group is unduly high. When allowance is made for cultures P.A.S.-resistant before the start of treatment, the figures for streptomycin resistance fall to about 13% of cultures and 2.5% of patients, which are comparable to the results for the streptomycin-isoniazid group.

It is clear from this and the previous Medical Research Council report that isoniazid should no more be used alone than should streptomycin or P.A.S. When any of these drugs is given alone, resistant tubercle bacilli are likely to emerge. Moreover, if in the same patient the relevant drug is later used in combination, it will be found to have lost its capacity to prevent or delay resistance to the other member of the combination. On the other hand, isoniazid 200 mg. daily given with streptomycin 1 g. daily seems to be the most effective combination so far available, even though its proved superiority over streptomycin and P.A.S. is seen only in weight gain and blood sedimentation rate. Isoniazid has the additional advantage over P.A.S. of negligible toxicity in the doses used. When streptomycin and isoniazid are given together, the reciprocal suppression of drug

resistance is of the same order as that of streptomycin and P.A.S. over a three-month period. But the few available figures for isoniazid resistance at four months are less reassuring. Three out of eight positive cultures were resistant, though in most of these patients streptomycin was given only three times a week in the fourth month. Until more evidence is available these results suggest caution in giving streptomycin less often than once daily when it is used with isoniazid, and we do not know that the combination will maintain its clinical superiority when continued for more than three months. The patient being treated with streptomycin and isoniazid is having the advantage of the two most powerful drugs at present available, but if tubercle bacilli emerge which are resistant to one they will probably become resistant to the other; in short, all one's chemotherapeutic eggs are in one basket. In view of this it would seem rational to confine streptomycin and isoniazid to certain types of case. When chemotherapy will probably be the definitive treatment of a patient—for instance, with relatively localized recent disease without cavitation—resistant organisms are less likely to emerge and it is reasonable to risk using the best combination. It is also justifiable if the patient is quite intolerant to P.A.S. or if, because of previous treatment with P.A.S. alone, there is strong possibility that the organisms are P.A.S.-resistant. In patients with cavities or with more extensive disease it is wiser to start with the well-tried streptomycin and P.A.S., keeping isoniazid in reserve in case the bacilli become resistant. Occasionally the patient's bacilli may be resistant to streptomycin but not to P.A.S.; combination of isoniazid with P.A.S. is then appropriate, though we have as yet no evidence on its efficacy. When patients are desperately ill, it is reasonable to give them all three drugs in the first place, but again it may be advisable to withdraw isoniazid into reserve as soon as the most acute phase has been controlled. If, because of resistance to streptomycin and P.A.S., the patient has to receive isoniazid—which has been kept in reserve—its use should be carefully timed to cover a crisis. The last important chemotherapeutic reserve must not be frittered away.

It must be remembered that patients may have been primarily infected with resistant bacilli. The bacilli of four patients in this series were initially resistant to streptomycin, though they had had no previous chemotherapy. Resistance tests on pre-treatment cultures are therefore essential. It may be impossible to defer treatment until results become available, but, as suggested in the report, one should take note of the chemotherapy given to known contacts before deciding on the best combination for the patient.

Clearly therefore every case must be carefully assessed before deciding on the appropriate form of chemotherapy. The possibility of drug resistance should always be borne in mind, and adequate information on drug sensitivity should be available at important stages in the patient's treatment. A culture at the end of the course of chemotherapy (or the last positive culture) should always be tested for drug-sensitivity.

The chemotherapy of tuberculosis is no longer simple. Its very success and diversity are creating ever-changing problems with which everyone who treats the disease must become familiar. The pace of research is such that even the conclusions of the present authoritative report may be out of date in a few months.

EPIDEMIC NAUSEA AND VOMITING

During the past few years many general practitioners and some medical officers of health¹⁻⁴ have been encountering an epidemic infection which, because it is mild and apt to be misdiagnosed, has not attracted much official attention. It is a disease characterized by nausea and vomiting of sudden onset, some initial fever and general aching, and in some cases giddiness, anorexia, and diarrhoea. The syndrome has a variety of synonyms such as epidemic viral gastro-enteritis, winter vomiting disease (because outbreaks occur more often in the winter), epidemic diarrhoea and vomiting, and gastric flu. This last diagnostic title, while apt, is likely to cause confusion if the outbreak of epidemic vomiting coincides with an epidemic of influenza, as has happened this winter. A false clinical picture of the syndrome may thus be obtained, in that respiratory symptoms may appear to be an integral part of the disease. But in school outbreaks, such as those recently reported by Garland² and by Dummer,⁴ respiratory symptoms have been notably absent.

This is no new disease. School outbreaks of a similar nature were reported by Miller and Raven⁵ in 1936, by Gray⁶ in 1939, and by Bradley⁷ in 1943, while some years ago epidemic diarrhoea and vomiting was a prevalent infection in maternity units, affecting both mothers and infants.⁸ However, profuse watery diarrhoea with or without vomiting was the principal symptom in these maternity hospital outbreaks, and it may be that there are two separate clinical entities.

When outbreaks occur in schools some form of food-poisoning is often suspected, but investigation shows that the outbreak has not the explosive character of a food-borne infection and has no close

correlation with the distribution of water, milk, or other foods, while bacteriological examination of stools, vomit, or suspected foods is invariably negative. Certain clinical features also help to distinguish epidemic vomiting from food-poisoning. Thus the sudden unexpected onset of projectile vomiting, most often in the middle of the night, has been an outstanding feature; giddiness has been a fairly common accompaniment, and there is often some general aching, with a frontal headache which tends to come and go. Fever up to 100° F. (37.8° C.) occurs at the onset. Abdominal signs are usually limited to some epigastric discomfort, and there are no colicky pains. The illness usually lasts for one to three days, but relapses may occur about one week after recovery. The nature of the clinical symptoms has suggested some disturbance of the central nervous system, but no direct evidence of its involvement has been described.

The disease is highly infectious, and the attack rate in a susceptible community varies from 10% to over 80% according to intimacy of contact. Outbreaks seem to occur most often in the autumn or winter, but no season is exempt. The incubation period may vary from two to seven days but is usually short, so that the infection spreads quickly through a school community. The epidemiological evidence suggests that the infection is spread by the respiratory route, although indirect spread by contaminated articles or food certainly cannot be excluded. The causative agent is unknown but is believed to be a virus. Gordon and his colleagues⁹ were able to infect human volunteers by feeding them with faecal filtrates or unfiltered throat washings from infected cases, whereas no symptoms occurred after inhalation of the throat washings. Attempts to infect the chick embryo and various experimental animals have been unsuccessful.

Although infectious syndromes of unusual nature may attract attention when they occur in schools or other institutions, clearly if they are of short duration and relatively mild they may be prevalent in the general community yet entirely escape official recognition by the health authority unless the general practitioner of his own accord notifies such cases to the medical officer of health. For example, it is clear from information received through the Public Health Laboratory Service that outbreaks of epidemic vomiting have been occurring among schoolchildren and students in many parts of the country during the past two or three years, yet no records of the prevalence

of this infection are generally available. Much useful information about the clinical features and epidemiology of prevalent but non-notifiable illnesses might be collected if there were some arrangement for doctors in different areas to act as "spotters" of new maladies. Is this another job for the College of General Practitioners?

AGRANULOCYTOSIS

Therapy of some kind is the usual cause of agranulocytosis. It was first described as a clinical entity in 1922, when Schultz¹ reported on six patients presenting with severe sore throat, prostration, and extreme reduction or disappearance of granulocytes from the peripheral blood. The number of reported cases increased steadily during the ensuing decade, largely owing to the use of amidopyrine in analgesic and antipyretic tablets. A few cases were caused by benzene, gold, and organic arsenicals. In 1933 the sale of amidopyrine was made illegal except on the prescription of a registered medical practitioner, and the frequency of cases due to this drug diminished. They did not completely disappear, because physicians continued to prescribe proprietary preparations without realizing that they contained amidopyrine.² During the last decade these older compounds have given way to newer ones as causes of agranulocytosis, and severe or total depression of granulocytes has been attributed to treatment with sulphonamides, thiouracil, tridione, P.A.S., chloramphenicol, isoniazid, and, most recently, "butazolidin."³ While a therapeutic agent is the commonest cause of agranulocytosis, hair-dressing chemicals may not be without blame: Cotter⁴ has reported three cases caused by thioglycolic acid, a substance used in a "home cold-wave" process.

The mechanism by which chemicals cause agranulocytosis remains unknown. Possibly they derange the metabolism of the granulopoietic marrow cells. Often the condition develops suddenly and after only a small dose. This, together with the observation that urticaria, angioneurotic oedema, asthma, and other allergic manifestations may be associated, has led to the belief that some patients have an idiosyncrasy to the drug.

Prevention of agranulocytosis lies in avoiding drugs known to cause the condition, and, when this is impossible, in warning the patients to stop taking the drug and to report immediately if they develop malaise, a sore throat, or any other new symptom. It is doubtful if white cell counts at weekly or longer intervals are of use, for a normal white cell count on one day may be followed two days later by a precipitous fall in granulocytes.

The many treatments recommended bear testimony to the difficulty of obtaining enough cases to test the value of any one therapeutic agent. Indeed, the disease is so

¹ Silvertown, M. L., *Med. Offr.*, 1952, **88**, 215.
² Garland, A., *ibid.*, 1952, **88**, 241.
³ Berry, R. B., *ibid.*, 1952, **88**, 262.
⁴ Dummer, F. H. M., *ibid.*, 1953, **89**, 65.
⁵ *British Medical Journal*, 1936, **1**, 1242.
⁶ *ibid.*, 1939, **1**, 209.
⁷ *ibid.*, 1943, **1**, 309.
⁸ Brown, G., et al., *ibid.*, 1945, **2**, 524.
⁹ *J. exp. Med.*, 1947, **86**, 409.

¹ *Dtsch. med. Wschr.*, 1922, **48**, 1495.
² Discombe, G., *British Medical Journal*, 1952, **1**, 1270.
³ *ibid.*, 1952, **2**, 1401.
⁴ *J. Amer. med. Ass.*, 1946, **131**, 592.
⁵ Nelson, D. H., Sandberg, A. A., Palmer, J. G., and Tyler, F. H., *J. clin. Invest.*, 1952, **31**, 843.
⁶ Caldwell, A. L., et al., *Canad. med. Ass. J.*, 1950, **62**, 506.
⁷ McMillin, J. S., *Amer. J. med. Sci.*, 1951, **222**, 392.
⁸ *Arch. intern. Med.*, 1952, **80**, 580.
⁹ *British Medical Journal*, 1952, **1**, 1273.

dangerous that usually blunderbuss therapy is given. All workers are agreed that the offending drug must be withheld. The most beneficial single therapeutic measure is to give penicillin as soon as the condition is diagnosed; it must be continued until the granulocytes reappear in the peripheral blood. Marrow function usually returns within seven days, and, if the patient can be protected from infection while the leucocyte defences are down, spontaneous recovery is likely. Attempts have been made to increase the number of circulating granulocytes, and for this pentnucleotide, folic acid, pyridoxine, and liver extract have been recommended, but their value has still to be proved. Fresh blood transfusions have been used, but it is doubtful whether they provide viable leucocytes for a sufficient length of time to be of help to the patient.

Recently cortisone and adrenocorticotrophin (A.C.T.H.) have been tried, partly because they are known to influence allergic reactions and partly because they cause a leucocytosis in normal subjects. In fact the well-known eosinopenia caused by these agents is not so marked as the less well known increase in neutrophilic cells.⁵ The course of agranulocytosis is so variable that it is difficult to assess the therapeutic value of A.C.T.H. and cortisone, and in the reported cases penicillin and other treatment were wisely given in addition. Two cases ascribed to sulphonamides recovered, but one of them showed improvement with early neutrophilic regeneration after treatment with penicillin and pentnucleotide and before the cortisone was given.^{6,7} Virkkunen⁸ reports two patients with rheumatoid arthritis who developed agranulocytosis following treatment with thiosemicarbazone: one had shown no improvement after six days of penicillin and the other after two days. Both appeared to respond promptly to A.C.T.H. Hart and his colleagues⁹ have reported a case due to "novalgin"—a proprietary preparation containing a substance allied to amidopyrine—which still showed depression of myeloid marrow cells 13 days after treatment with penicillin, blood transfusions, and pyridoxine. There was a notable response to A.C.T.H. Although the findings in these cases are suggestive, there is no proof that cortisone or A.C.T.H. was really responsible for the improvement, which may have been spontaneous. Further trials, if possible properly controlled, are required. One note of warning must be sounded. Cortisone and A.C.T.H. increase the liability to infection, and if they are given to patients with agranulocytosis large doses of penicillin are more necessary than ever.

CHLOROPHYLL

We recently discussed the evidence for the statements which continue to be so widely circulated that chlorophyll preparations have a deodorant action.¹ In an effort to credit some of the less unlikely claims, such as that chlorophyll dressings reduce foul odours from wounds, too favourable an opinion may have been expressed. Many of us are inclined to think in a matter

of this kind that there must be something in it, so that mere condemnation is unconvincing. On another page Dr. J. C. Brocklehurst describes some experiments arranged to test the deodorant action in an objective way. He used methylmercaptan as a substance with an unpleasant odour. It is said to be present in the urine after eating asparagus, and its relation, vinylmercaptan, is the substance discharged by the skunk. Dr. Brocklehurst showed that, when methylmercaptan passed a screen of filter-paper soaked in chlorophyll solution, it reduced just as much iodine as when the screen of filter-paper was soaked in water, showing that the methylmercaptan was not destroyed by the chlorophyll. Thus he substituted a quantitative estimate for an olfactory impression. He then bubbled nitrogen carrying methylmercaptan through a chlorophyll solution on the one hand and through water on the other and again failed to observe any difference in the decolorization of iodine. Another series of experiments revealed a deodorant action in one out of 22 trials, though here Dr. Brocklehurst regarded the mercaptan smell as merely being masked by a very strong smell of the chlorophyll solution. Observations were also made on a patient with incontinence of urine and faeces, and on a normal subject who ate asparagus. In neither of these was there any modification of the smell of the urine when large amounts of chlorophyll preparations were taken.

Recently Dr. A. H. Corwin,² head of the department of chemistry at Johns Hopkins University, quoted to the American Chemical Society a report from the National Bureau of Standards which said that "we have no reason whatever to believe that chlorophyll has anything to do with deodorization." It is evident that the wave of credulity which has swept the United States has not overwhelmed everyone, and it is to be hoped that it will not overwhelm too many in Britain. Some who are sceptical of chlorophyll tablets have faith in appliances which allow a substance to evaporate from a wick, the wick standing in a solution which contains chlorophyll; this substance is said to remove odours. Crotonaldehyde has been used for this purpose, and like formaldehyde it renders the olfactory nerve endings less capable of detecting any odour, unpleasant or otherwise.

NEW CORONERS RULES

New Coroners Rules came into force on March 1. They largely embody the B.M.A.'s recommendations, which were submitted to the Coroners Rules Committee of the Home Office in April, 1951.¹

Rule 26 provides that proceedings at an inquest shall be restricted to finding out who the victim was, how, when, and where he died, if the cause of death was murder, manslaughter, or infanticide, who ought to be charged as principal or accessory to the crime, and the particulars required for registration. Neither coroner nor jury is to express an opinion on anything else, except that they may make a recommendation designed to prevent a recurrence of similar fatalities. No rider to any other effect is to be recorded by the coroner. This

should go some way towards eliminating the cross-examination whose real purpose is not to ascertain the cause of death but to prepare the way for an action for damages against someone who may be civilly liable. It is reinforced by Rule 33, which expressly provides that no verdict is to be framed in such a way as to appear to determine any question of civil liability.

If anyone's conduct is likely in the coroner's opinion to be called in question at the inquest, he is to be either summoned to give evidence or given notice of the date, place, and time when it will be held. Further, if in the course of the inquest someone who is not there, and has not thus been given notice, has his conduct called in question on grounds which are substantial and relevant, the inquest must be adjourned to enable him to be there if he wishes. This will prevent anyone from being criticized without having the opportunity to give evidence on his own behalf. By Rule 18 the rule of evidence in legal proceedings both civil and criminal, that no witness has to answer a question tending to criminate him, is expressly applied to inquests. By Rule 28 documentary evidence is not to be admitted without the matter of the document being called, unless the coroner is satisfied that there is a good and sufficient reason why he should not attend; and, once it is admitted, if the coroner or any other properly interested person so requires, the inquest must be adjourned to enable the maker of it to give oral evidence. By Rule 16 the police are entitled to examine witnesses only through the medium of a solicitor or counsel. In all these matters of evidence the tendency of the Rules is to bring proceedings at an inquest more nearly in conformity than they have been in the past with proceedings in court. By Rule 8, although the full B.M.A. recommendation is not met, it is provided that necropsy is not to be carried out in a dwelling-house or on licensed premises, but only in premises adequately equipped for the purpose with running water, proper heating and lighting facilities, and containers for storing and preserving what may be necessary. It is satisfactory to find that these important provisions in the new Rules so largely accord with the Association's recommendations.

THYMECTOMY AND MYASTHENIA GRAVIS

In an article in the *Archives of the Middlesex Hospital* (which has maintained a high standard since its welcome reappearance two years ago), Holmes Sellors¹ has reviewed the treatment of myasthenia gravis by thymectomy and described the results of the operation in 37 cases: 32 of these patients had symptoms of myasthenia gravis. He concludes that removal of the thymus offers the best hope of permanent relief in this disease, particularly if carried out in its early stage. The connexion of the thymus gland with myasthenia, and indeed its function in the normal individual, remain unknown. That the thymus often appears enlarged or may contain a tumour in myasthenic patients was observed at necropsies fifty years ago. Sauerbruch carried out partial removal of the gland in 1911, but no further attempts to relieve the disease in this way were made

until Blalock's work in Baltimore; he published² the results of 20 operations in 1944. Since then the operation has not found as great favour in the U.S.A. as it has in this country, where the results in 155 cases published by Keynes³ in this *Journal* have been most stimulating. Over 90% of the surviving patients in his series were improved.

Most patients with myasthenia gravis have been treated with neostigmine since Walker,⁴ in 1934, reported on the relief of symptoms afforded by this drug. It is usually effective by mouth, but sometimes must be given by injection: atropine may be necessary to neutralize the side-effects, such as abdominal griping. Neostigmine must usually be taken after thymectomy, but often in smaller doses than before, and it becomes more effective. Some patients are so much improved that they dispense with it altogether. Sellors, like Keynes, has found that the operation is most likely to be successful when the history is short, and that, even in patients greatly benefited in other ways, muscles which have been weak for a long time may not recover, so that ptosis, for example, may be permanent. Some patients do not improve at all; unfortunately no way of predicting the likely result in any individual has been found.

About one in ten myasthenic patients has a tumour of the thymus, benign or malignant, though not all thymic tumours are associated with myasthenia. Some may be symptomless, and others may cause mediastinal obstruction. The tumours may be impossible to diagnose before operation, even with careful radiography. Sellors and Keynes have both found that the prognosis is poor after operation in cases of myasthenia with a tumour of the thymus, for the condition is liable to relapse. Occasionally the thymic tissue is ectopic, lying in the first or second intercostal spaces, but usually it is found immediately beneath the sternum, as in the infant, and consists of two lobes united by an isthmus, closely related to the left innominate vein. Surgical access is provided by vertical division of the sternum. All thymic tissue must be removed, and this is ensured by leaving no visible fatty tissue in the anterior mediastinum. If there is a tumour, adjacent pleura or pericardium should be excised: with controlled respiration by endotracheal anaesthesia no harm results, but wound closure must be airtight. Post-operative pulmonary complications can be dangerous, since muscular weakness may make coughing or even breathing difficult. Neostigmine should be continued, and it is wise to have an artificial respirator, such as a Drinker's apparatus, to hand. A watch should be kept for pneumothorax, and aspiration or bronchoscopy may have to be carried out if secretion of mucus becomes excessive or if atelectasis occurs. Some patients improve immediately after operation, others improve gradually. In its natural course the disease fluctuates in severity and there may be long remissions. These must be allowed for in assessing results of treatment, but, even so, Sellors's report confirms the value of operation.

¹ *Arch. Middlesex Hosp.*, 1952, 2, 1.

² *J. thorac. Surg.*, 1944, 13, 316.

³ *British Medical Journal*, 1949, 2, 611.

⁴ *Lancet*, 1934, 1, 1200.

¹ *British Medical Journal*, 1952, 2, 1086.
² *Sci. Amer.*, 1953, 188, 38.

¹ *British Medical Journal Supplement*, 1951, 1, 159.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

MEDICAL ASPECTS OF AIR TRAVEL—I. ENVIRONMENT AND IMMUNIZATION REQUIREMENTS

BY

Sir HAROLD E. WHITTINGHAM, K.C.B., K.B.E., LL.D. F.R.C.P.

Director of Medical Services, British Overseas Airways Corporation

Now that travel by air has become so commonplace general practitioners are consulted more and more by their patients on its medical aspects. The points on which information is often wanted are the medical contraindications to flying, how babies and the elderly react to long flights, what facilities are available for invalids, and what are the immunization requirements.

First, it is desirable briefly to consider the environment, particularly the limitations of space and other facilities on an airliner, and the effects of speed, altitude, noise, and vibration, as these are all factors of importance in the care and comfort of invalids who contemplate travelling long distances.

Space and Facilities for Invalids

The space allotted to each passenger is relatively small, even in the most luxurious airliners, and is virtually limited to a seat. Under the best conditions reclining seats are in pairs, with an arm-rest between them, arranged in rows on either side of a narrow gangway 18 to 20 in. (46 to 51 cm.) in width. Each pair of seats is pitched some 39 to 46 in. (99 to 117 cm.) from the next pair, so that there is just room to get in and out past one's neighbour. In some aircraft a number of sleeping berths can be made up at night. There is, of course, an extra charge for these, as there is also for any stretcher space needed; in the latter instance the charge is usually double fare, as two seats are occupied.

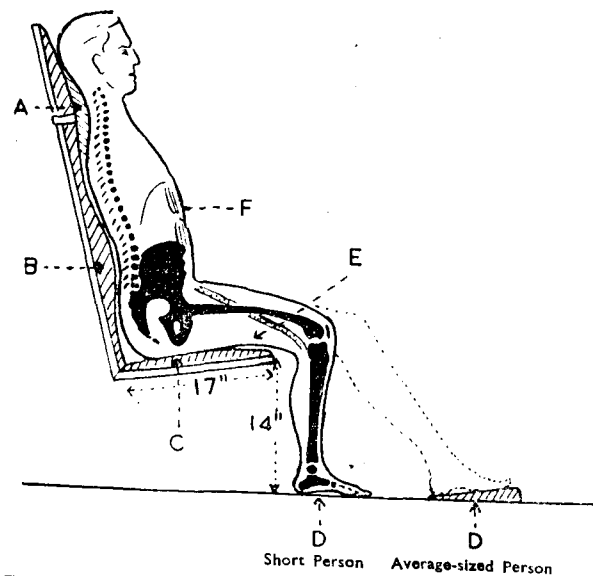


FIG. 1.—Diagram showing anatomical points in aircraft seats. (A) Adjustable support for head and neck. (B) Padding to support small of back. (C) Compression of seat cushion should not exceed 1 in. (2.5 cm.). (D) Feet must reach floor to take weight off lower thighs. A footstool damps vibration. (E) Avoid pressure on main veins and lymphatics and so prevent swelling of feet and ankles. (F) Position prevents abdominal muscles being too relaxed and so lessens pooling of blood in large veins of abdomen and helps to avoid flatulent distension of the gut.

Comfortable seats are essential on long flights of six to twelve hours at a stretch, otherwise passengers cannot rest properly, become unduly fatigued, and suffer from discomfort in the small of the back and from postural oedema of the feet, especially if they have poor circulation. This oedema is largely the result of the seat being too soft and

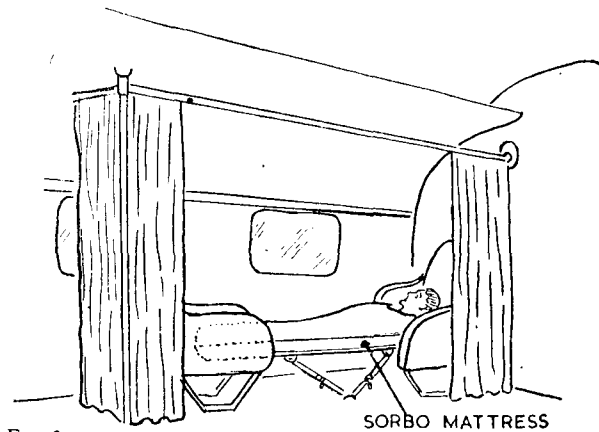


FIG. 2.—Stretcher cot suspended between two chairs and fastened to floor.

too long in the pan, so causing widespread pressure on the veins and lymphatics of the buttocks and underside of the thighs. The backache is due to insufficient support in the back of the seat to maintain the proper curve of the lumbar spine, with the result that the ligaments and muscles concerned are overstretched. Nowadays many aircraft seats are constructed on sound anatomical and physiological principles (Fig. 1), with padding in the right places and tilting devices to enable passengers to adjust their position from upright to reclining and with feet raised enough to prevent oedema. In addition, footstools and soft cushions are available to give further support where required and to suit individual peculiarities of build.

Where necessary or advisable, the airline's medical department recommends acceptance of certain types of invalids as stretcher or sleeping-berth cases only. Special seats are then allotted for the purpose, so that a stretcher can be accommodated or a lie-down constructed by bridging the gap between two facing seats and covering this with a mattress (Fig. 2). Curtains are available to screen off these invalids, particularly those requiring dressings or special attention during the flight.

Toilet facilities in a 40 to 60-seater aircraft are limited to a small "powder room" with two wash-basins and one closet for ladies, and a lavatory with two or three wash-basins, a urinal, and a closet for men. Hot meals are served in flight or at stopping places *en route*, and special diets can be provided for invalids if notification is given in advance.

Speed and Smoothness of Flight

Speed is not felt in the cabin type of aircraft so long as it is uniform and there are no visual cues, such as passing-by objects like clouds. Alterations in the speed or direction

of the aircraft, however, are felt: the greater the degree of change the more the sensation. Commercial passenger-carrying aircraft are flown so as to cause little or no sensation of speed; in fact, the only time when speed may be appreciated at all is at take-off and during ascent and descent, and even then it is no greater than that experienced in a carefully driven motor-car. Some motion may be felt in "bumpy" weather conditions, especially when flying through cloud, and this may cause airsickness in predisposed individuals. Bad-weather clouds frequently extend up to altitudes of 15,000 to 25,000 ft. (4,600 to 7,600 metres) in temperate zones and to 40,000 ft. (12,000 metres) or more in the Tropics. Modern airliners have therefore been specially designed to fly smoothly and speedily (up to 500 m.p.h.—800 km.p.h.) at altitudes between 15,000 and 40,000 ft. (4,600 and 12,000 metres)—that is, 3 to 8 miles high—and to do this the aircraft has to be "pressurized."

Effects of Altitude

Oxygen Lack or Anoxia

Although the air has the same percentage composition of its component gases at any altitude within the earth's atmosphere, it becomes progressively rarefied with increasing altitude above sea-level in accordance with Boyle's law. At 18,000 ft. (5,500 metres) the air has half the density it would have at sea-level, and at 40,000 ft. (12,000 metres) about one-fifth. This gives a rough idea of the corresponding reduction in the partial pressure of the oxygen available in the air inhaled at different altitudes. Healthy individuals are less affected by lack of oxygen than are the non-robust. The onset of anoxia in flying is insidious, and the symptoms are very similar to those of alcoholism: the individual is oblivious of the fact that he is suffering from lack of oxygen, and, like the inebriated, feels that he is "on top of the world" even when "half under the table." The first symptoms of oxygen deficiency of relatively minor degree occur after a stay of over an hour at an altitude of 10,000 ft. (3,000 metres), but normal individuals and most invalids, if more or less sedentary, can remain in the atmosphere of an altitude of 8,000 ft. (2,400 metres) for ten to twelve hours without suffering anything more than the ennui and fatigue experienced in most modes of travel. Aircraft are therefore pressurized to a degree adequate to compress the air in the cabin (even when the aircraft is flying at an altitude of 40,000 ft.—12,000 metres) to a density of the air at an altitude of 8,000 ft. (2,400 metres) or lower and to maintain it constantly at that density. When invalids are carried, however, the precaution is taken to provide special oxygen sets in case of need, but in practice it has been found that these are seldom required.

Air and other gases contained in the body spaces—for example, the middle ear, the paranasal sinuses, and the alimentary tract—naturally are also subject to Boyle's law, and therefore expand and contract with decrease and increase of the atmospheric or cabin pressure.

Ventilation of the Middle Ears

Normally, the air pressure on either side of the eardrums is equalized automatically by the expanding air escaping from the middle ears by way of the Eustachian tubes during ascent and by being drawn in during descent. This ventilation of the middle ears is apt to fail if the Eustachian tubes are even only partially occluded by nasopharyngitis or some other condition affecting their apertures, especially during a rapid descent, as the continuing contraction of the air imprisoned in the middle ears tends to draw together the walls of the Eustachian tubes. Consequently the tympanic membranes may result (acute otitic barotrauma). The immediate symptom is acute earache, followed by some loss of audibility and sometimes by tinnitus and vertigo. These symptoms may persist for some hours after ventilation of the ears has been re-established by the Valsalva technique or, in severe cases, by puncture of the safe area of the

tympanum with a fine needle. It follows, therefore, that those suffering from acute nasopharyngitis or sinusitis should be advised not to fly until they have recovered; if they do fly with a head cold they should inhale amphetamine or some other vasoconstrictors to help clear their Eustachian tubes.

Descents in airliners or alterations in their cabin pressure are usually made very gradually to permit proper ventilation of the middle ears, even if the passengers are sleeping. Young children may get airlocks in their ears: this makes them cry, an act which immediately relieves the condition by opening their Eustachian orifices. Mothers with babies should be instructed to give them a feed or a dummy to suck during ascent and descent. Persons about to travel by air for the first time, and who are apprehensive of their ability to ventilate their middle ears, should be advised to suck a sweet, chew gum, or practise the Valsalva technique during ascent and descent. In fact, this is a wise precaution for all to take, and it is the custom for cabin attendants to hand round to every passenger boiled sweets or chewing-gum at appropriate times.

Gases in the Alimentary Tract

Expansion of gas in the gut usually causes no trouble, except the embarrassment of passing flatus. It may, however, create painful distension in those with lax abdominal walls, and may even be dangerous on account of haemorrhage or perforation in cases of active ulceration or after major operations on the stomach or intestines. The general rule, therefore, is not to accept for air travel cases of appendicectomy or herniotomy for ten days after operation, and those who have had gastrectomy or a perforation or haemorrhage of the stomach or intestines (except for haemorrhoids) for at least two months after the event. Colostomy cases are usually not acceptable in the confines of an aircraft, owing to the odour from escaping faeces and flatus. Distension of the stomach and intestines may embarrass those with certain heart and lung conditions by interfering with diaphragmatic movements. Usually, however, alimentary tract distension is automatically relieved by the passage of flatus. It is in the interests of those prone to flatulence to ensure a good evacuation of the bowels before flight, to abstain from gas-producing foods (legumes and excess of carbohydrates), to avoid overeating during the journey, and to absorb some of the gas by means of charcoal biscuits.

Noise and Vibration in Aircraft

Noise and vibration of certain frequencies and intensities if continued are disturbing, induce fatigue, and contribute to the onset of airsickness, all of which are apt adversely to affect invalids. Most of the noise and vibration experienced when flying is derived from the engines, though some is from aerodynamic turbulence over the skin of the aircraft. Modern airliners are designed to reduce these defects as far as practicable by using sweeter running engines, by efficiently muffling and orientating exhausts, and by sound-proofing cabins. These measures have proved most effective in jet and turbo-jet aircraft, especially in the former, owing in part to the absence of propellers and pistons and in part to the fact that the engine noise is mainly of high pitch, which is more readily damped down or cut out by sound-proofing than is the lower-pitch noise of the piston engine. Cotton-wool is handed out in all aircraft so that those susceptible to noise can plug their ears; alternatively, passengers can provide themselves with rubber ear-plugs, but these are no more effective than moistened cotton-wool. Such plugs are not really needed in jet and turbo-jet aircraft, which are as quiet as most saloon cars.

Airsickness

It is appropriate now to consider airsickness, or motion-sickness, as a number of predisposing factors have already been mentioned—namely, bumpy weather, oxygen want,

fatigue, flatulence, noise, and vibration. Airsickness is rare in pressurized aircraft, which fly above the weather; in fact, the incidence is about 0.6% of all passengers carried, and even then it is usually only a temporary occurrence during ascent and descent when flying through cloud or regions of changing air temperatures in warm climates. It is important, however, to safeguard invalids against airsickness, particularly diabetics, pregnant women, and those with gastro-intestinal lesions such as ulcers and post-operative conditions.

Fortunately, airsickness can be prevented in most cases by the simple expedient of swallowing 1/100 gr. (0.65 mg.) of hyoscine hydrobromide half an hour before the time of take-off. Children under 15 years of age should be given half this dose. (Incidentally, hyoscine has been proved by the U.S. Air Force to be more efficient as a preventive of airsickness than the antihistaminic drugs.) It is rarely necessary to repeat the dose, as acclimatization to aircraft motion develops quickly in most instances, especially if steps are taken to minimize other predisposing factors. It is advisable, therefore, for invalids to be well rested before and during the journey, to obtain a good evacuation of the bowels before flight, to keep comfortably warm, and to plug their ears with cotton-wool to lessen noise.

Motion is felt less near the centre of the aircraft than towards the tail, so seats for invalids are specially allotted. Those who are particularly susceptible to travel-sickness should relax, lie back in their seats, and look upwards, so as to prevent over-stimulation of the labyrinths.

Immunization Requirements

In accordance with the International Sanitary Regulations of the World Health Organization, which came into force on October 1, 1952, passengers undertaking international air travel have to be in possession of certain immunization certificates, depending on the place of departure, the countries of transit, and the destination. For most journeys the would-be traveller must have been vaccinated against smallpox within three years, and, if it is intended to pass through or leave a yellow fever zone, immunized within six years against that disease. When travelling from or through cholera endemic areas, inoculation with anti-cholera vaccine is necessary within a period of six months. The immunizations done must be recorded on the international vaccination certificate form prescribed by the World Health Organization, dated* and signed by the doctor doing the inoculations, and in the case of yellow fever vaccine its origin and batch number must be stated.

Each certificate must then be authenticated and stamped by an authority approved for the purpose by the health administration of the particular country—that is, the Ministry of Health so far as England and Wales are concerned. The approved authenticating authority in England and Wales is the health officer of the town council, urban district council, or rural district council in whose area the doctor practises. These certificate forms are obtainable from the airline company or travel agency concerned or from the Government health department, except those for yellow fever vaccination, which are held at certain recognized centres. Details of immunization requirements can be obtained from the medical or traffic department of the airline concerned, or from the embassies, consulates, or other Government representatives of the countries to be visited. It is most important that travellers should have these certificates completed in all details and have them available with their passports throughout their journey, otherwise they are liable to be subjected to delays, compulsory vaccination, or surveillance, detention in quarantine, or to a fine.

Vaccination against smallpox and yellow fever should not be done at the same time, especially primary vaccination, as this increases the risk of encephalitis. Vaccination against yellow fever should always precede that against

*The date should be written thus, 3/X/52, to prevent misunderstanding, as in some countries the month is recorded in front of the day.

smallpox, because if primary vaccination were done first there would have to be an interval of twenty-one days before giving the yellow fever vaccine. A convenient scheme of inoculations, when all are needed, is as follows: First day: vaccination against yellow fever, cholera, and typhoid group (first T.A.B.); fourth day: vaccination against smallpox; seventh to ninth days: second dose of T.A.B. vaccine, after reading and recording the result of primary vaccination.

If it is decided that it is best for medical reasons not to give a required vaccination, the doctor concerned must certify the fact. It must be appreciated, however, that such individuals may be refused entry into certain countries or be detained in quarantine, and that the airline carrying such persons may have to remove them from the country at its own expense or pay a fine, and the aircraft may be detained. In any case a form of indemnity must be signed by a person who proposes to travel without any necessary certificate of vaccination: this is required to free the airline from any liability if the passenger meets with difficulties or expenses en route or on arrival. Conscientious objectors to vaccinations are treated in the same manner as those without valid certificates.

[Part II will appear in our next issue.]

Nova et Vetera

AN EARLY CASE OF HAEMOLYTIC JAUNDICE OF THE NEWBORN

During the last few years light has been shed on the condition whereby newborn infants used to perish in a deeply jaundiced state within a few days of birth; before the discovery of the Rhesus factor in the blood and its significance for the infant the occurrence of fatal jaundice which started soon after birth was a sad and hopeless problem. Lately, in searching through some letters written to Sir Hans Sloane and now preserved in the British Museum, one was found which is of historical significance and which, by the kindness of the authorities of the Museum, I am able to reproduce here. It was written to Sir Hans by Dr. George Cheselden, of Leicester, probably a distant relative of William Cheselden. It is dated Leicester, February 25, 1729, and runs as follows:

"At the request of a patient of mine (the bearer) I give you the following short account. The case of the gentlewoman has been very extraordinary. She has had the misfortune to lose 3 fine boys who came into the world with very healthful symptoms for the first 2 days and then the strongest signs of an icterus appear'd the epidermis being all over tinctur'd alike which bad symptoms prov'd most certainly mortal in a few days medicine being of no service to the infants.

"The mother for the generality has good health even when with child only, give me leave to observe that a few days after her quickening her water changed into a true jaundice colour as high as possible and so continues till she is deliver'd, and then as well as usual. Evacuations of all kinds we have made use of in vain alteratives chalybeates and advis'd to no purpose. Last year I advis'd to Scarborough with no better success.

"The last child to all outward appearance was a healthful one excepting the febrile disorder. I therefore importuned the parents that I might examine the Vesica Fell. Ductus Communis in which we found nothing amiss, all the viscera intirely perfect the liver not larger nor harder than common no stone nor obstruction any where nor decay in any part nor any part emaciated. The mother's habit of body you'll be better able to judge than I can represent in any letter. I hope that you'll be so good as to put the lady into a more successful method which I do assure you will give a great deal of satisfaction to

sir, your most obedient and humble servant

GEORGE CHESelden

"P.S. One line will be esteemed a favour."

There is no record of the reply from Sir Hans Sloane but it is to be feared that it would not have contained any solution for the problem propounded.

V. Z. C.

Correspondence

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

Assistance for Doctors in Flood Areas

SIR,—You kindly published my letter in the *Journal* (February 14, p. 399) in which I appealed to members of the profession to send donations to the Sir Charles Hastings Fund in order that the Trustees might give some immediate assistance to those doctors who have suffered in the recent floods. The response to my appeal has been most gratifying, and through the generosity of certain local medical committees and many individual members of the profession a sum of £1,200 has been received. In addition, through the Canadian Medical Association, our colleagues in Canada have most generously sent a splendid gift of \$1,000. Furthermore, the Trustees of the General Medical Services Defence Trust have very kindly decided to make available to the Trustees of the Hastings Fund moneys for immediate assistance up to £5,000 as and when necessary. As a result of this response the Trustees have been able to make gifts to certain doctors who have sustained considerable loss and whose houses have been severely damaged as a result of the flood waters.

The Trustees are anxious to give all further assistance that may be needed and hope that all doctors who have suffered on account of the floods, or anyone knowing of their difficulties, will not hesitate to write to the secretary to the Trustees. The question of long-term arrangements with regard to individual practices in these areas is already under discussion between representatives of the General Medical Services Committee and the Ministry of Health.

May I repeat that contributions should be sent to the secretary of the Fund at B.M.A. House, Tavistock Square, London, W.C.1, cheques being made payable to the Sir Charles Hastings Fund, and the envelopes marked "Flood Relief."—I am, etc.,

E. A. GREGG,
Chairman of Council.

London, W.C.1.

Ciba Foundation's Colloquia on Endocrinology

SIR,—In his pleasant review of four volumes of the Ciba Foundation's *Colloquia on Endocrinology* (February 21, p. 440) Dr. C. L. Cope commented that "it is disturbing to find that about two years have elapsed between the holding of many of these colloquia and their appearance in book form. . . . Speedier methods of publication must be found if these reports are adequately to serve the purpose for which they are intended."

In fairness to our publishers, I should like to explain that the unfortunate delay in some of these instances was due in part to my failure to anticipate the demand for publication of the earliest informal meetings, in part to my inexperience in having the whole of the proceedings of these first conferences electrically recorded, with all that meant in later transcription—a hard lesson—and in part to the fact that, when meetings are held of people from distant parts of the world, texts of the general discussions and proofs of papers have later to be sent equally far afield for correction—one contributor alone has held up publication of a volume now in the press for four months. Further, I should mention that the first of the volumes reviewed by Dr. Cope was published ten months ago.

So far as "speedier methods of publication" are concerned, I should point out that it is never intended that the conferences held at the Ciba Foundation should provide occasions for the announcement of completed research; rather we prefer to discuss problems in current research,

and any value in the subsequent books is mainly due to the collection within one cover of facts and thoughts published, or about to be published, elsewhere, but scattered throughout the world's literature.

The time taken over some of the volumes now in the press will, we believe, compare not unfavourably with the delay in publication of articles in some of the best-known special journals. The fact that our book *Isotopes in Biochemistry* was published in less than seven months shows how excellently our publishers, J. & A. Churchill Limited, carry out their side of the business when given the chance.—I am, etc.,

London, W.1.

GORDON WOLSTENHOLME,
Director, Ciba Foundation.

The Backward Child

SIR,—I agree with Dr. Brian H. Kirman (February 7, p. 334) that as a rule it is undesirable to classify pre-school children as "ineducable." Moreover, where an occupation centre is not available, as in many parts of the country, and the child is attending the infants' class of a school, and the teacher is satisfied with his behaviour, classification and notification are not indicated either.

The terms "educable" and "ineducable" do not separate children into watertight compartments, but must be interpreted not only in the social setting but in the light of advances in psychology and education. The latter is clearly veering away, although slowly, from a mechanistic philosophy. Theoretically, at least, secondary education is conceived not as a separation of the "superior" and "inferior," but as a differentiation into qualitatively different cultures.

In Glasgow, where I practised for some years, the term "special" has been abandoned in the designation of schools for "educationally subnormal" children. Since the modern "occupation centre" provides a wide range of stimulus patterns for the varied interests and levels of insight of relatively retarded children, whose response to adequate stimulation is obvious, it merits *par excellence* the generic title of an educational establishment—that is, school.—I am, etc.,

Perranporth.

D. JACKSON.

Christmas Disease

SIR,—Dr. Rosemary Biggs and her colleagues are to be congratulated for their excellent article (December 27, 1952, p. 1378). In this important paper it is pointed out that two individuals, both exhibiting clinically indistinguishable evidence of haemophilia, may actually lack two quite different substances from their plasma. The methods used and the results obtained are the same as those reported earlier in 1952 by Schulman and Smith.¹ The purpose of this letter is to protest against the name "Christmas disease" which has been adopted by Biggs *et al.*, because this name suggests a holiday rather than a haemorrhagic blood dyscrasia.

Since the patients exhibit a syndrome having haematological, clinical, and genetic features identical with those of classic haemophilia, it is not clear why the diagnosis of haemophilia is not applicable to these patients as well. As the authors point out, at least two substances exist in the plasma, a deficiency of either of which can give rise to a haemorrhagic disease. If these substances are designated by the numbers I and II, respectively, then the two corresponding haemorrhagic diseases could be designated as haemophilia I and haemophilia II, the former referring to the more commonly occurring type. Since at least two varieties of haemophilia exist, there is a possibility that there may also be a third or a fourth variety. This simple terminology, which is similar to that used by Schulman and Smith in their article, would allow for possible expansion should this become necessary as a result of future investigations. In the letter by Dr. Biggs and her colleagues (January 24, p. 221) the possibility of names such as haemophilia A and haemophilia B (or haemophilia I and haemo-

philia II) is discussed but rejected. The authors argue that the designation should emphasize the differences in the disease. However, all advances in scientific knowledge have always depended on the discovery of universal laws governing seemingly dissimilar phenomena, and, in fact, biological classifications are based primarily on similarities rather than on differences. Probably haemophilia I and haemophilia II (or haemophilia A and haemophilia B) are transmitted by corresponding allelic sex-linked genes (h^A and h^B). In this connexion it is of interest to notice the appearance of an article containing evidence of still another allelic form (h^m) of haemophilia.⁷

These remarks must not be misconstrued as evidence that the undersigned considers differences unimportant. In fact, two important sciences, genetics and blood grouping, arose entirely from the study of individual differences. In the designations haemophilia A and haemophilia B the existence of differences is clearly indicated by the letters, and at the same time proper emphasis is placed on the fact that these are both haemorrhagic blood diseases. In the name "Christmas disease," on the other hand, any emphasis is completely misplaced.—I am, etc.,

Brooklyn, New York.

A. S. WIENER.

REFERENCES

- ⁷ Blood, 1952, 7, 794.
⁸ Grabam, J. B., et al., *Amer. J. med. Sci.*, 1953, 255, 46.

Mental Hospital Service

SIR,—The Minister of Health is reported (*The Times*, February 6) to have said at the annual conference of the National Association for Mental Health that 8,000 persons, including a large number of children, are awaiting admission to mental hospitals. It is not possible to be sure how many patients are awaiting admission to mental hospitals proper, but it is certain that the majority of mental hospitals are overcrowded, some grossly so, and that many potential voluntary patients are being denied the help that in-patient treatment could give. There are many reasons for this. The poor facilities for the proper classification of patients due to overcrowding and out-of-date buildings are one important reason. Cases of psychoneurosis are too often mixed with psychotics in the same ward. Perhaps the most telling reason of all must be the inability of the average medical and nursing staff of a mental hospital to deal with any great number of voluntary patients suffering from neurosis or psychoneurosis. Psychiatrists know that the starting of a vigorous out-patient department soon greatly increases the number of voluntary admissions—a measure of a state of great and still largely unrelieved mental suffering in the community. Providing for the treatment of great numbers of early psychotic and neurotic patients requires careful consideration and planning if we are not to make serious mistakes.

The clinician working in a mental hospital is faced with two main clinical problems; first, the care of a large population of chronically mentally ill patients, most of whom will never leave the hospital, and, secondly, the active treatment of the new cases, usually at the rate of some hundreds a year. The way to avoid overcrowding and the frustration of being overwhelmed with both chronic and acute patients is not necessarily to provide still larger and more elaborate buildings. The two things that would do more than anything else to lessen the problem of mental illness would be to pursue an energetic programme of clinical treatment to prevent patients becoming chronic, and to provide adequate domiciliary and aftercare services for patients who have left hospital. We are convinced that the number of chronic patients being produced every year can be greatly lessened. It requires only the right sort of will and the necessary time and skill. Pinel managed it 150 years ago, with no "modern forms of treatment" (Pinel, P., *A Treatise on Insanity*, 1806).

We would submit some suggestions for improving the present state of affairs. In the hospitals themselves it would be better to spend money on providing more psychiatrists, particularly those skilled in psychotherapy and group therapy, rather than on providing new buildings and more beds. Junior staff are just as important, and every mental hospital should have its own registrars and carry out its own psychiatric training. In connexion with this, far more regional facilities for taking the D.P.M. are required. Occupational therapy should be developed towards

providing active rehabilitation for acute and recent cases rather than for providing occupation for chronic patients. The services of social workers need to be vastly extended, and their training should be based on the mental hospitals, so that psychiatrists can have the kind of service from them that they really need. Outside the hospitals, training centres exclusively for ex-patients and out-patients are greatly needed, as also is the need for group therapy at out-patient clinics. Perhaps the greatest single need is for psychiatric out-patient clubs, not run as a means of recreation for chronically mentally infirm patients, but staffed by one or more psychiatrists and a team of social workers and designed as active treatment units. Such clubs would, in our opinion, greatly reduce the number of readmissions—those dismal evidences of our failure who lower morale among both patients and staff.

A final word about "neurosis centres." These could be cheaply built on the lines of the many wartime hutted hospitals. The psychiatrists who oppose neurosis hospitals do so on the grounds that the mental hospitals will then only receive chronic patients. This difficulty could be overcome if the neurosis units were administered by the medical superintendent. This control could extend to neurosis beds in general hospitals. Every mental hospital would then have, in effect, three types of admission wards—one for the neurotic and early psychotic patients, the second for disturbed psychotics, and the third for elderly psychotic and demented patients. If neurosis centres are not allowed to become independent, nobody need fear that all the interesting and recoverable cases will pass out of the hands of the mental-hospital psychiatrist.

Our problem is, and will be for a long time to come, that there are already far too many patients for us to have time to treat properly. We would suggest that the Minister should consider the setting up of a small national committee to design a plan for the future of the mental hospital service.—We are, etc.,

Worcester.

R. A. SANDISON.
A. M. SPENCER.

The Metric System

SIR,—Dr. C. Langton Hewer's purist (February 21, p. 450) would be quite correct to speak of his blood count as 5 million per cubic millimetre, and at the same time to hold up his hands in horror if one referred to, say, his output of urine in cubic centimetres. This is because the volume of diluted blood in the haemocytometer chamber is based on linear measurements and so is correctly expressed as a unit of length cubed, whereas measures of volume like the litre are not.

The original idea of the French Government was to have all measures of length, volume, and mass based on a natural standard or metre—the ten-millionth part of a polar quadrant passing through Paris. Difficulties, however, led to an artificial standard metre being adopted and then an artificial standard of weight, the kilogram, not based on the metre. The unit of volume or litre was defined as the volume of a kilogram of water. As this kilogram is not strictly related to the metre the thousandth part of a volume of water of equal weight is not related to the metre either. It is not a cubic centimetre but is called an ml. (Incidentally the word "mil" is an engineering term for the thousandth part of an inch, now generally referred to as a "thou.")

Dr. Hewer's objection that 3.55 ml. per 6.35 kg. is hard to remember is not really a serious one. Surely doses are not so strict as all that and an expression in terms of the nearest ml. and round kg. would serve.—I am, etc.,

Enfield.

C. ALLAN BIRCH.

SIR,—With reference to your leading article on the metric system (February 7, p. 320), may I say that the older system is actually very safe and convenient in practice; that Professor W. C. W. Nixon and Mr. T. D. Whittet (p. 327) very much underestimate the difficulties in making a complete change; and that, so far as I know, the Association has never committed itself to the policy you advocate.

I am, however, much more concerned to point out what the older system of weights and measures actually did. In the days when counting was not so common as it is to-day different names were given at small intervals for the

measures most commonly in use, with units above and below these at much wider intervals. This holds broadly for weights, and measures of length and capacity. In fact, though many intermediate measures such as ell, gill, etc., were used, our forefathers had produced something like a logarithmic scale on either side of the common mean. This may not suit the age of comptometers and mechanization, but it was adapted to the needs of the time, it was a fumbling after something even more advanced than decimalization, and it minimized the chance of errors (which are very serious with decimal points). It ill becomes doctors to forget that measures were made for man and not men for machines.

The change-over may be inevitable, but let us credit our ancestors with possessing a sense of proportion which your article and that of your contributors signally fail to show when they compare the change-over in helm orders—which from the nature of the case had to be done universally at a given time—with a change which entails the re-marking or scrapping of most of the weights, measures, and containers in most of the dispensaries and chemists' shops in this country.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

The General Practitioner and Mass Radiography

SIR,—May I correct any false impression that it is universal practice to disallow general practitioners direct access to x-ray departments for the radiological investigations of their patients? The services of the x-ray departments under my charge have been available to general practitioners for the past five years. In the case of simple chest skiagrams, patients are x-rayed and reports reach the practitioners within a few days of the request being made. This is the routine practice, but where it is indicated that a more urgent examination is required suitable arrangements can be made to meet the needs of the case. In addition to the above service one of the hospital x-ray departments is also providing facilities for the x-ray examination of every case referred to the chest clinic, since the latter is housed in the main hospital building and has no independent radiography unit of its own. The area concerned has a population of 200,000.

Before, therefore, embarking on the scheme proposed by Dr. F. A. Nash and his colleagues (February 7, p. 304) consideration should be given to the possibility of getting freer use, for all interested parties, of the facilities which the main x-ray department of the hospital can provide. This service would, of course, be additional to the periodic surveys of the mass radiography unit.—I am, etc.,

Halifax.

R. I. LEWIS.

SIR,—I was pleased to see prominence given recently to routine diagnostic chest radiography services for general practitioners, both in the article by Dr. F. A. Nash, Mr. B. Benjamin, and Dr. T. J. Lee (February 7, p. 304) and in your annotation (p. 322). In particular the conception of relatively minor symptoms possibly representing early pulmonary tuberculosis is of considerable importance and can always bear repetition. Diagnostic delay is still all too common because radiographic action is not taken on symptoms alone, as it should be. Accepting that routine radiography on suspicion can go a long way to improve this position, the problem is how to provide the necessary radiographic facilities. In many areas a service similar to that described is being provided by the chest clinics in spite of the increased work thrown upon them by the shortage of sanatorium beds and the increased use of the clinics by practitioners for routine consultation on pulmonary problems. This suggests that the chest clinic fulfils a very real need, and in my opinion the time has come to consider whether the population (often 200,000–300,000) served by individual chest clinics is not very much too big.

The modern chest clinic is providing important and widely appreciated facilities which are becoming increasingly used. This service could be much more efficient were the popula-

tion served by each clinic (as at present constituted) considerably smaller—certainly not larger than 100,000 in urban areas. It would then also be possible for routine diagnostic radiography for general practitioners to be undertaken more easily. There is a much greater "recall" rate with such schemes than with routine mass miniature radiography as at present practised, and it is logical that chest clinics should undertake the work in such circumstances. Odelca camera units in chest clinics would facilitate this, and they have already been installed with considerable success in a number of clinics. Existing mass miniature radiography units could thus be used for the larger scale mass surveys in "black" areas which are still needed. Later, or at present if local conditions dictate, such units could undertake part of the work involved in routine radiography of practitioners' cases.

May I now correct two small errors? In referring to my work, Nash, Benjamin, and Lee state that the cases investigated were seen at Hammersmith Chest Clinic. In fact the particular investigation referred to was undertaken at Willesden Chest Clinic. Furthermore, the article reference is incorrect; it should read *British Medical Journal*, 1948, 2, 832. The *Lancet* reference given is my letter to the editor on another tuberculosis problem.—I am, etc.,

London, W.12.

PETER STRADLING.

Cortisone and Tuberculosis of the Lung

SIR,—Dr. T. M. Ball (February 14, p. 404) and Mr. D. Chalmers (January 17, p. 159) inquire whether any work is being undertaken in this country on the combined use of A.C.T.H. (or cortisone), streptomycin, and P.A.S. in pulmonary tuberculosis. I described a case so treated at the Oxford Conference on Diseases of the Chest in July, 1951 (*British Medical Journal*, 1951, 2, 296), and in November, 1952, I reported upon 10 further cases at a meeting of the British Tuberculosis Association. It is hoped that these results will shortly be published.—I am, etc.,

Harefield, Middx.

L. E. HOUGHTON.

Lung Resection for Pulmonary Tuberculosis

SIR,—Dr. F. H. Young (February 7, p. 287) has given us a very valuable account of his views of the present status of lung resection for pulmonary tuberculosis based on a long and extensive experience of this disease. One is surprised, however, to read the opening statement of his paper in which he says, "In few conditions is there such a difference in the point of view of physicians and surgeons as in the treatment of pulmonary tuberculosis." With the development of fully organized services for the treatment of this disease this divergence in view must be progressively diminished, as in the conjoint conferences of sanatorium physicians, area chest physicians, and surgeons any major difference in opinion becomes ironed out by the general discussions and presentations of successes and failures. The mythical side of the treatment of pulmonary tuberculosis rapidly becomes eliminated by frank inquiry and particularly by the long-term observations of the area chest physicians, which supplement the views put forward by those who work only in the hospital or sanatorium.

The concept that Dr. Young suggests some of us in Liverpool hold, that pulmonary tuberculosis is a localized disease, has not been interpreted correctly by him. In the stage of primary invasion by the tubercle bacillus, when the lymphatic system is wide open, a bacteraemia is usual, but in the later stages or in the stage of reinfection it is likely that the disease remains confined in most cases to the lungs. Occasionally we do see evidence of a bloodstream spread at this stage, but it is unusual. There is a general reaction of the body to this relatively localized disease, producing antibodies, white cells, etc., and cellular changes occurring in various organs due to circulation of toxins. It can be compared to a boil on the back of the neck in its general reactions, yet this is a condition which I would still call a localized disease. It is customary to state in most articles on pulmonary tuberculosis that "of

course we must never lose sight of the fact that pulmonary tuberculosis is a generalized disease." I would like a fuller explanation of this statement.

Dr. F. H. Young asks the most interesting question: "Why did the patient get the diseased area which has been removed?" He does not vouchsafe an answer to this. Does he believe that these are usually reactivation of some remnant of the primary infection? Although this not infrequently does occur, the history of most cases would suggest that exogenous reinfection is the main responsible factor.

I agree that bronchial stenosis, whether of the main bronchi or the lesser bronchi, is an important indication for resecting the affected area. Its presence can be assumed by the examination of serial radiographs in many cases, but in our experience (and we do some 300-400 bronchoscopies a year in tuberculous cases) it is relatively rare to find any evidence of permanent stenosis in the bronchoscopically visible bronchial tree. Dr. Young is most kind and complimentary to us in Liverpool on the low mortality rate of the operation of resection in our hands. I do not think the type of material varies greatly from that operated upon elsewhere, but the timing of the operation does, and this is the factor of importance. It is only by the very closest co-operation between physicians and surgeons that the timing of the operation can be accurately gauged in the best interests of the patient.

In a conjoint paper published recently (*Thorax*, 1952, 7, 310) we, both physicians and surgeons, laid down our guiding principles for submitting cases to resection, and it would be of interest to recall these: (1) Resection is undertaken of (a) an area which remains persistently active despite bed rest, chemotherapy, and simple relaxation therapy, and (b) an apparently "quiescent" area which experience indicates may reactivate with stress or intercurrent infection. (2) Resection is only undertaken when the body defences are fully mobilized. (3) The maximum localization of the disease is obtained by simple means before resection is undertaken. (4) Treatment as above usually leaves one or more areas of confluent disease and small scattered foci. The confluent areas are assessed as to likelihood of healing and resected if doubtful. The scattered small foci are unlikely to reactivate if hyperexpansion is not permitted. (5) Primary lesions only require excision if activity persists after all other forms of treatment. (6) The continued activity of a caseous pneumonia following gland rupture may require removal of that area. (7) Resection under 16 is only carried out after long activity owing to the recognized better tendency of children to heal their tubercle. (8) Between 16 and 20 the disease is unstable and resection is only carried out in these age groups on the clearest indications. (9) Hyperexpansion of remaining lung tissue must not be allowed. (10) Resection is not carried out through an area of active tuberculous endobronchitis.—I am, etc.,

Liverpool.

F. RONALD EDWARDS.

Intra-arterial Injection of Thiopentone

SIR.—I read with interest Dr. J. W. Dundee's letter (February 14, p. 402). He suggests that where thiopentone has been accidentally injected into the brachial artery the correct treatment would be to induce a brachial plexus block with 1% procaine, at the same time blocking the stellate ganglion and then injecting 40 mg. of papaverine into the subclavian artery. Kinmonth¹ has pointed out that sympathetic nerve fibres are responsible for neither the initiation nor the maintenance of spasm in the large arteries and paravertebral sympathetic blocks, or such procedures as blocking the brachial plexus have no place in the treatment. I can confirm Kinmonth's observations and conclusions from personal experience.

The most effective way of treating arterial spasm is to inject a vasodilator drug (and of these papaverine appears to produce the best results) either into or around the affected artery. It is pointless to attempt to inject a vasodilator

drug into the subclavian artery when the same effect can be obtained more speedily and much more easily by injecting it into the needle which is already in the brachial artery. I have not, fortunately, had the need to test the efficacy of intra-arterial injection of papaverine in order to counteract the results of thiopentone, but, in association with Dr. H. S. Pemberton, I have confirmed its almost miraculous power in relieving spasm due to other causes.—I am, etc.,

Liverpool.

J. B. OLDHAM.

REFERENCE

¹ *British Medical Journal*, 1952, 1, 59.

SIR.—Dr. J. N. Fell (January 10, p. 95) and Dr. J. W. Dundee (February 14, p. 402) both make it clear that the risks of accidental intra-arterial injection of thiopentone are ever with us.

In order to prevent the occurrence of this event, which may have serious consequences for the patient, is it not time that the teaching of the technique of venepuncture was altered? Practically every textbook where the technique is discussed recommends the use of veins in the antecubital fossa for withdrawal of blood or for intravenous injection. Your own expert in "Any Questions?" (January 10, p. 115) recommended this site for the former purpose. So long as the area on the anterior surface of the forearm is recommended as the situation of choice for venepuncture then reports of accidental intra-arterial injection will keep on occurring in the literature. I suggest, therefore, that an alternative site be used as the standard site for intravenous injection for three reasons: (1) Cohen, in a masterly paper (*Lancet*, 1948, 2, 361 and 409), states that high division of the brachial artery occurs in one out of ten arms, and that the vasa aberrantia are found on the anterior surface of the forearm. (2) The most usual drug for anaesthetists to inject intravenously is thiopentone, and a 2.5% solution of this drug in water has a pH of 10.4 to 10.6 by the glass electrode method. An alkali may be injected intravenously with impunity, but not so into an artery, where the intima is particularly sensitive to solutions of high pH, and, in any case, the superficial aberrant arteries on the front of the forearm, like other superficial arteries, have a fuller nerve supply than deeper branches, so they are more readily thrown into spasm. (3) To perform venepuncture in the antecubital fossa the forearm must be fully supinated, the arm partly abducted, and the humerus laterally rotated. With the upper limb kept in this position so that antecubital fossa veins may be used with a Gordh-type needle for repeated injections of various drugs during anaesthesia, the risk of producing a brachial plexus palsy in addition is greatly increased. To take an unjustifiable risk is folly, and venepuncture at the bend of the elbow exposes the patient to the very real twofold risk of arterial puncture and brachial plexus palsy.

The veins on the dorsum of the hand, however, are not likely to be accompanied by arteries, and successful venepuncture here can be accomplished only with the hand flexed and fully pronated, so the risks of both arterial puncture and of brachial plexus palsy are avoided. Further, the veins here are virtually constant in position from earliest infancy onwards, and they are so large that a transfusion needle or a Gordh-type needle may be inserted into them with ease, even in very small children. Venepuncture here is no more and no less painful than it is anywhere else. The disadvantage of this site is that, on withdrawal of the hollow needle, unless firm pressure is applied over the vein distal to the point of puncture, blood may flow out of the puncture hole as it may in any other site. On the dorsum of the hand ecchymosis, however caused, is more noticeable to the patient and his family than at the end of the elbow, but ecchymosis is a small price to pay for freedom from the effects of arterial spasm.—I am, etc.,

London, N.W.5.

JOHN HENDRIE.

Methorphan in Anaesthesia

SIR.—In reply to the letter of Dr. R. J. Whiting (January 31, p. 271) following the publication of my paper on methorphan as a supplement to nitrous oxide and oxygen anaesthesia (December 20, 1952, p. 1331), in my experience nausea occurs in about 5% of cases, but on one occasion only has it been prolonged or severe. I was interested to

note that Drs. J. H. Crawford and Rex Binning (January 31, p. 272) have had to administer larger dosage, but I can only confirm my previous statement that in my experience the dosage I recommended was adequate.—I am, etc.,

Dartford.

A. K. BROWN.

Sensitivity to Antibiotics

SIR.—As a physician with a special interest in allergic diseases I am impressed by the increasing numbers of cases of contact sensitivity to the antibiotics occurring in the medical and nursing professions. Penicillin and streptomycin are the major offenders, mainly owing to the fact that a trained person is required for each administration. Medical practitioners are fortunate on the whole, since they are able, once their sensitivity is recognized, either to take detailed precautions when handling the material or, more simply, to delegate the injection to someone else. Nurses are in a less privileged position, and this is particularly the case with district nurses, who in the course of their domiciliary duties find that a great proportion of their work consists in giving such injections.

Symptoms are frequently mild at first, involving only the interdigital or peri-orbital areas, and may pass unrecognized for a time; but with recurring contact the condition spreads and may become very severe indeed. No satisfactory method of hyposensitization has yet been devised, and once a serious degree of sensitivity has been acquired a minimal contact with the antibiotic may produce a widespread reaction of great severity and long duration. When such a reaction has once occurred it seems unlikely that the individual will ever again be able to return to normal routine duties, and this may mean the end of a career to which many years have been devoted. The condition is not as yet regarded as an occupational hazard.

It would appear that while more and more strains of bacteria are becoming antibiotic resistant, more and more human beings are becoming antibiotic hypersensitive. In my opinion, the following precautions represent the minimal efforts which should be made to combat this tendency, which may soon reach serious proportions: (1) Rubber gloves and a face-mask with "cellophane" visor should be used while filling a syringe, giving the injection, and cleansing the syringe. (2) Syringes used for this purpose must fit perfectly and there should be no leak round the piston or at the head of the needle. (3) In hospitals or clinics where penicillin and streptomycin are largely and constantly used (chest units, V.D. clinics, etc.), or on the district, patch tests should be performed on each nurse at the time of appointment, after three months' service, and again at regular intervals of, say, three to six months. Subclinical hypersensitivity might thus be demonstrated in time to forestall the outbreak of the rash by partial or complete avoidance of contact. (4) If symptoms do develop in a nurse, the advice given to her must depend on circumstances. At probationer level she would be well advised to give up nursing entirely: if partly or fully trained, she should be guided into administrative duties or encouraged to train as a health visitor; in the case of a district nurse, the local authority should be urged to make every effort to arrange her duties so that she need never handle a syringe again. (5) The occurrence of severe clinical hypersensitivity should be regarded as an occupational hazard.—I am, etc.,

Liverpool

D. BLAIR MACAULAY.

Export of Antibiotics to China

SIR.—Press reports¹ and questions² in the House of Commons have stated that an order placed in this country by the China National Import-Export Corporation for £500,000 worth of sulphonamides and antibiotics (including streptomycin) could not be met because export licences were not granted. We are not concerned with the effect of the embargo on British trade, but we are concerned with its effect on international medical relations. According to the Secretary for Overseas Trade³ the export of streptomycin "is not prohibited, but it is limited to normal civil require-

ments," and, in answer to a later question, he stated⁴: "The permissible export by the United Kingdom to meet China's normal civilian requirements of antibiotics and sulpha drugs has been estimated by reference to our exports to China and Hong Kong of these drugs in the first six months of 1950." Direct inquiry to the Board of Trade, so we are informed, indicated that no streptomycin was exported to China or Hong Kong in that period, and it would appear, therefore, that there is a complete embargo on the export of streptomycin. In contrast, the need is immense, and it has been variously estimated that there are 30 million cases of tuberculosis in China and that the annual civil requirements may be of the order of 50 million grammes. Even in time of war many doctors have not satisfied themselves that it is proper to withhold supplies needed for the medical treatment of enemy wounded. That this country, which is not at war with the Chinese people, should deliberately withhold a drug which is recognized as a specific for certain particularly fatal forms of tuberculosis and which—in combination with sulphonamides—is the standard treatment for plague, is inexcusable.—We are, etc.,

RICHARD DOLL.

D. N. LEYS.

DOUGLAS MCCLEAN.

L. S. PENROSE.

London, W.11.

REFERENCES

- ¹ *Observer*, December 14, 1952.
- ² *Hansard*, column 1200, December 16, 1952.
- ³ *Ibid.* (written answers), column 300, December 19, 1952.

"Lente" Novo Insulin

SIR.—The publication by Drs. R. D. Lawrence and Wilfrid Oakley (January 31, p. 242) of a preliminary trial of lente insulin is a contribution to the ideal of one dose of one insulin per day, and it is to be hoped that the absence of a substance such as protamine or globin may allow a more uniform rate of absorption from the subcutaneous space. Hitherto a single dose of protamine zinc insulin has been satisfactory in a limited number of cases, while globin insulin given alone has been more widely useful. In 1948 I published a series of blood sugars of 21 in-patients¹ which may be compared with the lente series of 11 patients.

	Average Blood Sugars in mg. %				
	6 a.m.	8 a.m.	Noon	6 p.m.	9 p.m.
11 patients on lente insulin	128	131	168	162	167
21 " " globin "			151	158	

These averages are worked out from the figures given in the two papers; the variations are not great. Lawrence and Oakley (excluding case 8 on the smaller dose of lente): minimum 67 mg. %, maximum 260 mg. %. Wauchope: minimum 62 mg. %, maximum 256 mg. %.

The real test is, of course, the ambulant treatment of out-patients, for which we must wait till lente becomes available for general use. But meanwhile globin does pretty well. I have gone through the notes of 180 patients—20 young people (ages 5 to 20), 55 men (ages 21 to 65), and 105 women of the same age. They are not selected except by the accident of initial and have all been on globin insulin for at least one year since my last survey in 1948. I have excluded the large number of people over 65 who are generally stable on any insulin.

The doses of globin insulin are as follows:

	Units			
	Under 20	21 to 40	41 to 60	61 to 86
Young people aged 5 to 20		3	7	10
Men 21 to 65	21	16	15	3
Women 21 to 65	23	47	29	6
Total	44	66	51	19

Stability is judged by wellbeing and ability to work, constant weight, absence of insulin reactions, polyuria, or ketosis. These criteria have been maintained in the great

majority with reasonable noon blood sugars and little sugar in the morning urine tests. There are three groups where the balance is not good: (a) One young man and one middle-aged man who reported polyuria at night and are now taking a single dose of P.Z.I. with success. (b) Those who report minor insulin reactions and/or alternating bouts of thirst and polyuria. Their blood sugars vary from about 60 mg.% to about 300 mg.%. Changes to other insulins, even to two doses of soluble insulin, do not produce a lasting balance. There are two men, three women, and two children in this group. (c) A group of one man, six women, and two children who have been brought into hospital in a severe insulin reaction or in ketosis or coma. They have been re-stabilized, sometimes more than once, and other insulins have been tried, but they remain unstable. In all about 10% have not been really well balanced on globin insulin, and I fancy this does not differ much from the records of patients of this age on any of the present methods of insulin therapy.

These notes may serve as a yardstick to assess lente insulin when it becomes available, and it is to be hoped that the management of diabetes will become more simple and that some at least of the present "strengths" and varieties of insulin will be eliminated.—I am, etc.,

Hove.

G. M. WAUCHOPE.

REFERENCE

¹ *British Medical Journal*, 1948, 2, 191.

The Catheter and the Prostate

SIR,—Is it seemly to interject among the pundits, "That depends upon the catheter"? An F.B. that fills frets the urethra. If trouble follows, do we ban the simple device or discriminate by deftly passing a loose-fitting No. 6/E Tieman catheter? For this tip—when immediate prostatectomy is imprudent—I am indebted to a general-practitioner colleague. The alternative suprapubic needle is not taboo in my department.

Mr. Arthur Jacobs (January 24, p. 217), quoting Mr. B. H. Page (December 27, 1952, p. 1415), notes that transurethral resection has the lowest mortality despite the use of catheters and largest-bore urethral instruments. May not the fact that the operator stops short of the anatomical line of cleavage used by the enucleating surgeon, and so avoids opening up inflammable cellular tissues in which the vasa and vesiculae are also embedded, be far more decisive than instrumentation?

Mr. J. A. Lloyd-Davies's figures (January 31, p. 257) on pre-operative infection of urine are illuminating, but they will be more cogent, and we more grateful, if he will supplement his research by tests on a similar series about a week post-operatively.—I am, etc.,

Bristol.

A. WILFRID ADAMS.

SIR,—I was interested to read that Mr. J. A. Lloyd-Davies (January 31, p. 257) has found fine polythene tubing useful for temporary suprapubic drainage of the bladder in retention of urine, and I feel sure that this method is preferable to leaving a long needle in the bladder.

I would like to point out that polythene tubing can also be used successfully for continuous urethral drainage in selected cases. The open end can be closed and rounded off in the flame of a spirit lamp, and the tip can be given a suitable curve after softening in the same way. Several small holes are then cut near the end of the tube, using a razor blade. Care must be taken to avoid weakening the tubing, and the edges of the holes can be strengthened by the momentary application of the flame. Using such an improvised catheter (size 3, Allen & Hanburys), I have found it possible to keep the urine sterile for up to a fortnight, even without the use of chemotherapy or antibiotics. Urethritis is absent or minimal, and the tube does not become blocked if the urine is initially clear and infection avoided. This method has obvious advantages in the treatment of the paraplegic bladder, but it can also be

applied to prostatic cases when the patient is unfit for immediate operation, and especially when transurethral prostatectomy is planned.—I am, etc.,

Liverpool.

NORMAN GIBBON.

Smoking and Lung Cancer

SIR,—Professor R. D. Passey (February 14, p. 399) may be quite right that the evidence on the aetiological relation of smoking to lung cancer is not conclusive, but it would not serve the interest of the public or that of the profession if we belittle or distort the available evidence.

In view of the work that has been done on necropsy protocols covering periods up to 50 years (to mention at random only two, Steiner, P. E., *et al.*, *J. Nat. Cancer Trust*, 1950, 11, 497, and Leschke, H., *Virchows Arch. path. Anat.*, 1952, 321, 101), which show the absolute increase of cancer of the lung, the "immeasurably greater ability to diagnose and far greater opportunities for diagnosis of this condition to-day" is an argument which cannot be accepted without some reservations. I am not sure whether Professor Passey really meant his analogy of breast cancer, which might have been related to the bone and metal supports of the corsets of the Edwardian days, to be taken seriously, but, if so, I would be very glad if he would quote one work on this subject which in its scientific conception, thoroughness, and magnitude is comparable with the work carried out by the Medical Research Council on the possibility of smoking being an aetiological factor in cancer of the lung.

One could argue with Professor Passey's interpretation of the evidence on every point he mentions, but it is his final conclusion which is the most surprising, because it is a direct contradiction of the traditions and history of our profession. It would be impossible to estimate the unnecessary loss of life if, for instance, Jenner, Semmelweis, and Lister had waited to put their theories into practice until they were "sure of their evidence." As a matter of fact, as medicine is not an exact science, our responsibility as a profession always has been, and still is, a greater burden to carry than the responsibility of any other learned profession, because more often than not we have to take the most far-reaching decisions according to our conscience, on insufficient evidence, and it will always be to the everlasting credit of our profession that we have never shirked this responsibility.—I am, etc.,

Colchester

FRANCIS KELLERMAN.

The College of General Practitioners

SIR,—The undersigned general practitioners met informally on January 14 to discuss the implications for Irish doctors of the report of the General Practitioner Steering Committee (*Journal*, December 20, 1952, p. 1321) and the subsequent foundation of the College of General Practitioners in London. It was unanimously agreed that these developments were of considerable importance and that a meeting representative of all general practitioners should be called in the near future in order to have the fullest discussion on the subject and to decide upon a unified line of action. Through the courtesy of the authorities of University College, Dublin, this meeting will be held in the College at 11.30 a.m. on Sunday, March 15.

This promises to be the most important meeting ever held in this country in relation to general practice. We hope that it will be attended, no matter what the personal inconvenience, not only by all those already working in this branch of medicine, whether as dispensary doctors, private practitioners, or in any other circumstances, but also by the newly qualified men and women intending to make general practice their career. It may be useful for those attending if some of the points raised at the preliminary discussion are mentioned here.

Irish practitioners have four choices in relation to the new college: (a) individuals having the necessary qualifications may join as members or associates; (b) an Irish faculty

of the new college may be formed (the method of doing this is being investigated); (c) an independent Irish college may be formed; or (d) they may do nothing.

The signatories of this letter feel that some definite step must be taken to ensure that Irish general practitioners may be enabled to secure full reciprocity with their opposite numbers in England, and that nothing should be neglected which would tend to maintain the status of the general practitioner. It is scarcely necessary to point out to readers that the field of medicine embraced by the term "general practice" has narrowed very considerably in recent years, and that many general practitioners find themselves dealing only with the clinical trivialities, while patients whom they could well treat gravitate elsewhere. In the opinion of most general practitioners there is room for great improvement in the training of medical students. While the great majority are destined to enter general practice, rarely if ever see the run-of-the-mill cases which make up a general practitioner's round, and are first introduced to the general practitioner's facts of life the hard way—hard alike for the newly qualified medico and his patients.

There is no intention among the undersigned that any new group, college, or faculty formed shall be a competitor or rival of existing institutions, but rather that it shall be or equal partner with the object of improving the professional status of the general practitioner secondary only to the maintenance of high ethical and clinical standards in the profession as a whole. We appeal most earnestly for a full attendance of our colleagues at the meeting on March 15.—We are, etc.,

DESMOND CARNEY.

JOHN J. MCCANN.

ANDREW E. H. O'BYRNE.

ROBERT O'MEARA.

JOHN FLEETWOOD.

NORA McNALLY.

Dublin.

J. ST. L. O'DEA.

E. A. O'REILLY.

D. S. KEARON.

LAURENCE MASTERTON.

J. F. O'GRADY.

A. RYAN.

SIR,—A College of General Practitioners certainly fills a gap the existence of which most of us have been too busy to notice. Other branches of medicine have their headquarters, the general practitioners had not. The usefulness of such a college must appear qualitatively and quantitatively to each of us in a different light, and it must therefore be conceded that the demand for such a college and the principles of its foundation can at the moment represent no unified opinion of general practitioners. I look upon the College's foundation with enthusiasm and pleasure, because it has a potentially important part to play in research and medical education, in both of which subjects I am deeply interested. If the prestige of general practitioners is increased by the work of the College, so much the better, but I do not put that as a reason for its foundation.

A deal of argument has arisen about the credentials necessary for a general practitioner to become a member of the College. Once a specialist or consultant has the necessary qualifications to practise his specialty, he automatically becomes a member of the Royal College of Physicians or Surgeons. Surely, then, when a doctor has obtained his qualification to practise as a general practitioner, he should become automatically a member of the College of General Practitioners? The specialist has no need to show evidence of continued good work to remain a member of his College, so why should a general practitioner? A specialist can be elected to a fellowship in the Royal College of Physicians, and a general practitioner could similarly be elected to a higher grade, if the idea is thought to be a good one. But, as I have mentioned, the general practitioner has much to contribute to medical research and education, and without a body such as a college to represent him he has little means of contribution. There are many questions which could be readily answered from the records of general practitioners. There are so many empirical forms of treatment that could easily be placed on a surer foundation. One simple example occurs in the treatment of shingles. Does liver extract help? I have not seen sufficient cases to be able to decide. A research department of the college could collect enough cases in a year to answer this question. And there are a

horde of other problems, stimulating to those of us who are young enough in mind to be interested in their solution.

The education of the medical student is in the hands of specialists, and, however hard they try to give a fair share of instruction to the needs of general practice, they can for the most part act only on hearsay evidence, having no first-hand information on the subject. A College of General Practitioners can provide the needed information and take its rightful share with the other colleges in the education of the student, which is the most important problem in medicine.

I think it a point of no small moment that those groups of our profession and its ancillaries which were represented by a college or similar body—physicians, surgeons, dentists, opticians, pharmacists—came to just agreements with the Government in negotiating the new Health Service, while the general practitioners made a bad bargain from which they have had to be rescued.—I am, etc.,

Leeds.

R. A. MURRAY SCOTT.

Intercourse after Syphilis

SIR,—The reply of your expert (February 7, p. 348) to Dr. T. E. Osmond's and my criticism (February 7, p. 348) of his answer to a question under the above heading would not prevent me from doing all I could to dissuade any girl—a daughter, for example—in whose welfare I was interested from marrying a man with a history of a syphilitic infection the treatment of which was completed six months or less ago. The objection that the articles by the authorities I quoted appeared before "salvarsan" was invented is beside the point. No treatment yet invented has afforded 100% success with the course prescribed at the outset before the patient is placed under observation, and, moreover, it is reasonable to believe that the more efficient the treatment, short of being completely successful, the longer is likely to be the clinically latent period before relapse is detected. Consequently, until a 100% cure has been evolved, the observation following any treatment must be longer than the longest known to have been followed by relapse. Your expert's observation respecting his failure to note any relapse more than six months after completion of treatment cuts no ice with me; it is easy to ascribe to reinfection an inconvenient (for statistical purposes) return of signs of the disease, and what American writers do in this matter does not influence me in the least. The failure of others to confirm the observations of Kertesz and of Warthin should be regarded with great caution, having regard to the experience of reliable experimental syphilographers in the difficulty of being certain that an inoculation with material suspected of containing *S. pallida* has failed. The quotation from Stokes *et al.* regarding infection of the ovum with *S. pallida* is not understood. Surely nobody now thinks that transmission of syphilis to the foetus is mostly by infection of the ovum?—I am, etc.,

London, N.W.10.

P. A. CLEMENTS.

The Dangers of Blood Transfusion

SIR,—The letter of Dr. S. H. Waddy (February 21, p. 454) should not go unanswered. Obviously the potential donor of blood should be treated with every consideration. He should not be bled without a knowledge of his haemoglobin level, and not bled at all if it is abnormally low; his blood film should also be examined. He should be bled by a skilful bleeder, and should be regarded as one deserving the thanks of the community, which should be expressed by one of those present at the bleeding session. Further points in the care of the donor could be added. If reasonable precautions are taken, little or no harm results to him.

But even if a very occasional donor is the worse for giving blood, there is much to be set on the other side. Many lives are saved annually in the practice of obstetrics by blood transfusion, and obstetrics is but a small section of the whole field of medicine. The results in the treatment of post-partum haemorrhage have been revolutionized by

ANDREW M. CLAYE.

MARY EVANS.
WILFRID GAISFORD.
A. HOLZEL.
M. L. THOMSON.
NESTA H. WELLS.

Daniels was frequently called upon by other bodies for his knowledge of epidemiology and tuberculosis control. In 1947, with Dr. D'Arcy Hart, he visited the British Zone of Germany and Berlin at the request of the Foreign Office, to investigate the prevalence of tuberculosis, which was alleged to be rising rapidly. Their report (1948) concluded that these fears were unfounded, and were due largely to the sad state of German morbidity statistics; they gave an optimistic forecast of the tuberculosis trends, which has since proved correct. In 1951 and 1952 he investigated the tuberculosis situation in displaced persons' camps in Trieste, on behalf of the U.N. High Commissioner for Refugees and W.H.O., and recommended improvements. He visited Poland and Yugoslavia for the British Council.

Into the short 15 years of his medical career, Daniels thus crowded a host of valuable activities. He worked with tremendous intensity, coupled with strict accuracy—"ruthless objectivity" a colleague once described it. A somewhat spartan approach to life helped him in many situations, not least in his illness. His enthusiasm extended beyond his work; he was a discriminating critic of painting and the theatre, and himself acted, photographed, and modelled with skill, and even took up the flute. He was not easy to get to know intimately, but those who did recognized his charm and warmth and the variety of his interests. Children were attracted to him and he loved their company. Daniels had been a sincere socialist for many years, and his abhorrence of the effects of war led him to join the Medical Association for the Prevention of War. He married, first, Anne Burgess in 1940, and there are two daughters, aged 8 and 11; in 1949 he married Kay Graw, who had been a fellow-worker in Unrra.

We are indebted to Professor A. BRADFORD HILL for the following appreciation: In a leading article, published in the *British Medical Journal* nearly five years ago, commenting upon the Medical Research Council's first controlled trial of streptomycin in pulmonary tuberculosis, it was suggested that the plan then adopted "may well serve as a model in this field." The prediction was right. Many therapeutic trials, not only in the field of tuberculosis, have been founded upon this early essay, and much of the credit for its success must go to Marc Daniels. I came to know him well at this time, and through his shy and diffident manner there stood out very clearly the characteristics that led to that success—an urge for perfection and accuracy, a patience and capacity for hard work that enabled him to seek that perfection in every detail, and an intellectual honesty that made him interested in nothing but gaining the truth. To this he added an organizing ability which kept the trial running smoothly in many different centres. It was the ideal combination of characteristics. He had also, I found later as we continued to work together, a very large share of that statistical "common sense" which is anything but common, and an outlook upon the ethical problem which made him pause and reflect at every step in a controlled trial. With all his eagerness for the experimental approach, no one could have been more humane than Daniels, more careful of the patient's well-being. He never resented criticism; he would argue the point quietly but effectively, and if he concluded he was wrong he would cheerfully start his project or the writing of a report all over again. He wrote concisely and dryly, in keeping with his character. He was too self-effacing and retiring ever to talk about himself, and so was a difficult person to get to know well. Indeed, after five years of friendship I knew practically nothing of his life. Yet his honesty of purpose was so apparent as to command one's admiration—as indeed did his courage in these last weeks—while his quiet shy smile and constant friendliness in discussion inevitably drew one's warm regard and affection. His death at an early age is a serious loss to British experimental medicine.

Sir LOUIS GREIG, K.B.E., C.V.O., M.B., Ch.B.

A friend of royalty and of other high personages, Group Captain Sir Louis Greig died at his home at Richmond Park on March 1 at the age of 72. He underwent a serious operation last December, and had recovered from its effects sufficiently to be able to spend Christmas at home with his family, but he recently suffered a relapse.

Louis Leisler Greig was born on November 17, 1880, the son of Mr. David Greig, of Glasgow and Fife, and was educated at Merchiston Castle School, Edin-

burgh, and at the University of Glasgow, where he graduated M.B., Ch.B. in 1905. Entering the Royal Navy as a surgeon lieutenant in the following year, he saw service in H.M.S. *Hibernia* and *Cumberland*, and at the Royal Naval College, Osborne, and the Royal Marines Depot, Deal. It was while at Osborne that he first met Prince Albert, later King George VI, and thus began a friendship which was ended only by the death of His Majesty last year. After Prince Albert's serious illness in 1917 Greig did much to restore him to health, and by example and encouragement he played his part in moulding the Prince's character.

Greig was serving with the Royal Marines Brigade when he was taken prisoner by the Germans in October, 1914, but, under the arrangement for the exchange of naval prisoners of war, he was repatriated in September, 1915, in time to witness the Battle of Jutland from the crow's nest of Jellicoe's flagship. In April, 1918, he transferred to the Royal Air Force with the rank of major, later becoming group captain. After the war Greig was Comptroller to the Duke of York, as Prince Albert had now become, from 1920 to 1923, and he was Gentleman Usher in Ordinary to King George V from 1924 to 1936 and Extra Gentleman Usher to King George VI from 1937 until His Majesty's death. Greig's services to royalty were recognized by his appointment as C.V.O. in 1917, and he was created K.B.E. in 1932, in which year he was appointed Deputy Ranger of Richmond Park. The recipient of a number of foreign honours, Greig was a Chevalier of the Légion d'Honneur and of the Ordre de Couronne of Belgium, and he was awarded the Belgian Croix de Guerre, the Dutch Order of Orange-Nassau with Swords, and the Legion of Merit of the U.S.A. In the last war he served as personal air secretary to the Secretary for Air from 1940 to 1946. He was appointed a Deputy Lieutenant for London in 1948.

As a young man Greig played Rugby football for Scotland, and was captain of the national fifteen several times. He was also a tennis enthusiast, and played the game often with the late King. In 1920 they won the men's doubles in the R.A.F. championships, and six years later they appeared together in the doubles at Wimbledon in the All-England championships. On that occasion, however, they were eliminated in the first round, but history was made, for it was the first time that a member of the Royal family had appeared in the championships. Greig was chairman of the All-England Club and of the Not-Forgotten Association; he was also a governor of Westminster Hospital and formerly of Guy's. He married Phyllis, daughter of Mr. J. Walter Scrimgeour, and had one son and two daughters.

HAROLD BALME, O.B.E., M.D., F.R.C.S.

Mr. H. W. S. WRIGHT contributes the following memoir of Dr. Balme, whose death we recorded in these columns last week:

The death of Harold Balme will leave a void, not only among his more intimate friends, but in the minds of doctors and students and medical administrators in widely separated parts of the world. When he had obtained the F.R.C.S. and D.P.H. he went to China as a missionary, and worked for some years in the interior at Tai Yuan Fu, where among other things he learnt something of the educational needs of provincial China. Later he went to Tsinanfu, the capital of Shantung, where he played a distinguished and critically important part in building up a modern medical school, starting with the building of a large, well-designed mission

hospital. This subsequently became a part of a university with faculties of arts, theology, and medicine. Its degrees were recognized by McGill University, and were registered in Canada. Balme was first professor of surgery and dean of the medical school, and then president of the university. It was at one time a centre for a research project of the Royal Society on the transmission of kala-azar, and it had a translation bureau which was partly responsible for the translation of standard textbooks into Chinese and the publication of a Chinese medical journal. Harold Balme's major contribution to this not inconsiderable achievement was his insistence that scientific education in China should be under any circumstances be used to produce half-educated medical assistants and teachers for mission hospitals and schools, but that their standards should be comparable with those of western universities. Further, his experience had shown him that at least one of the four universities should teach in Chinese. These rather obvious ideas were at the time the subject of acute and sometimes acrimonious controversy.

With Harold Balme, once a notion had been clarified it was never left to fade gently away and disperse with the tobacco smoke which had attended its birth. He persuaded mission boards and the Rockefeller Foundation to make it live in bricks, mortar, and personnel. To teach science, a method born of the Greek way of thinking, in a language adapted to expressing a very different set of ideas to very different cultural values, is in itself a formidable task. People who knew their subjects well enough and who were prepared to learn Chinese, adapting it to their needs as they went along, were not easy to find. Still, it was done, and in the years that followed this co-operative effort made a useful contribution to educational progress in North China. If for the medical side of it credit should go to some more than others, Samuel Cochrane, Harold Balme, and Roger Green of the China Medical Board deserve it.

About 1927 Balme felt that he had to go home, and went into general practice in Kent. Not having done any degree of medicine for about 10 years, he proceeded to the question of M.D., a feat which he regarded as merely a question of organization easily dealt with. It was the best and most successful general practice I have known. Every case had notes which would not have disgraced any hospital. He was not a born clinician and never became a remarkable one, but he knew how to find out what was the matter with people and how to organize their recovery. It is characteristic of him that during this period he wrote a book on pain related to its treatment in general practice. This practice he had to abandon on account of a long and trying illness which brought with it some disability.

After his work in the E.M.S. during the war, his major interest was rehabilitation, which he regarded more as an attitude of mind than as an affair of gymnastics, important as the latter are. He organized the Ministry of Health branch of rehabilitation and was their consultant adviser till 1951. He was also director of the welfare services of the British Red Cross Society, and as such he travelled widely all over Europe, advising on rehabilitation centres. In 1950 Balme's work on rehabilitation was enlarged by his appointment as adviser to the United Nations and World Health Organization, and also to the World Veterans Federation. This wide field took him on many laborious journeys to the United States, Egypt, and all over Europe. The setting up of international plans and action for the relief of all kinds of disability owed much to his contributions. Treatment for handicapped children was his special concern. In the last year of his life, although he was in constant pain, he organized study courses for experts from war-devastated countries, and he accomplished his final journey in Sweden, Finland, and Denmark last autumn, and was able to see his work successfully concluded.

Many of the last years of his life were a weary tale of suffering serenely borne. He was unable to survive an extensive operation, and he died on February 13, leaving behind him a widow, two sons, and two married daughters. They assuredly have the vivid and understanding sympathy of many friends. His life, whether as a missionary or as

an administrator, developed a consistently clear behaviour pattern. He early realized that creative ideas, of whatever kind, be they religious or secular, have in themselves a dynamic of their own, and his task, as he conceived it, was to crystallize them out in terms both of functioning institutions and human endeavour. This was his ideal, and in its practice he was supremely successful.

We are indebted to Dr. JOHN D. KERSHAW for the following appreciation:

As chief of the rehabilitation unit in the United Nations Secretariat in 1951-2 I was one of Dr. Harold Balme's closest professional colleagues in the last phase of his work, and I feel that some fuller comment upon it should be made in his obituary notices. He joined U.N. as a consultant at an age when most men are retiring from active professional work. U.N. and its Specialized Agencies had all been finding themselves engaged on problems of rehabilitation of the handicapped, and it was necessary to integrate their separate activities into a co-ordinated whole. As chairman of the joint working party of U.N. and the Agencies, Balme's special qualities of experience and personality made him the perfect catalyst, and the great measure of unity which was achieved between 1950 and 1952 was largely due to him. In the more active task of expert adviser to some of the less highly developed countries he combined a realistic outlook with unbounded enthusiasm, and several U.N. projects which are now in operation owe much of their success to him.

The work was exacting and probably hastened his death, but he never spared himself. Even those working with him did not always realize that he sometimes came straight to the conference table from a sick-bed to which he would return as soon as the meeting adjourned. I have, at his request, taken difficult problems to him in a hospital ward and found him as alert and helpful as if he were well and in his office. The Report on a Co-ordinated International Programme for the Rehabilitation of the Handicapped, which was presented to the U.N. Social Commission last year, and which is likely to form the basis of future developments in this field, was largely Balme's work, and in its fulfilment he will have a fitting memorial.

A. H. NORRIS, C.B.E., M.C., M.R.C.S.

Dr. Arthur Herbert Norris, C.B.E., M.C., who was chief inspector of the Children's Branch of the Home Office from 1918 until his retirement in 1940, died at Dawlish, Devon, on February 20 at the age of 77. The son of the late Rev. C. E. Norris, vicar of Falings, Rochdale, he was born in 1875 and educated at Ellesmere, Shropshire, Manchester University, and St. Thomas's Hospital, where he qualified in 1906. He obtained the D.P.H.(Vict.) in 1910 and the special certificate in school hygiene the following year. At Manchester he held a number of appointments, including senior medical officer of the Manchester Children's Dispensary. He was an assistant medical officer of health and school medical officer of the Berkshire County Council for some years, and shortly before the outbreak of the first world war he was appointed to the post of medical inspector of the Children's Branch of the Home Office. When war broke out he was called to the colours and served overseas as a battalion medical officer of the Manchester Regiment, being awarded the Military Cross. He was demobilized in 1917 to enable him to return to his post at the Home Office at a time when the health of the children in the industrial and reformatory schools was causing serious concern. In the same year he was appointed chief inspector of the Children's Branch in succession to Charles Russell, and his influence was rapidly felt. He served in 1927 on the departmental committee on the Treatment of Young Offenders, which culminated in the Children and Young Persons Act of 1933. In 1931 he was honoured with the C.B.E. Dr. Norris had a dynamic and genial personality, a remarkable memory, and an original mind. He did much to humanize the regime of the industrial and reformatory

Influenza

Graphs of Infectious Diseases

PNEUMONIA

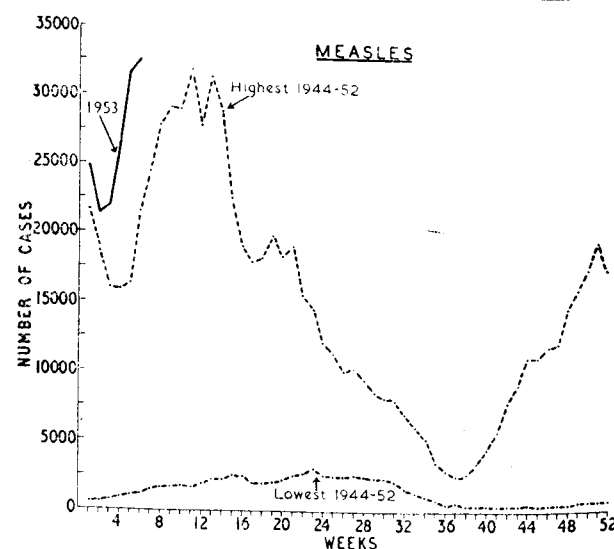
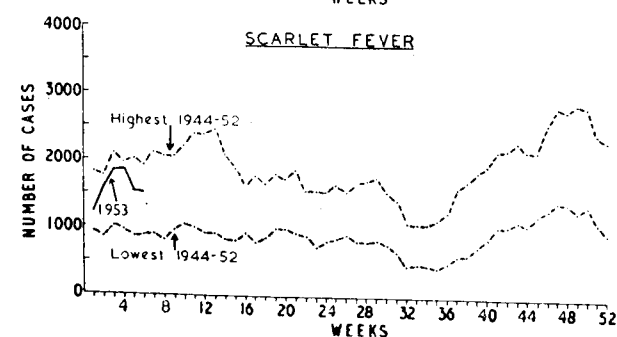
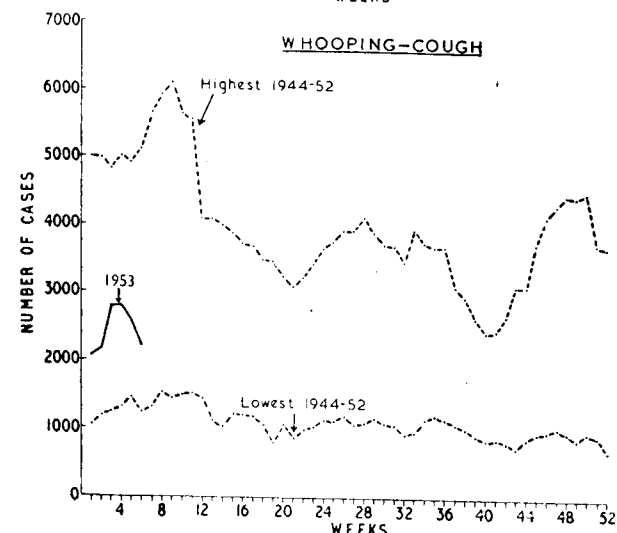
NUMBER OF CASES

Highest 1944-52

1953

Lowest 1944-52

WEEKS



Infectious Diseases

530 deaths were registered from influenza in the great towns; these were 84 more than in the preceding week. The rise in mortality occurred in the northern section of the country, while in the southern section it remained constant. The deaths in London and the south-east formed 52% of the total, compared with 61% and 64% in the two preceding weeks.

Industrial Accidents and Disease

The number of work-people (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in January was 100, compared with 137 in the previous month and 130 (revised figure) in January, 1952. The number of cases of industrial disease reported was 30, including 9 from lead poisoning, 3 from anthrax, 10 from epitheliomatous ulceration, and

Week Ending February 21

Medical News

"no" reply on this point.

"B.P., 1953."—The *British Pharmacopoeia*, 1953, which becomes official on September 1, has just been published. It has been completely revised. There are 64 new monographs, and 150 outdated ones have been deleted. The last edition was in 1948, with an addendum in 1951. The most outstanding change is the use of English instead of Latin for the main title of the monographs, which has necessitated a new alphabetical order. The metric system, being that normally used for chemical and pharmaceutical processes, is adopted throughout, although where dosage has been by custom in Imperial units these are also given. The B.P. is published under the direction of the General Medical Council. It costs 50s. net.

Nuffield Gerontological Research Fellowship.—The Nuffield Foundation, as part of its programme for the care of old people, is prepared to offer a Nuffield Research Fellowship, of professorial status, for research on the scientific aspects of ageing, or alternatively one or more fellowships of less senior status. Applications for both types of fellowship are invited, and appointment will be made by a committee representing the Royal Society and the Nuffield Foundation. The fellowship, which may be tenable at any university in the United Kingdom, will be open to applicants of either sex—usually not more than 45 years of age—who are of high merit and whose ability fits them for the conduct of original scientific research. Appointment to the senior award will normally be made for a period of five years and may be renewed for further periods of five years. The value will not be less than £2,000 per annum plus superannuation and child allowance. Research expenses will be met by the Foundation, including such provision for research assistants, apparatus, and technicians as the committee may think appropriate. In the event of one or more less senior workers, instead of one senior, being appointed, the period of appointment will be three years in the first instance. The value will be £1,000 to £1,500 per annum plus superannuation, child allowance, and research expenses. Applications must be received before June 1 by the secretary, the Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1, from whom full particulars and application forms can be obtained.

Psychiatric Research in America.—The creation of a large fund for research in psychiatry was announced last week by the president of Yale, according to the *New York Times*. The fund consists of a grant of \$6m. provided by the Social Research Foundation of New York. The

Human Behaviour.—Another large and recent American benefaction for research on human conduct is the Ford Foundation's appropriation of \$3.5m. to cover the first six years' programme of a new Centre for Advanced Study in the Behavioral Sciences. The funds will be used principally to permit 50 top-flight scholars and scientists to assemble for study and collaboration at the Centre each year. So far the location of the Centre has not been settled, but a board has been appointed to direct the work. The chairman of the board is the president of the Columbia Broadcasting System.

Société Belge de Droit International Médical.—With Professor René Sand as president a new society has been formed in Brussels to study the medical aspects of international law. The aims of the society, which includes both doctors and lawyers among its members, are : to study international medical law and work for its development ; to ensure close collaboration between doctors and lawyers, particularly where international law impinges on medical ethics ; to give help with the problems inherent in conventions on human rights, and in general to have regard to the impact of international law on medicine. There is a similar society in France.

Index Ophthalmologicus.—At the XVIIth International Congress of Ophthalmology, New York, 1954, a new edition of the "Indicia" will be issued under the title *Index Ophthalmologicus*, and the Ophthalmological Society has been asked to prepare the section covering Great Britain. Any ophthalmologist who is not a member of the Ophthalmological Society of the United Kingdom or the Faculty of Ophthalmologists, and who wishes to be included in this Index, is asked to send his name and address to the honorary secretary, Ophthalmological Society of the United Kingdom, 45, Lincoln's Inn Fields, London, W.C.2, before March 31.

Register of Chiropodists.—The 1952 *Register of Chiropodists* has now been published, and can be obtained by medical practitioners free on request to the Secretary and Registrar, Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, London, W.C.1. Chiropodists are classified on a geographical basis, and, besides address and telephone number, information is given on qualifications, hospital appointments, and whether private practice is undertaken.

Health Education.—In a praiseworthy attempt to provide authoritative information to those who are interested in health education in its broadest aspects, the Central Council for Health Education is publishing an "Information Digest" twice yearly. This contains extracts from and abstracts of reports and papers which have a bearing on a particular topic selected by the editors, Dr. A. J. Dalzell-Ward and Miss Priscilla Milton. In the issue dated January, 1953, the main headings of the separate sections are "School Health," "Whooping-cough," "The M.O.H. Reports," "Accidents in the Home," and "Health Education Programmes in Local Authorities." The papers selected for abstraction are not necessarily of very recent publication, but they do give a general view of current thought. The "Information Digest" is at present varityped, but future issues will probably be printed.

Dr. H. B. May, director of the clinical laboratories at the London Hospital, will succeed Dr. A. E. Clark-Kennedy as Dean of the London Hospital Medical College on October 1. Until then he will be Vice-Dean.

Mr. C. J. Cellan-Jones, honorary surgeon to the Swansea General Hospital, has been appointed a Deputy Lieutenant of Glamorgan.

Dr. Ludwig Guttman, director of the Ministry of Pensions Spinal Injuries Centre at Aylesbury, has been invited

to speak at a three-day symposium on stress which is being held from March 16 to 18 at the Army Medical Service Graduate School in Washington, D.C.

Emergency Bed Service: Applications and Admissions.—During the seven days ending March 2 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 1,302, of whom 86.5% were admitted. The white warning was cancelled from March 3.

COMING EVENTS

Institute of Psychiatry.—Details of the lectures to be given to postgraduate students in psychiatry at the Maudsley Hospital during the term beginning on April 13 are now available from the secretary of the Institute, Maudsley Hospital, London, S.E.5.

Ergonomics Research Society.—The third annual conference of the Ergonomics Research Society will be held at the Department of Human Anatomy, Oxford University, from April 13 to 16. The Chairman of the conference will be Professor W. E. Le Gros Clark, F.R.S., and the main subject for discussion will be "Human Performance: Its Measurement and Limitations." Those wishing to enrol as members of the symposium are asked to communicate with H. Murrell, Spinneys, Marlpit Lane, Headless Cross, near Redditch, Worcs.

Research on Micro-organisms.—The first Marjory Stephenson Memorial Lecture will be given by Dr. D. D. Woods, F.R.S., at the Royal Institution, Albemarle Street, London, at 6 p.m. on April 13. The title will be "The Integration of Research on the Nutrition and Metabolism of Micro-organisms," and all those interested are invited to attend. The Marjory Stephenson Memorial Fund is administered by the Society for General Microbiology.

NEW ISSUES

Abstracts of World Medicine.—The next issue (Vol. 13, No. 3) will be available in a week's time. The contents include abstracts of papers selected from the medical literature of the world on all aspects of clinical medicine and surgery and the allied sciences.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; a specimen will be sent free on request. Obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

Details in this column are necessarily brief. Further information and tickets where required (marked ●) should be obtained from the institution concerned.

Monday, March 9

EDINBURGH UNIVERSITY: FACULTY OF MEDICINE.—At University New Buildings, 5 p.m., Dr. Pierre Mallet-Guy (Lyons): Manometric and Radiographic Control of Biliary Surgery.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: lecture-demonstration for postgraduates.

LONDON UNIVERSITY.—At Bedford College, 5.15 p.m., Professor S. Bergström (Lund): Intestinal Absorption of Fats.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., Lettsomian Lecture by Dr. E. R. Callinan: Some Disorders of the Liver and Bile Passages.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—7.30 p.m., Professor J. H. Burn, F.R.S.: Progress in Biological Standardization.

Tuesday, March 10

CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel, 8.30 p.m., discussion to be opened by Mr. W. V. Gibson and Sir Hugh Griffiths: Medical Aspects of Road Accidents.

EDINBURGH UNIVERSITY.—At University New Buildings, 5 p.m., Professor A. Meyer: Anatomical Aspects of Neurosurgery in Mental Disorder.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. G. Cochrane: Leprosy.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Oliver-Sharpay Lecture by Dr. Clifford Wilson: Renal Factors in the Production of Hypertension.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Dr. T. Rowland Hill: neurological demonstration.

Wednesday, March 11

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. G. Cochrane: Histopathology of Leprosy.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, W.C., 4.30 for 5 p.m., Dr. A. H. Harkness: Non-gonococcal Urethritis.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8.30 p.m., annual general meeting.

Presidential address by Miss Diana Beck: Management of Head Injuries in General Practice.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Erasmus Wilson Demonstration by Mr. V. E. Negus: Protection of the Respiratory Tract. (On the Evidence of Comparative Anatomy.)

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. W. C. Harvey: Food Hygiene.

Thursday, March 12

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Drs. Donald Blair, A. R. Redfern, and E. Weissmann: Three Difficult Cases Treated by Adlerian Methods.

INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. R. E. Hope Simpson: Epidemiological Research in Children under 15 Years of Age.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Mycology—Pathology of Mycotic Infections.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Dr. J. G. Benstead: Antarctic Observations of Comparative Interest in Hygiene and Forensic Medicine; Dr. A. A. Miller: Case of Concomitant Endometrial Adenocarcinoma with Squamous Metaplasia and Endometrial and Tubal Tuberculosis.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Dorchester Hotel, 6.30 p.m. to 1 a.m., annual dinner-dance.

LONDON UNIVERSITY.—At Bedford College, 5.15 p.m., Professor S. Bergström (Lund): Formation and Interconversion of Bile Acids.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Mr. R. Llewelyn Davies, M.A., A.R.I.B.A.: Modern Trends in Hospital Architecture.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Oliver-Sharpay Lecture by Dr. Clifford Wilson: Renal Factors in the Production of Hypertension.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor J. B. Wyman: The Use of Pentamethonium and Hexamethonium Salts in Major Surgery.

ROYAL SOCIETY.—11 a.m., discussion to be opened by Professor J. Z. Young, F.R.S.: Function and Location of Enzymes in Cells.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Sir James Spence: Methods of Clinical Teaching.

UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., public lecture by Professor V. B. Wigglesworth, F.R.S.: Chemical Aspects of Insect Physiology.

FRIDAY, MARCH 13

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. G. Cochrane: Leprosy.

OXFORD UNIVERSITY.—At Department of Human Anatomy, 12 noon, Professor G. W. Corner (Washington): Application of Scientific Methods to the Study of Sex and Reproduction.

SATURDAY, MARCH 14

NORTH OF ENGLAND OTOLARYNGOLOGICAL SOCIETY.—At Hull Royal Infirmary, 2 p.m., meeting.

APPOINTMENTS

BLACK, DORIS JEAN, M.B., B.Ch., Assistant Divisional Medical Officer to the Chorley, Adlington, and Coppull areas of Division 4, Lancashire County Council.

CULLINGTON, D. E., M.B., B.Chir., D.P.H., D.C.H., Medical Officer of Health, Barking, and Area Medical Officer and Divisional School Medical Officer.

DAVIES, J. B. M., M.D., D.P.H., Deputy Medical Officer of Health and Deputy Port Medical Officer, City of Liverpool.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—Catherine N. McRobert, M.B., B.S., Resident Medical Officer at Tadworth Court; Ruth E. Trilling, B.M., B.Ch., D.C.H., Assistant Resident Medical Officer at Tadworth Court.

MORRIS, NORMAN F., M.D., M.R.C.O.G., First Assistant in Obstetric Unit, University College Hospital, London, W.C.

RAFTERY, J. D., D.Phil., F.R.C.S., Visiting Senior Orthopaedic Surgeon to King Edward VIII Hospital, Durban, and Part-time Assistant in the Department of Anatomy, Faculty of Medicine, University of Natal, Durban, South Africa.

VICKERY, K. O. A., M.D., D.P.H., Medical Officer of Health and School Medical Officer, County Borough of Eastbourne.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Evershed.—On February 5, 1953, at the Liverpool Maternity Hospital, to Elizabeth, wife of Squadron Leader T. A. Evershed, M.B., B.Chir., R.A.F., a son.

Heller.—On February 19, 1953, at St. Mary's Hospital, London, W., to Betty wife of Dr. Michael Heller, a son—Simon Richard.

Solomon.—On February 9, 1953, at the Bearded Memorial Hospital, London, N., to Vera (formerly Apt), wife of Dr. Terence Solomon, M.B., D.Obst.R.C.O.G., a son—Stephen Maxwell Ernest.

Walwyn-Jones.—On February 24, 1953, to Margaret (formerly Pemberton), wife of Dr. E. O. Walwyn-Jones, a son.

Winter.—On February 28, 1953, at the Gordon Road Nursing Home, Cardiff, to Mollie, wife of George Winter, M.B., Ch.B., a sister for John.

DEATHS

Joscelyne.—On February 11, 1953, Edward Walter Joscelyne, M.D., of 13, Stoke Grove, Westbury-on-Trym.

Kerr.—On February 10, 1953, at Grimsby, James Arthur Kerr, V.R.D., M.D., D.P.H., Surgeon Commander, R.N.V.R., aged 54.

Pickard.—On February 9, 1953, at Rusholme, Stratham Drive, Exeter, Ransom Pickard, C.B., C.M.G., M.D., M.S., F.R.C.S., Colonel, A.M.S., T.A., retired, aged 85.

Reid.—On February 10, 1953, at Walsall, Gordon Campbell Kinloch Reid, M.B., Ch.B.

Shears.—On February 5, 1953, at Beckenham Hospital, William Shears, late of Bromley Road, Catford, S.E., and 1, North Dene, Beckenham, Kent, aged 84.

Smith.—On February 13, 1953, at his home, Rodborough Grange, Aylth Road, Bournemouth, Hants, Alfred Tennyson Smith, O.B.E., M.D., aged 83.

Stewart.—On February 8, 1953, at Olney, Sandy Lane, St. Paul's Cray, Kent, Ian James Allan Stewart, M.B., Ch.B., aged 50.

Thompson.—On February 13, 1953, at Ashford Hospital, Hubert Gordon Thompson, M.D., F.R.C.S., of "Bennetts," Appledore, Kent, formerly of China, aged 74.

Turner.—On February 9, 1953, Reginald George Turner, C.M.G., D.S.O., F.R.C.S., Colonel I.M.S., retired, of Ardmore Road, Lower Parkstone, Dorset, late of Clevedon, Somerset.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Chilblains in Women

Q.—Why do women get chilblains more frequently than men?

A.—It is true that chilblains occur rather more frequently in women than in men, though they chiefly affect children and young adults. The individual predisposition appears to rest upon a vasomotor sensitivity which in turn is subject to emotional and endocrine influences. Over and above these considerations, which would favour an increased susceptibility in the female, is the question of clothing. The body temperature to some extent controls the vascular tone in the extremities, and it is desirable that body and limbs should be maintained at an even and adequate temperature by suitable clothing to prevent perniosis. In the matter of clothing the female is usually more adventurous than the male.

Foot-drop after Delivery

Q.—I have encountered two cases of foot-drop following delivery, in one of which there was sciatic pain and muscular wasting. It has been suggested that this was due to prolapse of an intervertebral disk. Is this a recognized complication of pregnancy or labour?

A.—Peroneal palsy is a well-recognized, although fortunately not very common, complication of childbirth. It may be bilateral but is mostly unilateral. The degree of paralysis varies from slight weakness of the dorsiflexors of the foot and toes to inability to move the leg. The affected muscles are flaccid and wasted. Sensory loss is a more variable finding. Sciatic pain and paraesthesiae in the foot may, or may not, be present.

This condition affects primiparae more than multiparae. It may follow normal labour, but seems more common after prolonged labour and difficult forceps deliveries. The first evidence of it may arise during labour or immediately afterwards, but sometimes it is not apparent for several days or weeks. When there is such an interval the injury is probably still attributable to labour, but may have been slight and overlooked. The older and traditional view about its aetiology is that it arises as the result of injury to the lumbosacral cord as it crosses the pelvic brim to the sacral plexus. The injury is said to arise either by direct pressure of the foetal head or forceps blade, or by traction on the relatively fixed nerve root. A more recent explanation¹ is that the paralysis is the result of a slipped disk—usually the disk between L.5 and S.1. This view has been widely but not universally accepted. Some times it is suggested that the mechanism of production may not be the same in all cases.

The prognosis is good in that the muscular wasting and weakness nearly always clears up in time—although it may take many months: it is usually said that recovery is invariably complete, and it is for all practical purposes. In fact, however, special tests often reveal some weakness in one or more groups of muscles many years afterwards. Moreover, if in after life the subject of such an injury is ever confined to bed for a long period, this weakness shows up temporarily.

If the best result is to be obtained, the management of the case is important and should be in the hands of an orthopaedic specialist. Usually the treatment is the same as for any flaccid paralysis of muscles—massage, galvanic stimulation, and the prevention of stretching of the muscles and permanent deformity by suitable splints or plaster. If

there is evidence of disk protrusion it may be necessary to keep the patient at rest in bed for several weeks, and operative treatment might have to be considered in the very severe case. Little can be done to prevent this injury, but if a patient complains of severe sciatic pain during labour it should be regarded as a warning not to proceed with vaginal delivery unless it is reasonably certain that there is no mechanical difficulty at all, and that there will be no need for the application of forceps.

The above comments are based on the assumption that paralysis due to regional analgesia, or to pressure on the peroneal nerve by any appliance used to maintain the lithotomy position, has been excluded.

REFERENCE

¹ O'Connell, J. E. A. (1944). *Surg. Gynec. Obstet.*, 79, 374.

Diagnosis of Polycythaemia Vera

Q.—What criteria are necessary to establish a diagnosis of polycythaemia vera? Is there any test which will exclude or confirm the presence of the disease beyond question? I have a patient who complains of vertigo, "headiness," "oppressive feelings," and tinnitus, whose R.B.C. count is 6,500,000 (Hb 117%). Are the symptoms likely to be related to the blood picture in this case?

A.—Polycythaemia requires for its diagnosis a persistently raised erythrocyte count and an increase in the packed cell volume; there is, naturally, an accompanying elevation of the haemoglobin level in most, but not all, instances. The upper limit of normal given by Wintrobe (*Clinical Hematology*, 3rd ed., 1951, Kimpton, London, for the red cell count is 6,200,000 per c.mm. for the male and 5,400,000 per c.mm. for the female, and for the packed cell volume 54% and 47% respectively. Most authorities would agree that red cell counts above 7,000,000 per c.mm. and packed cell volumes above 55% were always abnormal. The next step in diagnosis is the exclusion of such causes of secondary polycythaemia as cyanotic congenital heart disease and emphysema. Given their exclusion, a diagnosis of polycythaemia vera can then be accepted; it is made more certain by the presence of splenic enlargement and by a neutrophil leucocytosis with an increase in the platelet count. These remarks are sufficient to show that there is no single test which alone will "exclude or confirm the presence of the disease beyond question."

In the instance cited, the red blood cell count is perhaps just above the upper limit of normal; the symptoms, although not of specific significance, are those experienced by many polycythaemias; splenomegaly and leucocytosis would suggest that this patient has, in fact, polycythaemia vera. These symptoms are usually to be noted in the older patients and it seems likely that the combination of arterial degeneration with unduly viscid blood is responsible for them.

Prevention of Scale in a Sterilizer

Q.—What is the best way of preventing the deposition of scale in a sterilizer?

A.—From the wording of the question it is assumed that the sterilizer is one in which instruments are submerged in boiling water as distinct from their being enveloped in steam.

If this is the case, there are two methods of avoiding the deposition of scale. The more obvious method is to use softened water instead of hard water. At the same time it should be observed that even softened water should be rejected and replaced from time to time, for, with constant re-use and replenishment to make up for evaporation, excessive alkalinity or even a deposit will eventually be encountered. If softened water is not available the trouble can generally be avoided by adding a small quantity—the amount is not critical—of "calgon" (sodium hexametaphosphate) to the water. Here again, periodical rejection and replacement of the water is necessary if it is constantly re-used and topped up.

Crystalline or Procaine Penicillin

Q.—Which is the better preparation of penicillin for routine parenteral use—crystalline penicillin or a procaine penicillin? I have heard that the likelihood of the side-effects from the procaine in the procaine penicillin outweighs its advantages.

A.—Arguments about the relative merits of the two preparations are usually based on theoretical considerations rather than on any observed difference in therapeutic potency. After an intramuscular injection of 600,000 units of procaine penicillin a bacteriostatic level in the blood is maintained for 24 hours as a rule, whereas after an injection of the same dose of crystalline penicillin the concentration in the blood rises to a much higher peak, but rapidly declines to a level which is too low to be assayed. The ability of procaine penicillin to maintain a significant blood-concentration over a prolonged period would suggest that it was the preparation of choice for prophylactic use—for example, as a protective screen for the patient with valvular disease of the heart who requires dental extraction. On the other hand, in the treatment of established infections the high initial concentration of penicillin in the blood achieved with the crystalline salt may facilitate penetration of the antibiotic into the diseased tissues, where high concentrations may be found many hours after the blood level has fallen to zero. In practice the injection of 500,000 units of crystalline penicillin twice a day gives satisfactory therapeutic results. Reports of alarming, even fatal, responses to the administration of procaine penicillin (probably due to inadvertent intravenous injection) should be viewed against the background of the millions of injections that have been given without mishap; the incidence of dangerous side-effects is far too low to justify condemnation of procaine penicillin on this score.

Papaverine

Q.—What are the actions of papaverine? Is it useful clinically in the treatment of disorders such as angina pectoris and essential hypertension? If so, please indicate dosage.

A.—Papaverine is a feebly analgesic and narcotic alkaloid of opium which has a relaxing action on smooth muscle. The official preparation is papaverine hydrochloride, but it is also available as a sulphate and a nitrite. The usual dose is from 0.12 to 0.25 g. orally, but there are reports of as much as 1 g. being given intravenously without ill effect. Papaverine has been used extensively, especially on the Continent, in the treatment of angina, hypertension, and peripheral vascular disorders, but the effect is of short duration and the reports on its use are conflicting. It cannot be said to have any proved value in the treatment of these conditions.

Alcoholic and Traumatic Amnesia

Q.—Is it possible to differentiate between the amnesias due to head injury and alcoholic excess by the use of thiopentone or methylamphetamine?

A.—It should be possible to go some way towards clearing up an amnesic gap by investigation under intravenous thiopentone; and in some cases intravenous methylamphetamine might be tried as an alternative, though with much less prospect of success. Ordinary hypnosis will also sometimes succeed. Such measures should be completely successful in an amnesia solely due to hysterical dissociation, unless the patient is uncooperative. But with organically caused amnesias, though some forgotten events may be recalled, an irreducible minimum of amnesia usually remains. In this case it is presumably desired to explore the amnesia as a differential diagnostic method, to decide how far it might be caused by trauma or by alcohol. If the patient was in a deep alcoholic stupor he would be just as unconscious as after a severe concussion. In both cases, therefore, there might be equally good reasons for a permanent

and irreducible amnesic gap. The principal prospect of thiopentone investigation would then be to fill in the stor as far as possible, and in the light of a better knowledge of the circumstances so gained it might be possible to decide whether alcohol or trauma was implicated.

NOTES AND COMMENTS

Allergic Rhinitis.—Dr. MORRIS CUTNER and Dr. B. S. SWEETMAN (Chelsea, S.W.3.) write: May we supplement the answer under the above heading ("Any Questions?" February 7, p. 347) by quoting our experience? During the past 18 months or so we have submitted seven patients suffering from this condition to a course of histamine ionization. Of these, three have apparently been cured, two have been markedly improved, one (who incidentally has been relieved of her asthma) has not yet responded favourably, and one did not benefit. The numbers are small, but the clinical impression is significant. The only snag is that as each treatment aims at a general reaction it should (as in our cases) be carried out only by a competent therapist under direct medical supervision. As the patient in question derives some benefit from antihistamine drugs she would very likely benefit by this therapy. We hope to submit an article shortly giving clinical and other reasons for this belief.

OUR EXPERT writes: I have no personal experience of histamine ionization, but zinc ionization will help about half those with allergic rhinitis.

Night Starts.—ANOTHER DOCTOR writes: I was interested to read your correspondent's account of night starts in his legs following transverse myelitis (February 14, p. 414). I too have a spastic paralysis of both legs from a transverse myelitis. I observe that the degree of spasticity in my legs varies with the state of my large bowel. If I allow myself to become constipated the legs become much worse; if, on the other hand, the bowel is irritated with too much laxative the spasticity increases also. There is no doubt in my mind that these "kicks" of the legs are the result of an incoordination of large bowel peristalsis causing localized sections of the bowel to become dilated with flatus, and that they are motivated through a spinal reflex arc, the inhibitory impulses of the cerebral cortex having been cut off by the pyramidal lesion at the level of the myelitis. It is probable that air-swallowing during sleep is a factor in producing pockets of gas in the incoordinated large bowel. If I avoid flatus-forming foods the severity of the spasticity diminishes and vice versa. Weather conditions also have a very noticeable effect on the spasticity and "kicks," and it may well be that the lowering of the atmospheric pressure produces increased intra-abdominal pressure from the expansion of the flatus contained in the bowel.

Corrections.—In the obituary notice of Dr. Harold Balme (Journal, February 28, p. 511) we mistakenly recorded that he had only one son. In addition to Mr. David Mowbray Balme, Principal of the University College of the Gold Coast, Dr. Balme had another son, Dr. Harold Wykeham Balme, and two daughters.

In the appreciation of the late Sir William Douglas in last week's Journal (p. 513) he was wrongly described as Parliamentary Secretary to the Ministry of Health. Sir William's post was that of Permanent Secretary.

Dr. M. H. ARMSTRONG DAVISON writes: At the recent R.S.M. meeting on "Hypotension in Anaesthesia" (see February 28, p. 504), I stated that there had been only one death "on the table" in the last 60,000 anaesthetics given at the Royal Victoria Infirmary, Newcastle-upon-Tyne. I have subsequently discovered that there were in fact two such deaths.

The dose of L-thyroxine given in the second paragraph of the summary of the paper by Russell Fraser and M. Wilkinson in our issue of February 28 (p. 484) should read 0.1 mg. thrice daily, and not 1 mg.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London.* MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London.* B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

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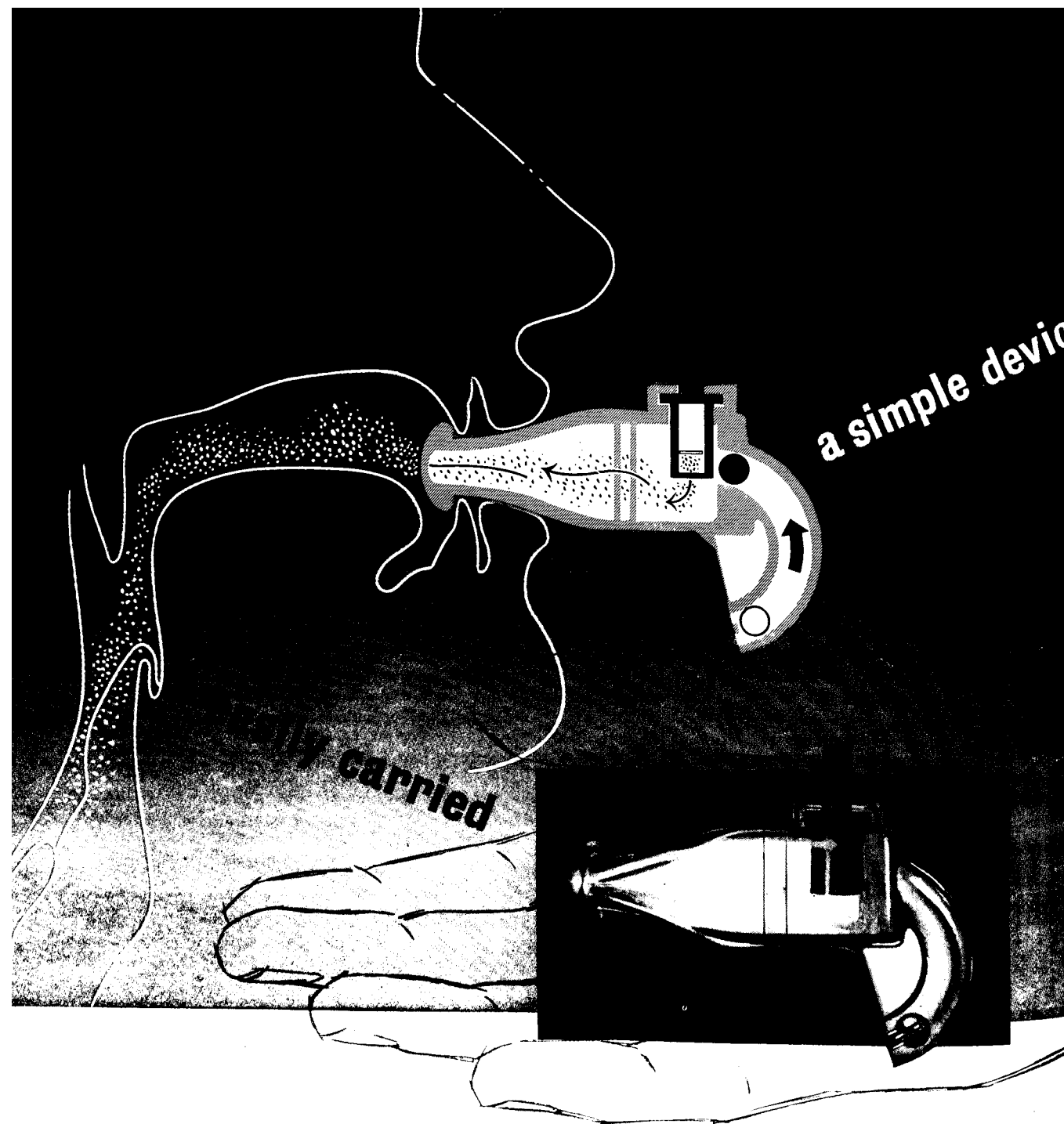
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CHANGING CONCEPTS OF HEALTH AND DISEASE, WITH PARTICULAR REFERENCE TO "PSYCHOSOMATIC MEDICINE"

BY

R. R. BOMFORD, D.M., F.R.C.P.
Physician to the London Hospital

I do not think anything I shall say is new; much of it has been better said before, and some of it is very old—so old indeed that there always is a chance it may be mistaken for new. But I am encouraged to hope that, even so, it may fulfil the terms of the Bradshaw Trust, which states simply that a lecture shall be given in memory of Dr. William Wood Bradshaw on a subject connected with medicine or surgery.

As a starting-point I propose to try to put into words some ideas about the nature of disease which seemed to be taken for granted in the medicine I was taught to be taken for granted in the medicine I was taught nearly twenty-five years ago. It was assumed, so far as I could see, that there were things or entities called diseases which could be studied and treated as such. Some of these arose in and affected the mind, and were the province of psychiatrists. Others arose in and affected the body, and were the province of physicians, surgeons, and various specialists.

Diseases with physical manifestations could be divided into organic and functional. Organic diseases were regarded as real, objective, and the proper object of study by scientific medicine. They had physical causes, which either had been or would be elucidated as a result of increasingly thorough study by physical, chemical, and bacteriological methods. In the investigation of a disease the object was to find "the cause" and to deal with it. There was little or no interest in functional disorder. Functional symptoms seemed usually to be regarded either as invented or imaginary or as rather mysterious and discreditable states which in some way affected inferior personalities.

I do not think, as a student, I heard the word "psychosomatic," which is not surprising, for this actual word was apparently first used in 1926. Within a few years, however, it was suggested that certain physical diseases for which no satisfactory cause could be found, and which were becoming increasingly noticeable in nature, were becoming increasingly noticeable in nature. These sources of disability, were psychosomatic in nature. This appeared to mean that the structural changes found in the body were caused by a disordered mind. This possibility was eagerly seized on by a few, but denied or ignored by the many who believed that real organic disease had little or nothing to do with the mind and

would ultimately yield its secrets to the methods of physics, chemistry, and bacteriology.

Though stated baldly and perhaps oversimplified, I believe that is a fair summary of some of the main ideas about disease which were more or less taken for granted in the medicine I was taught. If any of my teachers should say they took nothing of the kind for granted, I can only say that this was what an average student gathered, not so much perhaps from what they said as from what they did not say. One saw, of course, that many of one's teachers did treat their patients as persons rather than as mere vehicles of disease, but I believe this was more an expression of humanity than an indication that they accepted such an approach as necessary to the understanding of disease.

Ideas Still Taken for Granted

I believe that some at least of the ideas I have outlined are still taken for granted by many persons engaged in academic medicine, by which for the purpose of this lecture I mean medicine as taught in undergraduate teaching schools. I will not waste time in defending this latter statement at length, but would refer to two recent articles by eminent teachers in undergraduate schools.

The one lists what he calls the five common causes of disease: inborn and inherited abnormalities; excess of a chemical agent in the environment; deficiency of a chemical substance; infection or infestation by viruses, bacteria, fungi, or animal parasites; and physical trauma. He thinks it possible that the important diseases of unknown aetiology, such as the rheumatic diseases, peptic ulceration, and ulcerative colitis, will turn out to be due to these same causes, acting singly or in combination, but entertains the "possibility that there exists a group or groups of diseases the causation of which we do not comprehend, or comprehend but dimly." His statement of what he calls the psychosomatic hypothesis—which is at least commendably brief—is that it "attributes disease to certain abnormal states of the mind." This hypothesis is then immediately dismissed along with that of focal sepsis as unworthy of serious consideration by scientific medicine. "The small amount of critically established fact," he says, "on

*The Bradshaw Lecture delivered before the Royal College of Physicians of London on November 6, 1952.

which these two hypotheses were based can probably be accounted for on the fact that the condition of any patient suffering from a chronic disease deteriorates when there is superadded infection or disturbance of the mind" (Pickering, 1950).

The other, speaking of the place of psychotherapy in the treatment of peptic ulcer, says: "In this connexion it should be recognized that, while many neurotics invent digestive disturbances, the ranks of genuine ulcer cases contain no higher proportion of neurotics than does the population at large. Most ulcer patients, indeed, are the reverse of neurotic. They may be anxious and worried, but they never invent symptoms, generally make light of their suffering, and rarely give up work unless the pain is intolerable" (Illingworth, 1952).

I would like to assure the authors of these in many ways admirable lectures that I have picked on theirs out of many others I could have chosen, not from any personal animosity, but simply because they happen to illustrate my thesis that certain ideas which seemed implicit in what I was taught are still current in academic medicine to-day.

I believe these ideas are almost without exception open to serious objections. I shall now examine some of them further, and in doing so review in an admittedly eclectic manner some papers which seem to me to illustrate changing ideas. In particular I wish to examine a common misapprehension that there is something called the psychosomatic hypothesis, which holds that abnormal mental states can cause physical disease. This will involve at least some reference to the idea of diseases as entities, to the idea of cause in medicine, and to the problem of the relationship between mind and body.

Diseases

It was and often still is assumed that there are entities called diseases which can be studied and treated as such. But, if we think about it, it seems obvious that we cannot observe diseases: we can only observe diseased persons during life or the mortal remains of diseased persons after death. Nosological classification may be a necessary convenience for purposes of orderly description, but we have come to think and often to act as if the states it describes exist as entities which can be studied and dealt with apart from the person who is diseased. One might almost feel one had to apologize for mentioning something so apparently trite and obvious were it not that much current teaching and action appears to be based on the opposite assumption.

Cause in Relation to Medicine

I have already said that it seemed to be assumed, when I was a student, that organic diseases had physical causes, and by this there was often implied a single cause. The cause of lobar pneumonia was the pneumococcus. The cause of cirrhosis was alcohol, and so on. The business of diagnosis was to find the cause of the disease, and the object of rational treatment was to remove it. When the cause was unknown, only symptomatic or empirical treatment was possible. I have perhaps laboured these illustrations to show that we really did seem to think in terms of single causes, though we cannot have gone very far in considering the implications of this view.

The idea of cause is a complicated one, and many people much better qualified to do so than I have written about it in relation to medicine. Howe (1934), for instance, speaking of the kind of examples of cause and effect I have just mentioned, says: "However, not one of these examples is truly a case of cause and effect. Not only is the effect produced in each case by the interaction of at least two

antecedent events, but each of these antecedent events is produced by the interaction of another two. If we are to be accurate we must then recognize not 'a cause' but an endless multiplicity of causation, which is extremely confusing. There never is, in fact, 'a cause' but always 'a relationship.' And a little later on he says: "It is to-day generally agreed in theory, although not always recognized in practice, that disease is essentially an interaction between seed and soil, in both of which there is a convergence of a sequence of related events, from the association of which the effect is developed."

What we can observe, he says, is a series of events connected and related through the medium of time, stretching back into the past and forward into the future. If a bus runs over my leg I may say that the impact of the bus is the cause of the fracture of my femur. More accurately, the event may be described as the intersection of two time-sequences in which the bus time-sequence crosses the leg time-sequence. "If we seek causes we find two causal time chains: what caused the bus to be where it was, and what caused the driver of the bus to do as he did; what caused the leg to be where it was, and what caused the leg eventually to heal. These are not truly to be regarded as being causes, but as a series of related time-effects."

Recently Strauss (1952) devoted the first of his Croonian Lectures to a discussion of causality in medicine. I am afraid that many of the ill-educated generation to which I belong may have found his philosophical arguments difficult to follow. But we cannot fail to appreciate his criticism of rigid causal relationships in medicine and to be convinced of the inadequacy of our search for single or "specific" causes of disease. I cannot, however, resist one or two comments.

"It is arguable," says Strauss, "that a pure paired cause-effect relationship exists at two levels only: the ethical and the mechanical." Of the pure paired cause-effect complex at the mechanical level he gives two examples: a person swallowing a large amount of arsenic by mistake—the cause—leading to acute gastritis—the effect; and a second example, a personal experience of his own, of the sudden protrusion of a lumbar intervertebral disk—the cause—leading to severe pain in the back and complete immobilization below the waist—the effect.

These examples of simple cause and effect at a mechanical level are then contrasted with an account of the possible factors—bacteriological, constitutional, sociological, and psychological—concerned in the development by a particular person of the mode of morbid behaviour which we call pulmonary tuberculosis. The contrast is instructive, but one is compelled to ask whether in the two examples cited the effect can really be attributed to a single mechanical cause. I would like, for instance, to know how the "mistake" (which Strauss agrees is an over-simplification) of swallowing the arsenic occurred, and I would suggest the effect might have been different had the subject by some odd but not impossible chance been a habitual arsenic eater with a tolerance to the drug, such as has apparently been observed in Styrian woodcutters. Should not the effect in this case again be regarded as resulting from the convergence of two sequences of events—what caused the arsenic to be where it was and to be swallowed, and what caused the person who took it to be susceptible to its effects?

A Personal Experience

The second example interests me, also on account of a personal experience. I too suffered from a pain in my back—in this instance a chronic pain over many years—severe enough to be a nuisance at times, but never incapacitating or bad enough to make me do anything about it. In the earlier years I supposed it was due to fibrositis, whatever that is, and encouraged my dentist to look for a source of focal sepsis, which he did not find. Some years later, when it was particularly troublesome in a humid

tropical climate, I supposed that constantly damp clothes and bedclothes had something to do with it. Later, after reading about psychogenic backache, I concluded this must be the whole explanation. Some months ago an x-ray film of the spine showed, I am told, conclusive evidence of an old and considerable protrusion of a lumbar intervertebral disk. Here, surely, was another example of direct mechanical cause and effect, and incidentally a vindication of the importance of searching for a single demonstrable cause for a symptom or group of symptoms, rather than indulging in the vague speculations of multiple aetiology.

But I am not so sure, for I believe that the protrusion of my disk was not entirely an accident; and, further, I have to account for the fact that I have for some time been practically free from pain, though I am assured that the actual disk lesion is unlikely to have altered.

Briefly—and if you will forgive some personal details—I believe the protrusion of my disk can be traced back to two what might be called parlour tricks. The first was to challenge my fellows to put their hands flat on the ground in front of them without bending their knees. This, the only faintly distinctive physical achievement I had, used to give me satisfaction, and was probably harmless. Unfortunately some years later, though I had never been able to jump anything, I discovered I could do what is known in gymnastic circles as a "neck roll." This consists in diving over some object, turning a somersault on a cushion or mat, and landing on one's feet again. It was a great success at Army mess nights and similar occasions. Unfortunately it involved a sharp flexion of the lumbar spine, and after a year or two I had to abandon it on account of increasing pain and stiffness in my lower back. I have little doubt this eccentricity was an important factor in the protrusion of my disk, and, of course, the story could easily be pursued further by inquiring why a clumsy and rather obese physician should have found it necessary to perform "neck rolls" at an age when such an accomplishment is not generally considered necessary—but I do not intend to follow it further on this occasion. I have said enough to indicate that I am fairly sure the protrusion of my disk was not a simple mechanical accident.

Once it was discovered I was given some back-extension exercises and advised to wear a lumbo-sacral support. This contrivance supports nothing except any abdominal protrusion which may be present, but is effective because it makes bending so uncomfortable that one ceases to bend. I persevered with the belt and the exercises for at most a week or two. I was virtually free from pain within a few days and have now learnt that I can remain so without the aid of the support or the exercises, so long as I do not habitually slump in chairs and car seats. When I do so slump, I get a slight return of pain. I have no doubt that for me "slumping," as I have called it, is a physical expression of certain emotional attitudes.

I have troubled you with this rather long personal anecdote because it seems to me to illustrate clearly the inadequacy of the idea of single causes. For you will see that if you were to ask me what was "the cause" of the pain in my back I should find the question difficult to answer.

What we call the cause of an illness is never strictly the whole cause, though it may be a necessary factor in causation in the sense that one would not have that particular illness without that particular factor. I would not have had the particular kind of pain in my back if I had not had a protrusion of an intervertebral disk. But the protrusion of the disk was simply one link in a chain of causation, and the pain, once it was understood, was relieved by fairly simple measures, which presumably left the disk lesion *in situ*.

It is worth noticing, perhaps, that the main difference between these two examples of the protrusion of a disk is that the first might be described as an acute illness and the second as a chronic. This is probably an example of a

general difference, to which attention has often been drawn, as for instance by Ryle (1942). Whether or no the search for single or specific causes is ever justified on philosophical grounds, it has been more productive of results in acute than in chronic diseases. Medicine's greatest successes have been in connexion with acute disease and particularly acute infections. Where partial success has been achieved in the treatment of chronic diseases, as in myxoedema, diabetes, and pernicious anaemia, one must note that in each instance the patient is not cured, and our knowledge of the aetiology of the condition is still quite incomplete. Our ability to deal successfully with most chronic diseases has advanced much more slowly than in the case of acute ones, and it is possible that this is due, at least in part, to our undue preoccupation with single specific causes and direct mechanical cause and effect.

Aetiology in Relation to Medicine

Aetiology is defined in the *Oxford Dictionary* as "the science or philosophy of causation" and in *Dorland's Medical Dictionary* as "the sum of knowledge regarding causes." Strauss has described the substitution of the term "aetiology" for "cause" as no more than a resort to the magic of semantics in an attempt to escape from the fetters of rigid causality. But I believe that the change in words can be something more than semantic juggling, and may represent a change both in ways of thinking and in ways of acting, which is to be encouraged even though we are still far from a satisfactory concept of aetiology.

Ryle (1942), after quoting the definitions I have mentioned, continued: "It is well to insist on such definitions, for the discovery by Pasteur and the great pioneers in bacteriology of specific microbic agents of disease, and the recognition by others of specific chemical agents and specific deficiencies, have, until quite recently and contemporaneously with their immense benefits to medicine, had a peculiarly limiting effect upon the vision and the practice of many medical men, not excluding teachers. They have, in fact, compelled a neglect of the associated causal factors without which no disease can have its being. They have also fostered a belief in or search for single determining causes where none exist."

A paper by Halliday (1943) seems to me of particular value in that, though some difficult matters are perhaps oversimplified, the author outlines a concept of aetiology which seems to avoid obvious pitfalls and to provide a reasonable system of thought on which medical action can be based. In the space available I can do scant justice to this paper, which could with profit be read, pondered, and re-read by every teacher of medicine.

Cause in medicine, says Halliday, has usually been regarded in one of two ways; and he calls them the "mechanistic" and the "biological."

Mechanistic Cause

The word mechanism refers to a system of mutually adapted parts working together as a machine. Given the requisite preceding movement, the ensuing movement follows necessarily upon it, provided the machine is in working order. During the last three centuries, knowledge of the human organism in terms of mechanism increased progressively and the organism came to be regarded as if it were a machine. If it failed to function properly, in actual fact a machine. The primary concern of medicine was to identify the cause of the breakdown was similar to that of a machine—that is, a fault in one or more of the component bits and pieces. The primary concern of medicine was to identify the fault, which might be viewed by any technique—for example, gastric ulcer, a structural fault; acidosis, a chemical fault; or hypertension, a physical fault—and to take appropriate action by interfering with the mechanism.

Some of the implications of mechanistic aetiology Halliday summarized as follows: (1) The human organism

is a machine composed of mutually adjusted parts working together. (2) Illness corresponds to breakdown in the machine. (3) The cause of illness (provided the patient has adequate food, air, and water) is something wrong—a fault, disease, lesion, imbalance, or abnormality—in one or more of the parts. (4) Medical action is confined to interfering with the mechanism by what is known as the appropriate treatment.

This mechanistic attitude has, of course, brought great advances. The criticism of it is not so much that it is wrong as that it is not enough. In particular it gives little or no guide to action in the prevention of disease, for it is concerned with how a patient is ill rather than why he is ill. One might add that while few doctors now take a purely mechanistic view, most patients do, hence the very great difficulty of giving them any reasonable explanation of functional symptoms. Say what we will, the patient believes there must be a fault in the mechanism somewhere—"the cause"—and an appropriate means of dealing with it—"the cure." One might also point out that the mechanistic idea of disease allows of no definition of health other than the absence of disease, which is plainly inadequate, for there is a great difference between "no disease" and health.

Biological Cause

Halliday explains what he calls the biological idea of cause as follows. "Illness is regarded, not as a fault in the parts, but as a *reaction*, or mode of behaviour, or vital expression of a living unit in response to those forces which he encounters as he moves and grows in time. Cause is therefore *twofold* and is to be found in the nature of the individual and the nature of his environment at a particular point in time." The environment, the totality of exterior circumstances, may be investigated by a variety of techniques—physical, chemical, bacteriological, psychological, and so on—and in this way split up for convenience into separate components which we may call factors.

That an aspect of cause is found in the individual person may not at first sight seem so obvious. It may be illustrated by pointing out that when two persons encounter the same environmental factor the behaviour of each depends on his characteristics. Suppose, for instance, that a weight of 2 st. falls equally on the legs of a man aged 30 and of his father aged 80. The son will probably develop a superficial bruise, and the father a fracture of both legs. Two men swallow water containing virulent typhoid bacilli. One who gives no previous history of typhoid fever responds ten days later by a morbid reaction whose features include fever, prostration, diarrhoea, etc. The other, who does give a history of previous enteric fever, shows no evident morbid behaviour. When an SOS is broadcast several million people may be quite unaffected, while one man falls down in a faint. In each of these imaginary but quite possible examples the environmental factor was certainly not the whole cause. An aspect of cause was present in the persons affected.

Some of the implications of biological aetiology were summarized by Halliday as follows: (1) The human organism, although composed of parts, may also be regarded as an integrated unit or living person. (2) Illness represents a vital reaction of a person to factors of the environment which he meets as he moves in time. (3) The cause of illness is therefore twofold—certain characteristics of the person and certain factors of the environment. (4) Medical action is concerned primarily with measures designed (a) to alter or prevent characteristics of the person known to be causal, and (b) to alleviate or remove factors of the environment known to be causal.

This biological attitude is, as Halliday points out, a *sine qua non* for effective prevention of disease and may be very important in treatment. One might add that it does make possible a reasonable explanation of functional symptoms, the reaction of a particular personality to factors in the environment, and it does make possible a concept of health

other than in terms of "no disease." Halliday then summarizes the ideas underlying the phrase "the cause of the illness" as follows:

"(a) As regards the *illness*, the fields of observation and discourse are the features (signs and symptoms) of a mode of behaviour of an individual.

"(b) As regards the *cause*, the fields of observation and discourse are three—namely:

"(1) *The field of the person*. Under this heading are put the observations on the characteristics of the person before he became ill. These are innumerable, and may be noted in terms of any technique. They include, for example, age, sex, weight, height, bodily habitus, history of previous illnesses, history of illness in the family, blood pressure, menopause, intelligence, etc. The problem is to distinguish which of these characteristics may be regarded as relevant and causal.

"(2) *The field of the environment*. Under this heading are included observations on the factors of the environment which the person met at, or shortly before, the time he fell ill. The observations may be made in terms of any technique—e.g., physical (trauma, heat, cold, light), chemical (diet, poisons), bacteriological, and psychological (death of a loved person, failure or promotion, etc.). Such factors are innumerable, and the problem again is to determine which of them may be regarded as relevant and causal.

"(3) *The field of mechanism*. Under this heading are put observations on the 'bits and pieces' (structural, physical, chemical, psychological, etc.) which are set into action by the encounter and which ultimately bring about the particular mode of behaviour. The problem is to distinguish which of these are primarily involved."

And the three questions which he suggests one should attempt to answer about any illness are, of course, now quite well known: (1) What kind of a person was this before he took ill?—that is, which characteristics of the person are relevant and causal? The field of the person. (2) Why did he become ill when he did?—that is, which factors of environment are relevant and causal? The field of the environment. (3) Why did he become ill in the manner he did?—that is, which part contacted the factor and which bits and pieces by preceding movement and ensuing movement finally made manifest the particular mode of behaviour? The field of the mechanism.

It seems at least, from this brief review of what is meant by cause or aetiology in medicine, that we can never strictly think in terms of a single or specific cause of a disease. On this ground alone it appears unsatisfactory to suggest that abnormal mental states can in themselves cause physical disease.

Body-Mind Relationships, with Reference to the "Psychosomatic Hypothesis"

It was assumed, and I think still is, that diseases can arise in and affect the mind on the one hand, or can arise in and affect the body on the other; and we argue then whether disturbance in the mind may cause disease in the body. My excuse for venturing, with some trepidation and in however superficial and amateur a fashion, on a subject which has puzzled some of the best minds of every generation for well over two thousand years, must be that I believe it is impossible to practise or teach medicine without making some kind of assumption or taking for granted some kind of hypothesis about the relationship between what we call mind and what we call body. Many people do not, of course, consciously make any such assumptions. They take them over ready-made from teachers and textbooks. I should put it rather, perhaps, that our attitude to disease and our manner of dealing with patients must involve some hypothesis of body-mind relationships, whether we are aware of it or not. Fortunately the problem I want to discuss is a fairly limited one. It is simply to ask, have we any right to divide diseases into physical and psychological, in the sense that they arise in the body or arise in the mind, and have we any right to talk about events in the mind causing disease in the body?

Monism

Victorian materialism regarded matter as real and objective, and mind simply as some kind of a by-product of matter. Though, so far as can be seen from their medical writings, this is the view to which many medical scientists still adhere, others adopt some kind of psycho-physical parallelism or some form of monism, which regards mind or conscious states and brain states as different aspects of the same events. As Russell Brain (1951a) explained one form of this hypothesis: "What we call events in the physical brain are happenings about which we may have indirect knowledge inferred from our perception of other people's brains and what they tell us about their experiences; but we have direct awareness of the physical events in our own brains and when we thus perceive them we find them to be thoughts, sensations, feelings, and so on."

According to this hypothesis there is thus only one kind of events, but they appear different to us because we have knowledge of our own minds in terms of perceptual symbols and knowledge of the physical world, including other people's brains, expressed in conceptual symbols.

If for the moment we accept this hypothesis, then it seems to me that the questions I asked have little meaning. Brain states and mind states are two aspects of one series of events which appear different only because we perceive them in different ways. One cannot then imagine purely physical disease or purely psychological disease, and it makes no sense to ask whether mental states can cause physical states. If one asks whether emotions like anxiety or anger can cause physical disease—what one is really asking is whether mind-brain states like anxiety or anger can cause physical disease elsewhere in the body. If, indeed, we watch someone losing his temper, can we really say that this is something in the mind—something purely mental—causing something in the body? And I do not think it makes much difference to the argument if we suppose that brain states and mind states are different events, but events moving, so far as we know, exactly in parallel.

Common-sense Dualism

I would like to ask those who talk about physical diseases arising in the body and psychological disorders arising in the mind, and who argue whether disorder in the mind can cause physical disease in the body, to explain to what kind of a hypothesis of body-mind relationships they are subscribing? So far as one can see, it must be a so-called common-sense dualism, which conceives of an independent immaterial mind in some mysterious way interacting with a material brain and body. But I suspect that this popular dualism again depends on the two kinds of knowledge to which Russell Brain (1951b) has drawn attention. We have difficulty in equating events in our own minds which we perceive directly as thoughts and feelings with events in brains of which we have only indirect knowledge by inference, and we therefore regard our thoughts and feelings as more or less independent things, without pausing to consider the implications of this view.

But whatever ultimate belief or philosophical hypothesis we may entertain, so far as our observation can go, a person is surely a body-mind unity. We have no experience of mind separate from body in ourselves, and we cannot imagine such a state of affairs in anyone else. So far as our own observations and the inferences we can make from them go, a person is a body-mind unity; body and mind are in some way inseparable aspects of a person.

It would seem, therefore, that we must regard all diseases as states or modes of behaviour of a person who is a body-mind unity, and it follows, surely, that all disease must be regarded as psychosomatic, in the sense this word is generally used. All disease must affect in some degree both body and mind. We have no right, then, to divide diseases into physical and psychological, in the sense of that which arises in or affects the mind and that which

arises in or affects the body, nor to say that something happening in an entity mind can cause something else to happen in an entity body.

But we can study diseased persons by different methods. If we study them by methods which provide information in physical terms, we obtain information in physical terms. If we study them by methods which give an answer in psychological terms, we obtain information in psychological terms.

What we can do then is to group disease states roughly into those in which most of the relevant and useful information seems at present to be obtained by physical methods; those in which most of the relevant and useful information seems at present to be obtained by psychological methods; and those in which both methods supply relevant and useful information. The last group corresponds, of course, to what are often now referred to as the psychosomatic disorders.

But even this division can be no more than a rough and temporary grouping for the sake of convenience. For I believe it is true that the more diseased persons are studied by both physical and psychological techniques, the more disease states we find in which both methods produce relevant information.

Literature of "Psychosomatic Medicine"

The literature of so-called psychosomatic medicine—I shall come back to that term later—is already considerable, and I shall not attempt to review more than a very little of it, partly because such an attempt would need to occupy at least several lectures, and partly because I believe it would be unprofitable. For I suspect that a person's attitude to what may be called the psychosomatic method in medicine depends less on an intellectual evaluation of the literature than on his attitude to neurosis. Just as an overtly neurotic patient tends to arouse irrational feelings in most of us, so does the suggestion that illness, needless to say in ourselves as well as in our patients, can be fully explained only when psychological and physical factors are taken into account. We resist this suggestion as applied to ourselves, and we tend to deny it in our patients.

Earlier I quoted an article by Pickering (1950) in which he dismissed what he called the psychosomatic hypothesis in a few lines on the ground that the small amount of critically established fact on which it was based could be explained in other ways. But in doing this he makes an assumption: he assumes, it seems to me, that a satisfactory account of the causation of disease states, or some of them, has been, or can be, given in purely physical terms; and that it therefore behoves those who are interested in the so-called psychosomatic hypothesis to prove their case by providing critically established fact.

But this is a big assumption, and I would ask those who make it to consider carefully in how many chronic diseases can they give a satisfactory account of the aetiology in purely physical terms? We come nearest to giving such an account, I suppose, in nutritional deficiencies and in certain chronic infections, where again one factor in the environment is of particular importance. But is that factor, even in these instances, the whole story? A great deal is known, for instance, about the tubercle bacillus; but can we really explain on humoral grounds why some people become ill with tuberculosis while others do not, and, of those who do become ill, why in some the process is arrested while in others it is not? I doubt if we can, and I believe that studies of personal factors which may be concerned in the onset and course of tuberculosis such as those of Wittkower (1949) and of Day (1951, 1952), even though they do not amount to "critically established fact," are still of great interest and importance in this connexion.

I would like to suggest that we may equally, and indeed with much more reason, start from the historically older and philosophically more satisfactory assumption that illness

is a state of the whole man—in the sense that it is a state of a body-mind unity, and ask those who doubt the importance of psychosomatic method to establish their case by giving a satisfactory account in purely physical terms of the aetiology of even one of the chronic conditions which are at present described as of unknown aetiology. Peptic ulceration, ulcerative colitis, hypertension with all its sequels, rheumatoid arthritis, and asthma, to name but a few, await such an explanation.

But, it may be said, since rheumatoid arthritis can now be dramatically if not completely relieved by supplying the substance cortisone, we can surely regard rheumatoid arthritis as a purely physical abnormality, curable by physical means. And doesn't this make the complicated and difficult psychosomatic approach unnecessary?

Those who use this kind of argument are confusing mechanism with aetiology. The discovery of cortisone and A.C.T.H. has brilliantly illuminated, or bids fair to illuminate, the physico-chemical mechanism of rheumatoid arthritis amongst other things, but it has brought us no nearer being able to answer the question why a given person is taken ill with rheumatoid arthritis or how this illness can be prevented—just as the discovery of insulin and vitamin B₁₂ has led to very great advances in our knowledge of the physico-chemical mechanism of diabetes and pernicious anaemia without telling us why some people develop these conditions or how they may be prevented.

Medicine in undergraduate teaching schools, as Halliday put it, has shown hitherto a distinctly mechanistic bias, in the sense that it has devoted enormous energy to the explanation of the mechanism of disease in physico-chemical terms, relatively less to the environment, and still less to the person. But there are signs that this is changing. There have been, for instance, numerous psychological studies of personality types in different illnesses, notably the very extensive contributions of Dunbar (1943), and her colleagues from the psychiatric and medical divisions of Columbia University. My own feeling is that these and other personality studies, though of great interest, are somewhat inconclusive in that they seem to depend so greatly on the subjective interpretations of the observer, and it remains to be seen whether independent observers will always find the same personality types or range of types in the same illnesses. At the same time a start has been made on the more accurate study of physical types by means of Sheldon's method of somato-typing (Tanner, 1949).

To my mind the outstanding recent contribution to the study of man, rather than mechanism, has been the work of Wolf, Wolff, and their colleagues at Cornell University Medical College, over the last 10 to 15 years.

For details of their methods and results one must read at least their two monographs (Wolf and Wolff, 1943; Grace, Wolf, and Wolff, 1951). Very briefly, one patient with a gastrectomy and four with prolapsed colonic mucosa were studied over considerable periods. The rate of blood flow, as judged by colour changes in the mucosa, and secretory and motor activity of the stomach and colon were measured in a variety of circumstances, and notes made on the effect upon them of ordinary physiological stimuli, of drugs, of the patient's particular life situation, and sometimes of emotionally coloured happenings, either occurring spontaneously or provoked deliberately during the course of the experiments.

I believe these are important studies for several reasons. They were performed on man, and intact man, except for the accident by which either gastric or colonic mucosa was visible. Instead of trying to standardize the conditions of their experiment by avoiding the complication of using conscious human subjects, or by what might be called eliminating the human factor, these observers standardized all the other conditions of their experiments so far as possible, and deliberately set out to study, among other things, the effects on the stomach and colon of human situations and emotions.

What emotion the subjects were actually experiencing in the different experimental situations had, of course, to be inferred. But, given that the authors' inferences were substantially correct, their results are of the greatest interest. I would like to mention one or two points which seem particularly relevant to my lecture. In an animal preparation the actions of a drug are usually constant and predictable. In these observations on man there are several instances where this was not so, and where the actual effect of a drug appeared to depend not on its pharmacological action but on the meaning of its administration to the particular subject. This is seen most clearly in the account of the effects of the intravenous administration of atropine on the colon in three of the subjects with colostomies. In two subjects who were thought to be in a state of relative security and relaxation the injections were accepted with apparent equanimity, and their effect was a profound decrease in motor activity of the colon and some blanching of the colour of the mucosa, as would be expected on pharmacological grounds. In a third subject, who resented the experiment, the same intravenous dose of atropine was followed by a great increase in motor activity and in the colour of the mucosa—changes which had been found previously in states of anger—and, though the atropine produced its expected effects on the salivary secretion and circulatory system, at no time was there any pallor or diminution in the motor activity of the colon. It appears that in this instance the physiological effect of the resentment aroused by the injection of the drug predominated over its expected pharmacological effect.

This observation is in fact a particular instance of something which appears throughout these studies—namely, the important and often predominant effect on the subject's gastric and colonic function of the relationship existing at the time between the observer and the subject or, in more general terms, the physician and the patient.

Another point I would like to mention is the authors' finding that the colonic changes in anger and hostility were greatest in the two of the four patients who had conspicuous difficulty in expressing their feelings (and these incidentally were the two of the four patients who suffered from ulcerative colitis). This again only confirms what has long been held by psychiatrists, but the demonstration that the actual changes in the colon were greatest in those who appeared to be suppressing their anger is new and impressive.

I believe this study is important not only for its content, but because it represents a new departure—the measurement changes in function in the organs of man, in health and disease, in relation to life situations and emotional states. It may well be the beginning of a new chapter in our understanding of illness.

Health

It seems inescapable that sooner or later we shall come, or indeed we shall be driven by the economic pressure of the cost of sickness, to regard the prevention of disease and promotion of health as more important than the curative or more often palliative medicine to which at present we devote so much more attention. One of the main difficulties seems to be that we have no clear idea of what constitutes health. So far as I can remember, health was not mentioned when I was a student. The mechanistic view of disease which was then the rule left no room for a concept of health, other than in terms of no disease. Just as a machine which was in working order ran, so the body was regarded as healthy so long as there was no breakdown or disease. But good health is something more than no disease, and we can all recognize it when we see it, even though we cannot say just what constitutes it or how to go about getting it. I believe it is our profession's lack of a concept of health, other than as a state of no disease, that leaves the way open for widespread exploitation of the average person's natural desire to enjoy as good health as he can.

My object in raising this question is not to attempt to settle the meaning of health. We are asked to believe, indeed, that this has already been done by the World Health Organization, which has laid it down in most authoritative and uncompromising terms that "health is a state of complete physical, mental, and social well-being; and not merely the absence of disease and infirmity." Here, adds its Director-General, as a kind of warning to meddling intruders, is one word concerning the meaning of which the dictionaries will not have to worry from now on (Brock Chisholm, 1949). I need not spend time on this definition (with its necessary implication that all of us are sick, since none of us enjoy complete physical, mental, and social well-being), because it has already been ably examined and criticized by Curran (1952). With all deference to the Director-General of the World Health Organization, I believe we are still far from a satisfactory idea of what constitutes health.

The *Oxford Dictionary* defines health first as "soundness of body; that condition in which its functions are duly discharged," and gives as a further meaning "spiritual, moral, charged," and gives as a further meaning "spiritual, moral, or mental soundness." I imagine it would be generally agreed that health cannot be fully explained in physical terms, and, whatever opinion we hold about disease, health is certainly psychosomatic.

One of the most interesting discussions of health and disease I know of occurs in a small book by Crew (1949) on *Public and Personal Hygiene*. After pointing out that the individual must be capable of adjusting himself to the conditions and circumstances of his external physical and social worlds, he defines health "as that state of the individual in which harmony exists between the various component parts of himself and between the individual as a whole and the circumstances and conditions of his external world."

This definition is a distinct advance, but does not seem entirely satisfactory for at least two reasons: first, no one enjoys complete harmony either in himself or with his external world; and, secondly, health is not so much a state of harmony as the product of a process of continuous adaptation or adjustment, by which a reasonable degree of harmony is maintained. The nearest I can get to an explanation of health—I would not say a definition—is that a person's health depends first on the constitution he is born with, and then on the success he has in constantly adjusting either himself to his environment or his environment to himself, so that a reasonable degree of harmony is maintained both within himself and between himself and the social and material world in which he lives.

But my object in raising this question was not to attempt to settle the meaning of health. It was to point out the need for such a concept, and some of the difficulties in formulating it—difficulties which are, I believe, intimately connected with the questions that I have been discussing. It is no accident that academic medicine has no concept of health; for the mechanistic idea of disease leaves no room for one, other than in terms of no disease, which is clearly inadequate.

Discussion

I would now like to try to pull together some of the apparently disconnected threads of my discursive and eclectic review of some changing concepts in medicine.

Thinking in medicine seems too often to be based on unexamined or insufficiently examined assumptions. It seems often to be taken for granted, for instance, as I have tried to point out, that we can usefully study diseases rather than diseased persons; that all disease or most diseases can be explained in terms of direct mechanical cause and effect; and that diseases can be divided into physical and psychological, with the implication that so-called physical diseases can be studied and treated satisfactorily by exclusively physical methods. In general these individual assumptions add up to a main one, that disease—no one seems to have worried much about health—can be explained in mechanistic or physico-chemical terms.

The rise of so-called psychosomatic medicine, which in America appears already to have assumed very considerable proportions, can best be regarded in a social sense as a revolt against this main assumption; and it is significant that this revolt has coincided with a growing tendency among some physical scientists to question how much their methods can be expected to explain. Strictly, as I have also tried to emphasize, there can be no such thing as psychosomatic medicine or a psychosomatic disease, for these terms involve a confusion between the methods of examination and the objects of study. Health and disease are necessarily psychosomatic, so there cannot be a part of medicine or some diseases which are psychosomatic. What the psychosomatic method does insist—or rather reiterate, for its teachings are as old as medicine—is that in health and disease man must be considered as a whole, and diseased persons must be studied by both physical and psychological methods. It is perfectly true that, in some, much information may be given by physical and little by psychological methods, and in others much by psychological and little by physical methods; but we must not be tempted to conclude from this that there are physical diseases and psychological diseases.

It is often assumed that there is an antithesis of some kind between science and art in medicine. If one were to hazard a guess, a time will come when this too will be regarded as having been a mistaken assumption. When this has happened we shall recognize sciences of pathology, pharmacology, experimental medicine, and so on (for many aspects of disease are explicable in terms of mechanism); and possibly a science of psychology. But strictly clinical medicine will, I believe, be regarded neither as an art nor as a science in itself, but as a special kind of relationship between two persons, a doctor and a patient. It will be recognized that this relationship is the essential feature of clinical medicine; and that the degree of success that it has depends, as in other human affairs, on the skill with which both science and art are called to its aid.

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Australia's greatest pest, the rabbit, is rapidly being brought under control by the planned introduction by the Commonwealth Scientific and Industrial Research Organization of the virus disease myxomatosis. The disease is spread among rabbits by mosquitoes, and in the last three years has gained such ground that the Lands Department of Victoria now estimates that more than 90% of the rabbits have been destroyed in large areas of the State. Similar destruction is reported from many parts of New South Wales, South Australia, and Southern Queensland, with the result that farmers and graziers report a phenomenal increase in the carrying capacity of their pastures. The Minister for External Affairs, Mr. Casey, who is also in charge of the C.S.I.R.O., said that if the gains won at such low cost were maintained Australia's carrying capacity would increase by the equivalent of 10,000,000 sheep. However, he warned that in many districts rabbits were showing an increased resistance to the disease, and that in a very few more seasons myxomatosis might have lost most of its killing power.

THE ANTI-CURARE AGENTS

BY

A. R. HUNTER, M.D., F.R.F.P.S., D.A.

Anaesthetist, Royal Infirmary, Manchester

It is a truism to say that the only safe remedy for respiratory depression due to curarizing drugs is artificial respiration. It is, however, often very inconvenient to control a patient's breathing until such time as full spontaneous respiratory activity returns. Fortunately there has long been available in "prostigmin" (neostigmine, B.P.) an adequate and effective antidote drug. A few years ago, however, several fatalities were recorded shortly after the administration of this agent (Macintosh, 1949; Clutton-Brock, 1949; Hill, 1949). Lately the drug "tensilon" (3-hydroxyphenyl-dimethyl-ethyl ammonium iodide) has been adopted as an anti-curare agent in the United States. It has been investigated in Britain (Doughty and Wylie, 1952; Hunter, 1952) and found to be free from the dangers of

excessive parasympathetic stimulation inherent in the action of neostigmine. Unfortunately, tensilon has a very short action, and relapse into partial curarization may occur within some 10 minutes, especially in the deeply curarized subject. Neither antidote is thus completely satisfactory. However, since neostigmine is undoubtedly the more effective of the two, it seemed a matter of some importance to try to elucidate further the dangers of its administration and the methods available for their elimination.

The Investigation

Neostigmine was given to a series of 50 patients who had been curarized with various substitution myoneural blocking agents. All cases had been anaesthetized with nitrous oxide and oxygen and a supplement. It is generally agreed that the primary danger of neostigmine administration is cardiac inhibition. The pulse rates of the patients to whom the drug was given were therefore counted repeatedly at short intervals in order to obtain information on four points: (a) the pattern of the response of the pulse rate to neostigmine given with atropine; (b) the effect on this of giving the atropine some minutes before; (c) the modification induced by giving a sympathomimetic drug with the

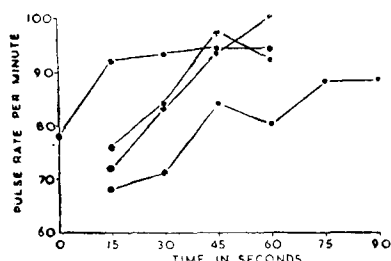


FIG. 1.—Pulse-rate changes after neostigmine, 1 to 1.5 mg., with atropine, 1/100 gr. (0.65 mg.).

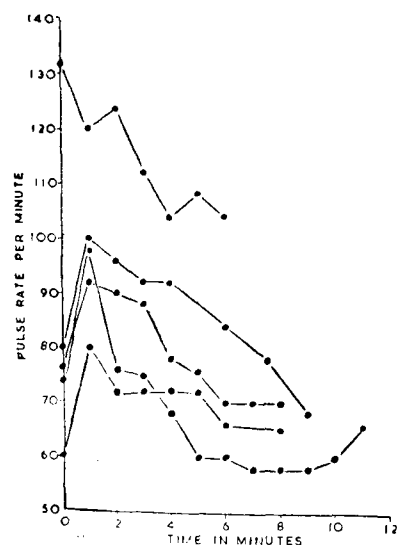


FIG. 2.—Later pulse-rate changes after neostigmine and atropine (doses as in Fig. 1).

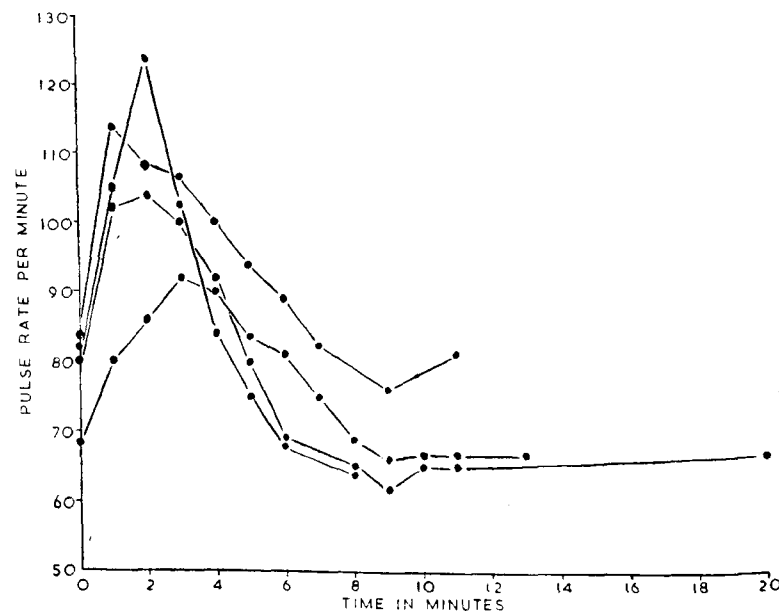


FIG. 3.—Pulse-rate changes after administration of neostigmine, 2.5 mg., with atropine 1/50 gr. (1.3 mg.).

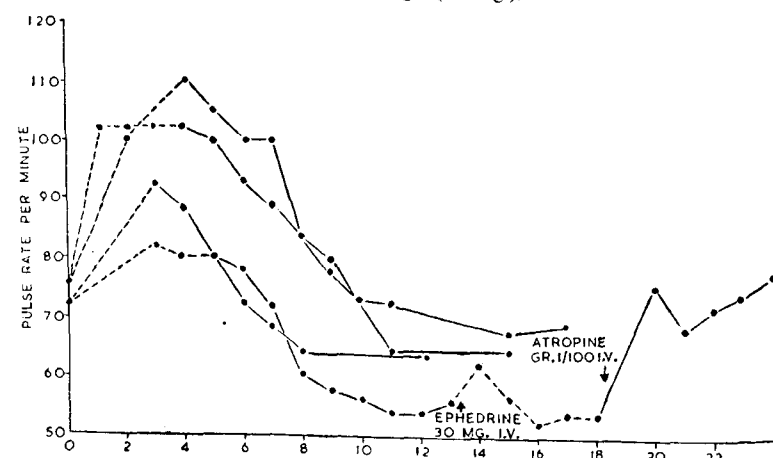


FIG. 4.—Pulse-rate changes after atropine 1/100 gr. (0.65 mg.), followed some minutes later by neostigmine, 1 to 1.5 mg. The time of administration of the neostigmine is indicated by the change from a broken to a solid line in the graph.

atropine and neostigmine; and (d) the appropriate amount of atropine required to make the ordinary doses of neostigmine safe.

Pattern of the Response of the Pulse Rate

The obvious danger of the administration of neostigmine is cardiac inhibition. With this in view, the pulse rates of patients to whom this drug was given with atropine were counted every 15 seconds after the injection had been completed (Fig. 1). It will be seen, however, that in every instance such change as did appear was in fact an acceleration and not a slowing. Presently it became apparent that bradycardia developed later in some cases. The pulse rates were therefore counted every minute for as long as possible after the injection of the drugs. In every instance it was found that there occurred a progressive slowing of the pulse rate to a minimum during the first 5 to 10 minutes after the injection had been given. Typical results are shown in Figs. 2 and 3. The slowing in some cases amounted to 60 beats a minute. The ultimate rate attained was related to the initial heart rate. In patients with a tachycardia of

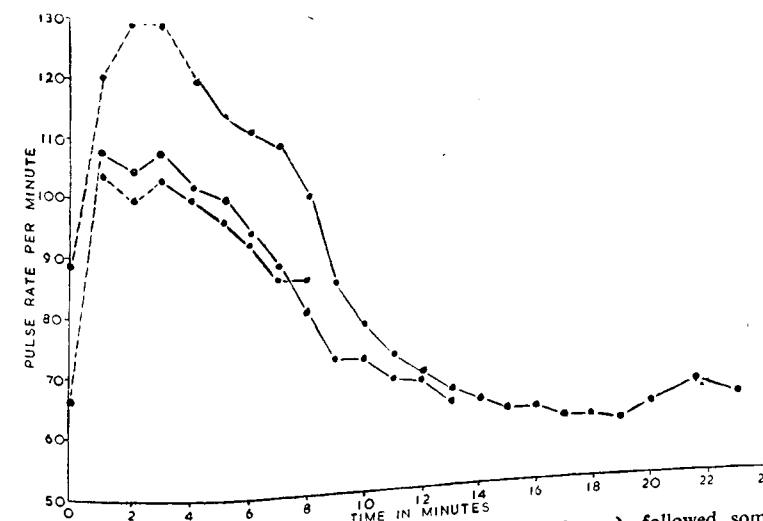


FIG. 5.—Pulse-rate changes after atropine, 1/50 gr. (1.3 mg.), followed some minutes later by neostigmine, 2.5 mg. The time of administration of the neostigmine is indicated by the change from a broken to a solid line in the graph.

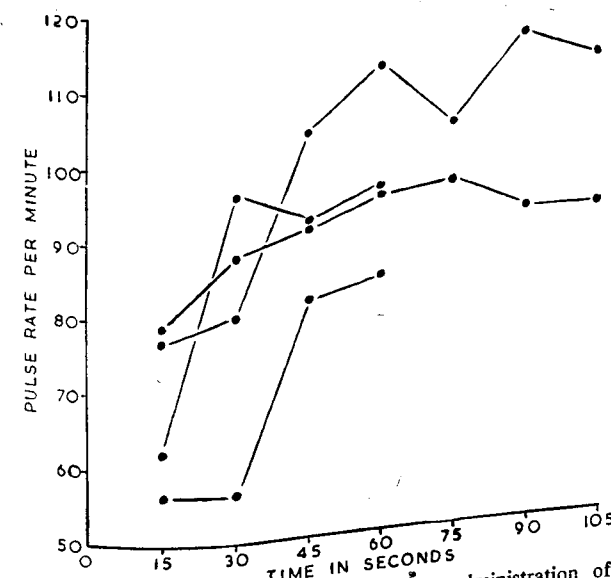


FIG. 6.—Immediate pulse-rate changes after administration of neostigmine, atropine, and a vasopressor drug. Doses: neostigmine, 1 to 1.5 mg.; atropine 1/100 gr. (0.65 mg.); ephedrine 30 mg. or methedrine 10 mg.

120 or more at the time neostigmine and atropine were given the rate tended to slow to speeds between 70 and 100 a minute. In those whose pulses were relatively slow there was a tendency to obvious bradycardia, and rates of 40 to 50 were sometimes seen.

Effect of Giving Atropine before Neostigmine

The work reported in the previous paragraph had suggested that in the anaesthetized human subject no initial period of slowing followed the administration of atropine intravenously. None the less, as the view is widely held that atropine slows the pulse by medullary stimulation before its peripheral accelerating mechanism develops, it seemed desirable to obtain direct evidence on this point. The pulse rates were therefore followed in patients to whom atropine was given at varying periods before the neostigmine. Neither with 1/100 gr. (0.65 mg.) (Fig. 4) nor with 1/50 gr. (1.3 mg.) (Fig. 5) was there any evidence of an initial bradycardia. Further, the pulse rate accelerated apparently immediately on the arrival of the drug at the heart. There was no change in the pattern of the response to the subsequently administered neostigmine even in a case in which 19 minutes elapsed between the injection of the two drugs.

Effect of Vasopressor Drugs

In the very early days of curarization in anaesthesia one of my cases became completely pulseless after the injection of neostigmine alone. For some years after that incident it was my habit to inject either 30 mg. of ephedrine or 10–20 mg. of methedrine with the neostigmine and atropine. Patients so treated were investigated in exactly the same way as those already described. It was found that the addition of a vasopressor to the antidote mixture produced a rather greater initial cardio-acceleration (Fig. 6). The pattern of the subsequent slowing of the pulse rate, however, remained unaltered (Fig. 7). There was some suggestion that the minimum pulse rate in these cases was a little higher than those in patients to whom no vasopressor had been given. The differences were

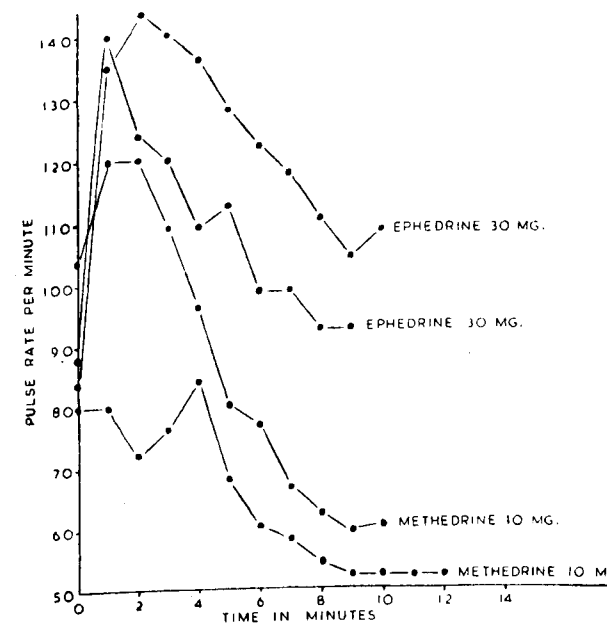


FIG. 7.—Later pulse-rate changes after neostigmine, atropine, and a vasopressor drug. Doses as in Fig. 6.

Dr. Bibley, of New York, writing to Dr. Merriman, says: "In no case where it [ergot] has been used, has haemorrhage occurred, and in natural labour when haemorrhage does occur, it has been given with great advantage" (Merriman, 1820). In 1840 Wardleworth wrote: "As a prophylactic ample experience justifies a reliance on its powers in suppressing haemorrhage. . . . We have repeatedly witnessed its good effects when given to women, some 10 or 20 minutes previous to the delivery." Berry Hart (1912) used intramuscular injection of a liquid extract of ergot as a routine. He wrote: "When the child is born, it is a good plan to give a hypodermic of ergot into the patient's upper hip. . . . I advise that it should be given in all cases after the head is born, and that one should not wait for haemorrhage before injecting it." But the indiscriminate use of ergot in the second stage has probably done more harm than good, and such abuse has earned it an evil reputation.

Chassar Moir, working at University College Obstetric Hospital, was the first to extract the oxytocic factor from crude ergot and to name it ergometrine (Chassar Moir, 1932; Dudley and Chassar Moir, 1935). Since this description, a number of authors (see Table III) have acclaimed

TABLE III

Author	Dose	Time Given	No. of Cases	Post-partum Haemorrhage Rate	Manual Removal of Placenta Rate
Reich (1939)	0.2 mg. i.v.	With shoulders	154	24.0%	0.3%
Davis and Boynton (1942)	0.2 mg. i.v.	" "	1,020	0.3%	0.8%
Diddle (1942)	0.2 mg. i.v.	" "	1,960	4.0% (over 500 ml.)	0.5%
Roberts (1942)	0.2 mg. i.v.	After birth	400	2.1% (over 500 ml.)	2.5%
O'Connor (1944)	0.2 mg. i.v.	With shoulders	900	1.0% (over 500 ml.)	1.7%
Quigley (1947)	0.2 mg. i.v.	On crowning	430	6.5%	1.4%
Léon (1949)	0.2 mg. i.v.	With shoulders	639	(500 ml. and over) 1.0%	1.7%
Vant (1950)	0.2 mg. i.v.	" "	4,204	4.3% (over 600 ml.)	?
Lister (1950)	1 mg. i.v.	On crowning	835	0.5% (20+ oz. (568.2 ml.))	1.6%
Daley (1951)	0.5 mg. i.m.	" "	490	9.2% (20 oz. and over (568.2 ml.))	3.5%
Snaith (1951)	0.125 mg. i.v.	Often after birth of baby	187	2.1% (20+ oz. (568.2 ml.))	6.9%

its merits in the prevention of haemorrhage. Many of them are enthusiastic, and the routine use of ergometrine with the birth of the baby would seem to be an increasingly popular procedure in the United States. In England its use is not so widespread. This may be due to its condemnation by Munro Kerr and Chassar Moir (1949), the equivocal findings of Linton Snaith (1951), and the modest claims of Daley (1951). Yet Lister's (1950) results are striking: using 1 mg. of ergometrine intravenously with the crowning of the head in 835 selected cases, she reduced the haemorrhage rate from 16% to 0.4%. Manual removal was neither more frequent nor more difficult, and the injection produced no ill-effects. She concludes that the routine employment of ergometrine in all cases would probably reduce the incidence of post-partum haemorrhage in hospital practice to at least one-tenth of its present level.

Ergometrine (0.5 mg. intramuscularly) was used at University College Obstetric Hospital by Flew (1947) in 500 cases in 1935. There was no constriction ring and no manual removal in this series, but the results were not impressive enough for the routine to be continued.

Some authors (Grimes *et al.*, 1948; Priver *et al.*, 1949) have reported side-effects from using intravenous ergo-

metrine. These include nausea, vomiting, headache, and a slate-coloured cyanosis. We have noticed no such complications.

Present Investigation

At an obstetric staff conference at University College Hospital under the direction of Professor W. C. W. Nixon in April, 1951, it was decided that all cases of vaginal delivery in the hospital should be given intravenous ergometrine (0.5 mg.) with the crowning of the baby's head. The present report deals with the first 1,000 cases so treated, and results are compared with a consecutive series of 1,000 cases taken from the years 1950 and 1951. The comparison is between the conservative and the active treatment of the third stage. All deliveries, except the instrumental ones, were done by medical students under supervision. Blood from vagina and perineum was collected in a kidney dish and measured. Episiotomy under local analgesia was performed if a perineal laceration seemed imminent.

In the "control" group the third stage was conducted in the following manner. Delivery of the baby's shoulders and trunk was not hurried. When the umbilical cord had been cut, the patient's abdomen was uncovered sufficiently for the fundus uteri to be observed. It was not handled.

So long as bleeding was slight the patient was left untouched until signs of separation of the placenta were obvious. Fundal pressure on the contracted uterus was used to assist delivery of the placenta from the vagina. Ergometrine, 0.5 mg., was then given intramuscularly, and bleeding checked by fundal stimulation.

If excessive bleeding occurred before the placenta was delivered or if, after waiting 20 minutes, separation had not taken place, pressure was applied to the contracted fundus uteri and the house-surgeon was called. In the absence of bleeding, preparations for manual removal were started after one hour. The house-surgeon was sometimes allowed to attempt one Credé expression. If there was haemorrhage he gave ergometrine, called the member of the staff on duty, took blood for cross-matching, and prepared for a manual removal.

In the ergometrine series the routine was as follows. Ergometrine, 0.5 mg., was given intravenously by a student with the crowning of the head. The shoulders and body of the baby were delivered slowly. To deliver the placenta a hand was placed on the fundus uteri, which was gently squeezed at the time of the first contraction while traction was applied to the umbilical cord. On completion of the third stage an intramuscular injection of ergometrine, 0.5 mg., was given. If the placenta was retained longer than 15 minutes, or if there was haemorrhage, the house-surgeon was informed.

Results

The control series is made up of 1,090 consecutive vaginal deliveries, of which 101 were forceps deliveries. From this series 36 cases have been excluded for various reasons, chiefly because the data required were incomplete, and three of these had haemorrhages. One of them was a case in which maternal death occurred from haemorrhage following a prolonged labour and forceps delivery. A further 54 cases were excluded because ergometrine was given with the birth of the baby, and all were forceps deliveries. In the remaining 1,000 cases the results were:

Primary post-partum haemorrhage (blood loss of 20 oz. (568.2 ml.) or more) . . . 131 cases (13.1%)
Secondary post-partum haemorrhage (excessive loss in the puerperium) . . . 3 cases (0.3%)
Manual removal of the placenta . . . 11 cases (1.1%)
Blood transfusion . . . 18 cases (1.8%)

Comparative figures in the ergometrine series were:

Primary post-partum haemorrhage . . . 12 cases (1.2%)
Secondary post-partum haemorrhage . . . 8 cases (0.8%)
Manual removal of placenta . . . 30 cases (3.0%)
Blood transfusion . . . 5 cases (0.5%)

This series consists of the first 1,000 cases given ergometrine intravenously, and comes from a group of 1,221

consecutive vaginal deliveries. In 176 (14.4%) ergometrine was not given either because the student failed to get the needle into the vein as the head crowned or because he was not present at delivery. (This failure rate was reduced to 10% in the last 500 cases.) In 42 patients the ergometrine was given intramuscularly, and in three cases the required data were not available. There were 19 primary haemorrhages and 1 secondary haemorrhage in the 221 excluded cases, and this figure includes two concealed accidental haemorrhages in which most of the post-partum loss was clot formed before birth.

A comparison of the blood loss in the two groups is seen in Table IV. The difference in the mean blood loss of the two groups is significant at the 1% level, and the conservation of blood in the ergometrine group is considerable.

TABLE IV

Amount of Blood Loss	% In Control Series	% In Ergometrine Series
0-9 oz. (0-255.7 ml.)	64	89.2
10-19 " (284.1-539.8 ml.)	22.9	9.6
20-29 oz. (568.2-823.9 ml.)	7.8	0.7
30-39 " (852.3-1,108 ml.)	3.0	0.3
40-49 " (1,136.4-1,392.1 ml.)	1.4	0.2
50 oz. (1,420.5 ml.) and over	0.9	—

Post-partum Haemorrhage

The haemorrhage rate of 13.1% in the control series is higher than stated in the annual report of the hospital because deliveries by caesarean section are excluded and all losses of 20 oz. (568.2 ml.) are included.

The time of administration of pethidine and the weight of the baby were studied in the 131 post-partum haemorrhages and the findings compared with 131 random cases. It could not be shown that pethidine administration increased the haemorrhage rate as Barnes (1947) showed in her report from this hospital. Large babies—over 9 lb. (4.1 kg.)—were significantly more frequent, as Reich (1939) reported. Any tendency towards heavy bleeding in forceps deliveries was due to loss from lacerations, although inexpertly administered or prolonged anaesthesia is a well-recognized cause of increased blood loss.

Delayed haemorrhage some hours after delivery (as reported by Lister, 1950) was not a feature of our treated series.

Secondary post-partum haemorrhage occurred in three cases in the control group and in eight in the ergometrine group. All three in the control group and four in the ergometrine group had a retained placental cotyledon. In the remaining four only fragments of placental tissue and decidua were removed at curettage.

Manual Removal

There were 41 cases of manual removal of the placenta in the 2,000 cases—30 in the ergometrine series, and 11 in the control group. The indication for the operation is seen in Table V.

TABLE V

	Manual Removal	
	For Retained Placenta	For Post-partum Haemorrhage
Ergometrine series	23	7
Control series	2	9

In the present series placental retention is increased (statistically significant at the 1% level) by the use of intravenous ergometrine. Out of the group of 23 cases in Table V there were five in which the injection of the ergometrine was given too late, and one breech delivery. In each of these cases the uterus did not contain the foetal body when it contracted—a situation which predisposes to

placental retention. It has been a recent practice of some operators to remove the placenta manually after a forceps delivery if it does not show immediate signs of separation, and this accounts for a further 6 of the 23 cases. The operation performed under such circumstances in a fit patient is safe, and, in our opinion, is not made more difficult by the use of ergometrine. In two cases in the ergometrine series the placenta was incompletely removed, resulting in a primary and a secondary haemorrhage, both avoidable.

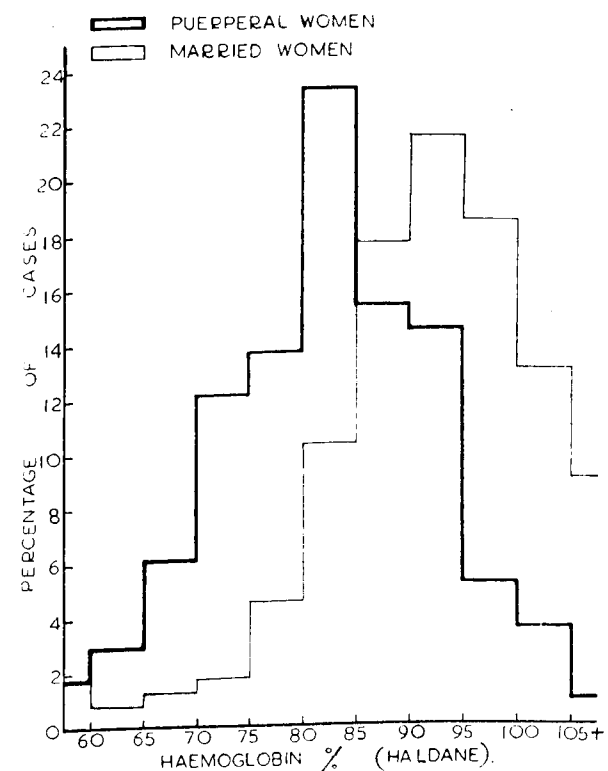
Haemoglobin Level and Blood Loss

A haemoglobin estimation by Haldane's method is done on all patients on the fourth or fifth day of the puerperium. The results in the 2,000 cases are given in Table VI.

TABLE VI

Haemoglobin	% In Control Group	% In Ergometrine Group
Below 60%	2.5	1
60-64%	3.6	2.4
65-69%	6.7	5.6
70-74%	12.7	11.7
75-79%	13.8	13.7
80-84%	24	22.7
85-89%	13.1	17.7
90-94%	13.9	15.2
95-99%	4.4	6.1
100-104%	3.9	3.3
105% and above	1.4	0.6

The standard deviations of the two groups are significantly different at the 1% level. The means of the two groups are not significantly different, but blood loss may occur without affecting the haemoglobin level; for the latter is dependent on haemodilution, which occurs in some cases and not in others (Dyson, Plaut, and Vaughan, 1943). The mean haemoglobin in the control group is 82%, and in the ergometrine group 83.4%. This difference, though small, is probably due to the greater blood loss in the first group, as there is a tendency for large blood loss to be associated with a low haemoglobin. This can be seen from the fact



Post-partum haemoglobin in the 2,000 cases of the series compared with that reported by the Medical Research Council (1945) in married women.

that 37.4% of those who lost more than 20 oz. (568.2 ml.) had haemoglobin values below 70% (49 out of 131), while only 9.1% of the remainder were below this value (79 out of 869). Among the ergometrine group those with a haemoglobin under 70% were 58.3% (7 out of 12) of patients with blood loss greater than 20 oz. (568.2 ml.) and 8.5% of the remainder (84 out of 988).

In the Chart the post-partum haemoglobin in the 2,000 cases is compared with that reported by the Medical Research Council (1945) in married women in this country. The numbers have been combined for this purpose, since the difference between the two sets of 1,000 is small compared with the difference between married and puerperal women. This report also stated that in the last trimester of pregnancy 9% of women had haemoglobin values under 70, and 37% had values under 80. The corresponding figures in our post-partum series are 12.8% and 39.3% in the control group, and 9% and 34.4% in the ergometrine group.

Length of Third Stage of Labour

There is no doubt that ergometrine reduces the length of the third stage, as Table VII shows. In the ergometrine series it was less than 20 minutes in 94% of cases.

Davis and Boynton (1942) noted that there was a direct relationship between blood loss and length of the third stage—an observation which is confirmed in our treated cases.

TABLE VII

Length of Third Stage	% In Control Group	% In Ergometrine Group
0-4 minutes	1.5	50.3
5-9 "	9.0	33.6
10-19 "	51.5	10.4
20-29 "	28.0	1.1
30-39 "	6.4	1.2
40+ "	3.6	3.4

Discussion

Intravenous ergometrine, if given with the crowning of the foetal head, causes a striking reduction in blood loss in the third stage of labour and a marked lowering of the post-partum haemorrhage rate. It also shortens the length of the third stage. These facts seem indisputable. Those authors who are not wholly in favour of using ergometrine, such as Roberts (1942) and Snaith (1951), admit that the timing of the injection was not accurately made, or else, like Daley (1951), they gave the ergometrine intramuscularly. We consider timing a most important point: intravenous ergometrine acts within a minute of injection, causing a tonic uterine contraction and placental separation while part of the baby still occupies the uterine cavity. Placental expression should be carried out as soon after the birth of the baby as possible. To facilitate this, cord traction is a useful and safe procedure. In a firmly contracted uterus the only danger of cord traction is the theoretical risk of causing acute inversion of the uterus, but, as Picton (1951) points out, before inversion can be initiated uterus and cervix must be relaxed.

In our series there was an increased incidence of manual removal of the placenta when ergometrine was used (3% as compared with 1.1% in the control series). The higher rate of this complication is used by some as an argument against intravenous ergometrine therapy. As we have pointed out, there is a tendency in this hospital towards a more frequent use of this procedure, particularly after instrumental deliveries. Recognition of the value of cord traction would possibly result in fewer manual removals, as might digital exploration of the upper vagina described by Graber (1950), revealing a placenta trapped in the cervix and therefore easily removed without anaesthesia. Smellie (1754) recommended both pulling on the cord and digital exploration to feel the placenta.

It would be wrong to claim that post-partum haemorrhage is eliminated by using ergometrine. The drug has

no effect on bleeding from cervical or vaginal lacerations. Occasionally the uterus fails to contract after 0.5 mg. of intravenous ergometrine, and there are other factors which may cause bleeding, such as an abnormal coagulation mechanism (Reid, 1951).

There is the disadvantage that an assistant must be available to give the injection at the right moment. In hospital this should not be too difficult to arrange. In domiciliary practice it is far less easy. This is a strong argument for teaching midwives the technique of intravenous injection.

We conclude by advocating a more widespread use of this technique, in the belief that it would prevent much puerperal morbidity and some maternal deaths.

Summary

Intravenous ergometrine, 0.5 mg., was given to 1,000 patients in the second stage of labour with the crowning of the foetal head. The results are compared with 1,000 control cases.

The use of ergometrine has shown: (1) A reduction in the primary post-partum haemorrhage rate from 13.1% to 1.2%. This is significant at the 0.1% level. (2) A reduction in the amount of post-partum anaemia. (3) A shortening of the third stage of labour. (4) A significant increase in the rate of manual removal of the placenta from 1.1% to 3%.

We are indebted to Professor W. C. W. Nixon for his help and advice; to the students and midwives who have made this investigation possible; and to Mr. N. W. Please, of the Department of Statistics, University College, London, for his suggestions and the statistical data.

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HAEMOGLOBIN LEVELS IN A GROUP OF ELDERLY PERSONS LIVING AT HOME ALONE OR WITH SPOUSE

BY

W. HOBSON, M.D., B.Sc., D.P.H.
*Professor of Social and Industrial Medicine,
University of Sheffield*

AND

E. K. BLACKBURN, M.D., F.R.F.P.S.
Consultant Haematologist, Royal Infirmary and Hospital,
Sheffield

Wintrobe (1951a) stated, "there are few satisfactory data for the blood in old age." Some studies of haemoglobin levels—for example, by Olbrich (1947) and Howell (1950)—have been carried out on old persons living in hospitals or institutions or under especially favourable conditions. Relatively little similar work, however, appears to have been done on adequate numbers of old people living under natural conditions in their own homes. A medical survey of old persons living alone or with spouse in Sheffield enabled us to carry out such a study.

Methods

1. Selection of Group.—The sample drawn in March, 1948, was a 1:30 random selection from the food office register in Sheffield of men and women who had reached pensionable age (65 in men and 60 in women). Only those living alone or with spouse were included in the medical survey. The haematological investigations were not carried out until at least one year later. Those eligible for inclusion were interviewed by a social worker, who invited their co-operation. Subjects who were willing were then medically examined in their homes and samples of blood were taken. The final group consisted of 177 men between the ages of 66 and 85, and 246 women between the ages of 61 and 87.

2. Dietary Survey.—Information was collected on the food and drink consumption of each subject for a period of one week. A spring balance and standard tablespoons and tea-

Results

Haemoglobin in Relation to Age and Sex.—The mean haemoglobin levels of the 177 males and of the 246 females were calculated, giving values of 14.4 g./100 ml. for the males and 13.8 g./100 ml. for the females. Using the large sample method (Fisher, 1941) for testing the significance of the difference between two means, the standard error of the difference was calculated (0.16), and the difference (0.6) was found to be significant. Thus the females had a signifi-

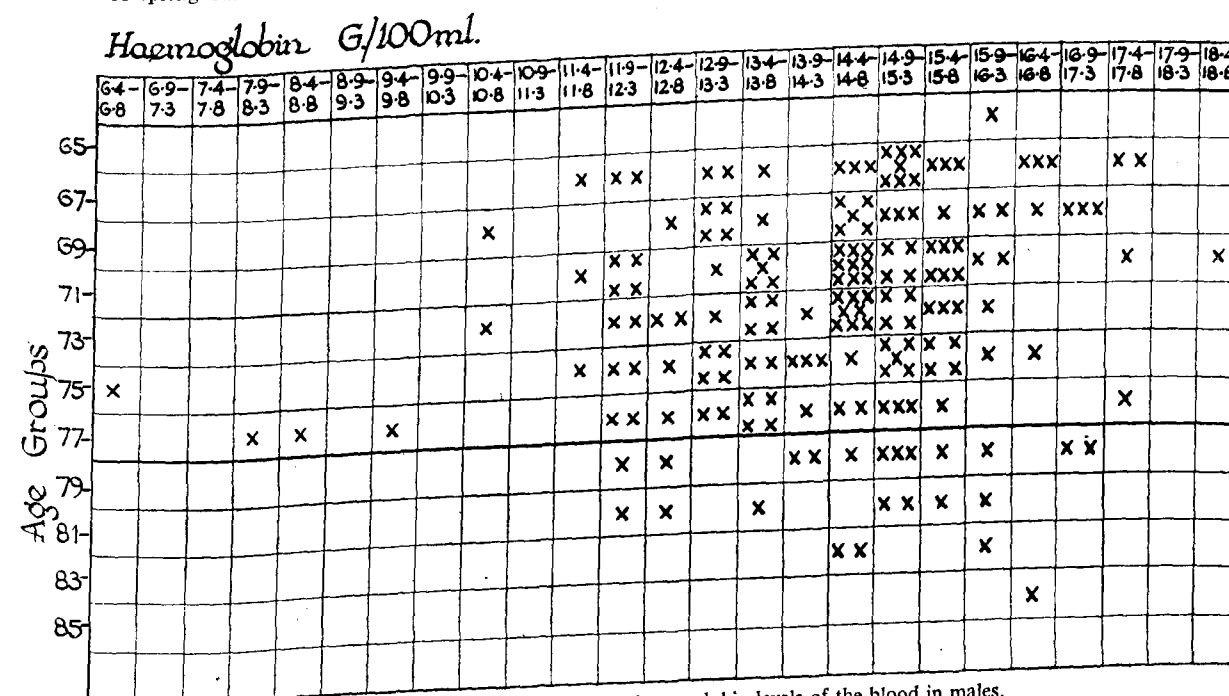


FIG. 1.—Scatter diagram relating age to haemoglobin levels of the blood in males.

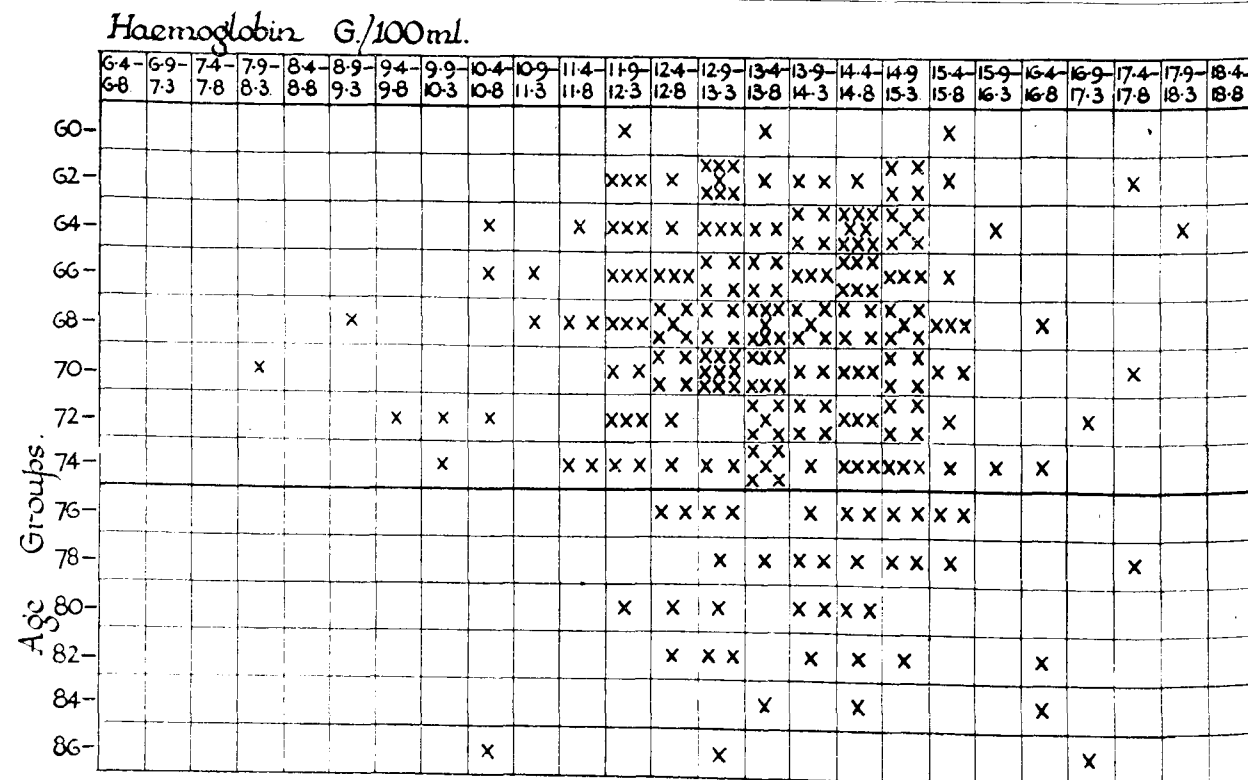


FIG. 2.—Scatter diagram relating age to haemoglobin levels of the blood in females.

cantly lower haemoglobin level than the males. The relationship between haemoglobin content of the blood and age is shown in the scatter diagrams (Figs. 1 and 2). Although from these diagrams there does not appear to be an overall correlation between haemoglobin levels and age, a negative correlation over the age range 65.5–77.5 years for the males and over the age range 60.5–74.5 years for the females is apparent.

The correlation coefficient between haemoglobin level and age for the males within the age range 65.5–75.5 years was calculated and found to be significant ($r = -0.2799$, $n = 154$, $P < 5\%$), whilst the correlation coefficient over the complete age range was not significant ($r = 0.1077$, $n = 177$, $P > 5\%$). Similarly for the females, the correlation coefficient over the age range 60.5–74.5 years was significant ($r = -0.262$, $n = 204$, $P < 5\%$), whilst that over the complete range was not significant ($r = 0.068$, $n = 244$, $P > 5\%$). Thus over a certain age range there was a significant decrease in the haemoglobin content of the blood with increasing age in both sexes, but beyond this age range the haemoglobin levels were narrowly scattered round the mean level for each respective sex group.

Haemoglobin and Social Class.—Based on the classification of occupational status of the Registrar-General, the subjects were divided into three groups: professional and managerial (Class I and II of the R.G.), skilled workers (Class III of the R.G.), and semi-skilled and unskilled workers (Class IV and V of the R.G.). There was no significant difference between the haemoglobin levels in either men or women in the different occupational groups.

Haemoglobin Levels in Those Living Alone compared with Those Living with Spouse.—The mean haemoglobin level of the 46 males living alone was 13.9 g./100 ml. compared with a mean level of 14.5 g./100 ml. in the 131 males who were living with their wives. This difference was significant at the 5% level of probability ($t = 2.06$). There was no significant difference between the mean haemoglobin levels of the females who lived alone (13.9 g./100 ml.) and those who were living with their husbands (13.8 g./100 ml.). Thus living alone seems to be aetiological significant for the males but not for the females.

Haemoglobin Level and Emphysema.—It is often taught that patients with emphysema show a high haemoglobin content of the blood. The mean haemoglobin level of the 45 females showing radiological evidence of emphysema was found to be lower than the mean level in 137 females showing no emphysema. The mean haemoglobin level of the 32 males with radiological evidence of emphysema was slightly higher than that of 106 males showing no emphysema. These differences were not significant. Hence this study does not lend any support to the thesis that in old people with emphysema there is a high haemoglobin content of the blood.

Causes of Anaemia in this Group

Any person with a haemoglobin level of 11.7 g./100 ml. (80% Haldane) or less was arbitrarily considered to have anaemia. Absolute values were estimated in these cases. The incidence of anaemia was as follows: men, 9 cases (5.1%); women, 16 cases (6.5%). It was possible to obtain dietary figures for only the more co-operative cases with anaemia—namely, five men and eight women.

In addition, information on the social and clinical condition of the subjects was available. Eight out of the nine male cases had microcytic anaemia of the iron-deficiency type. The other had macrocytic anaemia associated with Paget's disease. Three out of the 16 female cases suffered from macrocytic anaemia; the rest had microcytic anaemia of iron-deficiency type.

Under the conditions of our survey it was not possible to carry out other investigations—for example, fractional test meals.

In at least 11 out of the 25 cases of anaemia a poor diet seems to have been a contributory factor. Apathy and a low income were the chief reasons for inadequate diets. On the other hand, at least four cases appeared to have had adequate diets.

Another contributory factor was rheumatoid arthritis in seven cases, particularly in women (six cases). Chronic haemorrhage was not detected in any case.

Syphilis in one woman, scurvy in another, and chronic alcoholism in one man were the only other recognizable potential contributory conditions.

Discussion

As different methods have been used for haemoglobin determinations, and as varying standards have been set from time to time for the 100% level, using the same technique, comparison of our results with those of previous workers is feasible only if the results are expressed in grammes per 100 ml. The figures obtained in this survey of old people living in their own homes (14.4 g./100 ml. for males and 13.8 g./100 ml. for females) are in close agreement with those found by Olbrich (1947) for people living in institutions (13.9 g./100 ml. for males and 13.2 g./100 ml. for females).

Howell (1950) obtained very high values (18.3 g./100 ml. for men and 16.6 g./100 ml. for women) in a group of elderly patients in a hospital for the chronic sick. On the basis of these results he was unable to agree with statements made by earlier workers that "old people are anaemic." Exclusion of cases of anaemia and malignant disease, a higher standard of diet than in many cases found in our survey, and use of the Sahli method on the ward may all have played a part in determining his high results.

So far as we are aware, all observers agree that the level is higher in men than in women for all age groups. The present study confirms this observation so far as the elderly are concerned. The Committee on Haemoglobin Surveys (1945) found that in men the mean level tends to fall in later life; the information provided in our study confirms this view. They found, however, that the haemoglobin level in women falls slightly between the ages of 30 and 49, but rises again after that; this fall and rise may be associated with the occurrence and cessation of menstruation respectively. It would appear, however, that in women over 60 the cessation of menstruation no longer plays a part in causing a rise in haemoglobin. The fall in haemoglobin with age in both sexes may be partly due to decreasing ability to absorb haemopoietic substances. Thus Pollard (1933) has shown that the incidence of achlorhydria increases with age. The decrease may also be due to diminished intake of iron, since our survey showed that the intake of iron diminished in both sexes with age. The cessation of these trends in extreme old age is a phenomenon which we have found in other physiological estimations—for example, serum cholesterol, blood pressure. If a relatively low haemoglobin content of the blood gives a diminished risk of survival there may well be a selective removal of those with low haemoglobin levels, particularly in extreme old age, when the death rate is very high. In these circumstances the mean levels in these older age groups would tend to be higher. It would appear that the mean haemoglobin level falls with age in both sexes until extreme old age; this fall is interrupted in women by the cessation of menstruation, but ultimately resumes the downward trend.

The studies of Monroe (1951) on 7,941 patients over the age of 61 in a geriatric hospital revealed a much higher incidence of anaemia than in the present survey. He found that 15.5% of the men and 11.2% of the women had a haemoglobin level of below 70%. We are unable to make a strict comparison with our figures, as the method of haemoglobin estimation was not given. Monroe stated: "Loss of blood was the commonest cause of severe secondary anaemia in old age (522 cases). Malignant disease was the source of the blood loss in over half of them, closely followed by peptic ulcer and cirrhosis of the liver. Infection caused anaemia in 165 cases. Usually it was mild, but those due to the streptococcus occasionally produced so rapid a fall in blood counts as to suggest blood loss." Hence the idea that old people are anaemic may have arisen from hospital experience. These causes are very different from those found in the present study.

One of the most interesting findings of the survey was the lower haemoglobin level of the males living alone compared with those living with their wives.

The cases of anaemia in this group of elderly people living in their own homes were largely due to adverse social factors, such as apathy, a low income, or, in the case of males, living alone. A meals-on-wheels service would have helped considerably.

Anaemia seems to be a condition which is very easily missed in old people, as none of our cases were receiving any form of treatment for it. A simple haemoglobin estimation in all old people would be of great value for detecting a potentially remediable cause of ill-health.

Summary

The haemoglobin levels of 177 men between the ages of 66 and 85 years and of 246 women between the ages of 61 and 87 years were determined. All these old people were living in their own homes either alone or with spouse. In men and women there was a significant downward trend over a certain age range, and the males (mean haemoglobin level 14.4 g./100 ml.) had a significantly higher level than the females (mean haemoglobin level 13.8 g./100 ml.).

There was no significant social class difference in haemoglobin levels in either males or females.

Pulmonary emphysema was not associated with a high haemoglobin content of the blood.

Males living alone had significantly lower haemoglobin levels than those living with their wives. There was no difference in the case of females.

Nine men (5.1%) and 16 women (6.5%) had haemoglobin levels of 11.7 g./100 ml. or less. Eight of the men and 13 of the women had iron-deficiency anaemia, while one man and three women had macrocytic anaemia. None of the patients were having any form of treatment for their anaemia. The main contributory factors appeared to be poor diet (44%) and rheumatoid arthritis (28%). Apathy and a low income were the chief reasons for the poor diet. A simple haemoglobin estimation in all old people would be of considerable value for detecting a potentially remediable cause of ill-health. A meals-on-wheels service would have been of benefit.

We thank Dr. H. Droller for clinical examinations; Dr. J. L. A. Grout for radiological examinations; Miss C. Roseman for help with the statistics; Mr. A. S. Foster, the technical staff of the Haematological Department of the Royal Hospital, and Misses P. M. Ashton and A. A. Hutcheson for technical and clerical assistance; and the field workers and general practitioners, too numerous to mention by name, who helped us in the survey. We are indebted to Dr. E. R. Bransby, of the Ministry of Health, who arranged for a team of dietitians from the social survey to carry out the dietary investigations under the direction of Mrs. Barbara M. Osborne. Our grateful thanks are due to the Nuffield Foundation for its generous grant, which paid for the expenses of this investigation.

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CLINICAL TRIAL OF PHENYLINDANEDIONE AS AN ANTICOAGULANT

BY

M. TOOHEY, M.D., M.R.C.P.

Physician, New End Hospital, London

At present dicoumarol and ethyl biscoumacetate (*bis*-3, 3'-(4-oxycoumarinyl)-ethyl acetate; "tromexan") are the two drugs with a prothrombopenic action which are in common use as anticoagulants. Dicoumarol was the first prothrombopenic drug to come into use, but its toxic effect (due, however, in many instances to indiscriminate heavy overdosage and also to lack of proper control, including unreliable estimations of the prothrombin time) has led to severe haemorrhage in many cases. The great drawback with dicoumarol is its cumulative action, which may continue long after the drug has been stopped. This cumulative effect necessitates particularly skilled and detailed control of the drug with frequent estimations of the prothrombin time if severe haemorrhage is to be avoided. Another disadvantage with dicoumarol is the long delay, usually 48 to 72 hours, before a full therapeutic effect is reached.

Ethyl biscoumacetate has a much more rapid action than dicoumarol, a therapeutic effect usually being achieved in 18 to 24 hours. Moreover, the effect of ethyl biscoumacetate, unlike that of dicoumarol, is, owing to the rapid metabolism and elimination of the drug, almost never cumulative. The rapid inactivation of ethyl biscoumacetate, however, often makes it difficult to maintain an even therapeutic prothrombin concentration, especially in the initial stages of treatment. In addition, the wide individual variation in the reaction to ethyl biscoumacetate is another factor requiring detailed and meticulous control in every case.

In recent years a new prothrombopenic drug, phenylindanedione, has aroused interest and been the subject of clinical trial. In 1944 Kabat, Stohman, and Smith showed that certain indanedione derivatives have a specific action in reducing the plasma prothrombin. Soulier and Gueguen (1947) reported satisfactory results from using phenylindanedione, the most active of the indanedione derivatives. Jaques *et al.* (1949) found no toxic effects from phenylindanedione in animals. Blaustein *et al.* (1950) reported their observations on the use of the drug in 53 patients, and concluded that phenylindanedione had an action similar to but more rapid than that of dicoumarol. Bjerkelund (1950) found that phenylindanedione had not only a more rapid effect but also a more uniform action than dicoumarol. In addition, Bjerkelund showed that phenylindanedione had no effect on factor V.

The present paper is a report on the use of phenylindanedione in 68 patients. Most of them were suffering from coronary thrombosis or deep venous thrombosis, and in several there was evidence of cardiac failure. Quick's one-stage method was used for estimation of the prothrombin time, and the thromboplastin was a phenol-saline emulsion prepared from human brain. Therapeutic prothrombin levels of 10-20% (or approximately twice to three times the normal prothrombin time) were aimed at.

Rapidity of Action and Recovery

In practically all cases 200 mg. of phenylindanedione (divided into two equal doses) was given in the first 24 hours, followed by 100 mg. (in two equal doses) in the next 24 hours. On this dosage only 6 cases out of the 68 failed to reach an adequate therapeutic prothrombin level in 48 hours, whilst in only one of these was the prothrombin level above 40% at this time. In many cases in which the prothrombin time was estimated at 36 hours it was found that an adequate therapeutic level had been attained by this time. In most of the 68 cases an appreciable lowering of the prothrombin concentration to 50% or below was reached by 24 hours.

The effective action of phenylindanedione passes off fairly rapidly, and therefore the risk of cumulative effects is slight except where very large doses are given. Twenty-four hours after stopping the drug there was either no change or only a small fall in the prothrombin times in those patients in whom the prothrombin had previously been maintained at a full therapeutic level (10-20%) for at least several days. Up to 36 hours after cessation of phenylindanedione there was still an appreciable effect, but between 36 and 48 hours after the last dose there was a sudden sharp drop in the prothrombin time to near normal levels. By 72 hours the prothrombin times in practically all cases had become normal or almost so.

The return to normal of the prothrombin time in patients on phenylindanedione depends (as with other similar anticoagulants) largely on the level to which the prothrombin had been depressed. The lower the prothrombin concentration, the longer it takes for a normal prothrombin content to be regained. Again, any lowering of renal function will delay the excretion of the drug. In the very few cases in which the prothrombin time failed to return to normal or near normal within 48 to 72 hours after the last dose there were signs of deficient renal function.

The absorption and recovery rates of phenylindanedione are therefore midway between those of dicoumarol and ethyl biscoumacetate. Phenylindanedione has many advantages over dicoumarol in its quicker effect and the very slight danger of cumulative action. On the other hand, although it is not as rapid in action as ethyl biscoumacetate its more prolonged effect makes it much easier to maintain a therapeutic prothrombin level over a prolonged period. Ethyl biscoumacetate is practically all metabolized and excreted within 24 hours, so that omission of the drug for only one day will result in even an excessively prolonged prothrombin time returning to normal or near normal and the drug therefore losing its therapeutic effect. This rapid inactivation, combined with the wide individual variation in the reaction to the drug, necessitates the most detailed and experienced control when ethyl biscoumacetate is used. With phenylindanedione, however, the time-lag of 36 hours before there is any really appreciable change in the prothrombin concentration allows ample time for the clinician to ascertain the prothrombin level and to readjust the dose of phenylindanedione when necessary without wide fluctuations in the prothrombin level occurring.

Dosage

The initial dosage in all 68 cases was 200 mg. (100 mg. morning and evening) the first day, followed by 100 mg. on the second day. By 48 hours the full effect of this dosage was evident, and, according to the prothrombin level then reached, it was possible to estimate with a fair degree of accuracy the further doses needed for maintenance therapy. The greater the rise in the prothrombin time by 36 to 48 hours the more sensitive the patient is to the drug and the smaller the daily maintenance dose that is required. In 44 of the 68 cases this daily maintenance dose lay between 75 and 100 mg. and in only 5 cases did it fall outside the range of 50-150 mg. (see Table). The variation

Maintenance Doses of Phenylindanedione

No. of Cases	Daily Maintenance Doses in mg.	No. of Cases	Daily Maintenance Doses in mg.
2	50	3	125
4	50-75	2	125-150
22	75	4	150
4	75-100	2	150-175
18	100	1	175
4	100-125	2	175-200

in individual susceptibility to phenylindanedione is therefore not very great and seems to be much less than with either dicoumarol or ethyl biscoumacetate.

In all cases the total daily dose of phenylindanedione was given in approximately two equal amounts morning and evening. Dividing up the total daily dose seems to give more uniform results.

Guides to Dosage

There are several factors which help greatly in estimating the required maintenance doses in individual cases. Before, however, these are considered it is necessary to stress one important point. The initial doses for the first two days should (subject to the exceptional cases mentioned below) invariably be kept constant. To give a larger dose than 100 mg. on the second day, solely on the result of one prothrombin estimation taken 24 hours or less after starting treatment, will lead in most cases to too high a dose being given. The full effect of phenylindanedione is not evident for 36 to 48 hours.

To give a smaller dose than 100 mg. on the second day may, however, be justifiable where the prothrombin time at 24 hours (if taken) is already within a therapeutic range. In these few cases the dose of phenylindanedione on the second day may be reduced from 100 to 75 mg.

With phenylindanedione, as with all anticoagulants of the coumarin group, the extent of individual susceptibility is most important, so that the ultimate control of therapy in all cases lies in frequent prothrombin estimations. There are, however, several factors which can help in gauging, with some accuracy, the required maintenance doses of phenylindanedione:

1. Weight is important; the heavier the patient the more likely it is that the daily maintenance doses will be on the large size—that is, 125-175 mg.
2. The more acutely ill the patient (especially cases of coronary thrombosis accompanied by severe shock) the smaller the maintenance doses of phenylindanedione that are needed. It was noticed in several cases, however, that the maintenance doses in the acutely ill patients had to be increased later on when there was an improvement in their clinical condition.
3. Age is not so important in itself, but as older people tend to be more frail they require smaller doses. The apparent age is more important than the real age.
4. Renal function is of particular importance in gauging phenylindanedione (as other anticoagulant) therapy. Deficient renal function will lead to delayed excretion of the drug, so that much smaller maintenance doses are necessary. In this series the few cases in which there was an unexpectedly sharp rise in the prothrombin time were those in which it was not realized that renal function was depressed. As the majority of patients with lowered renal function are in the older age groups, it has been found most useful to perform routine blood-urea estimations in all patients of 60 and over.

Taking all the above factors into account, it will be found that the less acutely ill robust young patients require the largest maintenance doses of phenylindanedione, whilst the seriously ill frail elderly patients need the smallest doses.

Toxic Effects

No toxic effects were noticed in this series of 68 cases and there was no case of haemorrhage. Soulier and Gueguen (1947) reported dryness in the mouth, polydipsia, polyuria, and tachycardia with phenylindanedione, but in their cases very large doses, in the neighbourhood of 700 mg. and over, were given. In a small series of seven cases of mine in which large doses of phenylindanedione were

given in order to produce a severe prothrombin deficiency far in excess of that required for therapeutic purposes, no toxic effects were noticed apart from haematuria in one case only. In most patients on phenylindanedione the urine turns a pinkish-orange colour; this is of no significance.

Antidote.—The great drawback in anticoagulant therapy with drugs of the coumarin group has up till recently been the lack of a really effective antidote. Water-soluble vitamin-K analogues have only a very limited effect in correcting a severe prothrombin deficiency. Vitamin K₁, however, even by mouth, has a most dramatic and rapid effect (within 8 to 20 hours in most cases) in overcoming the prothrombopenic action of dicoumarol, ethyl biscoumacetate, and phenylindanedione (Toohey, 1952).

Frequency of Prothrombin Estimations

After the initial two or three prothrombin estimations necessary in the first four to five days of therapy, it is usually sufficient to carry out prothrombin estimations only twice or, at the most, three times a week. Phenylindanedione is very stable in its action, so that once the individual variation in reaction has been assessed it is not necessary to do daily prothrombin estimations.

It is perhaps advisable to point out here that minor unimportant fluctuations in the prothrombin time, as measured by the one-stage method, are often seen in practice in patients on anticoagulants. Therefore, to avoid unnecessarily frequent alterations in the maintenance doses of phenylindanedione and similar anticoagulants, the method of prothrombin estimation used should allow for a comparatively wide margin in the clotting-time within which the therapeutic control may be regarded as satisfactory. For this reason, phenol-saline thromboplastin is particularly suitable in that the effective therapeutic range of the prothrombin time is two to three times the normal control (or 30 to 45 seconds).

The administration of heparin interferes with the estimation of the prothrombin clotting-times. Therefore, if the patient is having heparin as well as phenylindanedione the sample of blood for prothrombin estimation should be taken at least four hours, and preferably six hours, after the last dose of intravenous heparin.

Summary and Conclusions

Phenylindanedione has been tried as an anticoagulant in 68 patients, mostly cases of coronary thrombosis and deep venous thrombosis. It is a very effective anticoagulant which in its action lies approximately midway between dicoumarol and ethyl biscoumacetate. The dangerous cumulative effect of dicoumarol occurs to a far lesser extent with phenylindanedione, whilst the fact that the metabolism and excretion of phenylindanedione is less rapid than that of ethyl biscoumacetate makes clinical control of anticoagulant therapy with phenylindanedione much easier.

In this series of 68 cases 200 mg. (in two equal divided doses) was given on the first day, followed by 100 mg. on the second day. On this dosage an appreciable fall in the prothrombin level was noticed in 24 hours, and a full therapeutic effect, with a prothrombin concentration in the region of 10-20%, was reached in 36 to 48 hours in nearly all cases.

The further daily maintenance doses of phenylindanedione varied between 50 and 200 mg. In 44 of the 68 cases the maintenance dose lay within the limited range of 75 to 100 mg., and in only five cases did it fall outside the range of 50-150 mg. Phenylindanedione seems to be much more uniform in action, and therefore easier to control, than either dicoumarol or ethyl biscoumacetate.

Important factors in assessing the appropriate daily maintenance dose within the range of 50 to 175 mg. are the weight, age (apparent rather than real), general health, and renal function. The more robust, young, and less acutely ill patients require the largest doses, whilst the frail, elderly, and severely ill cases need the smallest maintenance doses. Any lowering of renal function will materially reduce the amount of phenylindanedione required.

Once the daily maintenance dose has been established, this dose can be continued for a prolonged period without any significant fluctuation in the prothrombin times. (With improvement in a severely ill patient's general condition, a small increase in the daily maintenance dose may sometimes be necessary.) This uniform action of phenylindanedione means that in most cases, once the daily maintenance dose has been established, prothrombin estimations are necessary only twice or, at the most, three times a week. (In patients on prolonged therapy, prothrombin estimations weekly or less often are usually enough.)

No toxic effects from phenylindanedione were encountered in this series. In a small series of seven cases reported previously, the giving of much larger doses than those required to maintain an adequate therapeutic prothrombin level resulted in haemorrhage in one case only and no other toxic reactions. This haemorrhage and the severe prothrombin deficiency seen in the other six cases were quickly controlled within eight to twenty hours by vitamin K₁ given orally.

The total daily dose of phenylindanedione in each case was given in two divided amounts, morning and evening. In most cases it turns the urine a pinkish-orange colour.

I wish to thank Charles E. Frosst and Co. (Canada) for the initial supplies of phenylindanedione ("danilone") and also Evans Medical Supplies Ltd. for additional amounts of the drug ("dindevan"). I also wish to express my gratitude to Dr. E. Lozinski, of Charles E. Frosst and Co., for his help and advice.

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Robert James Graves, who died on March 20, 1853, is best remembered to-day for his accurate account of exophthalmic goitre (1835). Although earlier descriptions of the condition were given by Flajani (1802) and Parry (1815), it is best known in Britain as "Graves's disease." He was one of the founders of the Park Street School of Medicine in Dublin. While physician to the Meath Hospital he introduced Continental methods of clinical teaching with good effect. Graves qualified in 1818 and then studied in London and on the Continent. When he was in Austria his fluency in languages led him to be taken for a German spy and he was imprisoned for ten days. During a journey from Genoa to Sicily the ship in which he was travelling ran into a storm and the crew threatened to abandon ship. Graves seized an axe and smashed the ship's boat; he then assumed command and repaired the pumps with leather from his own boots. Graves contributed many papers to medical literature. His *Clinical Lectures on the Practice of Medicine*, 1848, is considered his best work.

TREATMENT OF NAUSEA AND VOMITING OF PREGNANCY WITH ANTIHISTAMINES

BY

SAMUEL LASK, M.D., M.R.C.O.G.

Obstetrician and Gynaecologist, St. Andrew's Hospital,
London, E.3

During the past few years good results have been reported from the use of antihistamine preparations in nausea and vomiting of pregnancy. Dougray (1949) recorded 94 cases thus treated, with 83% cured, and Carliner *et al.* (1949) reported on 43 patients treated with dimenhydrinate ("dramamine"), with 72% cured. At St. Andrew's Hospital during the past three years a large proportion of patients complaining of nausea and vomiting in pregnancy were freed from these symptoms by taking an antihistamine preparation. So successful was this treatment that it was extended to patients who complained mainly of heartburn, with equally gratifying results. After some months it was decided to make a clinical trial, treating one group of patients with an active antihistamine preparation and another group with an inert preparation.

Method

Although all patients were questioned as a routine on vomiting in pregnancy, only those who specifically complained were treated. Cases were divided into three groups: severe vomiting, in which vomiting occurred at frequent intervals during the day or caused the patient a good deal of distress; occasional vomiting, in which vomiting was not frequent and regular and did not unduly distress the patient; and cases in which heartburn and nausea were the predominant symptoms. No attempt at clinical assessment was made, apart from excluding any obvious non-obstetric cause of vomiting, and the patient's own statement was the guide to the group in which she was placed. As the element of suggestion plays a part in the treatment of these patients, and some patients will respond to any form of therapy, it was decided to include only those who had already received some other form of treatment without improving.

Two antihistamine preparations were used, both in tablet form: mepyramine maleate ("anthisan"), 100 mg., and promethazine-8-chlorotheophyllinate ("avomine"), 25 mg. They appeared to be equally effective. The control tablets contained lactose only, and were identical in size and shape, and almost identical in colour with the active tablets. Patients were divided into two groups of 60; one group was treated with antihistamine tablets and the other group with the inert tablets. The tablets were collected from the hospital dispensary and enough for three days' treatment were given. Patients were instructed to take a tablet at night before retiring. This routine was altered occasionally for those whose symptoms were particularly troublesome at a set time—for example, after the evening meal or after getting into bed at night. These patients were instructed to take the tablet about two hours before the expected time of onset of the symptoms.

Patients were seen five days later at the antenatal clinic. Those who were free from symptoms while taking the tablets were classified as cured; others were classified as improved or unchanged. The short period of three days for treatment was chosen because experience had shown that patients who were going to benefit by the treatment did so almost immediately. There was also the additional factor that by giving a short course of treatment and by

seeing the patients soon afterwards there was less risk of their forgetting the facts or becoming confused about details.

Results

Of the 60 patients who were treated with an active antihistamine preparation, 47 reported themselves as cured and six as improved. Thus 88% were either cured or improved by the treatment. In the control group, three patients regarded themselves as cured and four as improved, a total of 10%. Table I shows that no case of severe vomiting

TABLE I.—Results of Treatment

Treatment	No. of Cases	No. Cured	No. Improved	No Change
<i>Severe Vomiting</i>				
Antihistamine	31	25	2	4
Inert tablet	33	—	—	33
<i>Moderate Vomiting</i>				
Antihistamine	17	12	3	2
Inert tablet	16	2	4	10
<i>Nausea and Heartburn</i>				
Antihistamine	12	10	1	1
Inert tablet	11	1	—	10

was affected by an inert preparation, and that it was in the cases of moderate vomiting that the inert tablets had most effect.

Most of the patients in the control series were subsequently treated with antihistamines, when they showed a higher proportion of cured and improved (Table II). Thus

TABLE II.—Control Cases Subsequently Treated with Antihistamines

No. of Cases	No. Cured	No. Improved	No Change
50	43	3	4

out of 50 of these patients treated 86% were cured, 6% were improved, and only 8% showed no change. With this group, however, other factors may have affected the results. These patients were being treated at a somewhat later stage in pregnancy, and it was possible that time was effecting a cure. Also, as the antihistamine tablets they subsequently received were of a brighter colour than the inert tablets, they may well have deduced that they were receiving a more potent preparation, and so the factor of suggestion may have influenced the results.

In most cases three days' treatment was insufficient to effect a permanent cure, and it was necessary to continue treatment for at least a fortnight, and sometimes for four weeks. No other treatment was given and no dietary restrictions were imposed. No adverse effects were noted from even a prolonged course, although occasionally some patients complained of drowsiness.

Comment

The causes of nausea and vomiting in pregnancy are not known, and it is therefore a matter of speculation why the antihistamines give relief. Finch (1938) suggested that the antihistamines are due to an allergic tendency, and that the patient had become sensitized to some secretion of her own corpus luteum. He carried out intradermal tests with corpus luteum extract and found that the reaction produced was in direct proportion to the degree of nausea and vomiting present. Kapeller-Adler and Adler (1943) have shown that there is an increased histamine production by the body in pregnancy. They suggest that, whereas in normal pregnancies the serum is able to inactivate histamine, in cases of hyperemesis gravidarum and mild pre-eclampsia the serum has lost this power and

in consequence there is an excess of histamine in the body and it is this excess which is responsible for the disturbed gastric function.

These theories offer some explanation for the mode of action of the antihistamines. On the other hand, it is well recognized that most of the drugs used for their antihistamine properties have some depressant action on the central nervous system, and it is possible that they exert their influence by lowering the sensitivity of the vomiting centre.

Some of the patients who did not respond to treatment improved after the dosage was increased or when a more powerful form of antihistamine such as promethazine hydrochloride, 25 mg. twice daily, was given. This confirms Dougray's experience, although he found it necessary to give a higher dosage.

A number of patients had a recurrence of symptoms in the latter weeks of pregnancy, and these were all successfully treated with antihistamines. It is occasionally taught that vomiting late in pregnancy is of serious significance, but in the absence of any evidence of pre-eclampsia this is not so.

Summary

A number of patients suffering from gastric disturbances in pregnancy were treated with antihistamine preparations and an equal number were given an inert preparation. The results showed that a high proportion of patients obtained relief with the antihistamines and only a small proportion were relieved with the inert preparation.

My thanks are due to Messrs. May and Baker for a generous supply of avomine tablets and for supplying the inert tablets.

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ACUTE NITROBENZENE POISONING WITH TRANSIENT AMINO-ACIDURIA

BY

W. E. PARKES, M.D., M.R.C.P., D.C.H.

AND

D. W. NEILL, M.Sc., A.R.I.C.

(From the Royal Victoria Hospital, Belfast)

Many cases of nitrobenzene poisoning have been recorded. The majority of these have been due to accidental ingestion, contact, or inhalation, especially in industry. The case reported here was the result of a deliberate attempt at suicide and showed the usual characteristic manifestations of methaemoglobinemia. There was also a marked transient amino-aciduria.

Case Report

A married woman aged 24, living apart from her husband and 4-year-old son, became depressed and decided to commit suicide. At 11 a.m. she swallowed "about half a bottle" of a bee mixture, which was clearly labelled as a poison. So far as could be ascertained later, she drank about 1 oz. (28 ml.) of this mixture, which contains nitrobenzene (or oil of mirbane) 2 parts, safrol oil 1 part, and petrol 2 parts. Therefore she may have swallowed almost 200 minims (12 ml.) of nitrobenzene.

She found the taste of the mixture most unpleasant and noted a burning sensation in her mouth. Half an hour

later she vomited twice and felt dizzy and had to be helped to her bed. After a further half-hour she was seen to be deeply cyanosed. Her relatives became alarmed, and with some difficulty persuaded her to go to hospital. She was admitted in the early afternoon of December 13, 1951.

On admission she was hysterical and strongly resented having her stomach washed out with sodium bicarbonate. Her breath and the odour of the gastric residue were suggestive of floor polish. There was an intense blue-grey cyanosis, especially of the lips and face and beneath the finger-nails. She soon became more rational, although apprehensive, and told us that she had swallowed the bee mixture in an attempt to end her life. This preparation is popular with bee-keepers, and we had no difficulty in discovering that nitrobenzene was the active ingredient.

Examination revealed that the pulse was of poor volume but regular at 120 beats a minute. Her blood pressure was 120/70. There was no gross peripheral circulatory failure. She was given 1/30 gr. (2 mg.) of strychnine sulphate by hypodermic injection. An intravenous drip was begun soon after admission. Normal saline was given at first, but when we concluded that the cyanosis was due to methaemoglobinemia, 2 ml. of 10% methylene blue was injected into the drip tubing. Immediately afterwards the intravenous saline was replaced by blood and the patient was placed in an oxygen tent. There was no immediate change in colour, but approximately 20 minutes after the injection of methylene blue her colour reverted to normal. In view of this and as she was not obviously anaemic, the blood transfusion was discontinued after 350 ml. of blood had been given. For the next 24 hours 5% glucose by slow intravenous drip was given. Ascorbic acid, 1 g., was added to each pint (570 ml.). Two hours after admission the pulse rate was 88 and the blood pressure 110/70. The respirations had been rapid on admission, but soon became normal as the patient became more composed. A sample of blood which had been taken as the intravenous drip was started revealed methaemoglobin spectroscopically. A specimen of urine obtained later did not contain albumin or sugar.

The following day the blue-grey cyanosis was again intense and the patient complained of a severe headache, dizziness, and a bad taste in her mouth. The urine contained methaemoglobin and methylene blue in large amounts. Intravenous therapy was abandoned and the following oral regime begun: 16 gr. (1 g.) of methylene blue a day in divided doses and 200 mg. of ascorbic acid thrice daily.

On December 15 the intense cyanosis remained but she felt fairly well. The next day she complained of nausea and low back pain. On December 17 blood examination showed: haemoglobin, 85% (Haldane), or 12.6 g. per 100 ml.; red cells, 4,220,000; white cells, 6,650 (neutrophils 42%, eosinophils 3%, lymphocytes 45%, monocytes 10%). There was no punctate basophilia. The patient remained cyanosed but was free from symptoms.

On December 18 urinary chromatography, using the "rack tank" technique of Datta, Dent, and Harris (1950), revealed alanine, glutamine, serine, glycine, taurine, tyrosine, glutamic acid, and β -aminoisobutyric acid, all present in concentrations markedly in excess of the normal. Two days later the cyanosis finally disappeared and the patient felt well, but on December 24 she became dizzy when she was out of bed. Blood examination revealed: haemoglobin, 66% (Haldane), or 9.7 g. per 100 ml.; red cells, 2,860,000; colour index, 1.12; white cells, 12,750 (metamyelocytes 4%, neutrophils 54%, eosinophils 6%, lymphocytes 34%, monocytes 2%); corrected E.S.R., zero; P.C.V., 28%; M.C.V., 98 μ^3 ; M.C.H.C., 34%. A blood film showed polychromasia and anisocytosis with slight macrocytosis.

On December 27 the patient complained of nausea, but her appetite was good. Haemoglobin was 63% (Haldane), or 9.3 g. per 100 ml.; red cells, 2,890,000; colour index, 1.07; corrected E.S.R., zero; P.C.V., 30%; M.C.V., 103 μ^3 ; M.C.H.C., 31%; white cells, 11,050 (neutrophils 58%,

eosinophils 8%, lymphocytes 32%, monocytes 2%). On January 5, 1952, the haemoglobin was 65% (Haldane), or 9.6 g. per 100 ml.; red cells, 3,260,000; colour index, 0.98; corrected E.S.R., zero; P.C.V., 31%; M.C.V., 94 μ^3 ; M.C.H.C., 32%; white cells, 7,900. Although the blood picture was slowly reverting to normal the patient was given 2 pints (1,140 ml.) of blood by intravenous drip, to expedite recovery.

Blood examination on January 12 showed: haemoglobin, 85% (Haldane), or 12.6 g. per 100 ml.; red cells, 3,950,000; colour index, 1.06; corrected E.S.R., 7 mm. in one hour; P.C.V., 38%; M.C.V., 94 μ^3 ; M.C.H.C., 33%; white cells, 9,200; reticulocytes, 2.5%. On January 12, and again on February 8, the urinary chromatogram was normal.

The patient remained afebrile throughout her stay in hospital and was never jaundiced.

Discussion

This case differs from cases of nitrobenzene poisoning reported by Chapman and Fox (1945) and Nabarro (1948) in that cyanosis was noted one hour after the ingestion of the nitrobenzene, which was much sooner than in their cases. The odour of nitrobenzene is quite distinctive and has been likened to that of essence of bitter almonds by Nabarro.

Hamblin and Mangelsdorff (1938) found methaemoglobin in the blood of all cases of nitrobenzene poisoning, whereas Loeb, Bock, and Fitz (1921) were unable to detect it and suggested the formation of a nitrobenzene haemoglobin compound. In our case the spectrum for methaemoglobin was obtained, although with considerable difficulty, in spite of the intense degree of cyanosis. Nabarro (1948) suggested that if methylene blue was given transfusion might not be necessary, and our case confirmed this, as the blood picture was definitely improving spontaneously before the second blood transfusion. It is unfortunate that the effect of methylene blue seems to be transient. Its mode of action has been discussed fully by Gibson (1948).

In view of the results obtained by Deeny, Murdock, and Rogan (1943) in the treatment of congenital methaemoglobinemia with ascorbic acid we gave the patient large doses of this vitamin, although Shiels and Goldwater (1949) concluded that the beneficial effect of ascorbic acid in experimental and human benzene poisoning was not convincing.

Wirtschafter and Wolpaw (1944) have recorded a case of nitrobenzene poisoning in which there was a low total plasma protein content, a decrease in cholesterol esters, and slight but significant bromsulphthalein retention. It is probable that in their case, as in ours, there was an acute zonal hepatic necrosis. The condition must have been quite transient in our case, as subsequent urinary chromatography and extensive liver and kidney function tests did not reveal any abnormality. Uzman and Denny-Brown (1948) reported persistent amino-aciduria in early cases of hepato-lenticular degeneration (Wilson's disease) before liver-function tests showed any abnormality, and this has been confirmed in a similar case in this hospital. Himsworth (1950) considered that urinary chromatography was the best means of demonstrating amino-acids in the urine in cases of acute liver atrophy, and he suggested that their presence in this condition signified not only that liver cells had been killed but that few survived.

Wirtschafter and Wolpaw recommended glucose to fortify the liver and saline to replace that lost by vomiting. They dismissed replacement blood transfusion as unnecessary, but thought that the inhalation of oxygen in high concentration helped to prevent the formation of methaemoglobin, and they concluded that nitrobenzene affects the circulatory, respiratory, and central nervous systems both directly by toxic action and indirectly by the formation of methaemoglobin, with resultant anoxaemia. They thought that the hepatic and haemopoietic systems were damaged by direct toxic action.

Summary

A case of acute nitrobenzene poisoning is recorded in which there was methaemoglobinemia and amino-aciduria. Urinary chromatography revealed a transient gross excess of all the normal amino-acids. The literature on the symptomatology and treatment of the condition is reviewed briefly. The patient made a rapid recovery.

For permission to publish this case we are indebted to Dr. Robert Marshall and to Dr. J. A. Smyth, physician-in-charge, Biochemistry Department. We wish to thank Dr. M. G. Nelson for the haematological reports, and Mr. J. S. Coulter, F.I.M.L.T., for the spectroscopic demonstration of methaemoglobin.

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ACUTE TETRACHLORETHANE POISONING

A REPORT ON TWO FATAL CASES

BY

A. KEITH MANT, M.D.

First Assistant to the Department of Forensic Medicine,
Guy's Hospital

Cases of acute tetrachlorethane poisoning, following its ingestion by mouth, are unusual. Only three such cases are reported in the English literature (Hepple, 1927; Elliott, 1933; Forbes, 1943). Acute tetrachlorethane poisoning is generally suicidal, its distinctive odour rendering its accidental ingestion unlikely. One case of acute accidental poisoning has, however, been recorded (Hauser, 1939). There is no record of tetrachlorethane having been used as a homicidal agent.

Tetrachlorethane is a colourless, non-inflammable, oily liquid, boiling at 146.3° C., and with a specific gravity of 1.600 at 20° C. It is soluble in fats, oils, resins, and waxes, miscible with alcohol, and soluble in water to the extent of 1 part in 5,000. It has a sweetish smell and taste, somewhat resembling trichlorethylene, carbon tetrachloride, and chloroform, but quite distinct to those who are familiar with it. The commercial preparations have a yellow tinge. As a solvent, tetrachlorethane has many applications in industry, but, owing to its intensely poisonous properties, being the most toxic of the halogenated hydrocarbons (Hamilton, 1934; Browning, 1937), it is falling into disuse. At one time it was issued to the Army as "silk cleansing fluid," and two of the three acute cases recorded in the English literature occurred in soldiers. Its widest application outside industry is in horticulture—as an effective insecticide against white fly. In the two cases described below, the tetrachlorethane was originally purchased as an insecticide.

Chronic tetrachlorethane poisoning has been described and reviewed by a number of authors (Willcox, 1915; Minot and Smith, 1921; Legge, 1934; van Oettingen,

1937; Forbes, 1943). Methods for the early detection of chronic tetrachlorethane poisoning by examination of the blood and urine have been described by Minot and Smith (1921), and Gurney (1943). Toxic jaundice due to tetrachlorethane poisoning became compulsorily notifiable in this country after January 1, 1916, as the result of cases occurring amongst aircraft workers, who used it as "dope" for the treatment of fuselage. Twenty-six cases, five of which were fatal, were notified in 1916, but no further cases were notified until a fatal case occurred in 1929. Although chronic tetrachlorethane poisoning is becoming virtually unknown in this country, cases are still occurring abroad. Seven such cases, one of which was fatal, have been recorded by Coyer (1944).

When taken in large quantities by mouth, tetrachlorethane kills by its narcotic action before recognizable changes can take place in the liver and other organs. Consciousness is rapidly lost, and this is followed by a gradual depression of the vital centres, death occurring some 10 to 20 hours after ingestion. In these cases, except for the presence and smell of tetrachlorethane, the necropsy findings are those of narcotic poisoning, with changes in the gastric mucosa depending on the quantity taken and the presence or otherwise of food. In the two cases to be described the tetrachlorethane had been deliberately taken by mouth.

Case 1

A gardener aged 57 had become depressed because the estate on which he had been employed for thirty years was about to change hands. He left home one day as usual at 7 a.m., taking his sandwiches with him. As his mother, with whom he lived, was often in bed before he returned home in the evening, he was not missed until the next morning. At about 10 a.m. on that day he was found dead on the floor of his potting-shed; an uncorked bottle of tetrachlorethane lay by his side and a short farewell note was found scrawled in chalk across his work-bench.

Necropsy was carried out the next morning. A strong smell of tetrachlorethane was apparent on entering the mortuary. The body was that of a well-nourished man. There was an intense cyanosis of the post-mortem livid stains. Anoxic haemorrhages were present in the scalp.

There was no corrosion of the mouth, lips, or tongue. The lower third of the oesophagus was congested, and early superficial necrosis of the mucosa was present. At the cardiac end of the stomach extreme congestion of the entire gastric mucosa was found, with superficial necrosis and frank erosion. At the pyloric end of the stomach the exposed ridges of the rugae were principally affected. From the stomach and the first half of the duodenum 15 oz. (425 ml.) of tetrachlorethane was recovered. The tetrachlorethane had not passed beyond this point. The stomach also contained a further 5 oz. (142 ml.) of fluid consisting mainly of mucus. Food was not present.

Numerous anoxic haemorrhages were scattered throughout the brain, and there was early basal collapse of both lungs. No material natural disease was present in other organs.

Case 2

A carpenter aged 20, recently discharged from the R.A.F., was depressed over an error he had made at work. On the day before his death he returned home as usual for lunch. He had a good meal and left the house at 1.20 p.m. to return to work. At 2.30 p.m. it was noticed that his bicycle was still in the garden, and almost immediately afterwards he was found unconscious in a wheel-barrow which was standing close to a greenhouse. Later a medicine bottle which contained tetrachlorethane was found in the greenhouse, with approximately 1 to 2 oz. (28 to 57 ml.) missing.

POLYPOSIS OF SMALL INTESTINE WITH PIGMENTATION OF ORAL MUCOSA

REPORT OF TWO CASES

BY

A. P. KITCHIN, M.B., B.Chir., F.R.C.S.Ed.

Senior Surgical Registrar, West Herts Hospital Group

The following cases are recorded as further examples of this condition. They both came to hospital with symptoms of intestinal obstruction due to intussusception, one having had two previous operations for a similar condition. The typical pigmentation in the oral region was present in each case.

Case 1

A housewife aged 26 attended hospital complaining of attacks of lower abdominal pain for the previous six months, increasing in frequency and severity. On two occasions she had vomited during an attack. She had no disturbance of bowel function and had noticed nothing abnormal in the stools. Micturition and menstruation were normal, she had not lost weight, and had had no previous gastro-intestinal trouble, nor had anyone else in her family.

She was a well-built woman, dark, with a rather sallow complexion. On the circumoral skin there was a well-marked irregular dark brown mottling which extended over the mucous membrane of the lips and the cheeks, where the patches were more numerous. This had been present as long as she could remember and had not changed in any way during the time. No similar pigmentation was found elsewhere on the skin or the vaginal and rectal mucosa. The only other abnormality found was an elongated tumour in the left iliac fossa which was not tender and which varied in size and position during the course of the examination. A provisional diagnosis of recurrent intussusception was made, and she was admitted to hospital 48 hours later.

There was then a smaller and rounder mass in the right iliac fossa which was very mobile and disappeared completely after palpation. The attacks of pain were now much more frequent.

Laparotomy was carried out through a lower right paramedian incision. There was no free fluid in the peritoneal cavity. In the upper third of the ileum an intussusception was found which reduced easily, and after reduction three polyps about 1 in. (2.5 cm.) in diameter could be felt in the lumen of the bowel, one having been at the apex of the intussusception. In the lower ileum there was a Meckel's diverticulum 2 in. (5 cm.) in length and, just distal to it, a second intussusception with a further polyp rather larger than the others. The rest of the small intestine and the colon appeared normal and no other tumours were palpable. About 7 in. (18 cm.) of ileum, including the diverticulum and the polyp, was resected and a lateral anastomosis made. A similar length, including the tumours in the upper ileum, was removed, and an end-to-end anastomosis made. Her convalescence was uneventful, and she has so far had no further symptoms.

The four polyps removed showed no evidence of malignancy on histological examination.

Case 2

A housewife aged 35 was admitted to hospital complaining of intermittent abdominal pain and the passage of dark tarry stools for the past six days. In 1939 she had been admitted to this hospital with an intussusception, and 20 in. (50 cm.) of small intestine containing five polyps had been resected. In 1943, at another hospital, a second resection for an irreducible ileo-ileal intussusception had been done

but no polyps were found at this operation. Apart from these two incidents her health had been normal.

She had a much lighter complexion than the first case, but the pigmentation was of similar distribution over the inner surfaces of the cheeks and lips, although less marked on the circumoral skin. She was sure the condition had been present since childhood and had never noticed any change in it. There was no other pigmentation of the skin or of the rectal or vaginal mucosa. Apart from the two operation scars nothing abnormal was found on examination. A barium meal and follow-through x-ray examination showed dilatation of some loops of jejunum, suggestive of a subacute obstruction.

Laparotomy was carried out on the following day through a right paramedian incision. No free fluid was found. There was slight distension of the upper jejunum, and about 12 polyps could be felt along the course of the small intestine, one, larger than the rest, causing an intussusception in the upper ileum which was easily reduced. This polyp was excised with a small wedge of intestinal wall. In the lower part of the jejunum a 15-in. (38-cm.) length containing four polyps close together was resected with end-to-end anastomosis. No tumours were felt in the colon, but there was a complete intussusception of the appendix, which was reduced and the appendix removed. It contained three polyps. Histological examination showed no evidence of malignancy in any of the tumours.

She had an uninterrupted convalescence, and has so far remained free from further symptoms.

Comment

Although living in the same district, these two patients are not related. There is no evidence of pigmentation or polyposis in the family of Case 1. The second patient came to this country from Central Europe before the war, and further investigation is not possible, but she knows of no one else being affected in her family.

Four of the 27 cases so far recorded have been in this country—a father and daughter (Foster, 1944), a girl of 16 (Tanner, 1951), and a man of 50, originally operated on for intussusception in 1922 (Wolff, 1952).

Jeghers *et al.* (1949) have described the condition very fully, recording 10 cases of their own, and have shown the familial incidence in several of them and in the original cases of Peutz, in which three generations were involved. The presumptive evidence of polyposis is very strong in a number of cases with the characteristic pigmentation, including one of twins described by Jonathan Hutchinson (1896), Parkes Weber (1919), and two relations of Foster's cases. Wolff describes the typical pigmentation round the mouth and also on the hands in several relatives of his case, including one who died after an intussusception. Renyard (1951) also describes a case of gastro-intestinal polyposis with a number of small brown patches on the lower lip.

The pigmentation is either present at birth or appears in early childhood, and the intestinal symptoms usually appear by the third decade, as in the two cases described here. Polyposis without pigmentation is relatively common, but Jeghers *et al.* state that they have been able to find only one case of typical pigmentation with no evidence of polyposis, a woman of 57 years.

Intussusception of the appendix, as found in Case 2, was described nearly 100 years ago, but only about 90 cases have been recorded since, and Wakeley (1939) considers that the condition is probably much commoner than this would indicate. Various causative factors have been suggested, including foreign bodies, lack of meso-appendix, and enlarged lymphatic nodes, as in the ileo-caecal variety. I can find a record of only five cases due to polyps (McSwain, 1941), although polyposis of the appendix is not very infrequent.

I wish to thank Mr. V. Glendinning, who operated on these cases, for his help and advice, and Dr. White Phillips for the x-ray report.

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Medical Memorandum

Recurrent Intussusception Due to Polyposis of the Gastro-intestinal Tract Associated with Pigmentation

The intussusception, gastro-intestinal polyposis, and pigmentation of skin and buccal mucosa sign-complex was first described by Jeghers (1944) and further elaborated by Jeghers *et al.* (1949). Tanner (1951) reviewed the literature and added a further case. Since then, so far as we have been able to ascertain, only two more cases have been reported (Schaffer and Sachs, 1952; Wolff, 1952), bringing the total number of recorded cases to 27. The following case, to the best of our knowledge, is the first to be reported from the Middle East.

The salient features of the syndrome, as borne out by all the reported cases, are: (1) The patients are usually of dark complexion. (2) Pigmented spots are present on the buccal mucosa, lips, and face, and sometimes on the digits. The spots vary in colour from "light brown on the face to dark blue-black on the mucosa" and have been shown to contain melanin. (3) The presence of gastro-intestinal polyposis, predominantly in the small intestine. The polyps are usually benign, but in one case malignant change has been reported. (4) The condition usually presents as recurrent intussusception in the second decade of life. (5) It is often familial, and is believed to be transmitted as a Mendelian dominant.

CASE REPORT

A boy aged 16, who was born in Turkey and had come to Israel in 1950, was admitted to the department of surgery on October 1, 1952, complaining of generalized abdominal pain associated with anorexia and vomiting, following the passage of a hard stool some four to five hours previously. The pain was colicky in nature, maximal in the epigastrium, and radiated to the left flank. Nausea was persistent and he had vomited several times after the onset of the pain. The vomitus contained undigested food. No blood was present in the stools and there was no history of recent diarrhoea. He had had an almost identical attack two weeks previously, when he was admitted to another hospital and discharged 48 hours later, his symptoms having subsided.

He had been well until 18 months earlier (March 8, 1951), when he was admitted to this hospital complaining of abdominal pain, constipation, vomiting, and the passage of dominal pain, constipation, vomiting, and the passage of blood in his stools. On laparotomy an "ileo-ileal intussusception with a polyp about the size of an apricot" was found. The pathological report was that of a "benign polyp of the small gut." On discharge from hospital he continued to have attacks of abdominal pain with occasional bloody stools at approximately weekly intervals.

On August 9, 1952, he was readmitted with abdominal pain, constipation, vomiting, and blood in his stools. A laparotomy was again performed the day after admission, and "ileus due to adhesions related to the ileum and herniation of bowel through a deficiency in the omentum" was reported. After his discharge (nine days later) he was relatively well until the attack two weeks before his present admission to hospital. His mother, father, two brothers, and two sisters are all healthy and have no history of abdominal symptoms or operation.

Examination revealed a dark-complexioned youth, physically underdeveloped for his age—weight 73 lb. 11 oz. (33.4 kg.), height 4 ft. 10 in. (147 cm.). No pubic or axillary hair was present. The genitalia were small and undeveloped and the voice was high-pitched. Small pigmented spots about the size of a pinhead were present over the bridge of his nose and around his mouth. Larger bluish-black macular spots varying in size from 1/16 to 1/4 in. (1.6 to 6.4 mm.) in diameter were present on his lips and buccal mucosa, particularly the lower lip and the inside of the left cheek. No other pigmented spots or papillomata were found on the rest of the body surface. In the abdomen a sausage-shaped mass extending from the left flank to the left of the umbilicus was clearly palpable. Generalized abdominal tenderness was present, but no guarding or rigidity. No free fluid was detected, and the liver and spleen were not palpable. Rectal examination was negative.

A diagnosis of intussusception was made. At laparotomy a jejuno-jejunal triple intussusception was found involving about 1.5 m. of small bowel, with a large polyp (about 1 in. (1.9 cm.) in diameter) at the tip of the intussusception. Resection of 10 cm. of bowel, including the polyp, was performed and the specimen sent for section. The pathological report was of a "benign adenomatous papilloma."

The patient made an uneventful recovery. A barium meal and follow-through, and a barium enema at a later date, showed no radiological evidence of further polyposis. On rectoscopy, however, a cluster of four sessile polypi, each about 1/4 in. (6 mm.) in diameter, was seen on the left lateral rectal wall 9 cm. from the anal verge.

A subsequent examination of the patient's parents and siblings revealed no pigmentation of the buccal mucosa or skin in any of them, nor signs of polyposis of the bowel.

We wish to express our thanks to Dr. N. Rabinowitz, of the department of surgery, Hadassah University Hospital, for permission to report this case, and to Dr. Charlotte Kaplan for drawing our attention to this interesting but rare syndrome.

I. KAPLAN, M.B., Ch.B.

M. FEUCHTWANGER, M.D.

Department of Surgery,
Hadassah University Hospital, Jerusalem, Israel.

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Since its inception in 1947 the National Corporation for the Care of Old People has devoted its resources principally to assisting voluntary organizations by means of grants-in-aid to provide homes, clubs, and welfare centres. Its annual report for 1951-2 records that £116,515 was allocated in this way during the year, making a total of £790,000 during the last five years. The Corporation opened a rest home at Stanmore to admit patients discharged from the geriatric unit of West Middlesex Hospital and from Edgware General Hospital. Another home was opened at Greenisland, near Belfast, and a third is planned for Oxford. An experiment in Bristol was the provision in 1951 of a laundry service for old people. The Corporation, which has power to accept trusteeship of charitable bequests made to benefit old people, pleads that they "should not be regarded as a class apart, as objects either of pity or charity, but as people who with help can retain their independence and make their own contribution to the general welfare." The welfare of old people is also the concern of a special committee of the National Council of Social Service, whose annual report for 1951-2 records its activities. It makes available to Government departments, voluntary societies, students, and others up-to-date information and experience affecting the welfare of old people. At its national conference at Scarborough in 1952, 400 delegates heard Sir Walter Monckton outline the steps taken by the Government to ensure a new and sympathetic approach to the employment of the elderly on the part of employers, trade unions, and the public.

Reviews

CLINICAL NEUROLOGY

Clinical Neurology. By Frank A. Elliott, M.B., Ch.B., F.R.C.P., Professor Brodie Hughes, Ch.M.(Birm.), F.R.C.S., and J. W. Aldren Turner, M.A., D.M.(Oxon.), F.R.C.P. Edited by Frank A. Elliott. (Pp. 751. £2 2s.) London: Cassell and Co. 1952.

This book is "intended for those who are undergoing post-graduate training in medicine rather than for the junior student or the professed neurologist," and to this end it attempts "to present the common problems of neurology within a reasonable compass and to avoid the rare, the recondite, and the contentious."

In general, it follows orthodox lines. The first section is devoted to the principles of neurological diagnosis and includes essential anatomy and physiology, the mechanism of certain major symptoms, and methods of examination, including special diagnostic techniques, to which Dr. A. E. Ritchie contributes a useful section on the electrodiagnosis of neuromuscular disorders. The second section is on individual diseases. The text is throughout clear, concise, and unambiguous and the information sound and up to date. To each major section is appended a brief list of original papers which the reader might consult with profit. Nearly all of these are in English, but a few classical papers in French and German are included.

The growing contribution of neurosurgery is recognized by the admission of a surgeon to full partnership in the trinity of authorship. Professor Brodie Hughes is solely responsible for the sections on abscesses, aneurysms, vascular malformations, and tumours of the brain and cord and their adnexa, and shares responsibility for those on the examination of the patient and injuries to the head and spinal cord. All these are first rate. Other chapters which deserve special notice in an admirably balanced text are those on disorders of speech and language, mental disorders in organic disease, and infections of the central nervous system (though no treatment is given for Weil's disease). To 700 pages of text there are fifty of a most detailed and helpful index.

Useful additions to a future edition would be a section on occupational cramps (writer's cramp is mentioned only incidentally as a symptom of paralysis agitans), and references to the neurological manifestations of systemic lupus erythematosus, posterior interosseous neuritis (another "tunnel" syndrome), and the otolith syndrome, which are certainly not less common in Britain than cerebral schistosomiasis.

There is a notable absence of major typographical errors, but some of the minor defects and inconsistencies of multiple authorship are evident. On p. 186 tower skull is called turriccephaly; on p. 227 it becomes oxycephaly. Snippets of history are dispensed in some instances—for example, with tabes and G.P.I. (p. 357) but not with disseminated sclerosis or Parkinsonism. Sometimes capitals are used for all words in the nomenclature of disease—for example, Chronic Progressive Chorea (p. 252) and Parkinson's Disease (p. 525); in others this is modified—for example, Neuritic muscular atrophy (p. 247) and von Economo's disease (p. 323). Sometimes (Syn.: . . .), at others (Syn. . . .), and yet at others brackets only are used for synonyms; and, for example, in neurofibromatosis (p. 257), rabies (p. 337), and congenital spastic diplegia (p. 221) yet another form is seen. Moreover, "etc." should not occur among the synonyms (for example, p. 412).

The editor's claim that "eponymous terms have been avoided wherever possible" is hardly justified by the retention, even as synonyms, of such names as Fothergill's disease for tic douloureux, Swift's disease for erythroedema, Albl's ring for the calcification seen radiologically in the wall of an aneurysm, and Chastek paralysis for the lesions which

silver foxes develop when fed on a diet of raw fish (what price "the rare, the recondite" here?). On the other hand, though a description is given of "the adrenal type" of fulminating meningococcal septicaemia, the common eponym Friderichsen-Waterhouse syndrome is studiously avoided.

These criticisms might well appear niggardly and trifling, so it must be emphasized that such minor blemishes are commendably few and do not detract from the excellence of a work whose intrinsic merits and handsome production ensure its place in the treasury of neurological textbooks for which English medicine is so justly famed.

HENRY COHEN.

PANCREATIC NEOPLASMS

The Surgery of Pancreatic Neoplasms. By Rodney Smith, M.S., F.R.C.S. (Pp. 157; 111 figures. £1 15s.) Edinburgh and London: E. and S. Livingstone. 1953.

Mr. Rodney Smith won the Jacksonian Prize of the Royal College of Surgeons of England with the essay that forms the substance of this book. In it he has presented an admirable review of this important subject at a time when just such a balanced and impartial assessment is needed. The operation of pancreatoduodenectomy has passed from a hazardous procedure, successful only in the hands of a few pioneers, to an operation safe enough to be given a recognized position in orthodox operative surgery. The time has come for reassessment. And reassessment has shown that the prospects of cure in cases of malignant growth are much less satisfactory than was hoped at first.

In defining the problem, Mr. Smith states that the distinction between the so-called ampullary carcinomas and carcinomas of the head of the pancreas is of little practical value, and he deals with them together. But later, when he discusses symptoms and indications for operation, he admits the practical value of such a distinction, one that the majority of surgeons consider important. An ampullary carcinoma, whether it arises in duodenal mucosa, the lining of the ampulla, or the terminal bile duct, is a carcinoma that obstructs early and ulcerates early and is therefore recognized early. Further, being on the surface, it tends to spread superficially rather than deeply, to give radiological changes that are recognizable at an early stage, and to bleed early, sometimes so profusely as to call attention to its presence by profound anaemia.

The author presents the figures of Cattell, who has a greater experience of pancreatotomy than any other surgeon, and points out that in ampullary carcinoma the operative mortality is one-third that in carcinoma of the head, and the cure rate is 10 times as high. This is the experience of most surgeons, and, as Mr. Smith points out, the position to-day is that pancreatotomy for cancer of the head is attempted only when a careful preliminary mobilization fails to reveal any evidence of local or distant extension. Chapter XI, on the choice of operation, is admirable. Not everyone will agree with the statement that a one-stage resection is essential. Certainly any attempt at dissection, or any preliminary short-circuits, render the subsequent pancreatotomy almost impossible, but preliminary cholecystostomy, which does not interfere in any way with the operative field, has much to recommend it. A fortnight's drainage allows the liver to recover, and after resection the cholecystostomy removes the risk of leakage at the choledochojunal anastomosis.

One reason why the surgical results in cancer of the pancreas are so bad is because the growth is clinically silent in its early stages, and radiological and biochemical investigations give little help. The author quotes two London radiologists as stating that they have obtained positive evidence by a barium meal in over 50% of cases examined; contact with two such optimists must have been a delightful relief from the hard work of preparing this book. The final sentence in Chapter VIII—"It is bad treat-

ment to allow an operation to be unduly delayed in order to carry out a number of tests"—brings back a cool blast of common sense. In Chapter XVII the author brings out well the sharp distinction between cancer of the body of the pancreas and that of the head—in symptoms, in the technical problems associated with the removal, and in prognosis. The leading symptoms are constant and unremitting severe pain referred to the back and loss of weight.

The book is admirably produced and embellished by well-chosen illustrations, many of them in colour. About the only criticism that can be offered is that Figures 4 to 9 illustrating variations in the blood vessels of the pancreas should be further explained; as they stand they are confusing rather than helpful. But this is a small defect in a book which will be of the greatest help to surgeons and essential to every library.

HENEAGE OGILVIE.

RELIEF OF PAIN IN LABOUR

The Practical Management of Pain in Labour. W. D. Wylie, M.B., M.R.C.P., D.A. (Pp. 148; 42 figures. 18s. 6d.) London: Lloyd-Luke (Medical Books) Ltd. 1953.

Dr. Wylie shows an understanding of the practical problems of pain relief in labour that is somewhat unusual in the specialist anaesthetist, who rarely has the time to acquire much practical knowledge of the subject. Now that an increasing amount of midwifery is being done in hospitals this state of affairs is tending to change, and books such as this will undoubtedly be of the greatest value.

Dr. Wylie discusses pain in normal labour from the usual anatomical and pharmacological aspects and gives accounts of all the available methods now in use for mitigating it. In addition he considers in great detail the problems of pain relief during abnormal labour. The influence of an anaesthetist's general experience on problems peculiar to labour is seen when Dr. Wylie properly deprecates the use of thiopentone as an anaesthetic in these circumstances, and also in the prominence he gives to the danger, ever present in obstetric anaesthesia, of vomiting and its sequelae. The illustrations, though not numerous, are adequate, and in the main are reproductions of commercially supplied pictures and diagrams of apparatus. They are mostly gathered together in one group of pages in the centre of the book, an arrangement not always convenient for the reader. Altogether, this is a well-written, helpful, practical account of pain relief in labour as practised in Britain.

W. W. MUSHIN.

THE THYROID GLAND

Joll's Diseases of the Thyroid Gland. By Francis F. Rundle, M.D., F.R.C.S. Second edition. (Pp. 520; 165 figures. £4 4s.) London: William Heinemann Medical Books. 1951.

The Thyroid. By Professor T. H. McGavack, M.D., F.A.C.P. With a section on Surgery by Professor J. M. Winfield, M.D., F.A.C.S., and W. L. Mersheimer, M.D., F.A.C.S., and a section on History by Dorothy B. Spear, Ph.B., and T. H. McGavack. (Pp. 646; illustrated. £4 15s.) London: Henry Kimpton. 1951.

These two excellent books are almost exactly the same size in area and thickness, but they will appeal to different classes of reader. Traditional scholarship is well served by the new edition of "Joll," and, if little of the book was written by its original author, the complaints will be few. It is pleasing that Rundle, who could have written an excellent textbook under his own name, should have preferred to commemorate his old master at the New End Thyroid Clinic, for Joll was greater than the work he left behind him and deserves a memorial. Considering that the preface is dated November, 1950, the book is remarkably up to date. A lot of ¹³¹I has passed through the Geiger-Müller counters since then, but the references to radioactive iodine in diagnosis and treatment are full enough for the general reader. Neither this nor any other scientific consideration is allowed to alter the balance of an essenti-

ally clinical book, which gives an excellent impression of knowledge tested and illumined by the practical experience of its authors.

One can read Rundle for pleasure as well as profit. No one could read McGavack; the facts are too closely packed, the references too detailed and too numerous. It is astonishing how much information is given in so small a space, but because of this McGavack (though it is in fact a few ounces lighter) is heavier going for the reader than Joll. This is a book for the specialist, especially if he wants fundamental physiology, laboratory techniques, and the latest information (which cannot, in a book, be very recent) about radioactive iodine.

I think I would advise buying both books.

RAYMOND GREENE.

OBSTETRICS AND GYNAECOLOGY

Recent Advances in Obstetrics and Gynaecology. By Aleck W. Bourne, M.B., B.Ch.(Camb.), F.R.C.S., F.R.C.O.G., and Leslie H. Williams, M.D., M.S.(Lond.), F.R.C.S., F.R.C.O.G. Eighth edition. (Pp. 339; 92 figures. £1 7s. 6d.) London: J. and A. Churchill. 1953.

This justifiably popular book has reached its eighth edition in twenty-seven years, and the authors' zest and power to sift the wheat from the chaff remain as remarkable as in their first edition. In order to keep the total work the same size and yet to cover individual subjects adequately, the number of chapters is now reduced to eleven. Three of these are on new topics—hypertension and pregnancy, functional uterine haemorrhage, and intravascular thrombosis and embolism. The remaining chapters have been revised and brought up to date, and some of the revision is very extensive. Obstetric radiology is covered by Dr. E. Rohan Williams, and radiotherapy in gynaecology by Dr. W. M. Levitt.

All those specializing, or hoping to specialize, in obstetrics and gynaecology will welcome this book, although views on which chapters are most helpful and interesting will vary with the reader's taste. Some will give pride of place to the articles on lactation and on carcinoma of the cervix—both subjects on which ideas have changed and are changing rapidly. Others may prefer the accounts of weight change and water balance in pregnancy, or thrombosis and embolism. The concise review of the literature and the summing up to give some sort of practical guide are usually masterly, and carry that most important imprint, the authors' personality and experience. When space is limited, how difficult it must be to choose the subjects to be included in a work of this kind, to decide which advances are sufficiently consolidated to merit permanent recognition in this form, and which developments are so uncertain of future acceptance as to warrant discard. The choice made by Mr. Bourne and Mr. Williams will find favour in the eyes of large numbers of readers.

T. N. A. JEFFCOATE.

The well-known *Textbook of Medical Practice* edited by Dunlop, Davidson, and McNee has now reached its sixth edition (E. and S. Livingstone, Ltd., 50s.). All sections have been revised and many of them largely rewritten. New chapters have been included on chemotherapy, rehabilitation, the treatment of poisoning, and the chemotherapy of malignant disease. An unusual change is that the volume has been equipped with that essential feature a completely new index. Also appearing in its sixth edition is *Recent Advances in Pathology*, edited by Professor Geoffrey Hadfield (J. and A. Churchill, Ltd., 30s.). An attempt has been made to discuss in this edition disorders of function and their relation to general physiological principles. The section on endocrine organs has been completely rewritten, and the account of pulmonary diseases covers a wider field than in previous editions. *An Atlas of the Commoner Skin Diseases*, by Dr. C. G. Semon, has been revised for a fourth edition (Bristol: John Wright and Co., Ltd. London: Simpkin Marshall, Ltd. 75s.). All the 147 plates are in colour, and some new ones have been added.

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TUBERCULOSIS OF BOVINE ORIGIN

A difficulty with which anyone campaigning for safe milk in recent years has had to contend was the lack of modern information about the amount of tuberculosis attributable to infected milk. The well-known findings of Stanley Griffith are now 20 years old, and only a fresh survey could decide how far the position had changed since the early nineteen-thirties. Such a survey was undertaken by the Medical Research Council as part of an inquiry into the causes of an apparent increase in the death rate from tuberculosis in the early part of the war, and the whole of the findings in the three areas of Great Britain have now been published by the National Association for the Prevention of Tuberculosis.¹ The investigations covered the period 1943-5 in England and Wales, 1943-4 in Scotland, and 1945-50 in Northern Ireland, and consisted in typing tubercle bacilli from cases of non-pulmonary tuberculosis and pursuing detailed inquiries about the patients from whom they were derived. The number of strains examined was 994 in England, of which 261 (26.3%) proved to be bovine, 112 in Wales (19, or 17%, bovine), 1,051 in Scotland (228, or 21.7%, bovine) and 387 in Northern Ireland (16, or 4%, bovine). The fact that the Northern Ireland investigation was carried out later, and the inclusion in it of a very high proportion of cases of meningitis, render direct comparison with the other figures unjustifiable: it would nevertheless seem from these results that the prevalence of infection of bovine origin in Northern Ireland is much lower than elsewhere.

The main result of this survey is to show that tuberculosis of bovine origin has remained a serious problem. It can be calculated from the findings that in 1944 550 deaths in Great Britain from tuberculous meningitis and 1,050 from other varieties of non-pulmonary disease were due to bovine bacilli. This total of 1,600 annual deaths is not far short of the figure calculated from Griffith's results 20 years ago. To this, in any assessment of the effects of milk-borne infection, must be added the consequences of invali-

¹ Wilson, G. S., Blacklock, J. W. S., and Reilly, Lilian V., *Non-pulmonary Tuberculosis of Bovine Origin in Great Britain and Northern Ireland, 1952*, London.

dity or disablement in many thousands of patients with non-fatal infections. Detailed study of the age and sex incidence, history of raw milk consumption, history of contact with another case, and geographical distribution brings out a number of interesting points. The most notable and significant change is in the age incidence. In Griffith's series the highest incidence of bovine infection in every part of the body separately considered was in the 0-4 age group. According to the recent findings the age during which non-pulmonary tuberculosis is most often due to bovine bacilli is now 5-9 years; indeed, there is a general shift towards a later age incidence, a substantial proportion of bovine infections being in patients of 15 and over. The percentages of bovine infection in cases of meningitis and surgical tuberculosis respectively were in England 28.6 and 50.5 at ages 0-4 and 35.4 and 53.7 at ages 5-9. In Scotland the corresponding figures were 17.9% and 51.3% at ages 0-4 and 10.2% and 70.8% at ages 5-9. Why meningitis in Scotland alone should retain the older age distribution is unexplained.

There are several other minor discrepancies or differences of this kind between the findings in the several reports. Changes in feeding habits seem to provide the correct explanation for the more frequent occurrence of bovine infections in older children in recent times. Whereas in earlier days infants were often fed on cow's milk of doubtful quality, the efforts of welfare clinics have led to the introduction of systems of infant feeding with dried or other safe forms of milk, and the risk at this age and for some time after it, when similar foods continue to be used, is thus much diminished. On the other hand, the milk-in-schools scheme has led to a greatly increased consumption of milk from the age of 5 onwards, and some of this is still neither tuberculin-tested nor pasteurized. That the risk is not confined to childhood is illustrated by the fact that 30% of bovine infections in the English series were in patients aged 15 and over. The report also emphasizes that prolonged and regular consumption of raw milk is not always necessary to produce overt infection: inquiries into milk-drinking histories sometimes showed that its consumption can only have been "slight or occasional." Perhaps this evidence should not be accepted too literally: those questioned had to think back for some years, and a surprising number of intelligent people do not know whether the supply to their homes is pasteurized even at the time when they are asked about it. This report nevertheless affords strong support to the case for the general pasteurization of milk from any but T.T. herds.

DISTRIBUTION OF DOCTORS

The fourth report of the Medical Practices Committee, a summary of which is to be found in the *Supplement* of this issue, has just been received by executive councils of England and Wales. It covers a period of 18 months up to the end of 1952. This interesting document contains an analytical survey of the movement of general practitioners since July, 1948, and for the first time an attempt has been made to assess the effectiveness of "negative direction" upon the distribution of doctors. The committee admits that it is rather early for such an assessment. Some of the figures are for various reasons not wholly accurate, and four and a half years is hardly long enough for general practice to have shaken down in the Health Service environment: but the committee thinks that now is the time to look back before entering the new era of the Danckwerts award and the Working Party's scheme, which, in the words of the report, "are bound to have rapid effects on the distribution of medical manpower."

The figures given in the report illustrate clearly the relative changes in the distribution of doctors since 1948. The average size of list throughout the whole country was 2,461 in 1948 and 2,430 in 1952. This reduction is not big, but the wide discrepancies in the average size of list which were evident in different parts of the country have narrowed. In 1948, for instance, the average in Radnorshire was 1,120, while in parts of Glamorganshire it was over 8,000: in 1952 these figures had become 1,320 and 2,832 respectively. In 1948 there were 6,648 principals with average lists of 3,163 in areas where the average lists were high. By January, 1952, the picture had changed to 7,397 principals with average lists of 2,869: this represents an increase of 11% in the number of principals practising in these areas. Conversely, in areas where the average lists were low in 1948 there has been a 10% reduction in the number of principals and an increase in the average list from 1,648 to 2,010. This shift in distribution is clear evidence that the powers given to the Medical Practices Committee under the Act have been used effectively.

A reflection on the effect of the Danckwerts award and Working Party's scheme on partnerships is to be found in the report: "From the numbers of new partnerships of which we have been notified each week since July last we know that the process of assimilating doctors into general practice in this manner (partnership) has again been restored to a satisfactory level. During the next few months the number is likely to exceed those hitherto admitted

during any similar period." Again: "As a result of the Working Party's report, an increasing tendency for assistants in the larger practices to be taken into partnership has been noticed." The number of full-time assistants, other than trainees, dropped from 1,724 in 1951 to 1,566 in 1952. This is encouraging news to all who think that the best way of entry into general practice is by way of assistantship to partnership.

The task of the Medical Practices Committee is not easy. Its decisions must at times be unpopular and open to the criticism that a central body cannot be entirely conversant with local needs. In particular the task of reclassifying areas undertaken by the committee last year might well have led to disagreement with local executive councils and local medical committees. The fact that views were reconciled more easily than expected is a tribute which the central committee gladly pays to the local bodies. All this emphasizes the tact and understanding with which the Medical Practices Committee and its officials did their job.

THROMBOCYTOPENIC PURPURA

A useful introduction to the study of this disease is given in a review of eighty-nine cases by Hirsch and Dameshek,¹ since it provides what is so often lacking in otherwise comprehensive clinical accounts—a clear picture of the natural history of the disease. They define as "idiopathic" those cases of thrombocytopenia in which there is a normal or increased number of megakaryocytes in the bone marrow, and an absence of splenic disease and of conditions affecting the red- or white-cell precursors. Among the cases satisfying these conditions, two sharply differentiated groups were apparent.

The first group, consisting of 18 patients, was characterized by an acute onset of purpura haemorrhagica which subsided spontaneously in a few weeks or months. In 11 of these patients there was a probable aetiological factor such as a virus infection or the taking of a toxic drug before the onset of purpura. The second group consisted of 52 cases of chronic thrombocytopenic purpura in which haemorrhagic symptoms had persisted with fluctuating severity for many months or years, with no complete remission. Aetiological factors were not apparent in the majority of these patients, though in some cases chronic drug intoxication was possible.

It is clear that the recognition of these two varieties of thrombocytopenic purpura is important. In the first (acute) group splenectomy is probably contraindicated, since the condition is self-limiting. Transfusions of fresh blood, preferably taken by means of silicone-coated apparatus, have been found beneficial in tiding

the patient over the worst episodes. It is pointed out that reports of supposedly favourable responses to A.C.T.H. or cortisone may refer to its use in this type of naturally remitting thrombocytopenia.

In the chronic form of the condition only splenectomy seems to be of any real benefit, and the patient is likely to suffer from more or less severe haemorrhagic episodes until it is performed. Of 45 patients whose spleens were removed, 20 were cured, 10 received no benefit, and 3 died, while the remaining 12 survived the operation but were not followed up for a sufficient time to determine its effect.

Much remains to be learned about the aetiology of thrombocytopenic purpura. It is probable that in 11 of the 18 cases of the acute disease reported by Hirsch and Dameshek some toxic or infective process caused the thrombocytopenia, which was relieved when the toxic drug was withheld, or when the infection subsided. It is likely that in the remaining seven patients a similar but unidentified mechanism was operating, particularly as a blood eosinophilia or lymphocytosis was a feature of these acute cases.

Drugs had also been taken by a number of the patients suffering from chronic thrombocytopenia, and one patient was a habitual consumer of "sedormid." Some cases, at least, of chronic thrombocytopenia may be due therefore to chronic exposure to some toxic process. In this connexion the work of Ackroyd² is of the greatest significance. He has shown in thrombocytopenia due to sedormid that there is a factor in the patient's plasma which is capable *in vitro* of destroying platelets, provided that sedormid and complement are both present. It is probable that sedormid forms with the platelets an antigenic complex to which the sensitive patient produces an antibody, and this complex is destroyed by the antibody in the presence of complement. A similarity to the mechanism of haemolysis in acquired haemolytic anaemia is at once apparent. This similarity is emphasized by the observation of Evans and Duane³ that thrombocytopenia occurred in a number of patients suffering from haemolytic anaemia, and by that of Wright and colleagues⁴ that in six cases of "essential" thrombocytopenia there was evidence of an antibody coating the red cells. Evans and his colleagues⁵ have been able to demonstrate agglutination of platelets by the sera of some patients with "essential" thrombocytopenic purpura. The possibility that idiopathic thrombocytopenia is in many cases due to the presence of a lysin, damaging both platelets and megakaryocytes, and sometimes also the red cells, must be seriously considered. The finding by Harrington and co-workers⁶ that thrombocytopenia and purpura occur in normal subjects receiving transfusions of blood from patients with idiopathic thrombocytopenia could be

explained by the presence of such a lysin in the transfused blood. The effect of splenectomy might therefore be the same (though still unexplained) in both haemolytic anaemia and thrombocytopenic purpura.

Lastly, these observations give some information on the mechanism of the haemorrhagic state in the purpura. Ackroyd's finding that the local application of sedormid to the skin of sensitive patients caused purpuric haemorrhage in the area of application proves that a local vascular lesion is produced by the toxic agent. Ackroyd suggests that sedormid may form a complex with the vascular endothelium, which is then susceptible to damage by the platelet lysin, and there is evidence that, antigenically, platelets and vascular endothelium are very similar. Any agent that damages platelets may therefore damage endothelium, and it is probable that the vascular damage, and not the thrombocytopenia, is the principal cause of the haemorrhage. The haemorrhagic manifestations of thrombocytopenic purpura may be temporarily alleviated by the transfusion of platelet-rich blood,⁷ but the clinical improvement lasts up to 48 hours after the platelet count has relapsed to its original level. The platelets therefore exerted some indirect effect on the haemostatic mechanism in this experiment. Perhaps they absorbed from the circulation a lysin which impaired capillary function.

PLANT SEED HAEMAGGLUTININS

The existence of substances in the seeds of certain plants which agglutinate human and animal erythrocytes has been known for over 50 years, and in 1908 Landsteiner and Raubitschek¹ demonstrated that the extracts of seeds of some leguminous plants agglutinated the red cells of certain species of animals, whereas the red cells of other species remained unagglutinated. But not until 40 years later was it discovered that extracts of seeds could be used to distinguish the blood group characters of human erythrocytes.

Renkonen² studied 99 species of the family Leguminosae (pea family) and found that extracts of the seeds of 31 species had a non-specific agglutinating action against human red cells and that extracts of the seeds of six species had a specific action. Among the latter were extracts of *Vicia Cracca* (tufted vetch), which contained a powerful anti-A agglutinin, and extracts of *Lotus Tetragonolobus*, *Laburnum alpinum*, and *Cytisus sessilifolius* (broom) seeds which contained agglutinins reacting strongly with O and A₂ cells. An examination of the seeds of 262 varieties of plants belonging to 63 families by Boyd and Reguera³ and of those of certain Egyptian plants by Boyd⁴ revealed a number of other seed extracts which possessed a moderately specific agglutinating action. Several species of *Phaseolus* had a strong anti-A activity, and in particular *Phaseolus limensis* (Lima bean) var. *limenanus* was found to yield extracts which were completely, or almost completely, specific for erythrocytes of blood group A. No evidence

was obtained that any of the extracts acted specifically on the B, M, or N antigens or on those of the Rh system. Another source of specific and highly active anti-A agglutinins has been demonstrated by Bird,⁵⁻⁸ who has examined the behaviour of extracts of seeds of *Dolichos biflorus*—Belgaum 1-1-8. The agglutinins from these seeds show a much greater affinity for A₁ and A₁B cells than for A₂ and A₂B cells, but Bird considers that the extract can be used as a substitute for human anti-A sera provided special care is taken and freshly prepared extracts are used. As a reagent for the differentiation of the subgroups of A the *Dolichos biflorus* extracts present advantages over absorbed human anti-A serum because of the large difference between the titres against A₁ and against A₂ cells: in tests on 200 Indian blood samples of groups A and AB complete correspondence was found between the results obtained with the seed extract and those obtained with human anti-A serum. Extracts of *Vicia Cracca* seeds also react more strongly with A₁ than with A₂ cells, but this does not seem to be due to the presence of two antibodies, since absorption with A₂ cells was found to remove all antibodies against A₁ cells.⁹

The previous studies on plants of the family Leguminosae were repeated and extended by Cazal and Lalaurie⁹ to cover 420 species. They found agglutinins reacting preferentially with O and A₂ cells in some species in the Genisteae and Loteae and agglutinins for A cells in some species in the Galegeae, Viciaceae, and Phaseoleae, but they failed to find an extract which would react specifically with B cells. Agglutinins re-active to a fairly high titre with B cells have been reported, however, by Krüpe and Braun¹⁰ to be present in extracts of seeds of *Sophora japonica*; the extracts also contain agglutinins reactive with A cells, but the authors have indicated that these can be removed by absorption.

Recently the specificity of certain of the plant seed haemagglutinins has been examined in terms of purified human blood group substances and simple sugars of known structure.¹¹ Aqueous extracts of the seeds of three species reactive with O cells were inhibited by H-substance and the agglutinins in one of these extracts, H-substance and the agglutinins in one of these extracts, were inhibited by α -that of *Lotus Tetragonolobus*, were inhibited by α -that of *Lotus Tetragonolobus*, were inhibited by the methyl-L-fucopyranoside to a higher titre than by the H-substance and also, less strongly, by sugars possessing structures related to that of L-fucose. Human A-structures related to that of N-acetylchondrosamine, substance, and to a slight extent N-acetylchondrosamine, neutralized the anti-A agglutinins extracted from *Vicia Cracca* and Lima bean seeds. The agglutination of A or B cells by extracts of *Sophora japonica* seeds was found to be inhibited by either A or B substances and by N-acetylchondrosamine.

¹ Zbl. Bakt., 1. Abt. Orig., 1908, 45, 660.
² Ann. Med. exp. Biol. Fenn., 1948, 26, 66.

³ J. Immunol., 1949, 62, 333.

⁴ Ibid., 1950, 65, 281.

⁵ Curr. Sci., 1951, 20, 298.

⁶ Ind. J. med. Res., 1952, 40, 289.

⁷ J. Immunol., 1952, 69, 319.

⁸ Nature, Lond., 1952, 170, 674.

⁹ Cazal, P., and Lalaurie, M., Acta Haemat. (Basel), 1952, 8, 73.

¹⁰ Naturwissenschaften, 1952, 39, 284.

¹¹ Morgan, W. T. J., and Watkins, W. M., Brit. J. exp. Path., 1953, 34, 94.

The discovery of agglutinins in plant seeds which exhibit human blood group specificity has suggested the possibility of their future use as reagents for routine blood group determinations in place of human iso-agglutinating sera, but it is too early yet to assess whether this will be practicable or advantageous. The demonstration of these agglutinins in seeds has, however, given further evidence of the wide distribution in nature of materials related serologically to the antigens and antibodies classified within the human ABO system and has provided useful additional reagents for studies on blood group specificity.

ENDEMIC GOITRE

In recent years the treatment of thyrotoxicosis by thiouracil and radioactive iodine has rather stolen the limelight from the immense problem of endemic goitre which has to be solved in countries scattered all over the world. In order to encourage Governments to investigate this common disorder and take steps to remedy it in their respective territories, the World Health Organization at the end of last year brought together a study group at the National Institute for Medical Research, Mill Hill. Fifteen representatives from Britain, Mexico, Australia, the United States, Yugoslavia, Switzerland, Holland, and India were welcomed by Sir Charles Harrington, who has himself made such valuable contributions to the study of the thyroid gland. Sir Charles quoted these words from a memorandum¹ of the Goitre Subcommittee of the Medical Research Council:

"The immediate cause of simple goitre is failure of the thyroid gland to obtain a supply of iodine sufficient to maintain its normal structure and function. This failure is usually brought about by an absolute environmental deficiency of iodine; it may also be caused by factors which interfere with the availability of dietary iodine or which impose an abnormal demand on the thyroid gland."

This simple exposition of the problem was reinforced by Dr. Kimball, who recounted his early experiences with the iodization of salt in Akron, Ohio, and later in the State of Michigan, where school surveys eventually showed the elimination of goitre.

The problem as it presented itself to some of the other members of the group was by no means so simple. In underdeveloped countries salt may be so crude or obtained directly by each individual that it is impossible to add iodide to it. Again, the salt may be so damp or stored in such hot and humid conditions that even when the iodide has been added it rapidly disappears. To add to the complications, some races may consume three times as much salt as others, or so it was claimed. The possibility of adding iodate instead of iodide to the salt was discussed. Iodate is much more stable, as Professor Murray's work showed, and is just as readily available to the thyroid, as Dr. Pochin neatly demonstrated by administering it in radioactive form

¹ Lancet, 1944, 1, 107.

² Campbell, J. M. H., J. Hyg., 1927, 26, 1.

³ J. clin. Endocrinol., 1952, 12, 191.

¹ Arch. Intern. Med., 1951, 88, 701.

² Clin. Sci., 1949, 8, 235, 269; *ibid.*, 1951, 10, 185.

³ Blood, 1949, 4, 1196.

⁴ J. Lab. clin. Med., 1951, 37, 165.

⁵ Arch. Intern. Med., 1951, 87, 48.

⁶ Proc. Amer. Soc. clin. Invest., 1951, April 30, p. 25.

⁷ Stephanini, M., Chatterjee, J. B., Dameshek, W., Zannos, L., and Santiago, E. P., Blood, 1952, 7, 53.

Infection

Convulsions may also be due to infection of the brain or meninges. Virus encephalitis, encephalo-myelitis, bacterial meningitis, and, rarely, syphilitic pachymeningitis may begin in this way. Examination of the cerebrospinal fluid will assist the diagnosis and there may be other suggestive physical signs in the central nervous system. Lumbar puncture should not be lightly undertaken in the presence of papilloedema, for a brain tumour is then a possibility, with a pressure cone. Sudden release of cerebrospinal fluid may then prove fatal. If, therefore, in doubtful cases this investigation has to be undertaken, very little fluid should be removed and the operator should be prepared to inject sterile normal saline into the thecal canal immediately any alarming effects are noticed.

Localized Intracranial Lesions

Tumours of the brain situated supratentorially may give rise to convulsions as an early manifestation; in fact a Jacksonian epileptic attack may have some localizing value. Since, however, the cerebellum and pons are much more likely to become involved in children, fits are not often the presenting sign. The commonest site for *abscesses* is either the cerebellum or the temporal lobe, by direct extension from an infected ear or mastoid. Fits are therefore not a common feature, but they may result from pyaemic abscesses, which can develop anywhere in the brain. A more likely cause of fits from a localized lesion is a *subdural haematoma*. Its development from birth trauma has already been mentioned and also the delay before its presence is suspected. This is because it takes time for the haemorrhage to become fibrinized into a cystic tumour which absorbs fluid, gradually increases in size, and encroaches on neighbouring structures. The clinical picture then is that of progressive hydrocephalus with separation of the sutures and, in all probability, fits. Surgical removal of the cyst is followed by complete recovery. A blow on the head, seemingly insignificant at the time, may bring about the same sequence of events. Gross hydrocephalus from other causes may also produce convulsions, and for this reason fits usually occur in a rare protozoal infection—toxoplasmosis.

Epilepsy

This forms the largest group in any paediatric practice, and, although much can be done to control such fits, these cases are always likely to recur. Heredity plays a considerable part, but it is also possible for fits in one generation to be followed by migraine in the next and vice versa. Some indication of the outlook in epilepsy may be gathered from what occurred in a parent or elder brother or sister who suffered from similar trouble in childhood. If the disorder disappeared as they grew older, there is a reasonable prospect of the same happening in the child now brought for advice. Adie singled out a group of patients who suffered from innumerable attacks which were uninfluenced by any form of treatment. They appeared to be familial and tended to clear up at puberty (pyknolepsy).

Petit Mal.—This type of epilepsy is too well known to need detailed description. Difficulty in diagnosis may arise at first, since the lapse of consciousness may be so very brief as to pass unrecognized. The child may merely change colour momentarily or cease what he is doing and not resume where he left off. Two of my patients are particularly good examples of this. One boy was undressing to retire for the night, when he suddenly stopped and proceeded to re-dress himself and walk downstairs, thinking it was time to get up. The other, a young girl, set forth to fetch some milk from the local dairy. On her way she had her first "turn," with a brief gap in her train of thought. She never completed her errand and came home with an empty can. Parents sometimes bring their child because of "day-dreaming," which takes the form of a vacant stare into the distance for a few moments. Occasionally other epileptic equivalents are seen which make children behave

in an odd way. The lapse of consciousness may be just long enough for a child with *petit mal* to lose his balance and drop forward from a sitting posture. Recovery is almost instantaneous, and when the fits are often repeated they resemble the obeisances of an old Indian servant, and hence have been called "salaam convulsions." For the most part, however, *petit mal* is easy to recognize, the short seizures becoming more and more frequent until a bad case may develop as many as 50 a day. The differential diagnosis is not difficult. At times asphyxial attacks as a result of breath-holding have been mistaken for minor epilepsy, but the fact that they occur only when the child is thwarted and in a temper tantrum is enough to give the case away. The remedy, a douche of cold water, is both simple and effective. A Stokes-Adams syndrome is exceptional in childhood, although rare examples have appeared in congenital heart-block. Sudden cerebral anaemia is more likely to occur in the severest forms of Fallot's tetralogy, with an asphyxial "black-out" on the slightest exertion.

Grand Mal.—*Petit mal* can continue for some years, but after a time it generally becomes interspersed by major attacks. The reverse is not seen; if children begin with major epilepsy, this is the type of fit which will be repeated. It has the same characteristics as in adults, sometimes with incontinence of urine at the time, and often with vomiting, headache, and drowsiness afterwards. Auras are not likely to occur or are not recognized as such. Temporary paralysis of a limb, or a unilateral extensor plantar response, persisting for some days after a severe and prolonged fit, is not uncommon (Todd's paralysis). Outside influences, such as an accidental knock or a fever, can also sometimes precipitate an attack. There may then be difficulty in distinguishing true epilepsy from a symptomatic fit, and the diagnosis will depend on whether other attacks have occurred spontaneously. Help will also be gained from an electroencephalogram, which in idiopathic epilepsy will show characteristic waves. Occasionally, epilepsy will begin in a Jacksonian manner, although later it will take on the more usual form.

Status epilepticus, in which one fit succeeds another for one or two days on end, is a most dangerous condition. Every step should be taken to terminate it, otherwise the child may succumb through sheer exhaustion and with a high temperature. In some cases there is irretrievable damage to the brain.

Treatment of Epilepsy

Many drugs have been tried in idiopathic epilepsy. Bromides have largely passed into disuse and their place has been taken by phenobarbitone, which is particularly useful in grand mal, but less effective in *petit mal*. For infants $\frac{1}{4}$ to $\frac{1}{2}$ gr. (8 to 16 mg.) can be given twice a day as a maintenance dose; older children can take up to 1 to 3 gr. (65 to 200 mg.) a day according to age. Toxic signs will appear as ataxia, a rash, depression, and, occasionally, such excitability that the child will become difficult to control. Methylphenobarbitone has been claimed to be less toxic and so can be given in a dosage which is 50% to 100% greater. Phenobarbitone often fails in *petit mal* and then it is worth changing to phenytoin, $\frac{1}{4}$ to 3 gr. (50 to 200 mg.) daily up to 6 years of age; 3 to 4½ gr. (200 to 300 mg.) over 6 years.

Troxidone and "paradione," a less toxic compound, have been recommended as specially useful in *petit mal*, but they can have alarming side-effects, and patients on these drugs should remain under careful medical supervision and have blood counts carried out fortnightly at first, and then at monthly intervals. Leucopenia with agranulocytosis, albuminuria leading occasionally to Type II nephritis, rashes, and digestive upsets are the chief complications. It is advisable to combine troxidone with phenytoin, as otherwise there is danger of the treatment provoking an attack of grand mal. The dose of troxidone is 0.3 g. daily in three divided doses up to 2 years of age; 0.6 g. daily from 2 to 6 years; and 0.9 g. over 6 years. My experience with this drug has not

been very encouraging. "Mysoline" has undergone quite recent trials with reported good results in major epilepsy. A suitable dose would range between 0.25 and 0.75 g. daily, but the treatment is still in the experimental stage, and the optimum dose for children has not yet been established.

It is obvious from this account that of the two types of epilepsy *petit mal* is the most difficult to control, and sometimes the older forms of treatment are still found to be effective. Tincture of belladonna, 10 minims (0.6 ml.), combined with sodium borate, 6 gr. (400 mg.), three times a day for a child of about 6 years, is worth trying, and when everything else fails a ketogenic diet may save the situation. This is made up with an adequate amount of protein and with the proportion of fat to carbohydrate and protein in the ratio of 3 to 1, the total calorie value being 50 to 60 per kg. per day, depending on whether the child is under or over 5 years of age. Obviously with the present rationing in this country it is not easy to maintain this diet out of hospital, but special permits can be obtained at the local food office.

The urgency of treating status epilepticus energetically should again be emphasized. Chloroform and rectal thiopentone (1 g. per 25 kg. of body weight, diluted to a 2½% solution with water) are only temporary measures. Intramuscular injections of paraldehyde, 1 to 6 ml., according to age, is certainly the most effective and may have to be repeated if the fits recur.

Vasovagal Attacks and the Periodic Syndrome

There remain two other disorders which have not so far been considered. Girls, particularly when they are approaching puberty, are sometimes brought to the doctor with a history of fainting. Some strain such as early morning devotions on an empty stomach may be found responsible, and in others it is an inadequately functioning vasomotor system with sudden changes of position which is at fault. In any case the nature of the attacks, the colour of the patient, and the absence of any immediate sequelae are enough to differentiate them from true convulsions. Much more difficult to determine are the short lapses of consciousness which sometimes occur in migraine, cyclical vomiting, and the rest of that syndrome, but these black-outs cease as the child grows up and never develop into true epilepsy. They are nevertheless largely prevented by phenobarbitone.

In conclusion it can be said that fits in children are a common event and have a distinctly varied origin. Many of them are merely an expression of some temporary disorder; others are of a more serious and permanent nature. Among the latter, heredity plays an important part which is not unknown to the laity as well as to the medical profession:

Year by year in pious patience
Vengeful Mrs. Boffin sits
Waiting for the Sleary babies
To develop Sleary's fits.
—RUDYARD KIPLING.

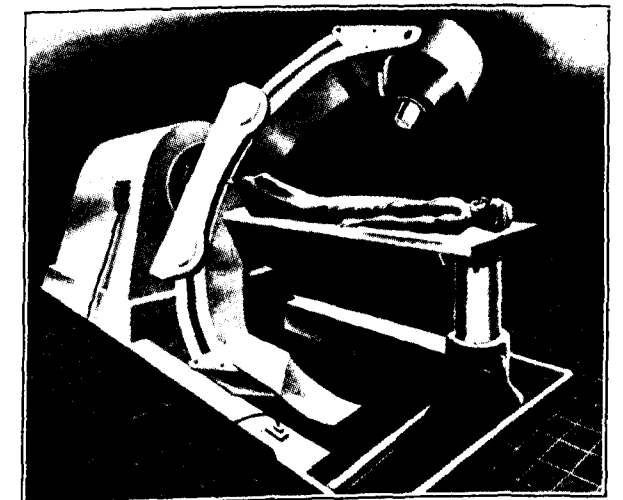
Next Refresher Course Article.—"Recurrent Boils," by Dr. S. T. Anning.

Some details of the scheme to establish medical hostels for industrial workers with rheumatism are given in the fifth annual report of the British Rheumatic Association. The first hostel was established last year at Northwood, in Middlesex, and when funds become available others are planned for Scotland, the industrial North, and the Midlands. Their object is to cut out long delays in waiting for hospital beds. Hostels will be sited near the rheumatic unit of a general hospital so that patients can start treatment at once. The hostels will be managed by the newly formed B.R.A. Homes Ltd., a housing society with charitable status. It is estimated that among miners alone absenteeism caused by rheumatism costs the country £15m. a year.

BEAM THERAPY GIFT TO CANCER CAMPAIGN

Presiding at a special meeting of the British Empire Cancer Campaign at the House of Lords on March 10, H.R.H. the Duke of Gloucester announced a generous gift to the Campaign of a cobalt-60 beam therapy unit. He said that the presence of considerable deposits of cobalt in Canada had led to large-scale experiments there on artificial radioactivity, and a few cobalt units for research into the treatment of cancer had been constructed in the Dominion. A unit had now been built incorporating all the improvements found desirable from experience with the earlier models, and it was this unit which had been presented to the Campaign. Sir Stanford Cade and Professor B. W. Windeyer, who visited Canada recently, had discussed the matter with their Canadian colleagues, and the financial difficulty had been removed by the action of one of Canada's outstanding philanthropists, Mr. McConnell, of Montreal, who had offered to pay for the entire unit himself at a cost of over £25,000.

His Royal Highness added that the unit was due to arrive in this country in August and would be installed at Mount Vernon Hospital, Northwood, after being first exhibited at



A Canadian artist's impression of the cobalt rotational beam therapy unit. (By courtesy of the British Empire Cancer Campaign.)

the seventh International Congress of Radiology at Copenhagen in July. The Campaign had arranged for a prominent physicist, who would be one of those working with the unit when it was installed, to go to Canada next month to gain first-hand knowledge of its operation.

Lord Horder, Chairman of the Campaign, in expressing appreciation of the gift, said that this new apparatus made him feel how far they had travelled in radiophysics in the last 25 years. It also brought home the complexity and difficulty of this subject, the enormously increased cost of the armamentarium, and the demand which its effective operation made upon highly trained personnel.

The Minister of Health, Mr. Iain Macleod, said that this was the most massive weapon ever made in this field. He expressed thanks to all concerned, in particular to Mr. McConnell for his magnificent financial contribution, to Mr. Paul Martin, Minister of National Health and Welfare in Canada, for his co-operation, and to the British Empire Cancer Campaign for undertaking the care and operation of this unit. It was altogether a fine chapter in voluntary effort.

Cobalt in Radiotherapy

Sir Stanford Cade and Professor Windeyer then gave a brief exposition of the place of cobalt in radiotherapy. Cobalt-60, a radioactive isotope, said Sir Stanford Cade, was at present the most suitable substitute for x rays and

radium, and in small quantities it had been used in this country as such. The cobalt unit would be both a tool for research and an instrument for treatment. It was nearly 200 times as powerful as the radium units in use at present. Its depth dose of radiation was about the same as that of 3,000,000 electron volts of x rays, but it was more stable, more reliable, and simpler to control than a supervoltage x-ray machine. The primary object in view was to treat inaccessible tumours which so far had proved beyond the effective range of existing radiotherapy apparatus. A further advantage was that a greater quantity of radiation could be delivered to the tumour with less damage to surrounding normal tissues and less general disturbance of the patient.

Professor Windeyer said that the most obvious way for cobalt-60 to be used was as a replacement for radium in some of the apparatus for telecurie therapy, the so-called radium bomb. Some 10-gramme radium units—the largest yet to be used in Britain—had been replaced by cobalt in amount up to a maximum of 50 curies.

The first massive telecobalt unit had been installed in the Victoria Hospital, London, Ontario, in November, 1951, and at about the same time a similar one, constructed by the staff of the University of Saskatchewan, was installed at Saskatoon. These units contained approximately 1,100 curies of cobalt-60, which was the equivalent of about 1,500 grammes of radium. The unit which was being given to the Campaign would contain the same amount of cobalt-60, but it was a greatly improved model. It could be used for rotational therapy, for example. On both technical and economic grounds the construction of a radium unit of such activity would be quite impracticable. The cost alone would be well over £1m. and the radium would take up too great a space. The cobalt-60 source was in the shape of a disk only 1 in. (2.5 cm.) in diameter and $\frac{1}{4}$ in. (1.3 cm.) thick. The beam of radiation coming from the unit could be compared in penetration power to that produced by an x-ray machine working at 3,000,000 volts, but with a somewhat lower output. It must be realized, however, that cobalt-60 deteriorated to half its original intensity in just over five years, and it was therefore necessary to arrange for reactivation of the source in a nuclear reactor at regular intervals. In addition to the original apparatus in London, Ontario, and in Saskatoon, there was one working in Vancouver, and arrangements were being made for units of this new model to be installed in Toronto, Montreal, and New York.

THE ELDERLY "CHRONIC"

Every student of geriatrics knows that the population of this country has more than doubled during the last 100 years, but that the number of persons of 65 and over has increased between four- and five-fold. Consequently there are continual complaints of the economic burden which the producing community has to carry owing to the rising proportion of ageing persons. There are, however, two qualifications which are often disregarded: one that the ratio of workers to non-workers is more favourable than it was 100 years ago because the child population has diminished to a greater extent than the aged population has increased; and the other that life has not only been prolonged but made more healthy and active, so that in many instances people remain producers to a more advanced age than formerly.

Neither of these considerations has been lost sight of in an admirable report on the treatment and care of the elderly chronic sick in Bristol which has been compiled by the Bristol Local Medical Committee.¹ In 1950 a subcommittee was appointed by the committee to investigate the treatment and care of such persons. It soon found that it had to widen its reference to include the "frail ambulant" (i.e., the aged infirm person), the acute aged sick, and the healthy old person whose principal need is to be properly housed. The

¹ Bristol Local Medical Committee, 7, The Dell, Westbury-on-Trym, Bristol. 2s. 6d., post free.

² *British Medical Journal*, 1952, 1, 1297.

number of people over 65 in Bristol is about 50,000, and reckoning, as is usual, that 3% require to be accommodated in institutions of one kind or another, 1,500 beds would be sufficient to cover the need. By 1975, however, if present trends continue, the number of beds may be 2,400. At present two hospitals with a total of 800 beds are allocated to the aged and chronic sick in Bristol, and there are one or two small institutions outside which accommodate some of Bristol's overflow.

The report states that the hospital-bed situation could be relieved by the provision of non-hospital facilities, mainly through social service agencies, for the elderly infirm as distinct from the chronic sick. The recommendations mention such needs as diversional occupational therapy, help for old people to maintain a healthy diet, an adequate chiropody service, and friendly assistance in various matters. The almoner is considered to be the most appropriate person to act as liaison officer between hospitals, general practitioners, and other authorities, although objection is sometimes raised to almoners undertaking work outside hospitals.

The division of responsibility between three sections of the National Health Service has complicated the problem. Hospitals are often unable to discharge patients because there is nowhere for them to go, and meanwhile other patients languish on hospital waiting-lists. The hard-pressed local authority cannot always find accommodation for the "frail ambulant" and mentally unstable patients whom the hospital authorities consider should be provided with hospital accommodation, while the third authority, represented by general practice, though willing to do its utmost to keep the old people well at home, is frustrated if hospital and local authorities fail to provide the help so necessary in medical and social emergencies. The subcommittee quotes with approval a statement by Dr. Mortimer O'Sullivan² that whatever the future of medicine in this country the chronic sick and aged infirm will in the main be the responsibility of general practice. "It is hard work, often harassing, and occasionally satisfying."

Preparations and Appliances

AN OCCLUDER

Dr. A. ESTCOURT-OSWALD, of Colchester, writes: The occluder illustrated consists of two black disks connected by a small steel clip. The front disk is meniscus in form and



the back disk flat. The occluder can very easily be slipped on over one lens of the patient's spectacles, whether they are glazed with flat, toric, or meniscus lenses. The examiner is thus able to test the sight of each eye while both his and the patient's hands are free. I have used this occluder for many years and have found it most useful. It can be obtained (price 6s., post free) from Messrs. Clement Clarke, of 63, Wigmore Street, London, W.1.

Correspondence

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

Modern Treatment

SIR,—A Victorian physician, whose name I have forgotten, used to say that "it took a strong constitution to stand a health resort, a convalescent home, a sanatorium, or an autumn holiday." Were he alive now I think he would add to this list "modern therapy."

Our old friend "treatment" seems to be harmless enough; indeed, I notice that the word is hardly ever used by those clever people who send you articles on the scientific aspects of medicine—articles most of which, I confess, mean almost nothing to me, and, I strongly suspect, to the majority of your readers also. (I note that you hint at this in a leading article in your issue of February 28, p. 496.) No, it is "therapy" which is the danger, and especially modern therapy, to be spoken of in reverential tones and written only in capital letters. I propose to refer to it as M.T. in accordance with the prevailing fashion of obscuring things by calling them by initial letters. M.T. lurks in every doctor's bag usually in the form of tablets or ampoules, but occasionally as a more innocent-seeming lozenge or ointment, and very rarely as a mixture. It accompanies him on his rounds and is ready to jump out at the slightest provocation and grapple with the disease—or should I say the "pathology"?—and it is when there is a tug of war between M.T. and the "pathology," with the patient as the rope, that a really strong constitution is required. M.M. (modern medicine) aids and abets M.T., for, being unable to diagnose the simplest case of "pathology" without numerous investigations, punctures, x-ray reports, and specialist opinions, the patient is usually pretty well exhausted before M.T. comes on the scene at all.

I am glad to see from your correspondence columns that the abuse of modern remedies (and their cost) is beginning to be recognized; but I think there should be a new petition in the litany to be read in hospital chapels or wherever doctors and nurses do, or ought to, congregate. It might be as follows: "From inability to let well alone; from too much zeal for the new and contempt for what is old; from putting knowledge before wisdom, science before art, and cleverness before common sense, from treating patients as cases, and from making the cure of the disease more grievous than the endurance of the same, Good Lord, deliver us." I could suggest several more petitions to meet our present needs, but the above may do to go on with.—I am, etc.,

ROBERT HUTCHISON.

Streatley, Berks.

Sensitization to Local Application of Antihistamine

SIR,—I was interested to read Dr. W. A. Heaton-Ward's account of a case of sensitization to the local application of an antihistamine (February 21, p. 455). A similar though more dramatic case happened only a few days ago in the routine of our practice.

A healthy young man who, apart from a period of observation for suspected pulmonary tuberculosis earlier in his life, gave no history of previous chest illness developed coryzal symptoms with marked acute rhinitis. He was given "antistin-privine" inhalant to relieve this latter symptom. About five hours after his first inhalation he developed a tightness in the chest. I saw him about 12 hours after the onset of this and found him in a typical, though slight, attack of bronchial asthma. The symptoms rapidly subsided after taking ephedrine $\frac{1}{2}$ gr. (32 mg.) three times daily. Twenty-four hours later the chest was almost clear.

In this case it would appear that the inhalation of an antihistamine spray produced a sharp allergic response in the form of bronchospasm.—I am, etc.,

Hereford.

A. DERRICK ROSE.

SIR,—I was interested in Dr. Heaton-Ward's report of a case of dermatitis following the use of phenindamine hydrogen tartrate ("thephorin") ointment (February 21, p. 455). Antihistamine creams and ointments are now widely used in the treatment of various itching dermatoses. For most of these conditions they are contraindicated, and in the remainder they are of doubtful value. In a controlled trial Baldridge¹ found that the addition of a histamine antagonist did not increase the antipruritic action of a vanishing-cream base.

The fact that a substance is capable of neutralizing histamine does not, unfortunately, prevent its being a potential cutaneous sensitizer, and it has been estimated² that 2-6% of patients so treated develop eczematous reactions. Sidi *et al.*³ report that a third of their recent cases of dermatitis medicamentosa resulted from sensitivity to antihistamine creams. Several of these patients became photosensitive, and those sensitized to promethazine hydrochloride ("phenergan") tended to give cross-reactions to the sulphonamides, paraphenylene diamine, and other substances of similar chemical structure.—I am, etc.,

HAROLD WILSON.

London, W.1.

REFERENCES

- ¹ *Arch. Derm. Syph. (Chicago)*, 1951, 63, 260.
- ² *Lancet*, 1953, 1, 126.
- ³ *Acta Allerg. (Kbh.)*, 1953, 5, 292.

Early Diagnosis and Cancer Education

SIR,—The headquarters of the British Empire Cancer Campaign in London have issued to every general practitioner a most useful booklet on *The Early Diagnosis of Cancer*. At the same time each is asked: "Do you consider that the launching of a scheme of lay educational propaganda (by pamphlets, lectures, films, etc.) would be of assistance in securing the earlier diagnosis of cancer and thereby improving the chances of a cure? Please answer Yes or No."

Surely, Sir, such a question is premature, since the practitioner can have no evidence whatever on which to base an opinion. In this country cancer education has only just been started in a very few centres. It would be useless to judge by the methods used in other countries, which may suit the psychology of their own people but would not be suitable in this country. It is to be noted that no one is allowed to have an open mind on the subject—the answer must be "Yes" or "No." So far no such question has been sent to consultants, many of whom see in a week as many cases of cancer as a general practitioner sees in a year. I am glad to be able to report that in this area, where all practitioners and consultants are kept fully informed about the efforts to carry out "Cancer Education," the medical profession seem open-minded, most co-operative, and prepared to try out a scheme for educating the public concerning cancer.—I am, etc.,

MALCOLM DONALDSON.

Correct Names for Drugs

SIR,—As one recently qualified, I have followed the correspondence on the cost of prescribing and the use of registered trade names with considerable interest, in view of my own experiences. As a student I was taught by a pharmacologist to avoid the use of proprietary names, especially in examinations. Yet, in a finals examination, I was asked, "What about 'physeptone'?" immediately after I had been talking about amidone (now methadone). When working in the wards as clerk and dresser, I knew that the housemen's prescribing was restricted to drugs and preparations found in the *B.P.*, the *B.P.C.*, the *N.F.*, and the hospital pharmacopoeia (now obsolete). On taking up an appointment as house-surgeon at a non-teaching hospital, I attempted to use only "approved names" where such existed. I found that many of these were quite unknown, and that the nurses did not know these names, but only some proprietary names. I was requested to put the ordinary name in brackets after those "fancy names."

Some of the "fancy names" were sulphadimidine, phthalylsulphathiazole, theophylline, amylobarbitone, and pentobarbitone. The hospital in question is a recognized training school for nurses, and I would have thought it a matter of some importance that "approved names" were known, as there are so many proprietary names for the same substance. Some of those in use—for example, one for phthalylsulphathiazole—were previously unknown to me.—I am, etc.,

Oswestry.

F. B. SINGLETON.

Classification of Diseases

SIR,—As co-author of the *Textbook and Guide to the Standard Nomenclature of Diseases and Operations*, I wish to say that your review (November 15, 1952, p. 1082) is an excellent one and we appreciate your comments. However, I would like to clarify two points which your reviewer does not know or understand. I am also associate editor of the *Standard Nomenclature of Diseases and Operations*, and I note that the reviewer made the following statement: "It is regrettable that in their enthusiasm for correlating the two codes the editors of the *Standard Nomenclature* invented numerical subdivisions for some international categories, thereby violating an important recommendation of W.H.O." The editors of the *Standard Nomenclature* worked very closely with the Bureau of Vital Statistics in Washington, D.C., and absolutely no international code numbers were assigned other than those by Dr. Selwyn D. Collins, of the Bureau, and his assistant, Mrs. Louise Bollo. When Dr. Collins and Mrs. Bollo started combining the two nomenclatures they realized there were deficiencies in the *International Statistical Classification* and made provisions accordingly. They considered it important that all *Standard Nomenclature* diseases should have a cross reference to the *International* rather than state that the item was not part of the *International*.

Perhaps, too, the reviewer does not understand the value of the disease service classification in the *Textbook and Guide to the Standard Nomenclature of Diseases and Operations*. The *Standard Nomenclature* is being used by 71.5% of the hospitals in the U.S. and there had not been a disease service classification written since 1927, when the alphabetic nomenclature was in use. Hospitals had been clamouring for a disease service assignment for diagnoses as they were listed in the *Nomenclature*, but the editorial advisory board of *Standard Nomenclature* did not consider it advisable to include the classification, therefore its inclusion in the *Textbook and Guide*.—I am, etc.,

Chicago.

ADALINE C. HAYDEN.

Information to Patients in Hospital

SIR,—All of us will agree with Dr. E. B. Grogono (February 14, p. 402) that the end we seek is a sympathy and understanding with our patients. Few of us, however, seem to be sufficiently gifted to attain this end without help, and I feel that any means which will lead towards it should be justified. My method of the printed sheet happens to be one I have found satisfactory. I cannot think that there can be such an objection to the printed word, nor do I believe that there is such a lack of originality in the profession that my "wretched" sheet will be copied to any great extent; it can, at most, be a guide to those who would like to try a similar method themselves. I would like to thank the many who have shown an interest in my sheet and could wish that Dr. Grogono had been amongst the numerous general practitioners who wrote to me asking for a copy.—I am, etc.,

Swindon.

GUY ROWORTH.

Against Umbrellas

SIR,—In your columns the haphazard use of "umbrellas" of assorted antibiotics has been properly condemned by Mr. Norman C. Lake (December 13, 1952, p. 1307) and

others, and you have stressed the desirability of making exact bacteriological diagnoses when prescribing these substances (December 13, p. 1301). To-day I have received a new invitation to expensive inaccuracy: a manufacturer's brochure about a pill which contains an assortment of anti-anæmic substances—for example, iron, liver, vitamin B₁₂ folic acid, etc. Surely it should be obvious that it is an economy and a refinement to have every clinical diagnosis of anaemia substantiated, and progress controlled, by simple haematological examinations so that unnecessary substances should not be prescribed. It is, unfortunately, not rare to come across a patient with a low colour index who has been receiving liver or B₁₂ for years without benefit to himself and at great expense to the National Health Service. Such cases of inadequate diagnosis may become commoner if "multiple" pills, which confuse by giving rise to a partial improvement, become popular. Whatever the type of anaemia, two-thirds of the ingredients are likely to be wasted, since an iron deficiency will not need liver, and a B₁₂ deficiency will recover without iron.

The National Health Service cannot afford to pay for these wasted ingredients.—I am, etc.,

London, N.W.11.

MAIR E. M. THOMAS.

Aetiology of Bronchiectasis

SIR,—While commenting on the papers of Dr. K. D. Forgan Morle and Squadron Leader Philip W. Robertson on "Segmental Aspiration Pneumonia and Bronchiectasis,"^{1,2} Dr. W. S. Davis (February 14, p. 400) asks for information regarding the frequency of a history of an abdominal operation as an aetiological factor in bronchiectasis. In a series of 166 cases (137 adults and 29 children) at the Bedford Chest Clinic,³ four adults traced the start of their symptoms to a general anaesthetic. In two this was for appendicectomy, in one for cholecystectomy, and in one for the treatment of a war wound.—I am, etc.,

Bedford.

N. WYNN-WILLIAMS.

REFERENCES

- ¹ *British Medical Journal*, 1951, 2, 994.
- ² *Ibid.*, 1953, 1, 130.
- ³ *Edinb. med. J.*, 1952, 59, 427.

The General Practitioner and Mass Radiography

SIR,—Dr. F. A. Nash, Mr. B. Benjamin, and Dr. T. J. Lee, in their recent article (February 7, p. 304) describing the facilities for chest radiography offered to general practitioners by the South-west London Mass X-ray Service, state that, to be adequate, such a service could only be possible were the available mass x-ray units to confine themselves to investigations of this nature. As pointed out in your annotation (February 7, p. 322), this is obviously most undesirable, but it is equally obvious that the chest clinics, under existing conditions of staff and equipment, are incapable of dealing with the number of examinations necessary if the estimated requirement of five examinations per 1,000 patients per month is accepted.

In an attempt to overcome these difficulties in the Blyth (Northumberland) area use has been made of an "odelca" 70-mm. camera unit recently provided at the chest clinic. Although primarily installed to assist in the routine work of the clinic, the unit gave such excellent results that it was decided to make an "open" chest radiological service freely available to general practitioners in the area, Friday evenings and Saturday mornings being reserved for this purpose. As the scheme has only been in operation for about two months no figures can be given, but the response has been most encouraging and averages between 50 and 60 examinations each week. This figure, if maintained, comfortably exceeds the estimated requirement quoted above for the area served. Already a number of cases of active pulmonary tuberculosis in need of treatment have been brought to light in which there might otherwise have been delay in diagnosis.

Practitioners are naturally reluctant to burden the chest physicians with extra examinations unless they have reason to suspect that disease may be present, and many in the area served have intimated that they find the "open" radiological sessions of the greatest possible assistance.—I am, etc.,

Blyth, Northumberland.

JAMES M. GILMORE.

A Journal and its Readers

SIR,—Those who criticize the *British Medical Journal* because it fails to please all its readers all the time can have little idea of the duties of an editor of a medical weekly journal. Not only must he hold the right balance between news and views, but he must also decide where general interest justifies his giving any particular scientific paper the benefit of a 78,000 circulation. At the same time, by its sponsorship of a fine series of specialist journals, the *British Medical Journal* admits that there is a field for both types of paper. The question which your leading article (February 28, p. 496) poses is whether general practice is a specialty in its own right, and therefore entitled to specialist journals of its own.

Setting aside the main question, it must at least be admitted that the conditions of work of the G.P. differ substantially from those of other doctors. Alone in the profession, he works regularly by both day and night; it is commonplace for him to be seeing his last patient not at 6 p.m. but at 9 p.m. or even later. The inevitable result is that his reading time is strictly limited. I cannot help wondering whether most G.P.s find time to read the articles with which they are presented each week.

Length in itself is less putting off than a turgid style of writing, which afflicts so many of us when we put pen to paper. Here the best remedy is the ruthless sub-editor; the author who objects to this type of surgery can have little regard for his message, for his readership will vary inversely with his verbosity. So I am ready to welcome any journal devoted to general practice, provided it says what it has to say in as few words as possible. And if it stimulates you, Sir, to further efforts in blue-pencil work, it will have done all in general practice a good turn.—I am, etc.,

London, N.7.

STEPHEN TAYLOR.

SIR,—A weakness of many journals intended for general medical reading (cf. leading article, February 28, p. 496) is that the accumulated knowledge of a general practitioner rarely finds expression therein for the benefit of other practitioners, general or otherwise. This does not necessarily reflect on editorial policy, for what an editor does not receive he most clearly cannot publish; and I suspect that he receives few articles from general practice. This would not be surprising. While clinical material and problems abound in general practice, there are many difficulties in taking advantage of them. Time is scarce, and especially time free from interruption. The general practitioner usually has no secretarial assistance, and is often unable to obtain laboratory and other investigations. He may be physically separated from reference libraries, he usually works alone in his surgery, and his work lacks the natural checks provided by registrars, house-men, nursing staff, and laboratory assistants. When a publication is the joint production of a team of workers, it gains in "printability." Even when two heads are no better than one, two witnesses certainly are. In these circumstances an article from a G.P. is likely to lack polish, and this renders publication unpredictable. Whether the *British Medical Journal* would be justified in printing this rather "rough" type of contribution is not for me to say.

I was dismayed to learn that the "Refresher Course" articles and "Any Questions?" cater specially for the general practitioner—as if to say that no other section of the profession needs any refreshing or feels impelled to send in

a question. In any case, an article in the "Refresher Course" should be able to hold its place in the *British Medical Journal* on its own merits and should not need to explain itself as being "for the general practitioner."—I am, etc.,

Lowestoft.

N. B. EASTWOOD.

SIR,—In a leading article (February 28, p. 496) you remind your readers that the *British Medical Journal* is not for general practitioners, or consultants, or public health officials, or laboratory workers, but that it is a journal which aims at representing the best of British medicine in order to "promote the medical and allied sciences." Such an *apologia pro vita tua* must be accorded universal approbation without lack of agreement that the programme is fully implemented; but I do not think you are comfortably convincing in your further reference to the general-practitioner reader.

I am not, of course, prepared with authoritative figures, but of the 78,000 copies distributed weekly a very large proportion must go to general practitioners or (pace your disapproval of the term) average readers. You rightly point out that they are catered for by the inclusion of the "Refresher Course"—a series of articles of practical importance and value. It would appear that, if to this feature are added the answers to "Any Questions?" and occasional synopses in short leaders or annotations, the pabulum for the average practitioner has been fully comprehended.

Yet, in order to forestall any charge of inadequate provision that may be supplied elsewhere, you question if the multiplication of journals which aim at the general practitioner's special requirements is a healthy tendency. It is a tendency, you say, that has behind it the assumption that the general practitioner is intellectually inferior, and he must be reassured to the contrary and be encouraged to keep up to date by reading a journal which tries to put before its readers the whole of medicine, not just part of it. I wonder if the large number of average doctors among the 78,000 will feel flattered or offended by the somewhat condescending and surely gratuitous reassurance that they are not intellectually inferior. If I may venture to express an opinion from their point of view, I apprehend that they read a medical journal primarily to maintain and increase efficiency in practice, although there are, of course, many other details in which they will be interested. But, although one may approve the enterprise of those who like to acquire knowledge for its own sake, it is practical application, not Utopian idealism, that must appeal to the majority. Is the average doctor expected to read the fifteen pages of research comprehended in the article on "Isoniazid in Treatment of Pulmonary Tuberculosis" (March 7, p. 521)? All medical men, you point out, have the same basic training, so he ought, I suppose, to be fully equipped to wrestle with "Capacity of a Cationic Exchange Resin ('Zeo-Karb 225') in Vivo" (March 7, p. 544). I think he would turn more willingly to the "Assessment of Chlorophyll as a Deodorant" (March 7, p. 541), which is admirably epitomized in a short annotation (p. 554), or to the "Effect of Nikethamide by Mouth in Man" (March 7, p. 547), which occupies only one page. Indeed, he could restrict himself to the last six lines of the article, which state that it has no effect whatever.

It is only right that all the details of such communications as the first to which I have referred should be recorded, so that other workers on the subject may critically examine all the evidence which they may wish to confirm or refute. It is only right that rare pathological conditions should be reported, and that the results of investigations of new drugs should be published. The academic approach towards "keeping up to date" demands an intimate study by those on the staffs of teaching hospitals, by examiners for higher degrees and diplomas, and by the candidates for these distinctions, however much or little they relate to their practice. But the average doctor must and can keep up to date without the impracticable effort demanded by such scientific study. It seems to me that you are in error in deprecating the consideration of his special requirements and particularly in introducing the question of intellectual inferiority.—I am, etc.,

London, W.1.

ADOLPHE ABRAHAM.

Chlorophyll as a Deodorant

SIR.—We have been using as a deodorant in radical mastoid cavities a solution containing nine parts by volume of a 10% solution of chloramphenicol in propylene glycol with one part of a preparation of chlorophyll which is perfumed similarly to the "solution C" of Dr. J. C. Brocklehurst (March 7, p. 541). The presence of "solution C" does not interfere with the destruction of cultures of sensitive organisms by the chloramphenicol, and the two solutions make a homogeneous fluid. The presence of "solution C" does not appear to be an irritant to the surface of the cavity nor to increase the occurrence of otitis externa.

Narrow ribbon gauze, soaked in the chloramphenicol and "solution C" fluid, is used in the cavity and external auditory meatus. The perfume does help to make the smell less unpleasant for the patient and those dressing the cavity, and disturbance of the gauze, by withdrawing the latter slightly, increases its effect. This disturbance (mentioned by Dr. Brocklehurst) and its effect upon odours have long been common knowledge.

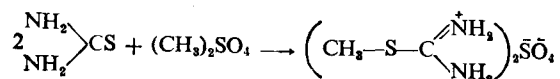
We are obliged to Dr. Crawford and Mr. Thompson, Hope Hospital, Salford, for their help.—We are, etc.,

Manchester, 3.

W. B. MCKELVIE.
EDITH V. WOODCOCK.

SIR.—With reference to the paper by Dr. J. C. Brocklehurst on chlorophyll (March 7, p. 541), there are certain points with regard to the chemistry of the subject to which I should like to draw your attention.

(1) The formula for chlorophyll, as shown, is incorrect. The two hydrogen atoms attached to the nitrogen atoms of the pyrrole rings should be deleted. (2) Methyl mercaptan cannot be obtained from thiourea sulphate by the action of sodium hydroxide. The standard method of obtaining it is by the action of sodium hydroxide on S-methyl isothiuronium sulphate, which is a derivative of thiourea, and obtained by the action of dimethyl sulphate on thiourea:



(3) Methyl mercaptan, in common with other mercaptans, is oxidized by iodine to give dimethyl disulphide and hydriodic acid, which reaction may be represented as follows:



—I am, etc.,

Stockport.

H. H. ARMSTRONG.

SIR.—I should like to answer criticisms raised by Dr. W. Mitchell and Mr. L. Deadman (March 14, p. 621) concerning my article on "An Assessment of Chlorophyll as a Deodorant."

The substance referred to as thiourea sulphate is, of course, S-methyl-iso-thiourea sulphate. The method of producing methyl mercaptan gas is that described by Arndt.¹ Chlorophyll (solution "A") was not assayed spectrophotometrically: it was supplied especially for experimental use by a chlorophyll manufacturer, who described the sample as consisting chiefly of sodium copper chlorophyllin. Solution "C," however much chlorophyll it contains, was a true sample of this substance as it is sold to the public. The mercaptan solution used in experiment 4 was a saturated solution of methyl mercaptan in water. Syrup of garlic used in the experiments was the B.P.C. compound: this contains approximately 20% juice of garlic, the composition of which is fully described in the B.P.C. monograph. The short time of exposure of methyl mercaptan to chlorophyll in the first two experiments is admitted. The third and fourth experiments were devised to allow a long-continued exposure.

I was interested to read of Dr. Mitchell's experiment with benzyl mercaptan, and look forward to hearing of the outcome of his trials with methyl mercaptan.—I am, etc.,

London, W.12.

JOHN C. BROCKLEHURST.

REFERENCE

¹ Ber. dtsch. chem. Ges., 1921, 54, 2236.

Spinach

SIR.—We feel that your expert has not given the whole picture when answering the question on spinach ("Any Questions?" November 29, 1952, p. 1217). Spinach contains 500–800 mg. of oxalic acid per 100 g., more than enough to form insoluble salts with all the calcium and magnesium present in it. Experiments on animals and man have demonstrated the poor availability of calcium in spinach as compared with other greens, milk, whole wheat, etc. Many workers, experimenting with rats, have shown that the oxalic acid in spinach interferes with calcium metabolism, producing increased calcium excretion, considerable calcium deficiency, and consequent poor calcification of bone, deposition of large amounts of oxalates in the kidneys, and formation of urinary calculi and kidney damage. This is particularly so if adequate calcium, magnesium, phosphorus, and vitamins are not included in the diet. Spinach, raw or cooked, when added to the diet of dogs which includes meat, cracker meal, and skimmed milk powder, produces not only a greater negative calcium balance but also poor absorption of nitrogen.

Comparable experiments on children with calcium-deficient diets could not be justified, but it has been calculated that 100 g. of spinach fed to an infant contains sufficient excess oxalic acid to precipitate the calcium in 200 g. of milk, or one-fifth of the total calcium given to the infant. McLaughlin,¹ using spinach as the only food high in calcium in a diet consisting of some of the most commonly used foods, produced positive calcium balances in six out of seven healthy women, but the duration of the experiments was only six days. McClendon and Sedgwick² found that the average gain per week was markedly increased when spinach was added to the diets of infants. They used dried and powdered spinach, mixing it with 6% of sea salts. It is possible that excess of salts and consequent water retention had something to do with the weight increase. Sherman and Hawley,³ on the other hand, were able to show that calcium and phosphorus retention after addition of spinach to the diets of children was in no case as good as with milk feeding alone, while Schlutz *et al.*⁴ found, in a six-day experiment, that the use of raw or puréed spinach as a supplement to milk feeding in very young infants did not affect the mineral balance in either direction, but when dried spinach was used the retention was slightly lower than that which prevailed when the minerals were derived solely from milk. Bonner *et al.*⁵ fed 10 children aged 5–8 years with 100 g. of spinach for 25 consecutive days, and found that the storage rates for nitrogen, calcium, and phosphorus were not significantly altered. However, they used healthy children, who were fed sumptuously on basal diets which had more than sufficient calcium to obviate any deleterious effect that the oxalic acid of spinach might have produced. It is to be expected that if excess of calcium is present in the diet, particularly in the form of milk, the oxalic acid of the spinach will be neutralized, but what if, as we have sometimes found, children refuse to take their daily quota of milk, and if, as may happen in poorer families, the children are not fed well enough to counteract the effect of spinach in the diet—particularly as it appears that utilization of dietary calcium may be impaired if there is a deficiency of protein in the diet?

Even if there is no upset in calcium balance, calcium oxalate crystals from the ingested oxalates of such substances as rhubarb, spinach, and asparagus are known to cause bladder irritability with frequency of micturition and

occasionally albuminuria and haematuria in man. Spinach also makes the lips of some children red and chapped and the buttocks round the anus red. Is it not possible that the intense dislike of spinach shown by most children is Nature's way of protecting them from its harmful effects? And yet we know of conscientious mothers who have forced large quantities of spinach on their unwilling children day after day.

Are the useful constituents of spinach irreplaceable? We think not. Many workers have pointed out that the cooking or canning of spinach entails a loss of vitamin C—12% by steaming for eight minutes, 60–65% by canning, and over 95% by cooking in a saucepan at 100°C. for 10 minutes. In our experience boiled or canned spinach is generally used in this country. Besides, even slightly wilted leaves will have lost much of their vitamin C before they reach the saucepan. Is it not better to rely on foods which need no cooking?

The use of spinach became widespread when it was shown that it contained large amounts of iron, but it was soon established that for most foods there was no correlation between the total amount of iron and its availability, and that only by feeding experiments could the availability of iron in individual food materials be accurately ascertained. Such experiments on animals have shown that the iron of whole wheat and wheat bran is equal in availability to ferric chloride, followed by beef and pork liver, soya beans, and peas (60% availability). There is little to choose between spinach, beef muscle, and egg yolk (20–40% availability). Spinach feeding is known to have only a moderately favourable effect on Hb formation in anaemic dogs, for the addition of iron salts to the spinach gives a summation effect, indicating that the spinach effect is not due to the iron in this vegetable.

It is of interest that Davidson *et al.*⁶ have established clinically the necessity of having calcium-rich diets if a normal blood picture is to be maintained on a diet with a moderate amount of iron. This finding, if applied to spinach, might result in the following train of events in the body: the excess oxalic acid will combine with calcium at the expense of the phosphorus, and the phosphorus thus released will combine with iron, forming insoluble iron phosphate, thus reducing the availability of iron. It is unlikely that vitamin A (or carotene) will be deficient in children's diets if the recommended dose of cod-liver oil or substitute is given, and if foods such as carrots, tomatoes, bananas, beans, brussels sprouts, eggs, and liver are included in the diet.

May we then suggest that, until further light is thrown on the subject, spinach should be considered a doubtful article of diet for children?—We are, etc.,

J. E. BAMJI.
N. S. BAMJI.

London, N.6.

REFERENCES

- ¹ J. biol. Chem., 1927, 74, 455.
- ² Ibid., 1921, 46, xxvii.
- ³ Ibid., 1920, 49, 21.
- ⁴ Amer. J. Dis. Child., 1933, 46, 757.
- ⁵ J. Pediat., 1938, 12, 188.
- ⁶ British Medical Journal, 1933, 1, 685.

Feeling the Cold

SIR.—Your annotation on "Feeling the Cold" (February 21, p. 445) tells us that "cold and warmth are separately appreciated. Different points on the skin respond either to cold or to warmth."

A homely experiment leads one to believe that the perception of a temperature gradient on the surface of the body is one thing, while the realization of whether we are dealing with a hot or cold agent is quite another. The dealing with a hot or cold agent is quite another. The experiment is the pleasurable one of lying extended in a warm bath. If the toes are extruded and the cold tap is turned gently on, the sensation is instantaneous, yet one has to tell oneself that the extraneous agent is a cold one; the actual sensation, for me at any rate, does not differ from that produced by a stream of hot water on a cold foot.

Temperature gradients, like ionization gradients, find a quick response by the body, but the mind does not immediately register the agent.—I am, etc.,

Bognor Regis.

SIDNEY RUSS.

Impetigo Contagiosa

SIR.—The bacteriology of this common condition is worthy of further study. It is an example of the unusual, but not unique, state of affairs in which a reasonably uniform syndrome appears to be associated with either or both of two very different organisms, both of which may also be present as harmless commensals in the body. Here are a few more figures to put alongside those of Dr. R. E. Church and his colleagues (February 7, p. 334):

During 1948 swabs were examined from the lesions of 39 patients with impetigo. None of these patients had received treatment with antibiotics or sulphonamides. The results were as follows:

	Occasions Grown
<i>Staphylococcus pyogenes</i> (coagulase positive) alone	18
<i>β-haemolytic streptococcus</i> alone	6
<i>Staphylococcus pyogenes</i> + <i>β-haemolytic streptococcus</i>	12
<i>Staphylococcus pyogenes</i> + diphtheroid	1
<i>Staphylococcus pyogenes</i> total	31
<i>β-haemolytic streptococcus</i> total	18
Other organisms (<i>Corynebacterium</i>)	1

The haemolytic streptococci were not all of the same group. The question immediately arises: When A infects B with impetigo and a staphylococcus or streptococcus or both is recovered from the lesions of both patients, are the organisms identical in the two cases? In other words, is the streptococcus the infectious component, preparing the ground for secondary invasion by an indigenous staphylococcus, or is the staphylococcus the continuous factor and the streptococcus the indigenous secondary invader? Or do both organisms when present take part in the serial transmission? There is, of course, another possibility—namely, that some third factor is responsible for the case-to-case transmission, both streptococci and staphylococci being secondary invaders.

On the few occasions on which it has been possible for us to examine the streptococci when impetigo has been transmitted inside a family these have been of the same group and type in all the cases. We have not yet examined the phage type of staphylococci in similar epidemiologically related cases. Though some people claim to be able to forecast from the appearance of the lesions what organism will be found on culture, I have been unable to do so. Despite the advent of chemotherapy and antibiotics the ebb and flow of impetigo in general practice do not seem to have altered very much during the past 20 years.—I am, etc.,

Cirencester.

R. E. HOPE SIMPSON.

The Teaching of Preventive Medicine at Oxford

SIR.—The progress report of the Social and Preventive Medicine Committee of the Royal College of Physicians was published in January, 1953, and was recently a subject for annotation in the *Journal* (February 7, p. 323). In this report there is implied criticism that Oxford is the only provincial school without a separate department of social and preventive medicine. The purpose of this letter is to point out that there is a small department of social medicine and that in any case Oxford medical students do get a and that in any case Oxford medical students do get a sound education in preventive medicine. The report gives details of the main topics dealt with by teaching departments of social and preventive medicine, and, with one possible exception, all appear to me to be covered in one way or another in the Oxford curriculum.

In the report, progress is measured by the number of hours allocated throughout the course to direct instruction in social medicine, but is this necessarily a reliable estimate of the total volume of preventive medicine teaching? Surely, we must all

agree that, ideally, each clinician should include preventive medicine as an essential part of his teaching, and that the nearer we can get to this ideal the less is there a need for a special department to cover the subject. From my knowledge of the consultant staff of the teaching hospital in Oxford and the close collaboration which exists between the health department and the special hospital departments dealing with obstetrics, paediatrics, otolaryngology, ophthalmology, orthopaedics, mental diseases, chest diseases, venereal diseases, dermatology, etc., I have no hesitation in stating categorically that the volume of preventive medicine teaching carried out in Oxford by the consultant staff, both by practice and precept, is very material, and Oxford medical students are most fortunate in this respect. In addition, the medical officer of health is also consultant in infectious diseases to the United Oxford Hospitals, so that in my infectious diseases course I am able to combine epidemiological and clinical instruction. Any gaps in this preventive medicine teaching by the consultant staff were filled, until recently, by the staff of the Institute of Social Medicine and will, I am sure, continue to be very adequately filled by the new reader in social medicine.

In addition to the preventive medicine teaching given within the hospital, it is of the utmost importance that medical students should have a sound knowledge of the functions of local-authority health departments, so that after qualification, whether as general practitioners or as doctors in hospital, industry, or laboratory, they will be able to co-operate fully with the many health services provided by the health departments in their area. I have therefore tried to give Oxford medical students a sound knowledge of the work of my department, partly by means of a course of lectures (admittedly short, but compensated to some extent by detailed lecture notes), but mainly by a good deal of practical instruction. For some time now, students in small numbers have regularly attended child welfare clinics, where, in addition to the routine work of the clinic, they have received instruction in various immunological procedures, including vaccination. They have also seen something of the work of the school health service, and more recently a series of public health visits has been arranged in which students, in groups of four, have gone out on successive afternoons with health visitors, mental health officers, sanitary inspectors, midwives, and district nurses (Warin, J. F., *Supplement*, September 20, 1952, p. 133). In connexion with this public health instruction, the report states that "in almost every school the former public health courses have been replaced by modernized courses in social and preventive medicine"; in Oxford it could be claimed that the reverse has also occurred in that a former course in social medicine has been replaced by a modernized course in public health. Perhaps Oxford is leading the way rather than lagging behind, as is inferred in the report.

The advantages of the development of statistical departments in close association with departments of social medicine is rightly stressed in the report, and certainly medical students should have a knowledge of statistical method, but care must be taken that the statistical tail does not wag the social medicine dog. Recent experience in Oxford demonstrated that you can have too much of a good thing, and the students showed signs of acute statistical indigestion by rebelling against the whole course in social medicine.

In the report, and in this letter, the terms "preventive medicine," "social medicine," and "public health" have all been used freely, but neither I nor, I think, anyone else knows precisely what is supposed to be the difference underlying these three terms. Is it not time that there was general recognition that, in actual fact, there is no fundamental difference and that it would simplify matters considerably if we could all agree to use one term, which I think might well be "preventive medicine"?—I am, etc.,

Oxford.

J. F. WARIN.

Dosage of Stilboestrol

SIR.—MR. J. Beattie in his Refresher Course article (February 21, p. 447) recommends a dosage of stilboestrol up to 25 mg. daily and increasing again thereafter. As the standard dose of stilboestrol is 0.5 mg. (not 5.0 mg.), the recommended dose seems extraordinarily high—beyond, in my opinion, the dose of toleration. Patients with malignant disease on treatment with stilboestrol seem unable to tolerate a dose greater than 15 mg. daily for very long.

Perhaps Mr. Beattie might think it worth while to make further comment.—I am, etc.,

Derby.

E. C. DAWSON.

Cleansing of Anaesthetic Machines

SIR.—One of the manufacturers of anaesthetic ether recently received a complaint from a hospital that the ether supplied to them was below standard and that the patients would not take it. On investigation it was discovered that the fault lay in the bottle of the anaesthetic machine itself, which had not been properly cleaned.

This letter is written on behalf of the makers of anaesthetic ether in the hope that you will publish it and the attention of interested parties will be drawn to the danger of using such machines without old ether having first been removed.—I am, etc.,

Ilford.

E. J. FLEETWOOD,
Sales Manager,
Howards & Sons, Ltd.

"Therapeutic Thorns"

SIR.—Professor D. M. Dunlop's review (February 21, p. 441) of the English translation of the Dutch book *Side Effects of Drugs*, of which we were co-translators, is as ingenious as the qualities—or lack of them—which he attributes to the work in question, and shows a very narrow appreciation of the labour involved in trying to make an English silk purse out of a foreign sow's ear. As regards his view that the "translators have a somewhat sketchy knowledge of English," he will probably be devastated by the riposte that one of us (W. M. C.) is a brother Sassenach born (Irish, not Scottish) and the other (Ph. V.) is a Dutchman who, although highly appreciative of Mr. Jingle, does not let himself be guided by that worthy in his efforts in the English language.

We feel that Professor Dunlop has not been quite fair in his summary disposal of this book. The author accumulated a vast amount of data which had to be condensed into a volume of handy size. This accounts for the "Jingle" style of writing. Professor Dunlop quite forgot to mention that there is a list of getting on for 2,000 references to the literature, from which the author drew his facts, and references to *Excerpta Medica* were only made when he had not access to the original article. Professor Dunlop's rather insular outlook is regrettable when foreign workers are endeavouring to make their observations available to their English-speaking colleagues. Whatever the shortcomings of Dr. Meyler's book, our job was to translate it, not to rewrite it. The end-result, if not redolent of an Osler or a Lane, is at least intelligible, and the condensed information given, if indeed "odd and alarming," represents a considerable amount of serious research on the author's part into the findings of observers all over the world.—We are, etc.,

Amsterdam.

W. MULHALL CORBET.
PH. VUJSJE.

Grease on the Skin

SIR.—Will you allow me a slight squeal of protest at your article "Grease on the Skin" (February 28, p. 499)? You say there that Squire and his co-workers¹ showed that the self-sterilizing effects of the skin depend on the action of fatty acids, mainly the unsaturated ones. I showed this many years ago,² and Professor Squire has himself acknowledged my work not only in the paper above referred to but in a letter accompanying reprints of his paper. In this letter he too generously describes his own work as very largely a confirmation of my own. It is, of course, far more than that. He and his colleagues demonstrated that the long-chain fatty acids, especially oleic, extracted from the skin itself are the responsible sterilizing agents, whereas I only deduced this fact from experiments done for the most part on hair fat, which at the time seemed far easier to obtain in reasonable quantity.

I think that the real pioneers of this work on autogenous disinfection of the skin are Brann,³ who discovered that human hair rarely contains pathogenic organisms and suggested that the fats of the scalp and hair might be lethal to

them; Marchionini and his school (in a whole series of papers in the Swiss and German medical press between 1928 and 1939), who showed the cardinal importance of the "acid mantle" of the skin; and Colebrook,⁴ who pointed out how rapidly the haemolytic streptococcus and other micro-organisms disappear from various areas of the skin. None of these workers is mentioned in your article, but I dare say you would argue that it was no part of your intention to give a comprehensive review of the subject.—

I am, etc.,

J. M. L. BURTENSHAW.

Rochester.

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- ¹ Ricketts, C. R., et al. (1951). *Clin. Sci.*, 10, 89.
- ² Burtenshaw, J. M. L. (1942). *J. Hyg. (Lond.)*, 42, 184.
- ³ Brann, G. (1928). *Klin. Wschr.*, 7, 2059.
- ⁴ Colebrook, L. (1930). *Interim Report of Departmental Commission on Maternal Mortality and Morbidity, Appendix*. H. M. Stationery Office, London.

"Thorough Overhaul"

SIR.—I was interested in the letter of Dr. Ronald Coldrey and others (February 28, p. 507) concerning the "thorough overhaul." In what follows, I take it the request has been made when nothing is complained of. Otherwise, of course, the doctor does whatever is in his opinion necessary in the way of examination.

I always discourage such requests, as in general tending to increase the unnecessary and time-wasting interest the public is taking in disease, and as being outside the scope of the N.H.S. When it is pointed out to patients making this request that the number of doctors who themselves have such regular examinations must be practically nil, they sometimes see the matter in a different light.

Incidentally, I have discovered that the expression "check-up" is not necessarily synonymous with "overhaul," and is often used when the patient has signs or symptoms and is desirous to be treated for or reassured about them—which is the correct time for him to consult a doctor.—I am, etc.,

T. J. KIRKPATRICK.

Stockport.

Smoking and Lung Cancer

SIR.—Dr. R. Doll and Professor A. Bradford Hill (February 28, p. 505) have given an admirable reply to Professor R. D. Passey (February 14, p. 399) but not, I think, entirely disposed of the point he was making. He expressed concern, shared by others, about the effect which some of the wilder statements being made about the results of this work may have on the public. The extent of the real increase of this disease in the last 40–50 years is unknown. Over 80,000 people are now recorded as dying each year in this country from respiratory diseases; about 17% of these deaths are registered as due to pulmonary tuberculosis and about 17% to lung cancer. Smoking would seem to be one of the most important predisposing factors in the development of these tumours, but it is certainly not the only one. It is important that we keep our sense of proportion and remember our responsibility to the public, in whom fear of cancer is already a serious problem.

Doll and Hill have done a fine piece of work and submitted a reasoned and balanced view; others who have not done the work should consider whether the remarks they make about it are helpful and what impact their statements may have on an anxious and ill-informed public. The letters from Dr. H. Binysh and Dr. Lennox Johnston (February 28, p. 505), for instance, do not seem to me to add anything of value. It is, contrary to Dr. Binysh, quite legitimate to suggest that the diagnosis of lung cancer has changed in the last 10 years. Antibiotics have made a clear difference, and this controversy alone is changing it still. It is, of course, and this controversy alone is changing it still, unjust to infer that Professor Passey dismissed the relationship between smoking and lung cancer as of no account. It is difficult to see how Dr. Johnston can "call on the nation to stop smoking now" without doing more harm than his drama than could be compensated for by any gain over the more prosaic, gradual, and realistic methods of enlightenment which are being adopted.

There are, amongst others, two pieces of information which might be welcomed by the present generation of doctors as they wait for their deaths to round off Doll and Hill's experiment. First, whether the proportion of metastases found in the brain which are due to lung cancer changed with the years from the 30–50% found in the 1920s and 1930s (Elkington¹). This proportion was thought to be remarkable despite the propensity of bronchial carcinomas to dissemination because of the view then held of the relative infrequency of primary tumours at this site. Secondly, whether the smoking habits of patients developing carcinoma of the larynx, with its falling recorded death rate, are really similar to those of patients with lung cancer (Jacobsson²), and, if so, what this may mean.—I am, etc.,

London, S.W.3.

REFERENCES

- ¹ *St. Thom. Hosp. Rep. (Second Series)*, 1936, 1, 97.
- ² *Acta Radiol. (Stockh.)*, 1952, 38, 143.

D. W. SMITHERS.

Intercourse after Syphilis

SIR.—Much has been written already on the topic of marriage after syphilis, but, as a most startling statement has been made in a section of the *Journal* ("Any Questions?" January 10, p. 115) which aims at answering questions and avoiding controversial matter, it is felt that it should be ventilated more fully so as to minimize any damage which may have been done. The criteria of cure for early syphilis have remained quite unaltered since the newer and simpler treatments have been evolved. It always has been impossible to be sure of the cure of early syphilis until adequate follow-up procedures have been conducted for at least two years following proper treatment. To my knowledge no one writer, American or otherwise, accustomed to dealing with large numbers of these infections has shifted from this viewpoint, or is likely to.

However, the question of matrimony after syphilis is rather different from the mere granting of permission to have sexual intercourse, for this conjures up the rather novelette situation of a Dorian Gray contemplating marriage to the vicar's daughter. In practice quite another state of affairs usually exists, and the decision regarding marriage is often made on social grounds rather than on those which are entirely medical. Thus, the syphilis may have been acquired from the girl in the first place, in which case both partners will already be under treatment, and, if marriage is still contemplated, sexual intercourse will continue whether the doctor "allows" it or not. Or the fiancée, although apparently uninfected, may be pregnant. In which case she probably has to be examined as a contact and given prophylactic treatment, but certainly not necessarily discouraged from immediate marriage, even if the man has not yet completed his injections.

The basis for any decision depends on whether or not premarital intercourse has recently taken place, and, at the risk of commencing a further controversy, the cynic might say that in this present day and age it is the rule rather than the exception—it certainly is in the bulk of patients for which such decisions have to be taken. If such intercourse has taken place, then the situation is similar to that when a married man has acquired syphilis. Thus it is essential that the fiancée is examined as a contact, and this means that the man has to own up to his misdeeds and to his misfortune. By this time the damage, if any, has been done, and the woman must either be observed to see whether she develops the infection (fifty-fifty chance), or given prophylactic treatment and observed subsequently for two years as if she had actually had the disease.

These events at once entail that the female re-examines the question of marriage. If she still wishes to proceed, provided that both parties are aware of the risks which may result from relapse in either, and both attend regularly for observation to safeguard them, and avoid pregnancy, then to advise that they wait even six months is unrealistic, as the patients will not heed the advice. On the other hand, when no intercourse has occurred, and when the

girl is unaware of the situation, to recommend that a man who has had early syphilis may get married after only six months from the initiation of treatment is out of step with all our knowledge of the condition.—I am, etc.,

London, W.1.

R. R. WILLCOX.

POINTS FROM LETTERS

Dr. Hugh Welch Diamond

Dr. J. B. WRATHALL ROWE (Harrow) writes: The above-named doctor, who died at Twickenham in 1886, was a pioneer in the field of medical photography and photomicrography. He contributed to the Royal Society in 1856 a paper entitled "The Application of Photography to the Physiognomic and Mental Phenomena of Insanity," and made several photographs of mental patients to illustrate his paper. Although the original paper is still preserved in the Archives of the Royal Society, the photographs have disappeared. I have already obtained from the Royal College of Surgeons, the Medical Society of London, and the Royal Photographic Society information and material regarding Dr. Diamond, but am anxious to trace his original medical photographs if they are still in existence. I should therefore be most grateful if anyone having knowledge of, or early examples of, Dr. Diamond's work would write to me c/o The Medical Department, Kodak Ltd., Harrow, Middlesex. In the library of the Royal College of Surgeons there is a photograph of a mental patient taken by Dr. Warren Hastings Diamond, who may have been the son of Hugh Welch Diamond. Hugh W. Diamond is believed to have had a grandson named R. Hugh Clarke. Any information regarding these persons or their descendants would also be gratefully received.

Alternative to Postgraduate Courses for General Practitioners

Dr. J. B. BAMFORD (Ely) writes: As an alternative to the usual postgraduate course at a teaching hospital, I suggest that the general practitioner could apply to his old teaching hospital, or other central body, for a senior registrar to come and spend a week in his own house. The advantages to both, in my opinion, would be great. I feel that more medicine and more tips are learnt over a cup of coffee or glass of port in the evening than by attending any number of postgraduate lectures. The registrar would also have the advantage of seeing how a general practitioner works and possibly make useful contacts, and would undoubtedly see a number of interesting and rare cases. The general practitioner would be able to obtain another opinion on many of his undiagnosed cases. A registrar could surely be spared by his chief at hospital for one week, or possibly two, in a year. A general practitioner could apply for this visit once in every three or five years. . . . I will be interested to hear what other general practitioners and registrars think of this suggestion and how to put it into operation.

Cancer in General Practice

Dr. W. A. MACKAY (Southport) writes: Your reviewer of this book (February 14, p. 381) passes without adverse comment the statement that in spite of all forms of treatment 50% of cases with stage 1 carcinoma of the breast die in five years. This conclusion is at variance with the report of Sir Gordon Gordon-Taylor to the B.M.A. meeting at Plymouth 15 years ago of 84% survival at ten years. Is the practitioner to conclude that Gordon-Taylor's figures were "optimistic," that cancer is becoming more malignant, or that treatment of cancer of the breast is deteriorating?

Medical Evidence in Court

Mr. J. H. C. PHILLIPS (Northampton) writes: In giving medical evidence it is all too easy to be unintentionally misleading by inference, but I feel that one cannot stress too strongly the grave responsibility of a medical witness in giving the court the benefit of his specialized knowledge, not only to be factually correct, but to be most careful not to imply more than was intended by failure to qualify his statements when necessary. In particular, it is important that witnesses, however eminent, who practise in one particular specialty should neither by direct statement nor by implication give evidence that goes beyond their competence.

Ferrous Sulphate Tablets

Dr. L. F. BECCLE (South Woodford, Essex) writes: I wonder why ferrous sulphate tablets are so freely prescribed for so-called anaemia. In three recent fatal cases of poisoning in infants with which, as a coroner, I have dealt in the last few months, no laboratory investigations whatsoever appear to have been made as to the existence or otherwise of anaemia. What makes the situation worse in my opinion is the utter uselessness of ferrous

sulphate in any other conditions. These bright green sugar-coated pills form an irresistible attraction to young infants, who devour them with great relish, with the most unfortunate consequences. What the answer to this menace is I do not profess to know at the moment. I am merely stating facts in the hope that this letter will direct the attention of doctors to this important matter and perhaps influence some to the extent of a little more circumspection in their prescribing of this drug.

Smoking and Lung Cancer

Dr. W. A. BELLAMY (Aylesbury) writes: Dr. Lennox Johnston's outpourings (February 28, p. 507) require an answer. He says, "The performance of our duty . . . is clearly to call on the nation to stop smoking now, voluntarily in the first instance." The magnitude of such a task, even if we as a profession agreed to participate, is so great as to be quite impracticable. And I do not like the implication in "voluntarily in the first instance." I hope, for his sake only, that Dr. Johnston is not suggesting that other means be used. He has, of course, alternate methods of raising £613,000,000 obtained last year from tax on tobacco. He should contact Mr. R. A. Butler immediately. "The upsurge in national health and morale" can take care of itself without Dr. Johnston's help. The nation's health has never been better, and its morale was proved in its "finest hour" not so very long ago—and it would be again should the need arise.

Damages Against Casualty Officer

Mr. J. H. ARMSTRONG (Accrington) writes: Having read the information on the case of *Payne v. St. Helier Group Hospital Management Committee* (January 17, p. 166), it seems that an important aspect of the matter has been passed over. No mention seems to have been made by the advocates for early operation as to exactly what should have been done having exposed a bruised caecum. Applying general surgical principles, one would leave a bruised but still viable portion of gut alone, apart, perhaps, from applying hot wet towels as in reduced strangulated enterocoele, which, however, would scarcely be useful in the case under consideration. If a clearly non-viable area of caecum could have been found at the time suggested for operation it seems impossible that the patient could have remained for so long without operative treatment in the comparatively fit condition described. If, on the other hand, a bruised but viable caecum had been found it seems that the operation would then have been concluded and to have been of an exploratory nature only and to have played no part in the effective treatment.

Catheterization in Retention of Urine

Dr. D. D. MACDONALD (London, N.1) writes: This problem does concern the general practitioner first and the urological surgeon second. Not infrequently, however, a casualty officer is the first, by reason of equipment ready to hand, to relieve this patient of his distress. One does not like to use the catheter immediately the condition of acute retention is ascertained. Provided the patient's general condition and age will allow of such treatment, $\frac{1}{4}$ - $\frac{1}{2}$ gr. (11-16 mg.) morphine given intramuscularly and followed by $\frac{1}{4}$ - $\frac{1}{2}$ hour's rest on a couch under an electrically heated blanket (or in a hot bath) will bring great benefits. The least of these is that passage of the catheter is infinitely easier for the medical attendant and much less uncomfortable for the patient. The warmth tends to relieve the prostatic vascular congestion, the morphine indirectly to relax spasm of the internal urethral sphincter. The combined effect is often sufficient to dispense with use of the catheter, with its risks and discomfort.

The Metric System

Dr. FRANZISKA FISCHER (Rotherham) writes: Dr. C. Langton Hewer (February 21, p. 450) is somewhat horrified at the idea that instead of "1 drachm per stone body weight" one would have to order "3.55 ml. per 6.35 kg." of a certain drug. That sounds terribly complicated, but nobody dreams of putting it like that under the metric system. One would give "0.6 ml. per kg." or perhaps 0.5 or 0.7 if that was more appropriate. After all, a drachm per stone is an approximate dosage only, though in general it is sufficiently accurate. I often thought that to put the literal equivalents of the English weights and measures in brackets, as is done in the *Journal*, discourages the use of the metric system. These figures look very complicated and may be a deterrent. The appropriate procedure in my opinion would be to put after the English weights not the exactly corresponding amount in the metric system but the amount one would actually order. If a weight is accurately given in stones, pounds, and ounces, then an accurate equivalent is, of course, required; but it would be much more helpful to put 0.015 g. or 0.01 g., or, if you like it better, 15 or 10 mg., for $\frac{1}{4}$ or $\frac{1}{2}$ gr. than 16 or 11 mg.

Obituary

W. JOBSON HORNE, M.D., M.R.C.P.

Dr. W. Jobson Horne, who died at Mereworth, near Maidstone, Kent, on March 7, at the age of 87, made important contributions to the advance of laryngology, mainly with reference to tuberculosis of the larynx. He was one of the last links with the older generation of laryngologists, for he missed the expected appointment in the 'nineties to the throat department of St. Bartholomew's Hospital because he had taken the M.R.C.P., as was usual in days gone by, instead of the more modern F.R.C.S., which had just become essential.

Walter Jobson Horne was born on August 2, 1865, and educated at Tonbridge School and Clare College, Cambridge, where he took a first class in the Natural Sciences Tripos in 1887, and went on to St. Bartholomew's Hospital, graduating M.B., B.Ch. in 1892, and proceeding M.D. nine years later. He took the M.R.C.P. in 1896, and was awarded the Weber-Parkes medal of the College in 1903. After holding a number of house appointments at Bart's he became chief assistant in the throat department there, and then continued his study of laryngology as a postgraduate at the University of Berlin. In 1896, when the Metropolitan Ear, Nose, and Throat Hospital was reorganized by Hemington Pegler, Jobson Horne joined the staff and began a long connexion with the hospital, which he served not only as honorary surgeon and later consulting surgeon but as honorary treasurer for many years to the board of management. He made his reputation rather as a laryngological pathologist than as a clinical laryngologist, and was the first to point out, by means of serial microscopic sections, that in tuberculous laryngitis the infection could begin in the laryngeal ventricle as well as in more obvious areas. Nevertheless, he was the inventor of two of the most useful and practical adjuncts to otolaryngology—the Jobson Horne ring-probe and the Jobson Horne head-mirror, both favourably known all over the world.

Jobson Horne was honorary secretary and editor of the catalogue of the museum of the British Congress for the Prevention of Tuberculosis in 1901. Having been honorary secretary and vice-president of the Section of Laryngology of the Royal Society of Medicine, he became president of the Section in 1920-1. He was the third laryngologist, following McBride and Killian, to be invited, in 1921, by the University of London to give the Semon Lecture, instituted in 1913 (no lecture was given during the years 1915-20). His lecture was entitled "The Relationship of the Larynx to Pulmonary Tuberculosis," and emphasized the fact, not then universally recognized, that tuberculous laryngitis was always secondary to pulmonary tuberculosis. During the war of 1914-18, when his hospital became the ear, nose, and throat subsection of Millbank (Queen Alexandra's) Hospital, Jobson Horne took a prominent part in the care of aural casualties, and wrote on gun deafness and its prevention. After the war he became aural specialist to the Ministry of Pensions for a number of years.

A B.M.A. scholar in the years 1902 and 1903, Jobson Horne continued to take an interest in the affairs of the Association; he was chairman of the Marylebone Division in 1927, and he held various offices in the Section of Laryngology and Otology at a number of Annual

Meetings, being president of the Section in 1924, when the Association met at Bradford. He also served for two years on the Science Committee. His colleagues in London had seen little of him since he retired from practice on the outbreak of the last war. A man of wide culture and recondite knowledge, he was interested in the history of medicine, had been vice-president of the Section of History of Medicine of the Royal Society of Medicine, wrote in its *Proceedings* on St. Blaise—the patron saint of laryngology—and had a notable collection of old lancets. He was unmarried, and in his retirement he enjoyed the rustic life in his country home in Kent. His brother had been a famous collector of Italian works of art, and he himself collected old silver and mediaeval antiquities. The stout, lumbering frame of Jobson Horne concealed a worldly wisdom and quick intelligence that have left their mark in laryngology.—R. S. S.

G. A. RYRIE, M.B., Ch.B.

The news of the death of Dr. G. A. Ryrie at Kirkcaldy on March 9 at the age of 53 will be received with regret by all those who admired his efforts to make easier the life of those afflicted with leprosy.

Gordon Alexander Ryrie was born in 1899, and was educated at Montrose Academy and at the University of Edinburgh, where he graduated M.B., Ch.B. in 1926. He entered the Colonial Medical Service in 1928, and was sent to Sungei Buloh, in Malaya, to act as medical officer to the leper settlement for three months; he stayed for 17 years. Having overcome the feeling of revulsion which the first sight of the settlement inspired, he accepted the appointment of medical superintendent and held the post until 1945, except for a period of about a year, during which he was a prisoner in a Japanese internment camp at Singapore. As medical superintendent he was responsible for great changes at the settlement. He emptied the leper prison of its inmates and dismissed the armed guards; he was successful in stamping out opium-smoking in the colony; and he improved the general health of his patients by installing modern sanitary arrangements. By the time the Japanese invaded Malaya in 1942 he had had the great satisfaction of seeing the colony transformed from a miserable collection of huts into a model community. The hospital was equipped with modern apparatus, and there were new houses and shops in the village. It was hardly surprising, therefore, that his patients, for whom he worked so hard, should reward him with their love and veneration. It was a bitter blow to him when the Japanese destroyed in a few months all he had built up over a period of 13 years.

After the defeat of the Japanese in 1945 Ryrie returned to Sungei Buloh for a short time, but the hardships he endured during the war and recurrent attacks of malaria greatly weakened his health, and he returned to England. In 1947 he was appointed medical secretary to the British Empire Leprosy Relief Association in succession to Dr. Ernest Muir, and he held the post until the end of 1950, when ill-health compelled him to resign the appointment.

We are indebted to Dr. ERNEST MUIR for the following appreciation:

The death of Dr. Gordon Ryrie ends a life of rare usefulness and devotion, with much suffering bravely borne during his last 10 years. A strong individualist and somewhat of a rebel by nature, he found it hard to fit into the usual routine of the Colonial Medical Service, but when appointed

medical superintendent of the new Sungei Buloh Leprosy Colony, near Kuala Lumpur, a job which few would have chosen, he found there a congenial task. For the next 14 years he devoted himself to the service of the victims of that disease, and built up one of the largest and best-equipped leprosy institutions. Ryrie took a deep interest not only in the social but also in the scientific aspects of leprosy. He contributed particularly to the study of the racial differences of the disease as found among Indians and Chinese.

When the Japanese advanced into Malaya in 1942, and most of the European civilians withdrew, Ryrie refused to leave his post or to abandon his patients. He continued to serve them for some two years. Short of food and medical appliances, he had to watch them day by day dying of starvation and slowly rotting away, in spite of all he could do for them. His life was repeatedly threatened, but he was saved by the devotion of the indigenous inhabitants, whose good will the Japanese were anxious to preserve. In the end he was removed to a concentration camp.

Ryrie had a rare facility in writing, and had his sympathy with suffering not led him to become a physician he might have been a successful literary man. During the years at Sungei Buloh his wife took a large share in the welfare work of the colony. When increasing ill-health made it impossible for him to continue in active work, he retired to Mrs. Ryrie's home in Fifeshire. We extend to her our deep sympathy in her loss.

Dr. A. G. BADENOCH writes: Sungei Buloh Leper Settlement in the Federated Malay States, beautifully sited in a closed valley, contains a central hospital and offices, playing fields, recreation rooms, a small theatre, and a school. Those who care may grow vegetables or keep poultry or pigs. The separate cottages have each its own flower garden. Unfortunately these amenities counted for little until Ryrie was appointed medical superintendent. Leprosy work had been dominated by the tradition that it was a loathsome and incurable disease: segregation and palliation were the rule. The atmosphere was charged with hopelessness and resentment. Gordon Ryrie changed all that within a few months. Trained in tuberculosis work, his new system gave a sense of security to all his staff, and he showed an example by his personal care of the worst cases, many of whom he dressed with his own hands. He appointed the lepers themselves to nursing, administrative, sanitary, and other duties. He was the friend of every one of his 1,500 patients, and after winning their confidence he set the burdensome routine of treatment on a firm and humane basis, with diagnostic and record centres, operation theatre, and isolation wards. Educational and sports clubs were formed, plays were produced, a magazine, *The Dawn*, was printed. Mrs. Ann Ryrie taught in the school. There was an annual sports day, a weekly cinema show, and the usual seasonal festivities. The whole atmosphere of the place soon changed to one of ordered activity and happiness. A survey showed that many patients had become cured or, as the phrase goes, "burnt out" and non-infectious. When Ryrie offered these their freedom, many pleaded to remain, and jobs were found for them on the outside staff.

When the Japanese invaded Malaya, Ryrie refused to leave his leper patients and stayed, sharing their poor rations and scant supplies. He was suspected of underground activities, and a local Chinese threatened to report him unless a large bribe was paid. Ryrie arranged to hand over the money at dead of night. A sick man already, he kept the appointment, limping on his wife's (international) hockey stick. He also carried dummy money and a syringe of HCN. The Chinese got the latter—and the hockey stick to make sure. This led to Ryrie's removal to a concentration camp. When he was released, though suffering severely from malaria, dysentery, and sores, he skipped the home convoy and trekked in disguise back to his lepers. His death—a result of his voluntary martyrdom in Malaya—marks the passing of a good and faithful servant of humanity.

JOHAN M. HOLST, M.D., Hon. LL.D., Hon. F.R.C.S.
Hon. F.R.C.S.Ed.

The death of the Norwegian surgeon Professor J. M. Holst on February 17 at the age of 60 came as a great shock to his many friends, who were accustomed to regard his lithe, athletic figure as an expression of vitality and an index to longevity. The son of the physician Professor Peter F. Holst, of Oslo, Johan Martin Holst was born on June 23, 1892, and began his surgical career as a volunteer in Finland during its war of 1918. Just over 20 years later he was again in Finland, this time in charge of a Norwegian ambulance service in 1939. When Norway was invaded by the Germans in 1940, Holst was appointed chief officer to the Royal Norwegian Army, Navy, and Air Force Medical Corps, a post he held for the rest of the war. He escaped from Norway in dramatic circumstances, and continued to take an active part in the war as an organizer and administrator abroad. In 1930, when only 38 years of age, he was appointed professor of surgery in the University of Oslo and was in charge of a surgical department at the Rikshospitalet. He specialized in surgery of the stomach, thyroid, and lungs, and it was his work on the operative treatment of pulmonary tuberculosis in particular which earned him the international reputation he so richly deserved. Holst was a member of the Scientific Academy of Oslo; the Académie de Chirurgie, Paris; and the Finnish and Swedish Medical Societies. His eminence as a surgeon was recognized by his election to the Honorary Fellowship of the Royal College of Surgeons of England in 1943, the Royal Society of Medicine in 1944, and the Royal College of Surgeons of Edinburgh in 1946; the honorary degree of LL.D. was conferred on him by the University of Glasgow in 1951.

Medical Notes in Parliament

Streptomycin Exports

Mr. PETER THORNECROFT, President of the Board of Trade, told Dr. Barnet STROSS on March 10 that, so far as he knew, no streptomycin was exported to China and Hong Kong in the first six months of 1950. Dr. STROSS recalled a statement that future exports to China for civilian purposes would be based on the amount exported during that period, and asked for an assurance that the fact that none was exported in that time because we had none to export did not mean that there would be no exports to China. Mr. THORNECROFT declined to go further in this direction than pointing out that the export of streptomycin was governed not by the export of that particular drug during the period but by the export of the group of drugs in which it was included.

Vivisection Experiments

The HOME SECRETARY, in a reply to Mr. Peter Freeman on March 12, stated that records were not kept of the number of animals used in vivisection, but the total number of experiments for the years 1885 to 1951 inclusive was 26,511,783, including 7,570 experiments on horses, asses, and mules, and 113,422 experiments on cats and dogs. The figures for horses, asses, mules, cats, and dogs did not include experiments where the animal was killed while still under anaesthesia, since separate records were not kept before 1949; nor did they include certain experiments on cats and dogs in 1940 and 1941, since the records were destroyed by enemy action.

Paying for Health Services

Sir GUY LLOYD asked the Minister of Health on March 12 whether, on all forms issued by his department and handled by the public in relation to the health services, he would cause to be printed a statement to the effect that the health services were not free but that the cost was borne principally by the taxpayer.

Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, replied that, while agreeing that this fact could not be too widely known, she did not think that the form of publicity suggested would be practicable.

Spasticity in Children

Mr. W. T. WILLIAMS asked the Minister of Education on March 12 how many special schools were provided for spastic children by her department and by voluntary organization, what sums were provided for the training and education of such children by her department and how such sums were allocated, and how many children of under 16 years of age were registered as spastics. Miss FLORENCE HORSBROUGH replied that there was no general register of spastic children, and she did not collect separate figures for spastic as distinct from other physically handicapped children. Educable spastic children might be sent by local education authorities to ordinary schools or to special schools for the physically handicapped. There were four special schools in England, of which three were maintained by voluntary organizations, and one by a local education authority, specifically for children suffering from cerebral palsy, and a number of others made special arrangements for them.

Tuberculosis Among Immigrants

Mr. KENNETH ROBINSON asked the Minister of Health on March 12 how long the Standing Tuberculosis Advisory Committee had been considering the problem of tuberculosis among persons taking up residence here from abroad, and what recommendations the committee had made on the subject.

Mr. IAIN MACLEOD said the actual reference to the Tuberculosis Advisory Committee was made in December. He understood it was to be discussed in a few days.

Mr. ROBINSON said there were indications that tuberculosis was being "imported" to a disturbing extent. It was not confined to aliens, as had been suggested recently, but included British subjects from parts of the Commonwealth and from Ireland.

Mr. MACLEOD said he did not quarrel with what Mr. Robinson had said. The wider questions he had raised were under discussion with the Ministry of Labour and the Aliens Department of the Home Office.

Aureomycin Supplies

Dr. SANTO JEGER on March 12 asked the Minister of Health whether, now that aureomycin was manufactured in this country and the limitations on its efficacy were so well known among general practitioners, he would make it more freely available to doctors so that delay is avoided when its use is indicated.

Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, replied that the manufacture of aureomycin in this country still involved bulk importation of the crude drug at considerable dollar cost, and the Minister thought that its issue ought to be subject to the present safeguards. He was not still to be subject to the present arrangements, there was any undue delay in supplying this drug to general practitioners in cases where its use was indicated. Since October 1, 1952, 896 applications by general practitioners for the use of aureomycin had been granted. About 5% were refused.

The Births and Deaths Registration Bill, a consolidation measure which has passed the House of Lords, was read a second time in the House of Commons on March 11.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 28 (No. 8) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	27	2	7	0	1	37	3	21	1	1
Dysentery ..	252	50	124	3		591	56	78	3	1
Encephalitis, acute ..	9	0	1	0		5	0	0	0	
Enteric fever: Typhoid ..	4	0	0	0	4	3	0	0	1	3
Paratyphoid ..	2	0	10	0	0	6	0	1 (B)	0	
Food-poisoning ..	101	15		1		85	21		0	
Infective enteritis or diarrhoea under 2 years ..				14	22				10	13
Measles* ..	30,884	1624	388	101	360	5,734	123	483	152	137
Meningococcal infection ..	47	5	14	1	6	45	5	25	3	5
Ophthalmia neonatorum ..	24	4	8	0		40	2	13	1	
Pneumonia† ..	1,897	83	456	20	13	1,143	50	478	20	3
Poliomyelitis, acute: Paralytic ..	12	2	1	2	4	9	1		1	1
Non-paralytic ..	1	0				5	0			
Puerperal fever‡ ..	278	23	14	2		218	39	9	2	
Scarlet fever ..	1,455	88	208	49	78	1,613	141	251	18	53
Tuberculosis: Respiratory ..			153	33				161	29	
Non-respiratory ..			27	5				35	4	
Whooping-cough ..	2,746	149	250	68	139	2,648	128	418	103	73

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	0		0	0	0	0	0		0	0
Dysentery ..	1	1		0		0	0		0	
Encephalitis, acute ..		0					0			0
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	13	3	1	2	0	14		1	0	1
Influenza ..	314	28	20	1	1	29	6	9	1	0
Measles ..		1	0	0	0		0	1	0	0
Meningococcal infection ..		3	1				0			
Pneumonia ..	578	81	45		8	368	57		18	20
Poliomyelitis, acute ..	8	0			0	0	0			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis: Respiratory ..	131	9	10	1	8	176	24	30	4	14
Non-respiratory ..		1	5	1	1		3	5	1	4
Whooping-cough ..	3	0	1	0	3	4	0		2	1
Deaths 0-1 year ..	284	40	47	12	23	296	32	43	23	13
Deaths (excluding stillbirths) ..	7,575	1003	754	145	179	6,856	967	796	162	202
LIVE BIRTHS ..	8,101	1208	914	227	367	8,101	1249	910	234	375
STILLBIRTHS ..	195	16	21			231	30	28		

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

Vital Statistics

Smallpox in the North Country

Up to March 17 four cases of smallpox had been diagnosed in three men working in a cotton mill at Todmorden, Yorkshire, and in the wife of one of them. One man had died. The cases are as follows:

Todmorden M.B., Yorkshire West Riding.—On March 12 a man aged 45 who had sickened on March 3 and developed a rash on March 7 was admitted to Halifax General Hospital. Here smallpox was suspected, and he was transferred three hours later to the Oakwell Smallpox Hospital. On March 16 there was laboratory confirmation. He had been vaccinated only at the age of 2. On March 15 a man aged 60 and his wife aged 57 were admitted to Oakwell Hospital. The man had sickened on February 28, and a rash, then thought to be chickenpox but now diagnosed smallpox, appeared on March 4. The wife's rash appeared on March 16. He had been vaccinated in infancy and again in the 1914-18 war. She had never been vaccinated.

Bacup M.B., Lancashire.—On March 12 a man aged 51 residing at Bacup but working in Todmorden was admitted to a cubicle at the Florence Nightingale Hospital, Bury, with the diagnosis of scarlet fever. On March 13 petechiae appeared, and the man died. Subsequently smallpox was suspected, and on March 16 there was laboratory confirmation. This man had been unwell with a quinsy since February 28, but was forced to take to his bed with what was probably the onset of smallpox on March 9. He had been vaccinated only in infancy.

In view of the delay in the recognition of the causes of the illness in several of these cases, amounting in one instance to a fortnight, it is very probable that the outbreak will continue.

Infant Mortality by Social Class

The latest *Annual Report* of the Registrar-General for Scotland (1950) contains an analysis of stillbirths and infant deaths according to social class of father. The following figures extracted from a table in the report (p. 47) illustrate how the stillbirth and infant mortality rates increase in relation to social class.

Social Class	Rates	
	Stillbirths per 1,000 Total Births (Live and Still)	Total Infant Mortality per 1,000 Live Births
I	16.3	25.9
II	22.6	24.2
III	26.4	37.0
IV	29.1	43.9
V	32.3	53.6
Total	26.9	38.6

The infant mortality in classes IV and V combined is 93% higher than in classes I and II. The difference between the social class becomes greatest for death rates later in the first year of life, neonatal causes (i.e., in the first four weeks) being only 54% higher in classes IV and V than in I and II.

Infectious Diseases

Falls were recorded in the number of notifications of infectious diseases in England and Wales during the week ending February 28—2,006 for measles, from 32,890 to 30,884; 245 for acute pneumonia, from 2,142 to 1,897; 95 for scarlet fever, from 1,550 to 1,455. The only large rise was 549 for whooping-cough, from 2,197 to 2,746.

The incidence of measles, which in the preceding week had reached the highest level since this disease was made notifiable, declined sharply. The largest falls were 367 in Southampton County, from 1,631 to 1,264; 321 in Lancashire, from 2,150 to 1,829; 268 in Durham, from 897 to 629; 335 in Middlesex, from 2,190 to 1,855; 208 in London,

from 1,832 to 1,624; 202 in Warwickshire, from 1,630 to 1,428. The largest exceptions to the decline in the incidence of measles were rises of 196 in Devonshire, from 841 to 1,037, and 126 in Kent, from 1,543 to 1,669. Only small variations occurred in the local trends of scarlet fever, with the exception of a decrease of 50 in Lancashire, where the notifications fell from 260 to 210. The largest increases in whooping-cough were 142 in Lancashire, from 540 to 682, and 69 in Kent, from 49 to 118. 27 cases of diphtheria were notified, 11 more than in the preceding week. The chief features of the returns of diphtheria were rises in Lancashire from 2 to 7 and in Warwickshire from 0 to 4. The largest centres of infection were Liverpool C.B. 5, Plymouth C.B. 4, and Birmingham C.B. 4.

13 cases of acute poliomyelitis were notified, and these were 13 fewer for paralytic and 1 fewer for non-paralytic cases than in the preceding week. Huntingdon, with 2 cases, was the only area with more than one case.

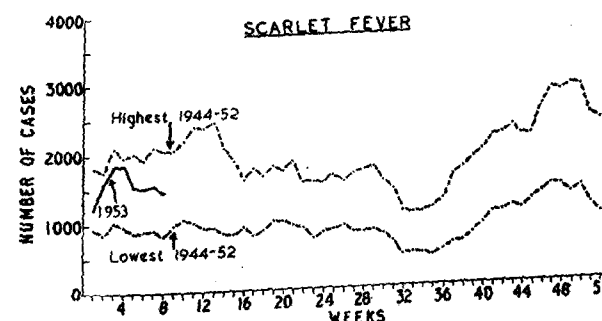
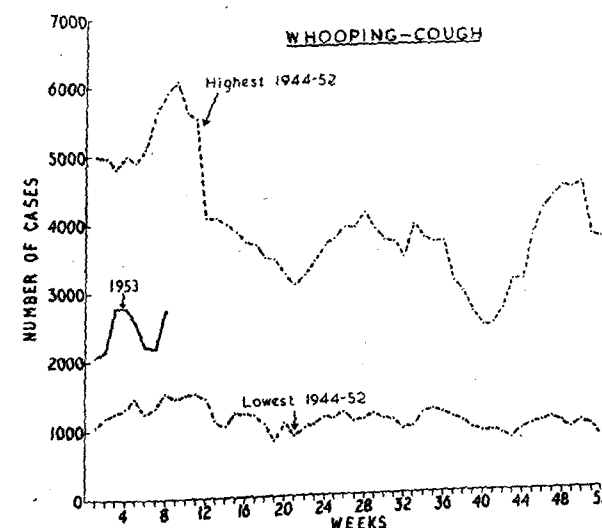
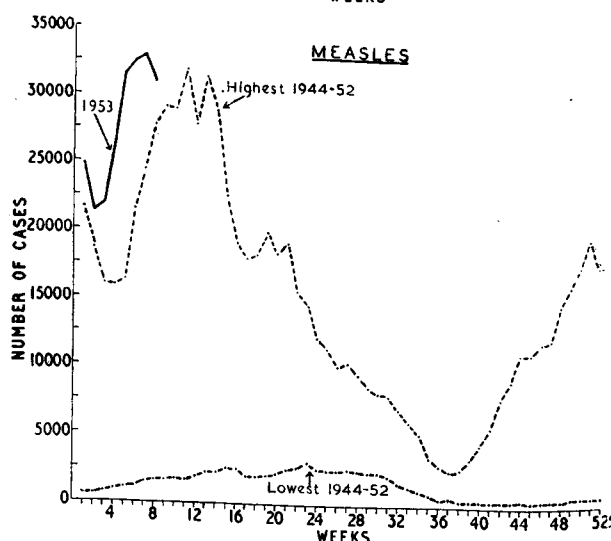
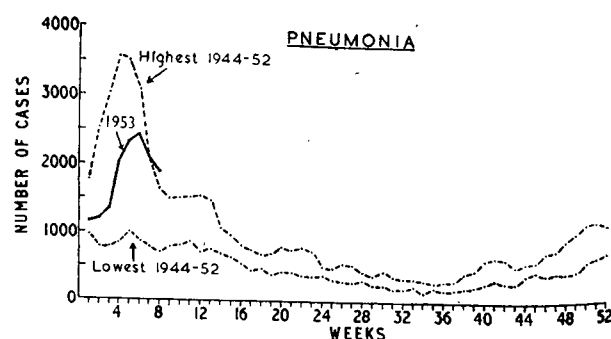
The notifications of dysentery rose from 241 to 252. The largest returns were Lancashire 58 (Liverpool C.B. 20, Manchester C.B. 20), London 50 (scattered through 16 boroughs), Yorkshire West Riding 39 (Leeds C.B. 29), and Warwickshire 14 (Rugby R.D. 12).

9 of the 10 cases of paratyphoid fever notified in Scotland were reported from Banff County.

314 deaths were attributed to influenza during the week in the great towns, 207 fewer than in the preceding week.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending March 7

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,534, whooping-cough 2,758, diphtheria 22, measles 27,638, acute poliomyelitis 17, dysentery 289, paratyphoid fever 6, and typhoid fever 6.

Medical News

Institute of Almoners.—The Jubilee Dinner of the Institute of Almoners was held at the Holborn Restaurant on March 14, with Professor Alan Moncrieff in the chair. In proposing the health of the Institute, Sir Russell Brain said that the Institute had 50 years of great achievement behind it. The almoner had been created by the growing complexity of society. "We doctors," he remarked, "cannot do without you." The almoner was a new form of social consciousness. He looked forward to the time when all non-medical workers in health would join with doctors in a voluntary council to meet the challenge of the welfare State. Miss E. C. Warner, A.M.I.A., in reply, said that 50 years ago the first almoners' committee was formed, and in the course of time this grew into the Institute. In 1903 there were in existence seven working almoners. Now the Institute had over a thousand members, and they were pleased to have been given university recognition by the recent decision of Edinburgh to provide a third-year course for almoners. Thanks, among others, to their chairman, the Ministry of Health had agreed to provide grants to the students. A third point she would like to mention was the successful result of the negotiations on scales of remuneration, and in this connexion they owed much to their general secretary, Miss M. Steel. In 1951 a committee was set up to survey the work of almoners, and the report now

drawn up had been almost unanimously accepted. "We have," Miss Warren concluded, "a place within the structure of our society. We must increase our recruits and improve standards of training." The toast of the guests was proposed in a most gracious and witty speech by Miss M. B. Streatfield, A.M.I.A., and Miss E. L. Younghusband maintained the high standard of speeches in her response.

Queen Elizabeth College of Household and Social Science.—The granting of a royal charter to the King's College of Household and Social Science, University of London, which is to be known henceforth as Queen Elizabeth College, after Queen Elizabeth the Queen Mother, was celebrated by a luncheon at the College on Campden Hill on March 11. The principal speaker was Lord Horder, who said that the College dated from a modest beginning in 1908, followed four years later by the foundation of the Household and Science Department of King's College for Women, with Sir Cooper Perry as first chairman. In 1916 a diploma and in 1920 a degree were granted in household and social science. Sir John Atkins, the present chairman, was elected to that office in 1922. Now a royal charter had been granted, and the university degree of B.Sc. had been replaced by two new degrees—B.Sc. in Household Science and B.Sc. in Nutrition. No more significant step could have been taken at Queen Elizabeth College, Lord Horder added, than the addition of the subject of nutrition to its curriculum. There were excellent opportunities in this field of research. Dame Caroline Haslett, who also spoke, mentioned the suitability of nutrition as a career for girls. They would find the theoretical and practical training given at the College invaluable.

Pictures, Books, and Music in Hospitals.—Last week Miss Pat Hornsby-Smith, Parliamentary Secretary to the Ministry of Health, opened a one-day conference on "Pictures, Books, and Music in Hospitals" at the Wellcome Research Institution, London. The conference was sponsored jointly by the British Red Cross Society Picture Library, the St. John and Red Cross Hospital Library, and the Council for Music in Hospitals. Lady Falmouth was in the chair. After an introductory talk on the work of the B.R.C.S. Picture Library by Lady Falmouth, the keeper of the Birmingham City Museum and Art Gallery, Dr. Mary Woodall, spoke on "Pictures and Patients." She was followed by Mrs. Harold Raymond, who described the great expansion of the St. John and Red Cross Hospital Library Department, which now caters for 1,500 hospital libraries in Britain as well as for all Service hospitals at home and overseas. Later there was a demonstration on the art of hospital librarianship. The last part of the conference, devoted to music, was introduced by the Earl of Harewood, president of the Council for Music in Hospitals. Dr. S. F. Mitchell described the curative value of music, particularly for those in mental hospitals. The conference concluded with a talk by Mr. Adrian Hill.

Ciba Foundation.—Since the opening of the Ciba Foundation for the Promotion of International Co-operation in Medical and Chemical Research less than four years ago, the Foundation has done much to live up to its title. Perhaps the most useful of its activities are the informal symposia which it holds in London. To these are invited 40 to 50 experts in the subject under discussion from all over the world. Last year there were six of these symposia, three being devoted to endocrinology ("Bio-assay of Anterior Pituitary and Adrenocortical Hormones," "Hormonal Factors in Carbohydrate Metabolism," and "Synthesis and Metabolism of Adrenocortical Steroids"), and three to general subjects ("The Spinal Cord," "Mammalian Germ Cells," and "Chemical Structure of Protein"). The proceedings of these conferences are later published (see our review pages, February 21, p. 440). Last year the Foundation inaugurated a series of exchange bursaries with the Institut National d'Hygiène in France. The bursaries are to allow doctors to pay short visits to France (or England) in order to obtain clinical experience or undertake research. Last year bursaries were awarded to five British doctors and six French. A constant stream of medical and scientific visitors have been accommodated at the Foundation's house

in Portland Place, London, W.1. On an average there were seven guests each night throughout the year, and they came from 29 different countries.

Cambridge University Health Service.—During the year 1951-2 all except 7 of the 2,296 freshmen arriving at Cambridge (99.7%) submitted to mass miniature radiography. Among them were found 15 cases of "possibly active" tuberculosis, five of which were previously unknown. Another five cases were found among the senior undergraduates, though here only about a quarter of those in residence were examined. This failure to take full advantage of the x-ray service is disappointing and the College authorities are blamed for not exerting more persuasion. Four seniors who failed to report for x-ray examination developed pulmonary tuberculosis during the year. Over three-quarters of the freshmen were also examined clinically (half an hour each), and, although the commonest causes of reference were eye symptoms or bad teeth, the University's major medical problems are said to centre round pulmonary tuberculosis and mental upset—as at Oxford. The health service is analysing its height and weight records of 7,000 undergraduates with a view to preparing standard tables.

Honorary Degrees at Edinburgh.—Among those who will receive the honorary degree of LL.D. at the summer graduation ceremonial at Edinburgh University in July are Professor Charles McNeil and Dr. S. L. A. Manuwa. Professor McNeil is professor emeritus of child life and health in the University of Edinburgh, and Dr. Manuwa is inspector-general of Medical Services, Nigeria. During the bicentenary celebrations of the publication of Dr. James Lind's "Treatise of the Scurvy," which are due to be held at Edinburgh on May 22, Surgeon Vice-Admiral Sir Sheldon Dudley will be made an honorary M.A. Lind recommended the juice of citrus fruits for the prevention of scurvy, and it was largely owing to him that scurvy was eventually eradicated from the British Navy.

New Geriatrics Journal.—The American Geriatrics Society has begun publication of a new journal on its specialty, the *Journal of the American Geriatrics Society*. It will appear six times a year at an annual subscription of £4 2s. The agents in this country are Messrs. Baillière, Tindall & Cox, 7-8, Henrietta Street, London, W.C.2. Interest in this subject in the U.S.A. is already sufficient to sustain two other journals, the quarterly *Journal of Gerontology*, and the bi-monthly *Geriatrics*. There is at present no British journal specializing in this subject.

Register of Orthoptists.—The 1953 *Register of Orthoptists* has now been published, and is available free to medical practitioners on application to the secretary and registrar, Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, W.C.1. Orthoptists are classified on a geographical basis, and the *Register* gives addresses and telephone numbers and denotes where private practice is undertaken.

Public Health (Infectious Diseases) Regulations, 1953.—New regulations on the notification and prevention of infectious diseases come into force on April 1. In general substance and form the new regulations are similar to the old. The main changes relate to the control of food-poisoning: wider powers are provided for its prevention.

Emergency Bed Service: Applications and Admissions.—During the seven days ending March 16 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 1,336, of whom 87.2% were admitted.

Dr. George Oliver, of Harrogate, in 1904 gave to the Royal College of Physicians £2,000 to endow a lectureship or prize in memory of William Sharpey. The College has not yet been able to obtain a portrait or photograph of Dr. Oliver, and if anyone knows of the existence of one would he kindly communicate with Professor E. C. Dodds, Harveian Librarian, Royal College of Physicians, Pall Mall East, London, S.W.1.

Dr. A. Q. Wells, a member of the Medical Research Council's staff at the Sir William Dunn School of Pathology, Oxford, and an authority on murine tuberculosis, has been appointed a Sheriff of Oxfordshire.

COMING EVENTS

Association of Clinical Biochemists.—The inaugural general meeting of the Association of Clinical Biochemists will be held at 2.30 p.m. on March 28 at the Postgraduate Medical School of London.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, March 23

MEDICAL SOCIETY OF LONDON.—8.30 p.m., discussion to be introduced by Dr. T. H. Mills and Mr. M. A. Falconer: Value of Arteriography.
ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: Physiology of Accommodation Clinically Considered. Treatment of the Hypermetrope.

Tuesday, March 24

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. W. N. Goldsmith: Vegetating Dermatoses.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor H. H. G. Eastcott: Arterial Grafting for the Ischaemic Lower Limb.
WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Dr. N. G. Hulbert: Neurological demonstration.

Wednesday, March 25

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At Monyhall Hall, King's Heath, 8 p.m., clinical meeting.
EUGENICS SOCIETY.—At Burlington House, Piccadilly, W., 5.30 p.m., Dr. Gertrude Willoughby: Population Problems and Family Policy in France.
●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Lichenoid Eruptions.
INSTITUTE OF UROLOGY.—At St. Paul's Hospital, W.C., 4.30 for 5 p.m., Mr. H. G. Hanley: Disorders of Micturition in Females.
ROYAL EYE HOSPITAL CLINICAL SOCIETY.—8 p.m., Mr. M. A. Falconer: Visual Field Changes in Compressions of the Optic Nerve.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. J. B. Alexander: Recent Advances in the Treatment of Pulmonary Tuberculosis in the Adult.

ROYAL SANITARY INSTITUTE.—At Town Hall, Walspool, 10.15 a.m., Dr. J. J. Jones: Trend of Population and its Effect on Public Health; Mr. F. A. Lodge: Slum Clearance Problems of To-day.
WELSH NATIONAL SCHOOL OF MEDICINE.—At Reardon Smith Lecture Theatre, Park Place, Cardiff, 8 p.m., 4th William Sheen Memorial Lecture by Sir Cecil Wakeley, P.R.C.S.: Modern Trends in the Treatment of Cancer.

Thursday, March 26

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Mycology—Epidemiology of Fungous Infections.
LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Dr. Lennox Johnston: Cure of Tobacco Smoking.
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At 11, Chandos Street, W., 8.30 p.m., Dr. M. H. Pappworth: Science of Diagnosis.
MIDDLESEX COUNTY MEDICAL SOCIETY.—At Central Middlesex Hospital, 3 p.m., clinical meeting; 4.45 p.m., Dr. F. Avery Jones: Australian Journey (with colour slides).
NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Manchester Royal Infirmary, 4.30 p.m., Mr. J. F. Dark and Mr. P. Jewsbury: Lung Resection in Pulmonary Tuberculosis.
ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Dr. E. R. Cullinan: East African Interlude.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor S. S. Rose: A Clinical and Radiological Survey of 150 Cases of Recurrent Swellings of the Salivary Glands.

Friday, March 27

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, University College, W.C., 11 a.m., annual general meeting.
●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. L. Forman: Lichen Planus.
MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—7.30 p.m., general meeting. Dr. A. H. Harkness: Therapeutics of Non-gonococcal Urethritis.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Feilden.—On March 5, 1953, at the Roan Antelope Copper Mines Hospital, Luanshya, Northern Rhodesia, to Elspeth (formerly Brown), M.B., B.S., wife of Francis Antony Feilden, a son—Humphrey John.
Howell.—On March 3, 1953, at St. David's Hospital, Cardiff, to Jean, wife of Dr. David Gordon Howell, a son—David Vaughan.
Masters.—On March 8, 1953, at Mason's Hill Maternity Hospital, Bromley, Kent, to Jean (formerly Newland), wife of Edgar James Masters, M.B., B.S., a son—Nigel James.
Sers.—On January 22, 1953, to Dr. Phyllis (formerly Neil), wife of Dr. Rolf Sers, Goldboro, Nova Scotia, a son.
Turner.—On March 3, 1953, at University College Hospital, London, W.C., to Joan, wife of Robert G. Turner, F.R.C.S., a son—Peter.

DEATHS

Buckle.—On February 27, 1953, at 56, Woodlands Lane, Great Shelford, Cambridge, William Frederick Buckle, M.D.
Cartwright.—On February 22, 1953, at the Lonsdale Nursing Home, Tunbridge Wells, Kent, Ernest Henry Cartwright, M.D., D.P.H., formerly of Myskyns, Ticehurst, Sussex, aged 87.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

The Origins of Clinical Thermometry

Q.—When was the measurement of the temperature of the body first used systematically for medical purposes, and when and where was the first clinical thermometer made?

A.—Hippocrates regarded heat as the chief diagnostic sign of acute diseases. Galileo is generally credited with the invention of the spirit thermometer. Sanctorius introduced it to the medical profession; in his commentary on Avicenna (Venice, 1626) he demonstrated its usefulness in the study of disease. His book includes an illustration of a thermometer. Fahrenheit introduced his scale in 1714, and Réaumur in 1730 introduced a mercury thermometer with a scale of 80° between freezing and boiling points. The centigrade scale was invented by Celsius, of Upsala, in 1742, with 100° as the melting point of ice and 0° as the boiling point of water. In the following year Christin, of Lyons, reversed this scale.

The first accurate observations on the temperature of healthy men and animals seem to have been recorded by G. Martine in his *Essays, Medical and Philosophical*, 1740. Boerhaave used the thermometer extensively in clinical work, probably employing the ordinary weather instrument. In 1835 Becquerel and Breschet established the mean body temperature in health as 37° C. (98.6° F.). The self-registering maximum thermometer for medical use was invented by Aitken about 1865. It was a cumbersome instrument some 10 in. (25 cm.) long, and in 1867 Clifford Allbutt instructed a Leeds firm to make him a series of experimental thermometers, and succeeded in reducing the length of the tube to 3 in. (7.6 cm.). The pocket clinical thermometer thus devised by him came rapidly into general use. The word *thermomètre* first appears in J. Leurechon's *Recréation mathématique*, 1624.

Intermittent Claudication Unrelieved by Sympathectomy

Q.—What further treatment is available for sufferers from intermittent claudication after the failure of lumbar sympathectomy?

A.—Conservative measures such as Buerger's exercises and the use of vasodilator drugs such as tolazoline ("prisco") should be persisted with. If there is no improvement a year after sympathectomy section of the tendo Achillis must be considered. This aims at relieving pain in the gastrocnemius and soleus muscles by inactivating them. It may also relieve pain arising in other muscles of the leg by reducing the bulk of muscle demanding blood during exercise. The most suitable cases are those in which pain starts in the back of the calf and radiates upwards or downwards without encircling the leg. A forecast of the possible effect of tenotomy may be made by applying a below-knee plaster cast to fix the ankle, and then observing the effect on walking distance of this method of reducing the activity on the affected side is sometimes helpful. The most suitable cases for tenotomy are those in which the opposite limb is relatively unaffected and in which the walking distance is less than 50 yards (45 m.). The operation should not be done unless the nutrition of the skin of the limb is good. There is some loss of power in certain actions such as pressing the brake pedal of a car, and this must be considered before operation is decided upon.

Reconstructive operations such as grafting are now possible in highly selected cases in suitably equipped centres.

Arteriography is a necessary first step. Localized thrombosis in an otherwise relatively healthy arterial tree may allow the insertion of a graft. The operation is best reserved for patients with more serious symptoms than claudication alone.

Sudden Death after Penicillin

Q.—Sudden death has been recorded following the injection of penicillin and ascribed to undue sensitivity to it. (1) Should sensitivity-testing be adopted routinely before giving penicillin? (2) What is the medico-legal position if there is a fatality and sensitivity-testing has not been done?

A.—Sudden death after a penicillin injection is almost unheard of and not explicable as the result of sensitization, when the principal effects are fever and urticaria, although occasionally a shock-like condition may result. Death has been caused by the injection of excessive doses intrathecally and by the accidental penetration of a vein during an intramuscular injection of certain preparations of penicillin other than those ordinarily used, but presumably the question does not refer to such cases. In view of the enormous number of doses of penicillin given daily with no ill effects by practitioners who could not possibly afford the time for precautions to guard against a highly improbable contingency, the answers must obviously be: (1) No; (2) There appears to be no cause of action.

Exact Identification of Bacteria

Q.—(1) What methods of typing bacteria are now available to assist the study of the spread of disease? (2) To which diseases of man may these methods now be usefully applied?

A.—(1) Bacteria can be typed by serological methods or by means of bacteriophage. The former are applicable to pneumococci, streptococci, meningococci, staphylococci, diphtheria bacilli, and in a modified sense of the term to certain of the *Enterobacteriaceae*, such as salmonella and dysentery bacilli. The latter is used chiefly for typing *Salmonella typhi*, *S. paratyphi* B, *S. typhi-murium*, and staphylococci. Methods for typing other organisms by bacteriophage have been described, but are not in routine use.

(2) These methods can be applied to the investigation of any of the diseases caused by the organisms which have been mentioned. In general, serological typing involves a good deal of work, and is reserved for special investigations. Bacteriophage typing of *S. typhi*, *S. paratyphi* B, and the staphylococci is relatively simple, and is employed as a routine where there is any reason to expect that the information obtained would be of epidemiological interest.

Kieselguhr Powder

Q.—What is kieselguhr powder? Has it any harmful effect if inhaled or in contact with the skin? A patient is exposed to the powder in his work, and complains that it causes a sore throat and cough.

A.—Kieselguhr powder is one of the diatomaceous earths, consisting of the skeletons of extinct diatoms. Its composition is almost pure silica in an amorphous form. Because of its amorphous form it is generally regarded as being a harmless dust to inhale. When inhaled in sufficient quantity over a long period of time it can cause silicosis; but whether or not silicosis develops probably depends on the treatment—for example, grinding or crushing—which the kieselguhr undergoes. The powder also has a drying effect on the throat and trachea, causing soreness and cough.

Some authorities state that calcined diatomaceous earths cause silicosis much more rapidly than those not so treated. For this reason it is very difficult to give any specific safe maximum concentration of dust. This type of silica may be mixed with alkalis and soap powders in the manufacture of abrasive cleaners, in which case the action of the silica

on the lungs seems to be increased by the presence of alkali. Apart from its abrasive qualities, which may rarely give rise to a friction dermatitis, the powder should not be harmful to the skin.

Kieselguhr powder should be handled with care. If the method of use is such as to cause continuous clouds of dust, it should be handled under exhaust ventilation. Special care is required in the case of calcined and ground kieselguhr.

Non-operative Treatment of Dupuytren's Contracture

Q.—Is there any non-operative treatment likely to improve an early case of Dupuytren's contracture? Would splinting during sleep be helpful? The patient's main relaxation is playing the piano.

A.—There seems to be no doubt that the progress of some cases of Dupuytren's contracture can be delayed, if not arrested, by the wearing of an appropriate splint at night combined with frequent manipulation of the finger by the patient himself during the day.

For many years a search has been made for some internal or local medicament which would soften contracting fibrous tissue. The use of "fibrolysin" and "iodolysin" (thiosinamine derivatives) in this way will be remembered by older practitioners. Recently two further materials have been suggested, the one vitamin E, and the other phenyl-cinchoninic acid. The writer has not noted much improvement from the employment of any of these methods, but some maintain that in the case of vitamin E the doses frequently used are inadequate and that if massive doses are given for a prolonged period results are obtained.

NOTES AND COMMENTS

Asthmatic Attacks in Infancy.—Dr. E. R. WINTON (London, S.E.9) writes: In the *Journal* of January 31 (p. 285) under the heading "Any Questions?" an inquiry was made about the alternative to injecting adrenaline in treating an asthmatic attack in a child. The questioner and his respondent (and perhaps others) might be interested to know that for about a year I have tried an unorthodox method with a modest amount of success. The treatment is to administer sublingually two or three minims (0.12 to 0.18 ml.) of ol. myristicae B.P. It had occurred to me that the essential oils used as carminatives, which somehow relaxed the cardiac sphincter sufficiently to permit eructation, might also act on other plain muscles; and an old wives' tale to the effect that nutmegs hung round the neck protected against asthma led me to use the particular oil mentioned as a pilot experiment. The administration of this oil is simple, requires no technical skill as does the syringe, conveys no discomfort in use, and in the dosage employed appears to produce no bad side-effects. If only one could say this of adrenaline, isoprenaline, and like preparations!

As it chanced, my first two cases, a girl of 6 and a woman of 35, were both completely relieved in an attack within a few minutes. In the case of the child I had my stethoscope applied to the chest and a stopwatch in my other hand; all spasm disappeared in two minutes exactly. In a later attack in this same child I had the pleasure of being able to demonstrate to my wife complete relief exactly two minutes after instilling the oil. Subsequently I obtained identical results in a little boy; the rest of a dozen cases either required a further dose after five minutes to obtain fair relief, or were very little helped. One lad of 16 acquired resistance to the treatment over weeks, and had never had relief comparable to isoprenaline or adrenaline; he is now considerably resistant to adrenaline also. In no case was there report of undesirable side-effects; I have myself taken sublingually five times the maximum B.P. dose without untoward effect.

My impression from this small, by no means statistically significant group of cases is that the better result may be looked for in young children, and that where irreversible bronchial changes have taken place the drug is likely to be useless. Certainly, of the six adults treated with this oil, only one obtained good relief. The only lesson I draw from this small experiment is that at least one essential oil containing many complex substances happens to contain some ingredient or combination of ingredients which relaxes smooth muscle. There are many essential oils, and a properly conducted clinical investigation combined with a laboratory study of the individual substances contained in them may reveal some useful non-toxic preparations to be added to our armamentarium. And in asthma, at least, this would be very welcome.

OUR EXPERT writes: There are very many unorthodox treatments of asthma, none of which were included in my brief answer. Some of the unorthodox treatments help individual cases by virtue of their ingredients, others work by faith. Most of these unorthodox treatments have been tried by orthodox doctors interested in asthma and have not been found to be helpful in a sufficiently high proportion of patients to be advised generally. Dr. Winton's results are not really surprising, for carminatives are known to help some attacks of asthma in some cases, perhaps rather more frequently than is appreciated in these modern days. The older clinicians some 20 to 30 years ago who emphasized "reflex causes" of asthma appreciated the relief that might be obtained when treatment was directed to relieving or avoiding gastric or colonic distension, but the older physicians were also all agreed on the value of ephedrine and adrenaline when they first came. We must also not forget that an injection of sterile water will sometimes stop an attack of asthma quite dramatically and within a few minutes. Asthma is a psychosomatic disease, and confidence and enthusiasm are assets in its treatment, as they are in many other illnesses.

It is of interest to learn of Dr. Winton's experience, but one would hesitate to conclude that "at least one essential oil containing many complex substances happens to contain some ingredient or combination of ingredients which relaxes smooth muscle." It does not necessarily follow, for an attack of asthma can be relieved by sterile water injection and also by an enema (I have known quite a few children relieved by enema), but in neither case is there any substance with relaxes smooth muscle. One would hesitate to recommend these methods of treatment as a routine. Carminatives have a very slight antispasmodic action, but it is indeed very slight, even though Dr. Winton tends to push up the dose a little high, and large doses can be dangerous.

A PHARMACOLOGIST writes: According to the published statements the treatment of asthma in children with 2 to 3 minims of ol. myristicae is not without risk. The oil constitutes about 10% of the material present in the nutmeg, and the toxic dose of nutmeg is 5–10 g. Hence the toxic dose of the oil may be as low as 0.5 g., and the doctor is giving nearly that dose. He states that he himself has taken about five times this dose by putting it under his tongue. There is great variation in the toxicity of a substance like ol. myristicae for different individuals, and he may be unusually resistant. There was a discussion of nutmeg poisoning in the *Proc. roy. Soc. Med.*, 1908 (Sect. of Therapeutics and Pharmacology), p. 39, and again in 1909, p. 69, in which Cushny and Dale took part. Numerous cases of poisoning by one or two grated nutmegs were described. There is no mention of an action on smooth muscle. There is a reference to nutmeg as a mild and safe hypnotic for children, and Dale thought that this therapeutic use was at least worth considering.

Foot-drop after Delivery.—Dr. W. S. ANDERSON (Brechin) writes: As a comment to the query on this subject ("Any Questions?" March 7, p. 575) may I state that my one experience of this condition was with a patient who developed foot-drop soon after delivery, and who gradually exhibited the signs and symptoms of disseminated sclerosis, from which she ultimately died some 12 years later? The foot-drop was treated, in the first place, orthopaedically.

Allergic Rhinitis.—Drs. MORRIS CUTNER and B. S. SWEETMAN (Chelsea, S.W.3) write: Your expert writes ("Notes and Comments," March 7, p. 576), "I have no personal experience of histamine ionization, but zinc ionization will help about half those with allergic rhinitis." May we just point out that zinc ionization is a localized treatment applied to the nasal mucosa for a localized result, whereas in the former treatment the histamine is ionized into the skin of the forearm and aims at a cure by effecting a general reaction.

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ACTION OF THE OVARIAN HORMONES ON UTERINE MUSCLE*

BY

GEORGE W. CORNER, M.D.

Director, Department of Embryology, Carnegie Institution of Washington, Baltimore, Maryland, U.S.A.; George Eastman Visiting Professor, Oxford University, 1952–3

AND

ARPAD CSAPO, M.D.

Staff Member, Department of Embryology, Carnegie Institution of Washington, Lecturer in Obstetrics, Johns Hopkins University School of Medicine, Baltimore

In 1907 Sir Henry Dale reported from his laboratory at Herne Hill the curious discovery that the uterus of the cat does not always react in the same way when its muscular tissue is stimulated through the hypogastric nerves or by intravenous injection of adrenaline. If the cat is not pregnant these stimuli cause relaxation of the uterus, but if she is pregnant they cause contraction. Before Dale's paper was printed Professor A. R. Cushny (1907) made identically the same observation at University College and reported it to the Physiological Society. Although it probably did not occur to either of these eminent pharmacologists that the reversal of muscular response which they had noticed was caused by action of the ovary, and although in fact "pregnancy reversal" still awaits detailed explanation, it was this observation that opened the way to study of the relation between the ovary and the behaviour of the uterine muscle.

In that same year the Heidelberg gynaecologist Erwin Kehrer (1907) was making his pioneer studies of uterine muscle *in vitro*, in which he applied the then very recent discovery of Rudolf Magnus that strips of involuntary muscle cut from the intestine will long remain active if immersed in warm oxygenated physiological salt solution. By attaching such a strip to a lever, the spontaneous isotonic contractions of the muscle and its response to stimulation can be registered. This beautifully simple method began at once to be used in every pharmacological laboratory where oxytocic drugs were studied, Kehrer himself leading the way. In 1908, reporting his first studies on the action of ergot derivatives, he recommended the use of young virgin cats, for he had found that uterine tissue from adult animals taken during the breeding season was often less active and less predictable in its responses. This precautionary specification of the virgin uterus for tests of oxytocic drugs was written into all the pharmacopoeias of the world long before it could be understood in the light of endocrinology.

In 1913 Max Stickel noticed that the movements of the rabbit's uterus *in situ* are greatly reduced by ablation of the ovaries, and a few years later (1919) Athias, of Lisbon, confirmed this fundamental observation by *in vitro* experiments on guinea-pigs' uteri by

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the Magnus-Kehrer method. Castration, he wrote, causes a gradual weakening of the automatic contractions to the point of disappearance. If, however, ovarian tissue is regrafted into the animal at the time of castration the uterus retains full power to contract spontaneously *in vitro*. Evidently uterine contractility depends upon an internal secretion of the ovaries. We shall be able, later in this lecture, to explain this remarkable fact, in part at least, on biochemical grounds. Thus, before the two ovarian hormones were isolated or even clearly foreshadowed, characteristic differences in the behaviour of uterine muscle were observed which we can now see were related to the action of progesterone and oestrogen respectively.

Shrewd Conjecture

One of us (G. W. C.) was fortunate in having in his laboratory, about the years 1921–2, a group of medical students doing research on various aspects of the ovarian cycle. Two of these young men, the twin brothers Guttmacher, happened to read Dale's paper of 1907, and made the suggestion that the changes in uterine response to adrenaline observed during pregnancy may be due to the action of the corpus luteum, and hence might be expected to occur also in non-pregnant animals during the corpus luteum phase of the reproductive cycle. This was an extraordinarily shrewd conjecture to be made by medical students. Going on to other studies, the Gutmachers were unable to test their conjecture, and with their consent it was turned over to another student, John D. Keye.

Keye was taught to utilize for this purpose the uteri of swine, which were readily available at an abattoir near the Johns Hopkins Medical School. The sow has a clearly defined reproductive cycle consisting of a follicular phase lasting one week, which culminates in oestrus and ovulation, during which oestrogen is the dominant hormone, and a corpus luteum phase about two weeks in length, during which progesterone is dominant. Such a sequence of events occurs, with various modifications, in all mammals that have been studied. In the rabbit, which is the chief subject of our contribution, oestrus is not periodic and ovulation does not occur spontaneously. Mature does will accept mating at almost any time, and then only do the follicles mature and rupture. The

follicular phase of the cycle (if we may speak of a cycle in this case) is therefore of indefinite length. The corpus luteum phase is ordinarily associated only with pregnancy, but an infertile mating (which may be arranged by the experimenter) gives rise to a corpus luteum phase or "pseudo-pregnancy" comparable in all respects to the corpus luteum phase of the sow's or the human cycle.

Uterine Contraction Pattern

For the purpose of Keye's investigation, strips from sows' uteri at various stages of the cycle were suspended in warm oxygenated salt solution by the Magnus-Kehr technique, and were to be treated with adrenaline and other oxytocics. But Keye (1923) never arrived at that stage of the experiment, for we were amazed to find that the pattern of spontaneous contraction of the muscle, before treatment with oxytocic drugs, varies in a dramatic way throughout the cycle. At oestrus, when ripe follicles are present in the ovaries, the contractions are large and infrequent, occurring once every one or two minutes; during the corpus luteum phase they are small but very frequent, at the rate of five to eight a minute. By observing these changes and the transitions between them it was possible to characterize the contraction pattern almost from day to day of the cycle. Simultaneously with Keye's study, a student of H. M. Evans—Blair (1923)—found something of the same sort in rats. But the shortness of the cycle in that species obscures the pattern of uterine contraction and no further work was done on the rat.

When the ovarian hormones became available they were promptly put to use in following up the earlier observations on uterine contractility. In 1929 Van Dyke and Gustavson reproduced the Dale-Cushny "pregnancy reversal" in kittens treated with crude lipoidal corpus luteum extracts. In the same year S. R. M. Reynolds introduced his ingenious method of recording uterine contractility *in situ* by a small balloon inserted into the rabbit's uterus through a vaginal fistula. He showed (Reynolds, 1931) that spontaneous contractility is almost abolished by castration but is quickly restored by subcutaneous injections of oestrogenic hormone.

Interest in the relation between the hormones and uterine motility was now greatly stimulated by a series of contributions from Herman Knaus (1930). This investigator noticed that uteri of pregnant and pseudo-pregnant rabbits studied *in vitro* do not respond to "pituirrin" by vigorous contraction as do the uteri of virgin rabbits. Learning, as had Van Dyke and Gustavson, of the corpus luteum hormone recently isolated by Corner and W. M. Allen, Knaus made the first crude progesterone produced in Europe, and with it induced in the virgin uterus an altered response to pituitrin resembling that seen in his earlier experiments on pregnant and pseudo-pregnant rabbits. As soon as crystalline progesterone was available, Makepeace, Corner, and Allen (1936) obtained the same result with the pure hormone. Reynolds and Allen (1932) found also that the large, regular, relatively infrequent contractions observed by the Reynolds fistula technique in oestrous rabbits or after oestrogen treatment are almost totally suppressed for hours by a single subcutaneous injection of progesterone. J. M. Robson (1936) added much to our detailed knowledge of the action of oxytocic hormones under varying hormonal conditions.

Beyond this point there has been no significant progress. Summarizing what has been learned, we see that (1) oestrogen is necessary for spontaneous motility; (2) the pattern of spontaneous contraction differs greatly according to the dominant hormone—namely, oestrogen in the unmated and oestrous rabbit, progesterone in pregnancy and in the corpus luteum phase of the cycle (pseudo-pregnancy); (3) the response to stimulation by certain oxytocic drugs may also differ under different hormone domination.

The observed facts cannot all be fitted together, nor do they permit, as yet, effective theorizing about their functional

significance for the behaviour of the uterus as a whole organ. They do, however, provide the basis for a new effort to discover, at the level of the muscle cell, and in biochemical terms, the mechanisms by which the ovarian hormones actually control uterine motility.

Molecular Physiology

For a clearer insight into the myometrial cell we must turn to molecular physiology. One single contraction-relaxation cycle of the uterus, observed in the obstetrical ward as a labour pain, or registered *in vivo* or *in vitro* by the techniques of classical physiology, is clearly a complex phenomenon involving a whole series of elementary events. In 1946 one of us (A. C.), a clinical obstetrician at the time, became convinced, after reading the articles of Szent-Györgyi and his associates, that the function of the myometrium, like that of the voluntary muscle which they were studying, could be understood only if the complexity of the contractile system were broken into simpler component elements and analysed step by step with biochemical and physico-chemical techniques. It was to be hoped that the system thus taken apart can gradually be put together again.

Muscle contraction involves basically a contractile substance, a supply of energy, a stimulus to initiate the contraction, and a means of conducting the stimulus to the contractile elements. Study of the process must be directed toward these four basic systems. The research which we here summarize began with the final contractile substance because, thanks to the efforts of the biochemists, it was far better characterized than any of the other systems.

Szent-Györgyi (1945) greatly simplified the problem by showing that "contraction" can be produced *in vitro* by merely bringing together the isolated constituents of the process—namely, the fibrous protein complex actomyosin (A.M.), the energy-rich nucleotide adenosine triphosphate (A.T.P.), and ions. Thus he claimed that muscle contraction in a final sense is an interreaction between A.M., A.T.P., and ions. His observation was the climax of a long extensive study conducted in several laboratories of different countries and led by outstanding biochemists and physical chemists (see for literature Szent-Györgyi, 1951).

Actomyosin

It is now a textbook statement that the final contractile substance of skeletal muscle is A.M. This complex, first recognized by Banga and Szent-Györgyi (see Szent-Györgyi, 1945), was decomposed in the latter's laboratory into its two component proteins, myosin (M.) and actin (A.). Actin-free myosin was prepared in pure ("crystalline") form by Szent-Györgyi himself, and actin was purified by his pupil Straub. A.T.P., the compound containing high-energy phosphate bonds ($\sim$ ph) was first demonstrated in muscle by Lohmann (1938). Myosin, as Engelhardt and Ljubimowa (1939) have shown, has the property of acting as an enzyme (more specifically, as an adenosine triphosphatase) which can break the high-energy linkage of the terminal phosphate of A.T.P. and release its free energy, calculated by Meyerhof to be 11,000 calories.

Weber (1935), who extracted from muscle a "myosin gel" (now known to consist of actomyosin), was able to form it into fibres similar in appearance to fine cotton threads. Szent-Györgyi (1945) showed that such threads of A.M. will shorten when A.T.P. is added, if they are suspended in a salt solution similar in ionic strength to serum. Objections were raised in various laboratories against the idea of analogy between this thread-contraction phenomenon and muscle contraction. This criticism led to the effort to make the molecular structure of the A.M. thread more like the structure of muscle. This was done by stretching the A.M. fibres, so that the A.M. micelles become parallel as they are in muscle. Such threads shorten and become thicker without changing volume. This effort culminated in Szent-Györgyi's preparation of glycerin-treated psoas muscle from the rabbit (Szent-Györgyi, 1947,

1951) in which the muscle-cell membrane is destroyed (in a functional sense as indicated by the loss of electrical excitability) and the water-soluble components are removed, but the contractile proteins preserve their architecture. When A.T.P. is added, such fibres develop tension similar to that of intact muscle. Taking all the opinions into account, Mommaerts (1950) wrote in his recent survey: "It seems justified to conclude that Szent-Györgyi actually succeeded in a dissolution, separation, and resynthesis of the contractile system."

With the information thus briefly outlined in hand, let us turn to the uterus and ask whether the final contractile system in the myometrium is fundamentally the same as that of skeletal muscle. With modifications required by the smaller amount of material available and the difference in structure, Csapo (1948, 1950a) succeeded in isolating A.M. from human, rabbit, rat, and cow uteri.

All tests performed so far on the A.M. of the uterus support the conclusion that it is fundamentally the same as that of skeletal muscle. It is true that slight differences have been observed between the two substances, which may be partly responsible for the differences between the two kinds of muscle long known to physiologists. First, however, let us consider the similarities.

Characteristics of Actomyosin

What are the characteristics of actomyosin? (see literature, Szent-Györgyi, 1951). A.M. can be extracted from fresh muscle by 0.5 mol KCl, and can be purified simply by precipitation by dilution. If redissolved in 0.5 mol KCl it has a high anomalous viscosity, which indicates that it is made up of highly asymmetric particles. If the purified extract is studied in the Svedberg ultracentrifuge or the Tiselius electrophoretic apparatus it tends to be distributed into two portions, yielding curves with a larger peak which represent A.M. and a smaller peak representing free M. uncombined with A. (Snellman and Erdős, 1944a, 1948b).

If A.T.P. is added to A.M. in the viscosimeter an immediate drop in viscosity will be observed. The viscosity of the component proteins, A. and M., being less than that of the complex, A.M., this drop in viscosity indicates the dissociation of the complex into its component parts. M. being an A.T.P.-ase, A.T.P. will be split and its dissociating effect on A.M. will be terminated; the A. and M. will then reassociate, combining to form A.M., as indicated by the gradual rise in viscosity. Actomyosin threads can be prepared from uterine muscle and will contract energetically when A.T.P. is added.

All the properties just mentioned are characteristic of uterine A.M. as well as that from skeletal muscle. As for the differences, observations by viscosimetry show that the amount of A.M. is much less in the uterus than in skeletal muscle (about one-seventh) and, moreover, A.M. forms only about one-third of the total amount of the contractile proteins, whereas in skeletal muscle extracts two-thirds is A.M. (Csapo, 1948, 1949, 1950a, 1950b).

By following the change of viscosity when A.T.P. is added to identical amounts of the two kinds of contractile proteins it is found (Csapo, 1949) that the recombination of uterine A.M. indicated by increase in viscosity does not begin as soon and does not proceed as fast as does that of skeletal muscle. This can be explained either by a lower A.T.P.-ase activity of the uterine extract or else by the lower activity of the myokinase system resulting in the accumulation of A.T.P. which keeps A.M. dissociated.

When the "contraction" of threads of the two kinds of actomyosin is compared (Csapo, 1950a), it is found that uterine A.M. contracts much more slowly than that from skeletal muscle, and with a longer "latent period" after the addition of A.T.P. Moreover, uterine A.M. threads contract only below the A.T.P. concentration of 4×10^{-3} mol. At this critical concentration the threads first lengthen before they contract, whereas above this concentration they

completely dissolve. In contrast threads of similar A.M. concentration (obtained by dilution) from skeletal muscle readily contract even in a twenty-times higher concentration of A.T.P. solution (Csapo, unpublished).

Uterine A.M., unlike that of skeletal muscle, practically loses its ability to contract (Csapo, 1949) if precipitated only once (by dilution). This process is reversible, however, and the precipitated A.M. can be reactivated if fresh watery extract is added to the precipitate or to the salt solution in which the thread is suspended. The speed of thread contraction thus depends on a factor (or factors) present in the watery extract of the uterus, and the speed of contraction is directly related to the concentration of this factor, which we will call "X." Skeletal muscle also contains X-factor in a much higher concentration or else in a more active form (Csapo, 1949). This matter of the X-factor is mentioned to emphasize the possibility that the differences between skeletal and uterine muscle extracts are not all necessarily due to differences of the A.M. itself, but may well be due to differences in their prosthetic groups or other active substances attached to the A.M. framework. When highly purified actin and myosin from the uterus become available this question can be further studied.

In summary, the final contractile substance in uterine muscle is actomyosin, generally resembling the characteristics of the contractile protein-complex of skeletal muscle, but present in much lower concentration and forming a smaller fraction of the total proteins.

Effect of Ovarian Hormones on Contractile Proteins of Myometrium

Next let us examine the effect of the ovarian hormones upon the contractile proteins of the myometrium. In skeletal muscle the concentration of A.M. and the ratio of A.M. to free M. are found to be constant. In uterine muscle, however, the concentration of A.M. is significantly different under varying hormonal conditions of the ovaries. When a rabbit is castrated the concentration of A.M. drops to about one-fifth that found in the oestrous animal. In late pregnancy, on the other hand, the concentration is about twice as much as in oestrus. In oestrus, moreover, two-thirds of the contractile protein is free M. and only one-third is A.M., whereas in late pregnancy the ratio is reversed, as viscosimetry has shown. The same holds for the human as demonstrated by ultracentrifugation and electrophoresis. These observations already suggest that the concentration of uterine A.M. is under the control of the ovaries (Csapo, 1948, 1950a, 1950b; Csapo, Erdős, Naeslund, and Snellman, 1950).

Studying the course of the change in A.M. concentration during pregnancy in rabbits, we observed a slight drop in the first third, followed by a sharp increase in the second third. A high plateau is maintained in the last third of pregnancy with a climax at labour, after which the concentration of A.M. drops rapidly to the non-pregnant (oestrous) level. This curve gives a further indication that oestrogen is responsible for the changes in A.M. concentration of the uterus (Csapo, unpublished). Final evidence for this conclusion was given by the following experiments.

Rabbits were bilaterally ovariectomized and a few weeks later the previously mentioned great decrease in A.M. concentration of the uterus was observed as a result of the castration. Oestrogen was then administered, and a gradual increase in the A.M. concentration caused by the removal of both ovaries can be experimentally reversed by supplying oestrogen to the animal (Csapo, 1950b).

In another set of experiments it was found that progesterone does not have any such effect as oestrogen upon concentration of A.M. in the uterus (Csapo and Corner, 1951). We believe that the slight drop of A.M. concentration during the first week of rabbit pregnancy mentioned above is due to the decrease or disappearance of tissue oestrogen and not to the increasing action of progesterone.

How oestrogen controls A.M. concentration in the uterus we do not know as yet. As pointed out by D. Needham (1952), it is possible that oestrogen affects the formation of A.M. by providing a means by which the "building stones" or precursors (of smaller molecular weight) are bound together to form longer fibrous units. This mechanism cannot, however, be the only one involved in A.M. formation, since in an oestrogen-treated castrate rabbit the uterine weight increases ten to twenty times while the protein concentration per unit of weight is also increasing. Thus large amounts of proteins must be synthesized as a result of the action of oestrogen upon the uterus. It is worth emphasizing that in the uterus we possess a tissue in which the effect of oestrogen on protein synthesis has been experimentally established. In skeletal muscle similar changes have been observed only during embryonic and post-natal development (Csapo and Herrmann, 1951); once sexual maturation is complete the contractile proteins of skeletal muscle are not subject to hormonal control.

The concentration of A.M. in uterine muscle is, however, not alone affected by oestrogen; the properties of extracted A.M. are also changed. With the viscosimeter we find that the "splitting-time" of A.T.P. is reduced by oestrogen treatment and the recombination of dissociated A.M. after A.T.P. has been split becomes faster (Csapo, 1949). The speed of A.M. thread contraction is also increased, as shown in specimens from late pregnancy (Csapo, 1948, 1950a). We assume tentatively that the concentration or activity of the X-factor is also affected by oestrogen.

Relation of Ovarian Hormones to the Energy-yielding System of the Uterus

With this we conclude our brief summary of the facts known at present about uterine A.M. and its dependence upon oestrogen. The next inquiry concerns the relation of the ovarian hormones to the energy-yielding system of the uterus. Before proceeding any further we must recall Szent-Györgyi's thread-contraction experiments, from which it is evident that not A.M. but A.M.-A.T.P. is the final contractile substance. Experiments in our laboratory have shown (Csapo and Gergely, 1950) that the total high-energy phosphate content of the uterus is only about one-seventh that of skeletal muscle, and recent measurements by means of Kalckar's differential spectrophotometric technique show that the same ratio holds for A.T.P. in particular (Menkes and Csapo, unpublished). Others have observed similar or lower values for the $\sim$ ph content of the uterus (see for literature Walaas and Walaas, 1950a). Since the concentration of actomyosin in uterine muscle was also found to be one-seventh that of the skeletal muscle a stoichiometric relationship may be assumed to exist between A.M. and A.T.P. The amount of A.T.P. present is much greater than is used in one concentration cycle, and since resynthesis of A.T.P. goes on with great speed the surplus may serve other purposes, such as to make the system complete and reactive. We calculated the amount of A.T.P. used in one contraction cycle and arrived at the figure of 0.25 micromols $\sim$ ph bond energy per gramme uterus per contraction (Csapo and Gergely, 1950). This value is identical with that calculated by A. V. Hill for skeletal muscle.

When the uterus is not under the influence of oestrogen its high-energy phosphate store is at a low ebb. In immature rabbits and also in adults after castration we found (Menkes and Csapo, 1952) a low concentration of A.T.P. and absence of creatine phosphate (C.P., another energy-rich phosphate ester in muscle from which the depleted A.T.P. is immediately resynthesized through the Lohmann reaction). Since the A.M. concentration is also very low in these conditions and there is no significant muscle function, A.T.P. is split only slightly and can be resynthesized slowly by other means than through C.P. The presence of a supply of A.T.P., thus maintained, without appreciable contractile activity indicates that this substance is essential not only for the contractile function but also for the

"private life," so to speak, of the myometrium. A certain amount of it is obviously required merely to keep the tissue alive.

When during sexual maturation the ovaries become functional and oestrogen production is increased, A.T.P. begins to increase and C.P. appears in significant quantities (Menkes and Csapo, 1952). The same occurs when oestrogen is administered experimentally to ovariectomized animals (Menkes and Csapo, unpublished). The increase of high-energy phosphates in response to oestrogen treatment is much quicker than that of A.M., and their concentration in the muscle reaches a climax while A.M. concentration is still not maximal and function is not yet fully restored. One possible explanation of the early rise of A.T.P. is that it may be involved in the resynthesis of the contractile proteins.

If oestrogen administration is continued, the $\sim$ ph will not increase further. These observations seem to be in contradiction to what one would expect when function is maximal. There is, however, another mechanism which takes care of the energy supply of increased function without increase of the concentration of A.T.P., by controlling the turnover of $\sim$ ph. As shown by Walaas and Walaas (1950b) and by Borell (1951), using P^{32} , oestrogen increases the turnover of the easily hydrolysable phosphate esters of the uterus. Thus we assume that in the castrated or in the immature animal—that is, in the non-functional uterus—both the final contractile system and the energy-yielding system are quite incomplete. If oestrogen is administered, A.T.P. and the turnover of the high $\sim$ ph increase with the simultaneous appearance of C.P. The increase in A.T.P. concentration soon becomes constant while function is still increasing, the extra amount of energy used being compensated for by the increased turnover of $\sim$ ph. A similar phenomenon has been observed in our laboratory to occur in the uterus during pregnancy (Menkes and Csapo, 1952). Until the twentieth day of pregnancy in rabbits the easily hydrolysable phosphate fraction of the uterus gradually increases. No further increase, but rather a decrease, can be observed after this period, which coincides with the beginning of a gradual increase in muscle activity and pharmacological reactivity. Thus we must assume that the low concentration of $\sim$ ph found after the twentieth day of pregnancy or in oestrus is optimal for maximal function, and the increased use of energy is taken care of by increased turnover of $\sim$ ph.

Progesterone, unlike oestrogen, has no activating effect on the uterus of castrates nor a regenerating effect on the final contractile system (Csapo and Corner, 1951). It increases the concentration of the easily hydrolysable phosphate fraction without influencing the A.T.P. concentration. It results, as observed so far, in the accumulation of an unknown compound in this fraction which is neither A.T.P. nor A.D.P. (Menkes and Csapo, unpublished). This effect can be evoked by injected progesterone or by mating (which results in natural progesterone domination through ovulation and corpus luteum formation). It has been shown recently by Walaas (1952) that oestrogens selectively increase the glycogen (and thus the potential $\sim$ ph) content of the myometrium of rats and rabbits. The effect is absent in the endometrium and in skeletal muscle and is independent from the blood-sugar level. He concludes that an increased rate of the hexokinase reaction is responsible for increased glycogen formation resulting from oestrogen effect. He found progesterone to be ineffective on the glycogen concentration of the uterus. All these observations indicate that the ovarian hormones affect the energy-yielding system of the uterus, but much more needs to be done before a more complete understanding can be achieved.

Considering the varying concentrations of actomyosin and of high-energy phosphates in various hormonal conditions of the reproductive tract, we ask how these changes alter myometrial function. For the answer we must turn to living muscle and the

data obtained at the molecular level. A first step in this direction is to observe the relation between actomyosin concentration in the myometrium and the working capacity of the muscle. The most adequate measure of this function is the isometric tension; that is to say, the force developed by contraction of an electrically stimulated strip of muscle that is not allowed to shorten. Thermodynamic studies of Szent-Györgyi (1951) and his associates on frog skeletal muscle have shown that for adequate information on working capacity isometric tension must be studied rather than isotonic amplitude.

One would expect that under well-standardized and optimal conditions the maximum isometric tension which the muscle is able to develop will depend on its actomyosin concentration. Experiments confirm this. After castration the actomyosin concentration and the maximum isometric tension both fall practically to zero and both are restored in similar fashion by administration of oestrogen. The ratio of actomyosin concentration in the oestrous uterus to that of the castrate is 4.6:1; the ratio of maximum isometric tension in the two conditions is 4.2:1. Progesterone, on the other hand, does not affect either actomyosin concentration or maximum tension (Csapo and Corner, 1953).

An Unexpected Observation

During the course of our work on isometric tension we made an unexpected observation which we think will help in understanding just how the ovarian hormones act upon the tissue which they affect. The answer to this question being of extreme importance in the physiology of reproduction, we summarize here what we have discovered, although the final proofs are still not available.

It is well established that the function, not only of the myometrium but of all other parts of the reproductive tract, is determined in a final sense by the two ovarian hormones, oestrogen and progesterone (see for literature Reynolds, 1949). Removal of both ovaries results in partial atrophy of the whole reproductive tract, including the myometrium. Castrate atrophy can be avoided, or, if it occurs, the original condition can be restored by the administration of oestrogen to the castrated animal. Special histological and physiological changes functionally adapted to pregnancy are brought about by progesterone.

How the ovarian hormones act upon the tissues to produce these conditions is unknown, and, indeed, the hope of understanding their basic action has been slight because of the great variety of their effects upon various elements of the reproductive tract. It has, however, proved helpful to assume that each ovarian hormone has but one type of effect, which shows itself in different ways in various parts of the reproductive tract because the structure and function of the component cellular elements are different. Moreover, the action of oestrogen and progesterone on a specific tissue, often seemingly opposite or antagonistic, may be fundamentally similar, differing only in the direction of the effect produced. This conjecture rests on a more general assumption about hormone action developed by Dr. Albert Szent-Györgyi (personal communication) from studies of the isolated frog heart, which postulates that hormonal effects are exerted upon the ionic balance of the living cell, and thus the same hormone may similarly affect tissues which are quite different in their organized structure and functions.

Maximum Isometric Tension in Relation to Stimuli

Although in our experiments with the final contractile system we followed the effect of the ovarian hormones down to the molecular level, we do not suppose that their effect

actually occurs at this low level of organization and that the hormone directly participates in the individual reactions of which myometrial function is composed. No one, indeed, has ever demonstrated an effect of the sex-gland hormones on any isolated enzyme system, a negative fact which makes it probable that these hormones act at the cellular level, and that their action is to produce favourable or unfavourable conditions for a set of reactions taking place in the cell. Our experiments so far indicate, though they do not

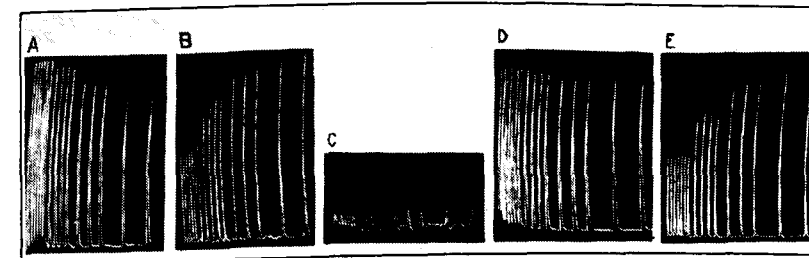


Fig. 1.—Dependence of maximum isometric tension on frequency of stimulation. Electrical stimulation at intervals of $\frac{1}{4}$, 1, 2, and 4 minutes. A, oestrogen-treated castrate; B, castrate treated with oestrogen plus progesterone; C, untreated castrate; D, natural oestrus; E, seven-days pregnancy.

as yet completely prove, that the effect of the ovarian hormones on the myometrium is accomplished by alteration of the potassium balance of the myometrial cells. The new observation from which this conclusion stems is that the maximum isometric tension which a strip of uterine muscle can develop depends on the rate at which successive stimuli are applied. If the rate of stimulation is varied from once every half-minute to once in four minutes, the oestrogen-dominated uterus exhibits a decrease in tension with decreasing rate of stimulation (Fig. 1), whereas the progesterone-dominated uterus increases its tension as the intervals become longer. This difference occurs not only in castrates treated with the respective hormones but also in intact animals under natural conditions—that is, in oestrus and pregnancy. Whether the hormone is supplied by the animal's own ovaries or by infection, the effect is the same. It should be added that the castrate uterus is insensitive to changes in rate, its weak isometric contractions developing the same tension regardless of the intervals.

It is surprising to see that the progesterone-dominated uterus, which completes a single isometric contraction cycle in shorter time than the oestrogen-dominated muscle, requires more rest between two stimuli in order to develop maximum tension. Return to zero tension, therefore, does not indicate complete recovery of the contractile system as a whole in the progesterone uterus. We first believed that the incomplete resynthesis of $\sim$ ph was responsible for the unique behaviour in this hormonal condition. This possibility can still not be completely disregarded in view of the active sodium transport, which may overlast the contraction cycle and which uses a considerable amount of energy (Steinbach, 1952). The suggestion of Ling (1952) also has to be considered, that high-energy phosphates influence muscle function not only because of their stored energy but also because of their high-valency negative charges, which participate in linking cations to the contractile proteins. Their concentration, therefore, will partly determine the cation gradient between the outside and the inside of the cell on which the resting potential depends. A more direct explanation results from the realization that the effect we have been discussing is quite similar to the well-known staircase phenomenon of heart muscle.

Hajdu and Szent-Györgyi (1952) have recently studied the Bowditch phenomenon of the frog heart under isometric conditions, varying the frequency of stimulation in a "steady state." They find that the steep slope of the staircase that develops in regular Ringer-Conway solution can be completely abolished if the potassium concentration of the perfusion fluid is decreased to one-eighth of the usual level.

Referring to the data of Fenn (1937) and Fenn and Cobb (1936), who found that contraction entails a loss of potassium, they assumed that the resting frog heart contains more intracellular potassium than is optimal for the development of maximum tension, and therefore the heart must be stimulated very frequently to exclude the supra-optimal amount of potassium and keep it out. If stimulation is discontinued, intracellular potassium accumulates, the staircase reoccurs, and the tension drops. This effect can be abolished by decreasing the potassium outside, the increasing gradient being unfavourable to the return of potassium. They have also demonstrated that the staircase disappears at 0° C., whereas its slope becomes steeper with increasing temperature. Serum, desoxycorticosterone, and digitalis glucosides have the same effect as the decrease of potassium in the perfusion Ringer. They believe that these substances inhibit the return of potassium to the cell.

The Uterine Staircase

We have shown that the uterus of a castrate rabbit exhibits no staircase if stimulated with constant frequency after a period of rest (Fig. 2). This suggests that the phenomenon

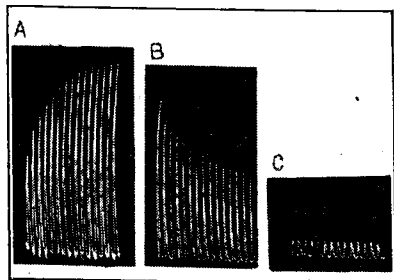


FIG. 2.—Uterine staircase. Maximum isometric tension developed upon stimulation at intervals of 1 minute, beginning after 10 minutes' rest. Castrated mature virgin rabbits; A, treated with oestrogen; B, oestrogen plus progesterone; C, untreated.

is not a fixed characteristic of the myometrium, but rather an expression of the dominant hormonal effect. The oestrogen-dominated uterus has a similar staircase to that of the frog heart, as first observed by Bowditch, whereas the progesterone-dominated uterus behaves in an opposite manner—that is, it has a staircase sloping

in the reverse direction, which will be designated as "negative staircase" in contrast to the regular or "positive staircase" (Csapo and Corner, 1952).

One would expect to see slopes intermediate between the extreme positive and negative staircase if the two hormones are simultaneously administered in various proportions. Experiments have shown this to be the case. For this and similar studies in which quantitative precision is important the frequency of stimulation has to be varied in an otherwise steady state.

The staircase was found to be most negative in early pregnancy. This condition can be imitated in the castrate only if after three days' oestrogen treatment progesterone is administered without oestrogen, a fact which suggests that the latter is not present during the first few days of pregnancy. By the administration of oestrogen during early pregnancy we expected, therefore, to produce a levelling effect on the negative slope of the staircase and also a disturbance of pregnancy. We found that a single dose of 5 µg. of oestrogen per 4 kg. body weight, administered between the second and fifth days of pregnancy, significantly reduces the slope of the negative staircase and completely abolishes pregnancy (Csapo, 1953).

Effect of Temperature and the Potassium-sodium Ratio

Inasmuch as the staircase so accurately reveals the delicate balance of the ovarian hormones, it is important to learn its nature. In agreement with Hajdu and Szent-Györgyi's observation (1952), we found that the positive staircase of the oestrogen uterus disappears at low temperature (Fig. 3), whereas its slope increases with increasing temperature. On the other hand, the negative slope of the

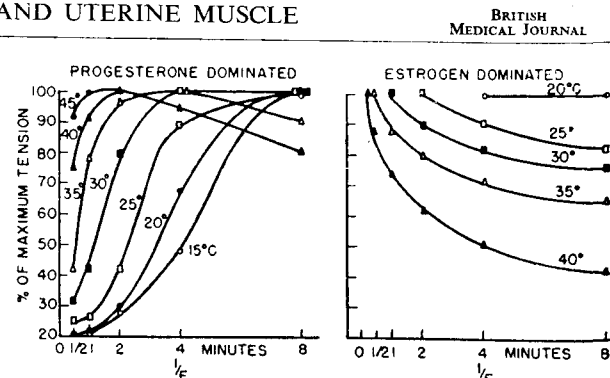


FIG. 3.—Temperature dependence of slope of staircase and negative staircase.

staircase of the progesterone uterus decreases with increasing temperature. Like the frog heart, the oestrogen uterus exhibits an increase in tension within about two minutes if the potassium-sodium ratio is decreased in the bath. The staircase does not disappear, however; its slope is only slightly reduced. If the tissue is subjected to repeated washing for half-hour periods in potassium-free Krebs solution, a gradual decrease in the slope of the staircase can be observed, with a complete disappearance of the staircase after about two hours' treatment, but at the same time the tension also decreases gradually (Csapo, 1953).

If the oestrogen uterus is kept in potassium-free Krebs solution as before and the perfusion fluid is then changed to normal Krebs solution, the potassium-sodium ratio thus being suddenly increased, and if the muscle is stimulated once every half-minute, the tension drops and remains at the low level for about 20 minutes, increasing slowly thereafter. If during this short period of time the staircase is observed a negative slope appears. Thus this rather drastic treatment results in behaviour of the oestrogen uterus similar to that of the progesterone uterus. It is a transitory effect, however, and after the 20 minutes the staircase is positive again (Csapo, 1953).

The effect of alterations in temperature and potassium-sodium ratio can be more easily observed with the progesterone-dominated uterus (Fig. 4). Increase of either

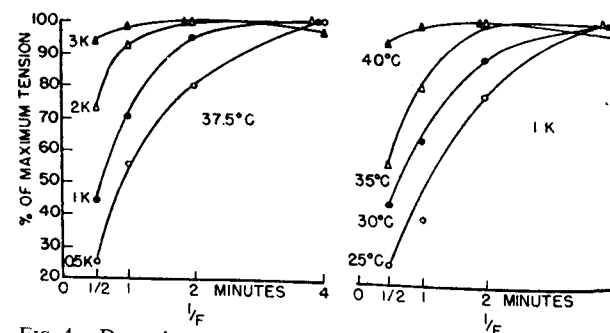


FIG. 4.—Dependence of slope of negative staircase upon potassium concentration and temperature.

temperature or the external potassium-sodium ratio results in gradual disappearance of the negative staircase. At sufficiently high potassium-sodium ratio outside (about fourfold increase in potassium concentration of the original Krebs solution), the negative slope of the staircase with the progesterone uterus not only disappears but there is a slight positive slope, such as is characteristic of the oestrogen uterus. Thus by alterations in the potassium concentration of the perfusion fluid the characteristic behaviour of oestrogen and progesterone uteri with respect to the slopes of their respective staircases can be more or less completely reversed (Csapo, 1953).

A striking difference in the behaviour of oestrogen and progesterone uteri with respect to maximum tension also appears if the potassium-sodium ratio outside is gradually increased (Fig. 5). The oestrogen uterus exhibits

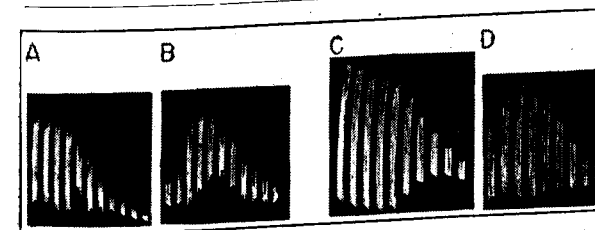


FIG. 5.—Dependence of maximum isometric tension upon potassium concentration. Each bar represents a group of four contractions in response to stimulation at 1-minute intervals. The K concentration is raised in each group from left to right, from standard or half-standard K concentration of Krebs solution, to standard or half-standard K concentration of Krebs solution; B, 2×, 3×, . . . 10×K. A, castrate treated with progesterone; C, as A; D, castrate treated with oestrogen plus progesterone; C, after 24 hours' storage at 0° C. strip from same uterus as C, but after 24 hours' storage at 0° C. Note resemblance in Krebs solution of standard K concentration. to B.

decrease in maximum tension with increasing potassium-sodium ratio, whereas the progesterone uterus shows the opposite behaviour up to a threefold increase in the potassium concentration over the original Krebs solution. If the oestrogen uterus is subjected to storage it loses its characteristic behaviour and exhibits a pattern similar to that of the progesterone uterus (Csapo, 1953).

The duration of a single isometric contraction cycle is also greatly dependent on temperature and on the external potassium-sodium ratio. In general, a decrease in temperature increases the duration of both oestrogen and progesterone uteri, but the former has a much greater temperature dependence. Decrease in the potassium-sodium ratio outside increases the duration of the contraction of the oestrogen uterus and steepens the ascending phase of the isometric contraction cycle. The progesterone uterus has no change in duration under similar experimental conditions (Csapo, 1953).

Conclusions

From these experiments one can conclude that oestrogen and progesterone alter myometrial function in 'opposite directions, as revealed by measurements of maximum isometric tension. Their effect can be counteracted or even reversed *in vitro* by changing the temperature or the potassium concentration of the perfusion Krebs solution. Whether a different intracellular potassium concentration exists in the uterus *in vivo* in the two contrasting hormonal conditions or as a result of the alteration of the potassium concentration in the perfusion fluid, we cannot say as yet, because we do not know the extent of the extracellular space in the uterus. It is possible that not the absolute quantities of the respective ions, but rather the dynamics of their movements, are changed. If the intracellular potassium concentration is changed as a result of hormonal action, the question ought to be considered whether a change in the distribution of other ions occurs simultaneously as a consequence of this alteration or as an independent effect.

The demonstrated *in vitro* effect of the potassium ion on the myometrial cell cannot be discussed in any detail at present, because the system in which the experiments have been performed is too complex. Hajdu and Szent-Györgyi (1952) proposed that alterations in the potassium balance of the muscle cell directly affect the contractile protein, actomyosin. The effect of potassium is, however, probably more complex. Its extreme importance in activating enzyme reactions, especially those involved in the glycolytic sequence of rabbit skeletal, cardiac, and uterine muscle, has been recently emphasized by Boyer (1953). We know from Walaas's work (1952) that oestrogen controls glycogen formation in the myometrium, perhaps through the hexokinase system.

Thus we have to consider, as one possibility, that the ovarian hormones, through their alteration of the potassium balance of the myometrium, will modify the activity of specific enzyme systems, especially those involved in cellular energetics. Ling (1952) has shown that A.T.P., C.P., and hexosephosphates occupy key positions in muscle function not only because of their stored energy but also because of their high-valency negative charges which link cations (especially potassium) to the contractile and other proteins of the muscle cell. Their concentration therefore determines not only the amount of energy which can be spent immediately during activity but also the gradient of cations between the outside and the inside of the cell, which in turn determines the resting potential of the cell. Thus we see that a change in the potassium balance of the myometrium evoked by the action of the ovarian hormones might easily modify a whole series of intracellular reactions, thus producing great variations in function of the organ as a whole.

This concept may ultimately not only explain the "pregnancy reversal" described 45 years ago by Sir Henry Dale but also provide a key to many other problems of uterine physiology and hormone action.

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The *Journal de Génétique Humaine*, a new quarterly publication, is intended for doctors, biologists, anthropologists, and others interested in problems related to heredity. Its editorial board comprises Professor A. Franceschetti (Geneva), Professor L. van Bogaert (Antwerp), and Professor M. Lamy (Paris). The journal is published by Editions Médecine et Hygiène, 15, Boulevard des Philosophes, Geneva, and the subscription is 30 Swiss francs (£2 10s.) per annum.

A SURVEY OF PRESCRIBING IN SCOTLAND IN 1951

BY

D. M. DUNLOP, M.D., F.R.C.P., F.R.C.P.Ed.

R. S. INCH, M.B., Ch.B., M.R.C.P.Ed.

AND

J. PAUL, Ph.D., M.B., Ch.B., M.R.C.P.Ed.

(From the Department of Therapeutics, University of Edinburgh)

A survey of 17,301 prescriptions issued on Form E.C.10 in England in 1949 (Dunlop *et al.*, 1952) provided an incentive to a further and more extended investigation of prescribing, and in addition indicated how a subsequent study could be planned in order to give more varied and statistically valid information, and to avoid some of the errors to which our attention was drawn in the previous paper. Scotland was chosen as the area to be surveyed, as it formed a manageable unit and represented all types of medical practice.

Material and Method

The material consisted of an approximately 1% sample of all E.C.10 forms issued in each of the 25 executive council areas in Scotland during the month of October, 1951. There were 13,340 of such forms, which included a total of 18,848 prescriptions. Except for a few minor changes the method of tabulation and sorting was similar to that adopted in our previous survey of English prescriptions. Nevertheless, since the method of selection was different and since the present survey follows the previous one after an interval of two

years, no very close comparison can be made between the results of the two surveys. It will be seen, however, that on the whole the frequency with which different drugs are ordered and the form in which they are prescribed are not dissimilar in England and Scotland.

In addition to the E.C.10 forms all the E.C.10A forms (stock order forms) for the same month of October were scrutinized. Their total number was 1,569. In Scotland such forms are used by practitioners to order drugs and appliances which they personally administer.

Results

That the orders on E.C.10A forms comprised only an insignificant part of the cost of the total prescriptions is indicated by the following figures:

Total cost of orders on Form E.C.10A in Scotland in October, 1951	£ 8,500
Total cost of prescriptions on Form E.C.10 in Scotland in October, 1951	412,500

Thus the cost of orders on Form E.C.10A comprised only about 2% of the total prescribing costs, and involved an average yearly expenditure per practitioner of £42 10s. About 45% of the orders on these forms were for dressings and appliances.

A study of the E.C.10A forms revealed only a small number of lavish and extravagant orders, though a total of 200 ml. of a proprietary liver extract on one form seemed hard to justify. Over 7 tons (7,112 kg.) of cotton-wool are ordered yearly on E.C.10A forms alone. Though the figure seems formidable, it represents a yearly consumption of rather less than 6½ lb. (2.9 kg.) per doctor.

The figures in Tables I and II have been grouped under the five Scottish regions. In addition those pertaining to the four main cities have been extracted separately. Even with this grouping a considerable variation in the average number of patients per practitioner (list size) and in the number of E.C.10 forms issued per unit (1,000 persons) of population is apparent, and the proportion of E.C.10 forms

TABLE I

	Western Region (Excluding Glasgow)	Glasgow City	S-eastern Region (Excluding Edinburgh)	Edinburgh City	Eastern Region (Excluding Dundee)	Dundee City	N-eastern Region (Excluding Aberdeen)	Aberdeen City	Northern Region
Population	1,740,200	1,093,276	643,192	465,913	223,879	177,890	316,754	181,923	173,912
No. of prescriptions analysed	6,364	4,959	2,237	1,732	633	667	1,066	780	420
E.C.10 forms per 1,000 population	248	311	252	257	212	264	246	312	182
Average list size	2.270	2.078	2.290	1.801	1.930	2.069	1.720	2.220	1.510

TABLE II.—Principal Types of Prescription and Groups of Drugs Prescribed

	Percentage of Total Prescriptions								
	Western Region (Excluding Glasgow)	Glasgow City	S-eastern Region (Excluding Edinburgh)	Edinburgh City	Eastern Region (Excluding Dundee)	Dundee City	N-eastern Region (Excluding Aberdeen)	Aberdeen City	Northern Region
Proprietary	32.8	31.6	28.8	28.3	31.4	27.4	35.5	27.4	36.5
Tablets	32.6	30.6	36.0	34.5	36.5	30.3	34.6	35.0	39.3
Mixtures	28.6	26.0	26.0	26.7	29.7	32.6	28.7	28.7	28.4
Skin preparations	14.6	14.4	13.6	14.8	11.5	13.8	11.3	13.3	9.6
Dressings	10.1	9.8	12.0	10.3	8.2	11.5	9.8	9.9	9.1
Powders	4.4	3.7	3.4	3.7	2.8	4.9	4.4	3.7	3.1
Eye, ear, nose	3.5	3.2	3.6	4.6	3.3	3.0	4.1	4.9	3.3
Injections	2.8	2.1	2.8	2.0	3.6	1.8	3.1	1.8	4.8
Gargles	1.7	2.3	1.5	1.9	3.0	1.0	2.1	1.8	0
Barbiturate	9.9	9.6	9.3	11.0	10.7	8.5	10.6	10.5	13.1
Bromide	1.1	1.2	0.9	0.5	1.7	1.5	1.1	1.0	1.0
Mild analgesic	9.0	10.6	10.3	9.3	9.2	10.9	10.1	9.0	8.2
Cough preparation	8.5	10.0	8.4	8.7	8.2	10.1	7.7	12.4	4.8
Stomachic	7.9	7.3	5.7	6.5	5.7	9.0	8.4	5.1	11.3
Antispasmodic	7.0	6.8	5.9	6.7	7.0	4.8	7.3	7.8	5.3
Sulphonamide	5.7	6.6	5.6	6.8	6.3	7.0	4.7	5.6	5.8
Antibiotic	5.4	5.2	5.1	4.9	6.6	4.5	5.8	5.1	5.5
Vitamin	5.0	5.6	4.4	4.7	4.1	4.3	4.9	3.4	6.2
Tonic	4.5	4.5	3.0	3.7	3.8	4.9	3.6	3.6	3.9
Antihistamine	4.3	2.9	3.0	3.6	3.2	3.1	3.3	4.1	5.5
Iron	3.3	3.0	3.0	3.3	3.2	4.0	2.4	3.1	2.9
Laxative	2.1	2.1	2.8	2.0	2.2	1.8	2.4	3.0	2.1
Strong analgesic	1.8	2.8	2.0	2.6	2.2	1.8	1.8	2.1	2.2
Amphetamine	2.0	1.8	2.1	1.7	1.3	1.5	1.9	1.8	0.5

issued per unit of population seems to vary according to the population density of the area. The significance of this finding is discussed later.

Vitamins, tonics, and symptomatic remedies (sedatives, hypnotics, analgesics, cough mixtures, stomachics, and laxatives) constituted 51.6% of all prescriptions written. A large proportion of these drugs must be prescribed as placebos. They are often relatively cheap in themselves, yet the total cost of compounding and packing them is relatively enormous. Thus, if the cost of prescriptions to the State is to be diminished it must be directed to a reduction of these symptomatic remedies as well as to extravagant prescriptions of expensive drugs to which so much attention has been directed in the past.

The general pattern of prescribing was similar to that found in the earlier English survey, but the following points seem worthy of emphasis because of their dissimilarity or of reiteration because of their importance.

As was to be expected after a lapse of two years, there was some increase in the prescription of newer drugs such as the antibiotics and the antihistamines. In Scotland, however, the prescription of the amphetamines was not significantly more frequent than it had been in England two years previously—a somewhat surprising finding in view of the Pricing Bureau's figures for 1952.

The variation in the proportion of proprietary preparations prescribed in the different areas was not great, but the overall proportion (30%) is considerably higher than the corresponding figure (21%) in the previous survey. An accurate comparable English figure for 1951 was not available to us, but this suggests that the tendency to prescribe proprietary medicines is either increasing generally or is greater in Scotland than in England.

It is satisfactory to note that bromides were prescribed alone very rarely (1%) compared with the previous English figure of 5.8%. Bromides seldom prove more effective than phenobarbitone either as sedatives or as anticonvulsants. Their frequent side-effects and the undesirable cumulative toxic effects which result from their prolonged administration relegate bromides to the group of drugs which should largely be discarded in modern therapeutics. Bromides, however, were prescribed with chloral hydrate on 40 occasions, representing some 4,000 of such prescriptions in Scotland in

October, 1951. It seems unfortunate that this mixture should appear in the *National Formulary* for 1952, for bromides are sedatives which have to be administered frequently before there is a sufficient replacement of chloride by bromide ion to exert a depressant effect on the central nervous system, and their occasional administration with a hypnotic such as chloral has no more effect than a dose of salt water.

Compound cough mixtures containing sedatives and expectorants were ordered as often as sedative preparations, but purely expectorant cough mixtures were not ordered as often as either. This is satisfactory, as there is considerable doubt about the value of expectorants, which were found to be very commonly prescribed in the English survey.

The proportion of prescriptions for cough mixtures was higher in the urban than in the rural areas. This was particularly noticeable in the case of Aberdeen City (12.4%) in comparison with the remainder of the North-eastern Region (7.7%). Such figures seem to indicate that coughs are one of the hazards of city as opposed to country life, and support is given to this hypothesis by the mortality figures for respiratory disease in the Registrar-General's report. On the other hand, there was no constant similar trend in the proportion of prescriptions for stomachics in town and country, which does not support the general impression that dyspepsia is also one of the penalties of urban life.

As in the previous survey, vitamins were prescribed more often than iron, and constituted about 5% of all prescriptions. The actual number of prescriptions for vitamins in the 1% sample of prescriptions analysed was 976—that is, approximately 97,600 for the month of October in Scotland, or over one million for the year. When it is remembered that the average prescription on Form E.C.10 costs the country over 4s., and that vitamins are often relatively expensive drugs, a very conservative estimate of the cost of vitamin prescriptions in Scotland for the year is £230,000. As the population of Scotland is about one-ninth that of the United Kingdom it might be argued that the bill for vitamin prescriptions alone in Britain is at least £2,000,000. This estimate is intentionally a very conservative one, since, as will be seen later, the number of prescriptions issued in October happened to be above average. That the figure

TABLE III

	No. of Registered Patients	No. of Doctors	Scripts Issued 1951					
			July	August	September	October	November	December
Western hospital region:	1,093,276	526	224,923	258,486	279,743	339,656	327,146	286,412
City of Glasgow	75,709	61	14,969	14,284	13,644	14,916	14,421	13,056
Argyll and Bute (counties of)	313,134	139	66,635	66,880	70,546	79,478	77,907	71,468
Ayr (and county of)	82,552	38	18,004	18,287	18,874	22,578	21,698	19,985
Dumfries (and county of)	156,303	62	31,124	34,562	36,033	44,192	42,928	37,869
Dunbarton (county of)	59,335	34	10,084	10,430	10,635	11,545	11,407	10,795
Galloway (Kirkcudbright and Wigtown (and counties of))	512,530	205	104,940	109,366	118,335	139,910	137,154	122,710
Lanark (and county of)	322,626	136	60,934	60,491	65,823	80,068	77,591	65,059
Renfrew (and county of)	218,011	92	44,865	45,162	49,177	58,520	57,607	52,347
Stirling and Clackmannan (and counties of)								
South-eastern hospital region:	465,913	259	89,586	87,649	93,323	119,840	116,602	101,233
City of Edinburgh	301,776	123	69,052	69,817	73,368	83,960	82,399	76,650
Fife (county of)	249,457	106	45,641	47,669	49,427	57,212	55,333	51,208
Lothians and Peebles (and counties of)								
Roxburgh, Berwick, and Selkirk (and counties of)	91,959	52	17,366	17,227	18,014	20,999	20,714	19,642
Eastern hospital region:	177,890	86	32,589	36,989	39,745	46,849	47,110	43,638
City of Dundee	93,018	43	18,179	18,140	19,574	21,478	21,870	21,328
Angus (county of)	130,861	73	22,103	22,169	23,919	26,025	26,673	24,630
Perth and Kinross (and counties of)								
North-eastern hospital region:	181,923	82	44,261	45,339	43,309	57,070	56,221	53,304
City of Aberdeen	171,968	87	34,561	35,663	36,406	39,068	37,402	38,261
Aberdeen and Kincardine (counties of)	104,831	65	29,116	30,072	31,395	32,726	33,037	33,027
Banff and Moray (counties of)	20,792	18	3,681	3,409	3,797	4,289	4,184	4,067
Orkney (county of)	19,163	14	2,223	2,247	2,250	2,200	2,520	2,668
Zetland (county of)								
Northern hospital region:	78,743	53	11,418	11,753	11,305	12,618	12,439	11,546
Inverness (and county of)	22,416	11	3,894	3,865	4,002	4,351	4,126	4,316
Caithness (county of)	59,401	40	9,980	9,957	10,599	10,938	11,762	11,572
Ross and Cromarty (counties of)	13,352	11	1,976	2,085	2,038	2,298	2,118	2,079
Sutherland (and county of)								

is not an overestimate can be deduced from the fact that vitamins account for at least 5% of the total annual expenditure on drugs, which was well over £40,000,000 in 1951, giving a figure in excess of £2,000,000. It is probable that only a very small proportion of the vitamin prescriptions representing this vast sum serve any very useful purpose, especially as cod-liver oil and orange juice for babies and expectant mothers are issued at antenatal and child welfare centres and do not appear on Form E.C.10. When it is recalled that, owing to the present financial position of the country, health centres cannot be built and that all hospital boards are being faced with serious difficulties as regards the staffing and general administration of their hospitals, these figures applied to vitamins alone, quite apart from other placebo prescriptions, deserve serious consideration.

In the English survey it was noted that liver extracts were ordered 50 times, in comparison with only 68 prescriptions for insulin. As the megaloblastic anaemias are relatively uncommon in comparison with diabetes mellitus it was concluded that liver extract was often used for its questionable general tonic rather than for its haemopoietic properties or for anaemias other than megaloblastic, for which it could be of no service. The present survey gave even more striking figures in this respect, for it showed that liver extract was ordered 125 times, in comparison with only 97 prescriptions for insulin and 134 for digitalis. Further, folic acid was ordered 32 times. When it is recalled that this drug should be used only in tropical sprue and in some rare cases of megaloblastic anaemia, such as the megaloblastic anaemias of the malabsorption syndrome and pregnancy, and that it is absolutely contraindicated in pernicious anaemia, some 3,000 prescriptions for it a month in Scotland would seem to be excessive.

It has been suggested from time to time by lay members of executive councils that quantities of expensive toilet requisites are commonly prescribed on Form E.C.10. This survey did not suggest that there was any justification for such strictures.

Factors Influencing Prescription Rates

The interest of these various findings should not divert attention from the more fundamental fact, demonstrated in Table I, that there is a remarkable variation between the different areas in the number of scripts (E.C.10 forms) issued per unit of population, although there is generally not much variation in the type of drug prescribed (Table II). It was realized that the figures for October alone might not give a truly representative picture of prescribing practice. Consequently the information shown in Table III for the months of July to December, 1951, inclusive was obtained. It will be noted that the number of scripts issued in October, which was chosen fortuitously for the detailed survey, was actually considerably higher than in the other months. The data collected in Table III are analysed in Table IV and in Figs. 1, 2, and 3.

Table IV suggests that there is a relationship between the script rate and the population density, though the position of Banff at the head of the list is inexplicable. The figures for population density do not take into account the uneven distribution of the population over the areas concerned. Thus in Lanarkshire there is a highly industrialized portion in the north, where the population is of almost urban density, while the remainder of the county is agricultural and sparsely populated. The same considerations apply to Fife, Dunbarton, Dumfries, and Stirling, and account for their apparently incongruous position in the Table. That there is nevertheless a definite statistical relationship between script rate and population density is obvious from Fig. 1.

Fig. 2 shows that the script rate varies with list size, and it can also be demonstrated that there is a statistical correlation between list size and population density. There is thus an intimate interrelationship between these three factors—script rate, population density, and list size.

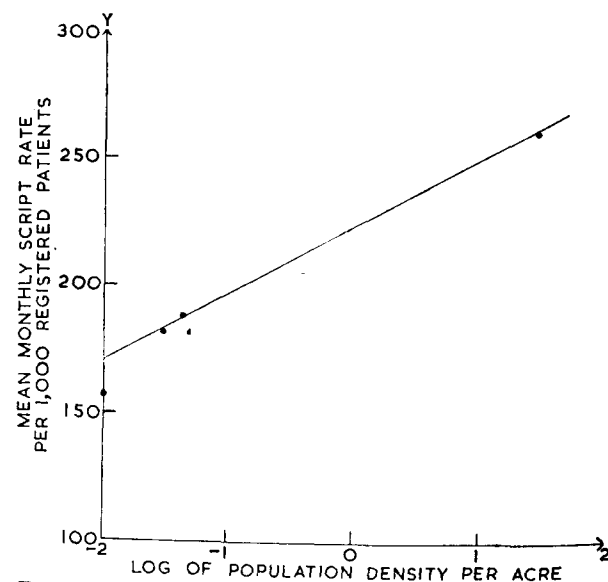


FIG. 1.—Correlation between script rate and population density. ($Y = 225.1 + 26.9X$; $r = 0.617$; $P < 1\%$, d.f. 23.)

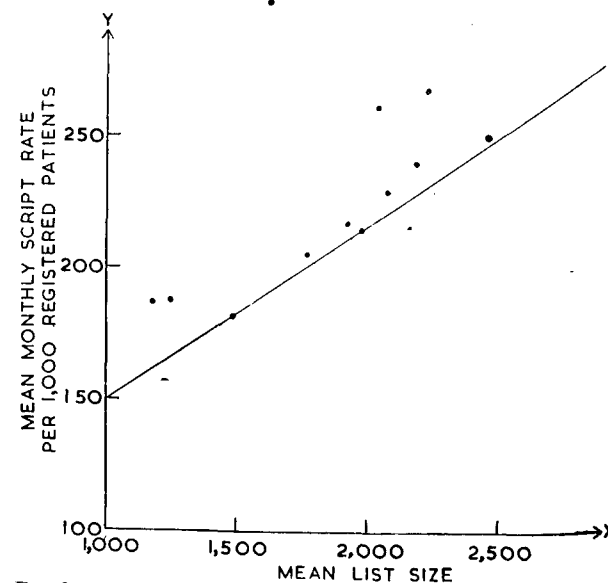


FIG. 2.—Correlation between script rate and list size. ($Y = 83.3 - 0.0667X$; $r = 0.7$; $P < 1\%$, d.f. 23.)

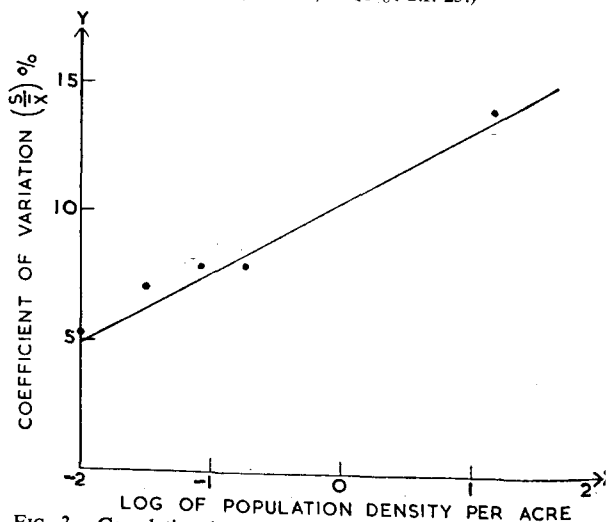


FIG. 3.—Correlation between coefficient of variation of monthly script rates with population density. ($Y = 10.44 + 2.75X$; $r = 0.83$; $P < 1\%$, d.f. 23.)

TABLE IV

Executive Council Area	Mean Monthly Script Rate per 1,000 Population July–December, 1951 (and Standard Deviation)	Population Density per Acre	Average List Size
Banff*	301 (18)	0.14	1,614
Aberdeen	269 (35.2)	17.47	2,220
Glasgow	262 (33.6)	28.21	2,078
Fife	251 (20.7)	0.96	2,455
Dunbarton	242 (32.2)	1.06	2,520
Dumfries	241 (28.9)	0.13	2,180
Lanark	238 (27.8)	0.98	2,500
Stirling	230 (27.7)	0.70	2,370
Dundee	230 (32.4)	14.57	2,069
Ayr	230 (16.4)	0.45	2,255
Edinburgh	218 (28.4)	14.42	1,801
Angus	216 (18)	0.18	2,165
Aberdeen county	215 (9.8)	0.12	1,977
Renfrew	212 (27.7)	2.27	2,375
Roxburgh	206 (18.1)	0.10	1,769
Lothians	205 (17.9)	0.38	2,355
Argyll	188 (10)	0.04	1,240
Orkney	187 (16.1)	0.09	1,175
Perth	185 (14.6)	0.08	1,792
Ross	182 (12.9)	0.03	1,480
Galloway	182 (9.3)	0.07	1,742
Caithness	182 (15.1)	0.05	2,038
Sutherland	157 (8.3)	0.01	1,214
Inverness	151 (7)	0.03	1,484
Zetland	123 (10)	0.06	1,370

* See text.

The correlation between script rate and population density is an overall relationship, since associated with population density, though not necessarily dependent upon it, are such factors as the availability of the doctor, differential morbidity, the psychological attitude of the patient to disease, and the list size. Thus in urban areas the practitioner is usually conveniently available for a consultation and a prescription, often for very trivial maladies, in contrast to the Highlands and Islands of Scotland, where moor and fen, crag and torrent, and even stormy seas may intervene between the patient and doctor. Secondly, there may be an increased morbidity in the urban as opposed to the country population. Respiratory disease, as has been noted, is an obvious example. Thirdly, as Ferguson (1945) has suggested, the industrial population, perhaps because of family tradition, trade union example, habit, and economic pressure, are possibly more likely to declare themselves unfit for work than the rural population. To a bored, disinterested workman, with an unpleasant job in squalid surroundings and in the company of uncongenial associates, a very minor disability may perhaps be a welcome pretext to absent himself from work, and prescriptions follow.

Lastly, list size has been implicated as a cause for a high script rate, and this is suggested by Fig. 2. The overworked practitioner with an excessive number of visits to make and an inflated attendance at his surgeries may well find that it takes a long time to get a full history and to make a complete clinical examination, but only a short time to write a prescription. Nevertheless it will be readily understood that script rate may be related to list size simply because the latter depends upon population density. To assess accurately the significance of list size on script rate it would be necessary to obtain the figures for script rate in large as opposed to small practices among populations of similar density, but this information is not available. By an indirect approach, however, some evidence can be obtained to suggest that list size is not at any rate the sole factor involved, and probably not the most important one.

Table III shows a considerable monthly variation in the number of scripts issued in each area, and it is apparent that the degree of variation tends to be greater where the population is dense. There can be no doubt about the co-significance of the correlation shown by plotting the coefficient of variation against the population density (Fig. 3). This implies that the seasonal variation is relatively greater in densely populated areas. It is improbable that this can be entirely attributable to list size, and it is more likely to be due to other factors. If among these other factors the availability of the doctor and the psychological attitude of

the industrial worker towards disease are, as has been suggested, important, then the 1s. charge on prescriptions, which has been instituted since 1951, may be justifiable as a mild mass deterrent, though it is unfortunate that it penalizes the chronic sick without greatly discouraging the hypochondriac with a passion for medicine.

Summary

A survey has been made of 18,848 prescriptions on Form E.C.10 and of 1,569 E.C.10A forms issued in Scotland during the month of October, 1951, and the general pattern of prescribing has been analysed and reviewed.

In an attempt to elucidate the factors determining prescribing rates the number of scripts issued in the 25 executive council areas in Scotland in the months of July to December inclusive was contrasted with the population density and the average list size. A considerable degree of correlation was established, and the factors concerned are discussed.

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URINARY EXCRETION OF THE PRESSOR AMINES IN RELATION TO PHAEOCHROMOCYTOMA

BY

GEORGE P. BURN, B.M.

(From the Department of Biochemistry (Radcliffe Infirmary), University of Oxford)

The presence of adrenaline-like substances in human urine has acquired importance from the increase in the number of adrenal medullary tumours diagnosed during the past three years. Of cases of hypertension it appears that a certain percentage owe their symptoms to the release of adrenaline or, more usually, to the non-methylated substance noradrenaline, from an abnormal adrenal gland in which the medullary tissue is greatly hypertrophied. These patients suffer from intermittent attacks of high blood pressure, but there appear to be a few in whom the pressure is also raised above the normal between the attacks (Green, 1946). The diagnosis of the presence of such a tumour is a matter of importance, since its removal is followed by a disappearance of the symptoms.

Tumours examined (Holton, 1949; Swan, 1951) usually contain excessive amounts of active material. The normal suprarenal gland in man, obtained *post mortem*, was found by West, Shepherd, and Hunter (1951) in 36 cases to contain an average of 0.2 mg. of total pressor amine per gramme. This figure may be low, as in laboratory animals it is about 1 mg./g. Tumours have been found to contain from 2 to 20 mg. of total pressor amine per gramme, and this mostly of noradrenaline. It is not surprising that the release of some active material causes a rise of blood pressure, and theoretically it should be possible to demonstrate active material in the blood. This is, however, not easy, and Engel and Euler (1950) showed that a large amount of noradrenaline can be found in urine.

Holtz, Credner, and Kroneberg (1947) were the first workers to show that human urine contained adrenaline, noradrenaline, and hydroxytyramine. This last substance

is relatively of low pressor activity. They found from 100 to 150 $\mu\text{g.}$ of adrenaline or *noradrenaline*, and 2 to 3 mg. of hydroxytyramine per 24 hours. They also stated, without giving figures, that urine from a subject with essential hypertension contained a larger amount of pressor substances than urine from a normal subject.

Euler and Hellner (1951) studied 24-hour urine specimens from 20 young normal subjects. They obtained mean values of 11 $\mu\text{g.}$ of adrenaline and 29 $\mu\text{g.}$ of *noradrenaline* per subject. They did not find sufficient hydroxytyramine in the extracts to interfere with the estimations.

In the present work the urinary output of pressor substances as obtained by Euler's method of extraction has been investigated. No attempt has been made to divide the pressor activity into adrenaline and *noradrenaline*; it has been estimated as though it were all *noradrenaline*.

Method

Extraction of Urine.—The urine was collected into a Winchester bottle containing 5 ml. of concentrated hydrochloric acid. It was stored in the refrigerator at about pH 3 whenever more than two days elapsed before it could be extracted. The volume was measured.

An aliquot of 300 ml. was adjusted to pH 1–2, and boiled under a reflux for 20 minutes. The acidity was checked during the boiling, as the solution tended to become alkaline. The hot urine was cooled in running water and 4 ml. of 20% (w/v) aluminium sulphate per 100 ml. was added. A smaller amount of aluminium sulphate solution very often failed to produce much precipitate, especially in concentrated urine. The cold urine was first neutralized with 20% (w/v) caustic soda, till the first appearance of aluminium hydroxide; and then the neutralization was completed with 2% caustic soda to pH 7.5, using phenol red as an external indicator. The solution was allowed to stand for 10 minutes, when the reaction was readjusted to pH 7.5.

The precipitate of aluminium hydroxide was separated by centrifuging at 800 g. for 5 to 10 minutes. The supernatant fluid was decanted off and the precipitate dissolved in 5N sulphuric acid. This solution was carefully neutralized with 20% caustic soda with vigorous mixing, till aluminium hydroxide just failed to be precipitated again; bromphenol blue, as an external indicator, became a greenish colour. This neutralization was important, because an acid solution depressed the blood pressure of the cat used for the final test.

A mixture of one volume of acetone and one volume of alcohol was then added and the solution allowed to stand in the refrigerator for one hour or more, usually overnight. The precipitate and crystals were filtered off and the filtrate was evaporated *in vacuo* to a small volume. This volume, together with the washings from the flask in which evaporation occurred, was 2–4 ml.

Biological Assay.—The extract was compared with a known solution of *noradrenaline* by intravenous injection into a cat anaesthetized with chloralose and given atropine to exclude vagal reflexes. The amount of the extract which caused the same rise of blood pressure as a given dose of *noradrenaline* was determined.

Results

Recovery of Added Noradrenaline.—To test the efficiency of the extraction process a specimen of urine was divided into two parts. To one part was added a quantity—for example, 100 $\mu\text{g.}$ —of *noradrenaline*. Both parts were then extracted, and the difference between the two assays gave the amount of *noradrenaline* recovered. In 20 observations the mean amount recovered was 100%, the values lying between 75 and 125%. As a further indication of the accuracy of the method, from one specimen of urine

two aliquots of 300 ml. were extracted, and both extracts were assayed three times. The figures obtained for the first extract were 29, 34, and 33 $\mu\text{g.}$, and those for the second extract 27, 29, and 29 $\mu\text{g.}$ Other pressor substances may be present in urine. These are piperidine (Euler, 1944), *isoamylamine* (Bain, 1914), tyramine (Bain, 1910), nicotine (Corcoran *et al.*, 1939), and the posterior pituitary hormone (Burn and Singh Grewal, 1951). A series of experiments was carried out in which each of these substances was added in large amount to a sample of urine. The urine was then extracted and tested. It was found that none of them appeared in the extract in sufficient quantity to be mistaken for *noradrenaline*.

Variation in Daily Excretion.—The excretion of *noradrenaline* was followed in one subject aged 31 for 14 successive days. The excretion per 24 hours varied from 16 to 86 $\mu\text{g.}$ on different days, which is about fivefold. The mean figure was 41 $\mu\text{g.}$

Influence of Age.—Urine from older people was found to contain a larger amount of *noradrenaline*. Table I contains the results on 38 subjects, divided into four age

TABLE I.—Influence of Age on the Urinary Excretion of Pressor Amines Estimated as *Noradrenaline*. The Figures Were Obtained After Hydrolysis of the Urine

Age Limits	Mean Age	No. of Subjects	Mean <i>Noradrenaline</i> ($\mu\text{g.}$)
3 months–10 years	6	9	18
23–30 years	27	12	59
31–40	32	10	64
41–63	50	7	71

groups. The mean excretion of children, aged from 3 months to 10 years, was 18 $\mu\text{g.}$ of *noradrenaline*. The mean excretion in the second group, young adults aged from 23 to 30, was 59 $\mu\text{g.}$ of *noradrenaline*. The difference between these two age groups is significant ($P=0.05$). The mean excretion in the two older groups aged 31–40 and 41–63 was 64 $\mu\text{g.}$ and 71 $\mu\text{g.}$ respectively. These figures are only slightly larger than the figure for the second group, but they conceal the wide variation observed. In adults of any age, the 24-hour excretion of *noradrenaline* may be at any value from 15 to 150 $\mu\text{g.}$

Free and Conjugated Noradrenaline.—Boiling the urine for 20 minutes at pH 1–2 hydrolysed any conjugated *noradrenaline* and rendered it free for adsorption on the aluminium hydroxide. If this preliminary hydrolysis was omitted some so-called “free” *noradrenaline* was extracted. The results in 12 adults and 9 children are shown in Table II.

TABLE II.—Mean Excretion of Free and Conjugated *Noradrenaline* in $\mu\text{g.}$ by Night and by Day, for 12 Adults and for 9 Children. Night for adults was from bedtime to the time of rising. Day for adults was all the rest of the 24 hours. For the children, night was 6 p.m. to 6 a.m., the day 6 a.m. to 6 p.m.

	Night			Day			Total		
	Free	Conj.	Total	Free	Conj.	Total	Free	Conj.	Total
12 adults	6	17	23	36	28	64	42	43	85
9 children	4	4	8	6	4	10	10	8	18

Conjugated *noradrenaline* was obtained by subtracting the figure for “free” from that for “total” *noradrenaline*, which was the result obtained after boiling the urine.

Essential Hypertension.—It is well known that older people commonly have a higher blood pressure than younger people, and one cause of this may be diminished destruction of pressor amines in the blood. Such a diminished destruction might result in increased excretion in the urine. The output of pressor amines was therefore determined in a series of subjects with a blood pressure less than 130 mm., and was compared with the output in a second series having

TABLE III.—Relation of Excretion of Pressor Amines to Blood Pressure in the Middle-aged

Normal Blood Pressures				Raised Blood Pressures			
Sex	Age	B.P. (mm. Hg)	<i>Noradrenaline</i> ($\mu\text{g.}$)	Sex	Age	B.P. (mm. Hg)	<i>Noradrenaline</i> ($\mu\text{g.}$)
M	52	95	90	M	55	135	150
M	50	115	85	F	50	140	70
F	45	120	60	M	59	155	120
M	48	120	150	F	35	170	67
M	45	120	83	F	57	180	94
M	46	122	69	F	63	190	61
F	63	130	22	F	57	200	36
				F	55	220	46
Mean	50	116	71		54	170	80

a blood pressure greater than 130 mm. The results are shown in Table III. The systolic blood pressures in the first group ranged from 95 to 130 mm., the mean being 116 mm.; those in the second group ranged from 135 to 220 mm., the mean being 170 mm. The ages in the two groups were similar, the means being 50 and 54 respectively. The mean output of pressor amines in the first group was 71 $\mu\text{g.}$ per day and in the second group 80 $\mu\text{g.}$ per day. Thus the subjects with the higher blood pressures did not excrete more pressor amine in the urine than the others.

Toxaemia of Pregnancy.—The excretion of *noradrenaline* was studied in cases of toxaemia of pregnancy associated with hypertension. The results are given in Table IV. A 24-hour collection of urine was made as soon as possible after the diagnosis, as rest in bed often caused the blood pressure to fall. The normal pregnancy group shown in the table were also resting in bed. Table IV shows that

TABLE IV.—Relation of Excretion of Pressor Amines to Blood Pressure in Toxaemia of Pregnancy

Normal Pregnancy			Toxaemia of Pregnancy		
Age	B.P. (mm. Hg)	<i>Noradrenaline</i> ($\mu\text{g.}$)	Age	B.P. (mm. Hg)	<i>Noradrenaline</i> ($\mu\text{g.}$)
28	100	26	31	130	38
34	100	57	32	130	46
31	100	63			
23	100	80	31	130	55
36	105	42	24	140	67
30	115	54	29	150	90
29	125	71	29	170	50
Mean: 30	106	56	29	142	58

there was no difference between the two groups, but the blood pressures of those with toxaemias were not very high.

Phaeochromocytoma.—In this series there were three cases of phaeochromocytoma, all suffering from paroxysmal hypertension. At operation an adrenal tumour was removed from each. Table V contains the figures for free and total *noradrenaline*. It is seen that the figures for *noradrenaline* are all greater than the highest normal figure, which is about 100 $\mu\text{g.}$ for free *noradrenaline* and 150 $\mu\text{g.}$ for total *noradrenaline*. In Case 2 of Table V the tumour itself was examined and found to contain 15 mg. of pressor amines per gramme, of which *noradrenaline* was about 50%, and adrenaline 50%. In addition there were 10 cases of suspected phaeochromocytoma, some of whom were suffering from sustained hypertension and some from paroxysmal hypertension, and whose general symptoms and signs were consistent with the diagnosis. The output of *noradrenaline*

TABLE V.—The 24-hour Output of Pressor Amines in Three Cases of Phaeochromocytoma

Case	Sex	Age	<i>Noradrenaline</i> Output in 24 Hours ($\mu\text{g.}$)	
			Free	Total
1	F	32	180	180
2	F	33		300
3	F	23	2,700	3,800

in these 10 cases ranged from 20 to 100 $\mu\text{g.}$, all being less than the highest normal figure of 150 $\mu\text{g.}$. No case has been operated on, but one patient died, and at the post-mortem examination the adrenal glands were found to be normal.

Discussion

The value of a determination of pressor amines in the urine seems to be confined to the diagnosis of phaeochromocytoma. Euler (1952) has stated that *noradrenaline* is excreted in increased amounts in a certain proportion of cases of hypertensive disease. Out of a total of 500 cases of hypertension he found that the excretion of pressor amines was normal in about 60% of the cases, but that it was increased in the remaining 40%. He has not yet published details to show the extent of the increase. It is difficult to compare this result with the present work, because the excretion of *noradrenaline* has been found to increase with advancing years.

The figures for the excretion in the three cases of phaeochromocytoma show a wide variation, and the lowest figure is not very much greater than the highest figure obtained for normal adults. It is reasonably certain that the excretion in patients who have these tumours will depend on the number of paroxysms which they suffer. On a quiet day with no paroxysms the excretion may be low. For certainty of diagnosis it is therefore important that the urine be examined for a period in which paroxysms have occurred.

Urine should not be collected on a day when a benzodioxane test has been carried out. In one case when this was done the benzodioxane test was negative, the systolic pressure rising from 200 to 260 mm. Hg, and the output of pressor amines in the 24-hour period was 490 $\mu\text{g.}$. An abnormally high output of pressor amines was not obtained in this case on three later days.

Green (1946) introduced a source of ambiguity when he showed that 37 out of 53 cases of phaeochromocytoma suffered from sustained hypertension. He defined sustained hypertension by the statement that the blood pressure did not fall between attacks to below 140 mm. systolic and 90 mm. diastolic, or that it did not fall below 95 mm. diastolic. He did not mean that the blood pressure was always at a constant high level.

On present evidence, however, the sustained hypertension of phaeochromocytoma should be marked by a high urinary excretion of pressor amines, while essential hypertension which is accompanied by paroxysms should not.

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The Turkish National Bibliographical Institute has started publication of a monthly selective bibliography of articles appearing in Turkish periodicals. Information is given in Turkish and French, classification is by the International Decimal Code, and there is an index of authors and journals which will be cumulated annually. Medicine is well represented in the bibliography, which may be obtained from Milli Kütüphane, Ankara.

CROHN'S DISEASE INVOLVING THE
STOMACH

A REPORT ON TWO CASES

BY

F. R. R. MARTIN, M.B., F.R.C.S.

Surgeon, Bradford Royal Infirmary

AND

R. J. CARR, M.D., D.M.R.

Consulting Radiologist, Bradford "A" Group Hospitals

Crohn's disease is now a well-recognized pathological and clinical entity. It is generally agreed that the characteristic lesions occur predominantly in the terminal ileum, but that "skip" lesions are found anywhere in the jejunum, ileum, or colon. Crohn (1949) describes three main varieties: regional ileitis, ileo-jejunitis, and ileo-colitis. He also mentions cases in which the second and third parts of the duodenum were involved, and states that in two of these there were radiological appearances suggesting spread of the disease to the stomach. So far as we are aware, no cases have been published in which there has been proof of the disease occurring in the stomach, nor have the clinical or radiological features been described. In the following two cases Crohn's disease was shown to be present in the stomach.

Case 1

A single woman aged 23 was first seen on May 6, 1949, when she complained of peri-umbilical pain, accompanied by vomiting. Her vomit was alleged to have contained streaks of blood. Her appetite was good, she had no indigestion, and her bowels were said to act normally. Examination revealed the presence of a small, tender, irreducible umbilical hernia, which was dealt with by operation. She returned to the out-patient clinic one year later complaining of repeated attacks of epigastric pain, lasting for one to two hours at a time, associated with nausea. She had not lost any weight and had had no diarrhoea. Nothing abnormal was found on examination except some generalized abdominal tenderness. The operation scar was soundly healed.

During the next three months she was kept under observation, and a series of barium meals at six-weekly intervals revealed changes which may be summarized as follows. (a) There was absence of normal peristalsis in the pyloric antrum and cap. (b) There was deficient mucosal pattern in the pyloric antrum, the duodenal cap, and the upper half of the second part of the duodenum. The transition from normal to pathological mucosa was sharp and well defined in the stomach (Fig. 1) and in the second part of the duodenum (Fig. 2). Above and below the involved area the mucosal relief pattern was normal. Throughout the affected region the margins of the barium-filled lumen were slightly irregular, suggesting the possibility of superficial ulceration, but no definite ulcer crater was identified. The duodenal cap showed some contraction of the fornices, and its mucosa was devoid of folds. In the second part of the duodenum the usual feathery pattern was replaced by an unbroken column of barium until the normal mucosa was reached. The whole of the involved area remained motionless, showing complete absence of peristalsis, and even the cap was persistently full of barium. (c) There was no gastric or small-bowel stasis, and the colon showed no gross abnormality. At the x-ray examination on August 8, 1950, early changes in the mucosal pattern of the last 2 in. (5 cm.) of the terminal ileum were detected for the first time. (d) Her lung fields were normal, except for a calcified focus.

The changes in the stomach and duodenum were interpreted as a gastroduodenitis, and, in view of the appear-

ances of the terminal ileum, a provisional diagnosis of Crohn's disease associated with a gastroduodenitis was made.

During the three months she was under observation as an out-patient her general condition steadily deteriorated. On August 20 she was admitted to hospital. By this time her vomiting had become more insistent and she could retain only water. Attacks of severe abdominal pain occurred, but she had no diarrhoea during the week she was in bed before operation. Her pulse rate varied considerably, rising at times to 120-130, and she had some pyrexia. Though on palpation generalized abdominal tenderness persisted, at no time was there any distension or rigidity of the abdomen. Her haemoglobin was 82% and her E. S. R. (Westergren) was 38 mm. in one hour.

On August 29 it was decided to explore her abdomen. Typical changes of Crohn's disease were found in the terminal ileum and irregular inflamed patches were present throughout the colon. The stomach wall appeared to be only a little thickened, but in view of the previous barium-meal reports a biopsy of the gastric mucosa was taken from the region of the pyloric antrum. The disease was clearly too widespread for any benefit to be expected from short-circuiting or excision of affected portions of the bowel. The abdomen was therefore closed.

The histological report on the gastric biopsy was: "The stroma is heavily infiltrated by lymphocytes, plasma cells, and endothelial cells. Giant cells are present. No caseation or tubercle bacilli were found. A chronic granulomatous process like Crohn's disease appears to be present."

After operation the patient appeared to convalesce satisfactorily. In view of her pyrexia it was decided to try the effect of a course of streptomycin, which was given with apparent benefit. Her vomiting became much less frequent, and she was sent home on the sixteenth day.



FIG. 1.—Case 1. Showing the absence of mucosal folds in the antrum, cap, and upper half of the descending part of the duodenum. The arrows indicate the junction of the normal and pathological mucosa.



FIG. 2.—Case 1. Showing the irregular margins of the duodenal cap and absence of folds in the mucosa of the cap and upper descending duodenum.

Her subsequent history is of interest. Some weeks after going home persistent vomiting and anorexia returned. She became seriously ill. Though she remained at home, in retrospect it is clear that she should have been readmitted to hospital at this time, since the difficulties of giving her enough nourishment might then have been decreased. As it was, she started to make a slow improvement in the spring of 1951, and was well enough to come to the follow-up clinic in August. She then stated that there had been much less vomiting and abdominal pain in recent months, and that she was feeling much better. A barium meal was given on September 10. It showed that active peristalsis had now returned to the pyloric region and to the whole of the duodenum. Though there was still some residual narrowing of the lumen of the antrum, the outline was smooth and the mucosal relief pattern was normal. There was, however, delay in the emptying of the ileum, where after seven hours a considerable residue of barium remained. The last 3 in. (7.6 cm.) of the terminal ileum showed narrowing, and there was a typical Steirlin sign in the caecum. The ileum proximal to the narrowed portion was slightly dilated (Fig. 3). The x-ray appearances had therefore, after 12 months, become those typically found in regional ileitis.



FIG. 3.—Case 1. Showing the typical appearances of Crohn's disease in the terminal ileum and caecum at the end of the first year.



FIG. 4.—Case 2. One year later, when peristalsis and mucosal pattern were absent from antrum, cap, and upper descending duodenum.

seen in June, 1950. She complained that during the past three years she had suffered from lack of energy, lassitude, and attacks of abdominal pain and diarrhoea. Her stools were watery, but did not contain blood or mucus; her pain was relieved by evacuation of the bowels. Her appetite was good. On examination the only abnormal finding was tenderness in the right iliac fossa, where there seemed to be a palpable swelling. She was admitted to hospital for

observation. The results of investigations were as follows: F.T.M. was normal, haemoglobin 73%, and no pathogenic bacteria were found in her stools. On October 30 a barium meal showed normal functioning of the stomach and duodenum. No gross changes were seen in the small bowel.

She returned home, and on a subsequent visit complained of a vaginal discharge, for the treatment of which she was referred to a gynaecologist. He detected the presence of an ovarian cyst, and on February 7, 1951, he performed a laparotomy. The cyst was removed. On examination of the small bowel it was obvious that the terminal ileum was affected by changes indicating the presence of Crohn's disease. She was then referred to one of us (F. R. R. M.), and on April 6, when the abdomen was reopened, the diagnosis was confirmed. As the disease appeared to be confined to the terminal ileum, a right hemicolectomy was carried out, the caecum, ascending colon, and the last 3 feet (0.9 metre) of the ileum being resected. Histological report on the excised bowel confirmed the diagnosis.

She made a good recovery from the operation. When seen as an out-patient two months later she still complained of frequent motions, but the abdominal pain had disappeared. On August 21 she complained of anorexia and repeated vomiting. She had lost 14 lb. (6.4 kg.) in weight since her previous visit, and looseness of the bowels still continued to trouble her. She looked ill, but examination of her abdomen failed to reveal any significant abnormality. Further investigation showed that her E.S.R. had risen from 12 to 23 mm. in one hour. Her haemoglobin was 80%. The clinical picture thus seemed similar to that found in Case 1, and this opinion was confirmed when the supporting evidence of a barium meal was obtained (R. J. C.). The report may be summarized as follows: (1) There was pronounced gastric dilatation, with an excess of fasting juice. (2) Gastric peristalsis was almost completely absent. (3) The normal mucosal pattern in the pyloric antrum and in the duodenal cap was absent (Fig. 4). (4) The emptying rate of the stomach was normal. In six hours all the barium was in the colon, and in 24 hours most of it had reached the sigmoid.

Comparison of films taken at this time with those taken on October 30, 1950, showed that a great change had occurred in the interval. It was now clear that the change in symptoms had a pathological basis—that is, that of a gastroduodenitis, the nature of which might well be presumed to be similar to that described in Case 1.

Her subsequent history has amply confirmed this opinion. She has been in hospital since October, 1951. Her general condition has deteriorated on account of persistent anorexia and vomiting, and consequent inability to take adequate nourishment. She has become anaemic (Hb 63%) and suffers from frequent pyrexia. Oedema from alteration in serum proteins has occurred, and at times since admission to hospital it has often seemed as if she were going to die.

Discussion

These two cases appear to shed fresh light on the significance of anorexia and vomiting in cases of Crohn's disease. It would seem that such symptoms may herald the onset of this disease, and that when Crohn stated that "nausea and vomiting are rare manifestations and only occur in the later stenotic phases of the disease. Appetite is usually well preserved," he had not this possibility in mind. In neither of the above two cases was stenosis a primary feature. In fact, it was found only in the later stages of Case 1 when vomiting had ceased to feature in her complaints and when her gastric symptoms had largely subsided. No stenotic lesion was demonstrated in Case 2. It therefore seems justifiable to assert that when persistent anorexia and vomiting occur in Crohn's disease, and if other clinical evidence of intestinal obstruction is absent, the possibility of the stomach and duodenum being involved in the pathological process should always be considered. Having seen two cases of gastroduodenitis due to Crohn's disease in the limited practice of one surgeon in the last 18 months, we

Case 2

A married woman aged 24 with two children was first

Summary

The 55 toxoplasmin-positive patients found in a population of 698 mental defectives have been scrutinized for evidence of toxoplasmosis. Most of the patients were children. The incidence of positive cases increased with advancing age. In two cases eye lesions suggestive of toxoplasmosis were found. Radiology and lumbar puncture showed no findings suggestive of toxoplasmosis. In no cases could the mental defect be definitely attributed to toxoplasmosis. In some cases other definite causal factors were present—for example, epiloia, phenylketonuria, mongolism. It was concluded that in mental institutions or elsewhere a positive toxoplasmin reaction is acquired like a positive Schick reaction with increasing age, and is very infrequently associated with clinical toxoplasmosis; and that toxoplasmosis is not a common cause of mental defect.

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MYXOEDEMA AS A CAUSE OF DEATH

REPORT OF TWO CASES

BY

H. S. LE MARQUAND, M.D., F.R.C.P.

W. HAUSMANN, M.R.C.P.

AND

E. H. HEMSTED, M.B., B.Chir., D.C.P.

(From Reading Combined Hospitals)

Since the introduction of treatment with thyroid extract by Murray in 1891, it has been presumed that myxoedema as a cause of death is rare. We have been able to find only three recent references, and therefore report the following two cases.

Case 1

A woman aged 61 was admitted to hospital on January 7, 1951, with the following history. Thirty-five years ago she developed a left-sided hemiplegia, from which she made a good recovery. Two years ago she had another stroke, also involving the left side. Again recovery was fairly complete. The patient had had four children without trouble and the menopause had occurred at the age of 48. She had been in fairly good health until a fortnight before admission, when a cold and a severe cough developed. Her condition gradually deteriorated until January 6, when she first called in her doctor. He found her semi-conscious, and the following morning noticed considerable puffiness of the face.

On admission her pulse rate was 62 and temperature 97° F. (36.1° C.). She was moderately obese, and had pronounced supraclavicular fat pads. She was extremely lethargic but obeyed simple commands. Her voice was low-pitched and croaking. The scalp hair was dry and scanty, the pubic hair was extremely sparse, and the axillary hair was missing. Her skin felt dry and cold; her face, especially the eyelids, was puffy. Nothing abnormal was found in the heart, lungs, or abdomen. The blood pressure was 140/100 mm. Hg. There was pitting oedema of the legs up to the knees, and the hands were swollen but did not pit on pressure. Some evidence of previous hemiplegia was found in slight spasticity of the left side with an extensor plantar response, but there was no other abnormality in the central nervous system.

Investigations.—Urine: albumin was present; film showed scanty red cells, leucocytes, and mixed bacterial flora. The haemoglobin was 90%; blood urea, 50 mg. per 100 ml.; blood sugar, 57 mg. per 100 ml.; blood cholesterol, 390 mg. per 100 ml.; serum potassium, 18.4 mg. per 100 ml.; serum sodium, 345 mg. per 100 ml.; plasma chlorides, 595 mg. per 100 ml.; serum protein, total 7.2% (albumin 3.7%, globulin 3.5%, A/G ratio 1.1). An electrocardiogram showed flat and inverted T-waves in all leads, suggestive of myxoedema.

The diagnosis was difficult. Renal failure was suspected, but there was no confirmatory evidence on investigation. It was thought that an adrenal failure might be the cause, so treatment was started with penicillin and adrenal cortical extract, 10 ml. four-hourly. Although the patient became brighter mentally, her general condition deteriorated, respiration became laboured, and she died four days later. Her temperature remained at a low level all the time, and varied between 95 and 97° F. (35 and 36.1° C.). Her pulse rate varied between 60 and 70.

Necropsy

The following were the outstanding features: a widespread consolidation of the lungs; ante-mortem haemorrhages involving the suprarenals; remnants of thyroid gland; a heart of normal size and coronary vessels normal for her age.

Histological Examination.—Sections taken from both lobes of the thyroid gland showed marked fibrosis. A few small islets of lymphoid tissue were present in each lobe, and within these the remains of thyroid acini could be identified. The latter were composed of large pale irregular cells showing variable eosinophilic staining properties. Colloid was absent except in one small area. These remaining acini were surrounded by plasma cells and an outer zone of small lymphocytes. The lungs showed the picture of grey hepatization, with the alveoli distended by polymorphonuclear exudate. No heart-failure cells were present. **Kidneys:** the cortex was thinner than normal and patchy interstitial fibrosis was present. A considerable number of normal-looking glomeruli were to be seen. The vessels showed some thickening of the walls, but no elastosis.

Evidence of antemortem haemorrhage was found in the suprarenal gland. The pituitary gland was larger than normal. Acidophilic staining cells were noted to be extremely scanty, otherwise the histological appearance was within normal limits.

Case 2

An unmarried woman aged 50 was admitted to hospital on January 7, 1952. The previous history was that she had been well enough to do her own housework until five months before admission. Since then she had complained of weakness and of feeling cold, and these symptoms had gradually become worse. On the day of admission she suddenly complained of loss of vision, and the doctor found her lying across the bed unconscious.

On admission her temperature was 95° F. (35° C.) and pulse 42. She was semi-conscious and repeated such sentences to herself as, "What have I done?" but she would obey simple commands. Anasarca was present and the face and eyelids were swollen. The skin was coarse and dry. The scalp, pubic, and axillary hair was scanty; the superciliary hair was absent. Coarse rales were heard at the bases of both lungs, and there was tracheal rattle; the heart sounds were normal; the blood pressure was 250/140 mm. Hg. Nothing abnormal was found in the abdomen or in the central nervous system.

Investigations.—Urine: albumin was present; film showed many Gram-negative bacilli. The blood urea was 25 mg. per 100 ml.; blood cholesterol, 495 mg. per 100 ml.; serum sodium, 295 mg. per 100 ml.; plasma chloride, 420 mg. per 100 ml.; alkali reserve, 44 c.cm. CO₂; serum protein, total 6% (albumin 3.4%, globulin 2.6%, A/G ratio 1.3). The cerebrospinal fluid contained 1 white cell per c.mm. and 56 mg. of protein per 100 ml. An electrocardiogram showed flat T-waves in all leads; the tracings were compatible with the diagnosis of myxoedema.

Ten hours after admission the patient had a tonic fit. She was given a small amount of thiopentone intravenously; when the respiration stopped and the pulse became impalpable. Artificial respiration was started and she recovered. She was treated with continuous oxygen and penicillin, 1,000,000 units six-hourly. She improved considerably, but remained confused and slightly maniacal. Her blood pressure was about 160/100 mm. Hg. On January 10 she was given 10 mg. of thyroxine, with great improvement in the general condition. The puffiness and the subcutaneous oedema disappeared and the blood cholesterol fell to 388 mg. per 100 ml. Nine days later her temperature went up to 101° F. (38.3° C.), her breathing became laboured, and her general condition deteriorated. On the 21st day she became unconscious and her pulse impalpable, and she died.

Necropsy

A full post-mortem examination revealed very little positive information. Macroscopically the heart and coronary arteries appeared normal.

Histological Examination.—The thyroid gland was slightly enlarged and the cut surface firm and pale. The histological appearance was that of a Hashimoto or lymphadenoid goitre. **Kidneys:** Both were of normal size and appearance. Histological examination showed slight thickening and elastosis of the vessels. An occasional glomerulus was undergoing hyalinization. Adequate numbers of normal-looking glomeruli were present, however, and there was no evidence of tubular degeneration or interstitial fibrosis. The appearance was thought to fit in with an early hypertensive kidney.

The pituitary gland seemed to be quite normal. The ovaries were fibrotic.

Discussion

In our opinion myxoedema was the main cause of death in both cases. In Case 1 it can be presumed that a patient with severe untreated myxoedema was exposed to the stress of pneumonia and that this produced suprarenal failure. McGavack (1951) says that there is atrophy of the zona fasciculata in myxoedema and the excretion of 17-keto-steroids and glucocorticoids is greatly diminished. It seems feasible that when such a gland is exposed to additional stress acute adrenal cortical failure may ensue. The fact that there was widespread haemorrhagic destruction of the adrenal glands is in agreement with this assumption.

Case 2 is not quite so conclusive. Hypertensive encephalopathy had to be considered in the differential diagnosis. The reasons, however, against hypertension playing a major part in the fatal outcome of this case are: (1) the normal appearance of the eye background; (2) the normal size of the heart; and (3) the electrocardiogram, which was

suggestive of myxoedema rather than of hypertension. The fact that the blood pressure, except on admission, was within normal limits is also against this diagnosis.

Recent reports of death due to myxoedema are scanty. The largest series is that by McGavack and Schwimmer (1944), who described nine deaths, all due to cardiac complications of myxoedema. One case was described by Foster and Barr (1944) in which there was myxoedema of long duration with slow deterioration. A case was reported by Chioloro and Meerwein (1939), but it was doubtful whether myxoedema was responsible for death, as the case was complicated by the presence of schizophrenia and chronic ulcerative colitis. The largest series described was in a Report on Myxoedema (1888) in which 22 cases were mentioned. There it was stated that the majority of the patients died from intercurrent diseases, mainly pulmonary or renal, but in some cases death was the direct result of myxoedema. These cases showed intense anaemia and a variety of nervous symptoms, such as maniacal excitement, coma, etc.

A very interesting report has recently been published by Sheehan and Summers (1952) which stressed the important part that hypothermia played as a cause of coma in similar cases. In their patients the rectal temperature was recorded as 77 and 83° F. (25 and 28.3° C.). They point out that the clinical thermometer does not register below 95° F. (35° C.) and therefore this condition goes unrecognized. In retrospect, it is probable that our two cases fall into the same class. The temperature recorded in Case 1 was between 95 and 97° F. (35 and 36.1° C.), which most likely meant that the thermometer did not register, and the difference in the temperature depended only on how far the mercury column was pushed down by the nurse. In Case 2 the temperature was recorded on admission as 95° F. (35° C.). Only after the administration of thyroxine were temperatures above 98° F. (36.7° C.) recorded. The pulse rate in both cases was very low, which is in agreement with the observations recorded by Sheehan and Summers. Perhaps a significant fact is that both cases were admitted in the middle of winter, when the danger of hypothermia is obviously greatest.

The lesson to be learned from our cases is that under certain circumstances myxoedema may be a fatal disease. Therefore it is essential to diagnose these cases early and to treat them promptly. Unfortunately, the possibility of myxoedema may not even be considered. In our cases the diagnosis on admission was chronic nephritis, and that is probably the most common mistake. The patients may also be treated with iron and liver in the belief that the condition is due to anaemia, or cardiac disease may be suspected. It is important to stress the fact that the diagnosis may not only be missed in life but that, even when a necropsy is done, it may remain uncertain because the thyroid gland may not be examined.

In Case 2 the thyroid gland was of normal size, and only on histological section could destruction be confirmed. For these reasons we think that this condition may often remain undiagnosed.

Unfortunately, treatment of these two cases was not successful. In Case 1 adrenal cortical extract was used but did not prevent the fatal outcome. In Case 2 we had the experience of the first to suggest the possible diagnosis. The patient was given an adequate dose of thyroxine without success. Probably, irreversible change had taken place before treatment was begun. The answer is, of course, early diagnosis.

Summary

Two cases in which death was due to myxoedema are reported. It is suggested that this diagnosis is often missed, and that it is necessary to examine the thyroid gland after death as a routine procedure, particularly in elderly people.

rare, and in this instance there is no indication of how the organisms gained a "bridgehead" in the muscle. It is, however, possible that in some cases of clostridial myositis following a wound or an injection the infecting organism has been derived from the bowel rather than by inoculation from the exterior of the body. There was a rather suggestive latent period of at least eight days in the case reported by Shaw and Evans (1953), though admittedly delays of longer than five days may occur even in grossly contaminated wounds.

Direct evidence that phenylbutazone contributed to death is lacking. However, in view of the rarity of the condition, and the known effects of phenylbutazone on the continuity of the gut mucosa and on the circulating white corpuscles, it is difficult to dissociate the drug from some part in the initiation or spread of the gangrene or terminal septicaemia.

Since these two cases, both treated in general practice, two other fatalities have come to my notice. Both were instances of death due to perforation of peptic ulcer during phenylbutazone treatment. It should be noted that in Case 1 the perforation was unsuspected, nor was the cause of death clinically apparent in Case 2. The possibility of analgesic properties masking signs and symptoms is therefore of some importance.

It seems pertinent to iterate that, apart from the known contraindications, phenylbutazone should never be given without regular and frequent clinical assessment of the patient and appropriate white-cell counts.

Assessment of the precise risks attached to new drugs is never easy, and risks are not necessarily as great in hospital as they are in general practice. It is perhaps desirable that statutory post-mortem examinations should be held on all patients dying while treated by any new drug within a specified time of its inception even if there is no *prima facie* reason for supposing death to be attributable to treatment.

J. G. BENSTEAD, M.A., M.D.,
Consulting Pathologist,
Southport and District Hospitals Group.

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A Case of Subserous Duodenal Haematoma

A case of this condition due to non-penetrating and apparently trivial injury is reported because a search of the literature has not brought to light any record of a similar case.

CASE REPORT

A thin boy aged 9 was admitted to hospital on April 9, 1952, for abdominal pain and vomiting. Five days before admission he had "gone over" the handlebars of his bicycle; he thought he had fallen mainly on his left side, and had had a small abrasion of the left temple and left leg. From his own and his parents' account of the injury, it seems to have been regarded as trivial, and he was riding his cycle again a short time after the accident. He complained of some abdominal pain, but this was not severe and passed off in a few hours. Two days later he was seized with a sudden abdominal pain of such severity that he had to be put to bed; a hot-water bottle was applied to the abdomen, which apparently relieved him and he slept, but he woke at midnight and vomited food. Pain was felt in the central abdomen and remained in this area. The next day his general condition became worse; the abdominal pain was more severe, and vomiting and retching continued all day. His bowels were not open. His doctor decided that the condition was probably appendicular colic. He was kept in bed and given fluids and "sulphatrad."

On the day before admission he seemed to be slightly better: the pain was less severe, but vomiting and retching

continued. There was a slight rise of temperature and pulse rate. His bowels had still not been open. On the day of admission the pain had again increased and vomiting and retching were very frequent. The doctor noted a slightly raised temperature, but the pulse rate had risen further.

Apart from the usual childhood diseases he had always been well.

On admission the patient was slightly flushed and seemed to be in some distress. His temperature was 98.6° F. (37° C.), pulse 74, respirations 22. The tongue was coated and dry, and there was some fetor oris. The abdomen was slightly distended but moved freely with respiration. There was no evidence of bruising or abrasion of the abdominal wall. The boy pointed to the site of pain as immediately below the umbilicus, and there was some guarding and tenderness in this region. Hard faeces could be felt in the descending colon. No other abnormality could be detected on abdominal examination. On rectal examination hard faeces were felt; there was no tenderness or induration. Routine urine examination showed no abnormality. The haemoglobin was 15 g.%; total leucocyte count, 16,200 (polymorphonuclears 84%, lymphocytes 16%); bleeding-time, 5½ minutes; clotting-time, 9 minutes. A straight x-ray film of the abdomen showed that the stomach contained a considerable quantity of gas.

The child was placed under observation and given fluids only by mouth. He vomited twice soon after admission; each vomit was of a few ounces and contained mucus and flecks of altered blood. An intravenous drip of glucose-saline was set up, a Ryle's tube passed, and gastric suction started; about 1 pint (570 ml.) of a "coffee ground" type of gastric fluid was aspirated. Further examination of the abdomen about eight hours later revealed a fixed ill-defined mass in the midline above the umbilicus.

On the morning of April 10 the boy's general condition had improved, and it was decided to perform a laparotomy to find the cause of what was obviously a high small-intestine obstruction. The abdomen was opened through an upper midline incision. The mass was found to be a gross enlargement of the second, third, and fourth parts of the duodenum and the first 4 in. (10 cm.) of the jejunum. At first sight the mass appeared to be gangrenous, being blue-black. Further examination showed that there was a very large subserous haematoma: 4 oz. (114 ml.) of fluid blood was aspirated from beneath the serous coat, and after incision of the serosa a great quantity of clot was evacuated with the finger. The underlying muscle coat appeared to be intact, but the presence of such a large clot had completely closed the lumen of the duodenum. The serosa was left unsutured and the abdomen closed without drainage.

Convalescence was slow but uneventful, and the patient was discharged from hospital six weeks after operation. When seen one month and three months after discharge he was very well. He had gained weight and was taking normal diet. No mass could be felt on abdominal examination.

COMMENT

Although there is no clear history of injury in this case, it is reasonable to assume that the lesion was caused by abdominal injury at the time of the accident. That the force of the blow was slight is evident from the fact that neither the child nor the parents were definitely aware of it, and from the absence of bruising of the anterior abdominal wall. The injury seems to be related to the blast injuries of the abdomen seen in the late war, and the effects of the injury were maximal in that area because of the immobility of the second, third, and fourth parts of the duodenum and the relative immobility of the duodeno-jejunal flexure.

I wish to thank Dr. C. D. Agassiz, physician-superintendent of Queen Mary's Hospital for Children, and Mr. A. M. Desmond, who performed the operation, for permission to publish this case.

D. I. STIRK, F.R.C.S.,
Resident Surgical Officer, Putney Hospital;
Late Surgical Registrar, Queen Mary's Hospital for Children.

Reviews

MEDICAL BIBLIOGRAPHERS

The Great Medical Bibliographers: A Study in Humanism. By John F. Fulton. (Pp. 83, with 5 appendices, index, and 37 figures. 32s.) Philadelphia: University of Pennsylvania Press. 1951.

The wine of Dr. Fulton's providing needs no bush. To one who loves books, without any vestige of knowledge of bibliography, his account of *The Great Medical Bibliographers* has brought vividly back to memory his delightful pen-picture of the three wise men—Welch, Arnold Klebs, and Cushing—toiling up an Apennine pass "bursting with the erudite gossip of the ages." As a young graduate John Fulton had come to England to work under Cushing's old teachers, Sir Charles Sherrington and Sir William Osler, *quibus ille studiis ab ineunte anno imbutus* he became enamoured of the humanistic traditions of Europe's scholar-physicians, started then to collect old books, and, in his own words, "has been at it ever since." To-day, his term of office as Sterling Professor of Physiology at Yale having expired, he is the fortunate director of that university's medical historical library, founded on the joint bequest of Cushing's, Klebs's, and his own collections. "Thrice happy men are they whose Nature sorts with their vocations."

How can one with no pretensions to the bibliographer's expertise proceed to review this book? Simply by trying to convey some small share of the pleasure its reading has given him. For Dr. Fulton wears his learning as lightly as ever cavalier wore cloak, conveying with enviable ease through text and footnote the pleasure that may be found in the collection and collation of ancient texts. To him, as collector and connoisseur, bibliography is "the noble art of describing useful and beautiful books"—a happier description than any to be found within the covers of the *Encyclopaedia Britannica*. His enthusiasm is infectious.

In a memorable passage Harvey Cushing has described the febrile state induced by handling a calf-bound volume (1542) published by Etienne Dolet,

"the unfortunate young Renaissance scholar, contemporary and friend of such as Erasmus and Rabelais, who lived in Lyons when Lyons was a place to live in, who published eighty books, and for three words which left his meaning dubious went to the stake and was burned with his books."

Inscribing his book to the memory of three great medical bibliographers—Conrad Gesner, whom Osler named as the father of bibliography, Albrecht von Haller, in whose soul burned the fire of incessant industry, and John Shaw Billings, whose legacy to medical scholars has been the *Index-Catalogue* of the Surgeon-General's Library at Washington—Dr. Fulton takes his readers straight to sixteenth-century Lyons. Texts then were few, and books both new and rare, but the printers Gryphus and Dolet, for whom Champier, Canappe, and Rabelais—humanist physicians all three—translated and corrected the ancient texts, made their city the first intellectual centre of France. On then from Lyons to Zurich, where Gesner spent his youth poring over the literature of learning as he compiled his *Bibliotheca universalis*. Dr. Fulton's brief account of the scholar rising from his table to tend his ailing wife, as poor and young as he, explains Osler's affection for him.

Through the sixteenth and seventeenth centuries collections of books were private, made by wealthy practitioners only. On their death the collections were either bequeathed to institutions or sold by auction. Printed sales catalogues of "vendible books" first appeared towards the end of the seventeenth century, and copies are still extant of Jean Riolan's collection (1654), of Sir Kenelm Digby's (1665), and of the 20,000 books belonging to Dr. Bernard, at whose sale sixteen Caxtons were sold for five shillings apiece. Such catalogues are of value to-day as evidence of the medical interests of the time or in tracing the provenance

of rare books. With the growth of hospitals and medical societies in the eighteenth century came the growing demand for libraries, biographies, and dictionaries.

If, as Butterfield will have it, the seventeenth was the century of the *philosophes*, the eighteenth was as definitely that of the *encyclopédistes*. Greatest of these was the amazing Haller, who as a precocious child of 8 had written 2,000 potted biographies of men of history, and at 10 had completed a Greek lexicon. These were the forerunners of the encyclopaedic work of his maturity: the monumental bibliography of physiology in nine volumes, and his four great *Bibliothecae* of botany (1771), of surgery and anatomy (both in 1774), and of medicine (1776).

And so, not failing in tribute to many lesser luminaries, we are brought down to our own days, in which the expansion of medical literature has surpassed the energy of the individual bibliographer. Even the *Index Medicus* is in arrears, and the *Index Catalogue* of Billings's creation has had to suspend publication, to the consternation of librarians the world over. Choulant and Osler have been known in person to many who will read this fascinating book, and Geoffrey Keynes is happily with us still to carry on the humanist tradition, working *manu sua* as did his forerunners to the delight of all literate men.

"A collection of books is a university, and the custodian of books is necessarily a teacher." They are the words of Osler, who made old books, and the men who wrote them, live. His *Bibliotheca* is to-day a Canadian shrine, tended with loving care by his nephew. And through these Transatlantic collections, from Montreal and Baltimore, through Boston, New Haven, and Washington, runs J. C. Bay's "golden thread" which connects all members of a noble lineage back to the little house in Zurich in which Gesner worked and died. The weaving of the thread has been the task of the bibliographer. How fascinating the task, whether of weaving or following, Dr. Fulton's pages most eloquently tell.

WM. DOOLIN.

POLIOMYELITIS

Poliomyelitis. By W. Ritchie Russell, C.B.E., M.D.(Edin.), M.A.(Oxon.), F.R.C.P.Ed., F.R.C.P.Lond. (Pp. 84; 20 figures. 14s.) London: Edward Arnold. 1952.

It is refreshing to read a book on anterior poliomyelitis written by an author conversant with modern trends in neurophysiology and versed in the clinical vagaries of diseases affecting the central nervous system. The book is short, and certain aspects of the disease are scarcely mentioned. There is very little, for instance, about the method of spread of infection. Possibly this was omitted as being outside the author's personal experience, but it is a pity that he does not say more about the morbid anatomy, in which interesting work has been done in the past few years. The account of the clinical features of the acute illness is admirable, and Ritchie Russell makes clear the nature of the "muscle spasm," a term which has been used in such the varying senses in the literature of poliomyelitis. He notes that muscle fasciculation may be an important sign in the pre-paralytic phase, occurring in muscles which are likely to become weak during the succeeding 24 hours.

Two-thirds of the book are devoted to the treatment of the disease, about which Ritchie Russell has obviously thought deeply. His account of the importance of postural drainage in bulbar poliomyelitis, and of the use of the respirator in respiratory failure, is of great value, and explains several points which were previously by no means clear to the reviewer. The most controversial feature of the book concerns the methods advised for the treatment of weak or paralysed muscles. By now Ritchie Russell's of weak or paralysed muscles. By now Ritchie Russell's work on the importance of strict rest in the pre-paralytic stage is generally accepted, but there is likely to be some disagreement with his opinion about treatment when the acute phase is over. He advocates passive movements from the first appearance of paralysis to prevent contractures in

the opposing muscles, avoidance of splints so far as possible, and, within two weeks of the onset of paralysis, progressive active movement to the point of physiological fatigue. He has not been able to confirm that deliberately induced fatigue does any harm to weak muscles in the recovering stages of poliomyelitis, but he emphasizes that research is needed to find out the best method of exercising weak muscles under different conditions.

This is the most stimulating work on poliomyelitis which has appeared for years. Possibly some of the author's ideas on the treatment of weak muscles will not be proved to be correct, but the book should encourage all who treat patients suffering from the disease to think again about treatment. The whole theme of the book, and the unsolved questions which it poses, emphasize the need for special centres for the treatment and study of patients with poliomyelitis so that the best results can be obtained—a pressing problem with the increasing incidence of the disease.

J. W. ALDREN TURNER.

ADVANCES IN MEDICINE

Advances in Internal Medicine. Volume V. Edited by William Dock, M.D., and I. Snapper, M.D. (Pp. 464. £4.) Chicago: Yearbook Publishers. London: Interscience Publishers. 1952.

The average clinical scientist or academically minded consultant tries to skim through at least 30 to 40 weekly, monthly, and quarterly journals to keep *au fait* with what is going on in his subject. It is more difficult to establish a routine for dealing with the annual publications, of which the present is an example, and there are therefore good grounds why they should be reviewed in the same way as books are. Some of these volumes are reprints of courses of lectures and owe their publication merely to local piety or the need to expend an earmarked bequest. Others, however, are of more serious interest, and this one has shown itself to be a useful annual review on whose table of contents the aspiring physician should keep a watchful eye. The present volume of approximately 450 pages contains seven articles, five by American and two by European authors. The lists of references in most of them run up to 150–200 titles. The subjects treated are diseases of the pregnant woman affecting the offspring, catheterization of the heart, portal hypertension, the anaemia of infection, gout, ganglionic and adrenergic blocking agents, influenza, A.C.T.H. and cortisone, and the abnormal proteins in myeloma. The last is an article by Waldenström in which he discusses the whole subject of hyperglobulinaemia. It is an admirable review of a recondite subject which is nevertheless of great interest to haematologists. Most of the other articles are of more general interest. This is indeed an excellent publication, and the only drawback to it is the high price.

L. J. WITTS.

PSYCHOLOGY OF TWINS

Twins: A Study of Three Pairs of Identical Twins. By Dorothy Burlingham. (Pp. 94 and 28 appendices. £1 15s.) London: Imago Publishing Co. 1952.

Mrs. Burlingham's publications with Miss Freud on the work of the Hampstead war nurseries have achieved worldwide recognition. We now have a beautifully produced volume which is a study of three sets of identical twins, and this too will redound to the credit of those who organized the remarkable work done in the war nurseries in London under air attack. The high price of the book must be due to the development charts which are an essential part of it. Mrs. Burlingham has found a method, using three-colour printing, whereby the reader may easily follow the details of the development of each child as a person, and of each child in relation to the development of the twin.

The text is short; it contains well-balanced views on twins and their special problems of emotional development, with the attendant problems of management. Mrs. Burlingham is also able to show that close observation of twins can pro-

vide material for work on the theory of the early stages of personality growth.

Children have brothers and sisters, they have animals, real or stuffed or imaginary, they have dolls, they have dream-siblings, fantasies of belonging to a home other than their own, and so on. The problem is, How does a real twin fit in with all these and other similar enrichments and complications that belong to all infants and children? According to Mrs. Burlingham the relationship to the twin is used to soften the crude anxieties that belong to the relation of the child to the parents—that is to say, that belong to the Oedipus complex. But there is also the meaning of twinning to infants who have not yet reached the Oedipus complex level, to those children who have not developed well enough at the earliest stages and who cannot achieve the status of whole persons engaged in inter-personal relationships. There is much work to be done just here, and twins do give a special type of evidence that is useful, and which can, moreover, be collected outside psycho-analysis, by direct observation. For those who are interested in this type of problem the book is probably the most comprehensive work of its kind in existence.

D. W. WINNICOTT.

GYNAECOLOGICAL DIAGNOSIS

Handbook of Gynaecological Diagnosis for Practitioners and Students. By Professor Walter Neuweiler, M.D. Translated from the German by Dr. Paul Ederer. (Pp. 448; 406 figures. £4.) London: William Heinemann Medical Books. 1952.

Dr. Walter Neuweiler is professor of midwifery and gynaecology at the University of Berne, and this is a translation of his *Lehrbuch der gynäkologischen Diagnostik für Ärzte und Studierende*. And an excellent translation it is. The English is impeccable, and the illustrations are not only numerous but are mostly of a high quality. The reproduction of radiographs could hardly be bettered.

The author's thesis is that satisfactory treatment depends on accurate diagnosis, and that the diagnosis demands study of the patient as a whole rather than of her pelvic organs. He concentrates on clinical methods rather than adventitious aids, and the first 100 pages are devoted to a masterly account of history-taking and physical examination. The accounts of colposcopy, hysterosalpingography, endometrial biopsy, and other methods of investigation are short but satisfying.

The major part of the book, however, is rather surprisingly planned on the basis of pathology and follows the usual scheme of setting out in logical order the various morbid processes which may affect each pelvic organ. The clinical features and aetiology of each are discussed separately, but many useful clinical hints and observations can be found. There are also small sections devoted to symptoms such as backache, sterility, discharge, amenorrhoea, and excessive uterine haemorrhage. These, although showing a more clinical approach, do not attain the high standard set elsewhere. One pleasing result of the particular arrangement is that the pathological basis and mechanism of production of clinical features are often explained.

Although all manner of quite rare conditions receive some mention, the work is not intended to be exhaustive or to be an all-purpose textbook. It is designed to supplement rather than to replace standard gynaecological books, and, judged in this light, it is unquestionably attractive.

T. N. A. JEFFCOATE.

During the war Dr. George Spanopoulos, now a general practitioner in Cyprus, served as an R.M.O. with the British Army, and in a little book, *Rabaguena* (Nicosia: Zavallis Press), he describes his experiences from arriving in the middle of the Kalahari Desert to being made a Bechuana chief with the title "Father of Crocodiles." He tells some good stories of the natives of Bechuanaland, their evident enjoyment of castor oil, and the schemes he had to resort to in order to impress them with the powers of his remedies. Indeed, his story has many illustrations of how primitive people prefer the doctor to bring his magic rather than his science to their aid.

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POST-PARTUM HAEMORRHAGE

Post-partum haemorrhage, including third-stage bleeding, is still a leading cause of maternal death. That this should be so despite the advent of the blood bank and of the obstetric flying squad, and at a time when an increasing proportion of deliveries are conducted in hospital, has led in recent years to expressions of dissatisfaction with the traditional methods of management of the third stage of labour. Despite the rear-guard action of the old school, championed most recently by Hammond,¹ the trend in institutional midwifery is to discard controlling the fundus, to deprecate Credé's method of placental expression, and to favour the prophylactic intravenous injection of ergometrine towards the close of the second stage. In last week's *British Medical Journal* (p. 643), Drs. J. D. Martin and J. G. Dumoulin added to the literature another report on the efficacy of intravenous ergometrine in shortening the third stage and in preventing post-partum haemorrhage. Secondary relaxation of the uterus may still occur after the delivery of the placenta, but this can be prevented by a further intramuscular injection at this time.² In some hospitals prophylactic intravenous ergometrine is given in all labours, but in others it is used only when shortening of the third stage is particularly desired because the risk of bleeding is thought to be greater than average—for instance, when the birth is a multiple one, when there has been a previous history of an abnormal third stage, and when delivery has been performed under general anaesthesia. Prolonged labour is also generally quoted as predisposing to post-partum haemorrhage, but it is surprising how often such bleeding follows a short and efficient labour. One further advantage of delivering the placenta as soon as possible is that it reduces the blood loss from lacerations or episiotomy wounds because these can then be sutured earlier.

Martin and Dumoulin confirm that the timing of the injection of ergometrine with the crowning of the foetal head or the delivery of the anterior shoulder is a most important point of technique. They differ from some, but not all, previous investigators in having found that the procedure caused a significant increase in the rate of manual removal of the placenta. But, even if this point is conceded to them, it is not a serious drawback in hospital practice, where the operation of manual removal is a safe procedure in skilled hands.³ But this operation does not carry the same freedom from risk in domiciliary practice, in which, therefore, the routine use of prophylactic intravenous ergometrine is not advised. This may seem a serious disadvantage to the general practitioner, but it must be viewed in proper perspective, for factors other than the length of the third stage are concerned in the prevention and treatment of post-partum haemorrhage. Thus, for example, it is of the first importance to keep the haemoglobin of the expectant mother at as high a figure as possible. Skilled conduct of the first stages of labour is reflected in a low rate of traumatic as well as atonic post-partum haemorrhage. In particular the slow delivery of the foetal body encourages normal uterine action in the third stage. Further, Hammond¹ has shown that the proper and efficient management of the third stage along traditional lines has excellent results. Some would modify the classical instructions by substituting a "hands off the uterus" policy for the time-honoured controlling or guarding of the fundus, but with well-trained attendants little if anything is gained thereby. In an obese patient a relaxed uterus distended with blood may be overlooked unless the fundus is controlled.⁴ Finally, should the third stage be marked by atony and bleeding, the prompt administration of intravenous ergometrine will cause the uterus to contract, and the placenta can then be delivered or, at worst, the bleeding will be controlled until either the obstetric flying squad answers the summons or preparations are made for manual removal of the placenta.

Once the placenta is delivered the mother should be watched for a further hour. It is in this time that true post-partum haemorrhage is most likely to occur: indeed, there is much to commend the suggestion that this first post-partum hour be designated the fourth stage of labour.⁵ If bleeding occurs after the completion of the third stage oxytocic drugs are the first line of treatment, but if the haemorrhage persists or recurs exploration of the uterus should not be deferred. Most commonly clots or retained placental fragments will be found, but it is also necessary to exclude rupture of the uterus and even incomplete

¹ *J. Obstet. Gynaec. Brit. Emp.*, 1952, **59**, 493.

² Snaith, L. M., *ibid.*, 1951, **58**, 633.

³ Cacciarelli, R. A., *Amer. J. Obstet. Gynec.*, 1949, **57**, 351.

⁴ Macafee, C. H. G., in *Modern Trends in Obstetrics and Gynaecology*, 1950, London, p. 323.

⁵ Greenberg, E. M., *Amer. J. Obstet. Gynec.*, 1946, **52**, 746.

uterine inversion. From the point of view of the mother, perhaps the least fortunate patient is the one who loses a moderate amount of blood—more than normally attends labour but less than warrants transfusion. An unremarked and untreated post-natal anaemia is a serious handicap, lessening the resistance to infection, slowing the rate of recovery from labour, and denying the mother the fullness of energy and well-being necessary for the discharge of her duties and the enjoyment of her baby.

THE HEALTH SERVICE ESTIMATES

A year ago, in commenting on the Health Service estimates, we pointed out that they appeared to have achieved an uneasy stability—which, as it happened, was temporarily upset by the Danckwerts award to general practitioners. Now the budget season has come round again, and the Health Service estimates are being scrutinized to see whether stability has been maintained.

Last year, if the Danckwerts award is ignored, stability was achieved by the imposition of new charges on the patient. Apart from their deterrent effect, the charges for spectacles, dental treatment and dentures, and for drugs were between them estimated to bring in over £23m. in the year now ending. In addition, small sums were to be saved in the hospital service by charges for appliances and drugs for out-patients, and by a higher charge for amenity beds. The effect was to allow the Health Service roughly the same amount of resources at the new prices—which had risen sharply in the preceding twelve months—but to make the patient rather than the taxpayer meet the heavier bill. This year policy seems to have somewhat changed. As a special correspondent shows on page 723, the net cost to the taxpayer has risen to £410m. largely because of the higher payments to general practitioners. There are also increases of varying amounts in the other main items of expenditure. But the charges in the coming year—in the ophthalmic, dental, and pharmaceutical services—are estimated to yield less than £18m. In other words, whereas last year the patient was intended to relieve the taxpayer, this year the taxpayer appears to be shouldering more of the burden.

On Budget Day the Chancellor of the Exchequer may give some information on how effective the charges have been. What is chiefly significant at this stage is that in spite of maintaining the yield from the charges roughly at last year's figure the taxpayer's

drugs bill is increased by over £4m. The fall in the total estimated yield from the charges is mainly accounted for by a reduction of £4m. in patients' payments for dental treatment and dentures. In this case, however, the charge seems to have been more effective as a deterrent than the prescriptions charge, for the gross receipts of dentists are estimated to show a further fall—but not enough to save the taxpayer from having to pay a little more for this service as well.

An important feature of this year's estimates is the virtual stability of the grants to hospital boards. Hitherto hospital budgets have been allowed to jump by something like £20m. from year to year, and even then hospital authorities have not been able to undertake much desirable expansion and re-equipment. This year they have not even been able to increase their expenditure to take into account the rise in prices—which has continued in 1952–3, though to a much smaller extent than in the previous twelve months. On the face of it this would imply that the hospitals' budgets have been reduced in real terms, which would in its turn imply a contraction in services. Or it may be that expansion planned a year ago is not being carried out. What does seem to be clear from the estimates is that Health Service expenditure is now marked by a duel between the hospitals and prescriptions. Last year the hospitals were allowed an increase of about £21m. in their budgets, while an attempt was made to keep prescribing in check by means of the shilling charge. This year prescribing has been allowed more latitude, whereas hospital budgets have been rigidly kept down. In fact there are signs that the drugs bill is getting out of control. In the first full year of the Health Service £35m. was spent on drugs prescribed by general practitioners, and this figure was high enough to impel the Labour Government to take power to impose a charge. In the coming year the comparable cost is estimated at nearly £52m., and, even when allowance has been made for the charge, the net cost to the taxpayer is £10m. more than in 1949–50.

The drugs bill is difficult to control because, apart from increasing costs of material year by year, its size depends ultimately on the action of individual general practitioners. It cannot be reduced to any extent by cuts in chemists' fees, for, as the analysis shows, three-fifths of the total is accounted for by the cost of ingredients. Again, many important new drugs are very expensive. Our correspondent points out that in Scotland the pharmaceutical service is estimated to cost less in the coming year than in 1952–3. Yet the price of drugs is the same on each

side of the Border. Perhaps Scottish patients are not so attached to bottles of medicine as the English and Welsh. Or are Scottish doctors more careful in their prescribing?

POISONS IN AGRICULTURE

Since the Threshing Machine Act of 1878 and the Chaff Cutting Machine Act of 1897 no further legislation had been introduced to safeguard the health of agricultural and horticultural workers until the enactment of the Bill known as the Agriculture (Poisonous Substances) Act, 1952. Regulations under the Act have now been made by the Ministry of Agriculture and Fisheries in England and Wales and the Secretary of State for Scotland. They are for the purpose of protecting employees against risks of poisoning from the dinitro and organo-phosphorus compounds, which are now extensively used in agriculture and horticulture for the control of weeds and pests.

Because of the food shortage since the war, the search for chemical substances to be used as selective weed-killers and insecticides became intense. Many of these chemical substances are extremely toxic to both man and animals. They were brought into general use before methods of safe handling had been studied, and deaths and cases of acute poisoning occurred in Britain, on the continent of Europe, and in the U.S.A.¹⁻⁵

The dinitro compounds named in the regulations are D.N.C. (dinitro-*ortho*-cresol, or D.N.O.C.) and "dinoseb" (dinitro-*sec*-butyl phenol, or D.N.B.P.). D.N.C. is a selective weed-killer and is widely used in the spring as a spray on cereal crops; dinoseb is mainly used as a spray on leguminous crops. They behave like cumulative drugs in man.⁶ The symptoms of acute poisoning are insidious in onset, but, once initiated, progress with extreme rapidity. Death has occurred within one hour of the first signs of illness.¹ The basal metabolism may be raised to above 300% of normal, and death from asphyxia or heat stroke occurs. There is no specific treatment for poisoning by the dinitro compounds.

The organo-phosphorus insecticides named in the regulations are "parathion," "schradan," "dimefox," "mipafox," and T.E.P.P. (H.E.T.P.). These compounds are powerful insecticides and are extremely toxic to both man and animals. Their pharmacological action is that of irreversible inhibition of the cholinesterase enzymes. Reports of cases of poisoning and methods of treatment have been fully described.²⁻⁴

The regulations prohibit the use of the dinitro and the organo-phosphorus compounds unless the men working with them are wearing protective clothing. The protective clothing varies according to the particular operation carried out, and includes rubber gloves, rubber boots, face-shield, hood, and either overalls or mackintosh. The number of hours during which workers can

be employed are restricted to ten hours in any one day and sixty hours during seven days. The employment of any worker under the age of 18 is prohibited. The regulations also contain requirements about the provision and maintenance of protective clothing, the provision of washing facilities for workers, the notification of sickness and absence, the training and supervision of workers, and the keeping of registers.

The regulations serve to emphasize to both worker and employer that these chemicals are highly toxic. They are open to criticism for the reliance they place on the wearing of face-shields rather than full face respirators. The main route of absorption is through the lungs, and face-shields do not prevent absorption by this route during spraying operations. They are likely to be particularly ineffectual when organo-phosphorus compounds are used in an enclosed space such as a greenhouse. The regulations do not make adequate provision for the medical supervision of workers. Since the early symptoms and signs of poisoning are vague and indefinite and do not occur until potentially dangerous quantities of the poisons have been absorbed, routine blood tests on the workers would serve to detect absorption of significant amounts before the onset of symptoms, which are often irreversible. Methods for the measurement of dinitro compounds in small quantities of blood have been developed,⁷ as also have methods for estimating the cholinesterase activity on 0.1 ml. of blood.⁸

MORTALITY IN AMPUTEES

Some surprising effects of amputation and sepsis are revealed by a searching investigation, recently completed, into the medical fate of several thousands of Service amputees of the 1914–18 war. In 1950 the Ministry of Pensions appointed a committee of eminent medical men under the chairmanship of Sir Ernest Rock Carling to consider whether amputees are living as long as other people and whether they are more liable to cardiovascular disease. An interim report appeared in 1951, and now a final report has been issued.

The interim findings were as follows. First, living amputees did not seem to be unduly prone to suffer from heart disease or hypertension. Secondly, the mortality rates during 1930–50 of all pensioners who had suffered limb wounds during 1914–18 did not differ much from what was expected, but those who had suffered the more severe wounds and amputations had appreciably higher rates. Thirdly, among the pensioners who died during 1945–9 the average age at death of leg amputees was a little lower, and more of the deaths were due to cardiovascular disease (though not to a statistically significant extent) than among a control group of pensioners who had suffered minor leg wounds only, without amputation. The investigation was subsequently continued in order to explore these divergencies further, to extend the terms of reference to cover certain types of wound, particularly fracture of femur, that did not lead to amputation, and to consider the influence of serious sepsis, overweight, and sedentary life. Little information about the last two factors was forthcoming, but a detailed analysis of the effects of sepsis was carried out.

¹ Bidstrup, P. L., and Payne, D. J. H., *British Medical Journal*, 1951, 2, 16.

² Report to Pesticides Committee. *J. Amer. med. Ass.*, 1950, 144, 104.

³ Grob, D., et al., *Bull. Johns Hopk. Hosp.*, 1950, 87, 106.

⁴ Abrams, H. K., et al., *J. Amer. med. Ass.*, 1950, 144, 107.

⁵ Bidstrup, P. L., *British Medical Journal*, 1950, 2, 548.

⁶ Bidstrup, P. L., et al., *ibid.*, 1951, 2, 13.

⁷ Harvey, D. G., et al., *ibid.*, 1951, 2, 13.

⁸ Harvey, D. G., *Lancet*, 1952, 1, 796.

⁹ Aldridge, W. N., and Davies, D. R., *British Medical Journal*, 1952, 1, 945.

The full medical records of one-third of the pensioners who had received leg wounds in the 1914-18 war and who had died during 1945-9 were classified into several categories. It was found that men who had had one leg amputated as the result of their 1914-18 service died on the average at a younger age during 1945-9 than those who had sustained a fracture of femur merely, and these in turn died sooner than those who had only a minor wound. But within each of these three classes the pensioners with a history at some time of serious sepsis died younger than those with no such history. Thus the nature and severity of the wound, and, independently, the degree of sepsis associated, both had their effect upon the average longevity of the individuals concerned. It was also found that men who had had both legs amputated, or had had single above-knee amputations, died somewhat younger than those with below-knee amputations or minor wounds only; and that cases classed as serious sepsis on account of osteomyelitis or suppurating joint fared worse than those with necrosis, sequestra, or sinuses allocated to the "serious" sepsis category because of their chronicity. The percentage of deaths at ages under 60 in the main groups analysed can be summarized as follows:

	Double Leg Amputees	Single Leg Amputees	Fractured Femur	Minor Wounds
With serious sepsis	78.8	60.8	60.1	52.2
Without serious sepsis	63.5	55.5	45.3	44.0

The causes of death of single leg amputees, fractured femur cases, and those with minor wounds were studied, and this revealed only a small excess of cardiovascular disease among the amputees. But when the various groups were subdivided in accordance with history of serious sepsis it was found that men whose records showed evidence of serious sepsis at some time in the past had a higher proportion of deaths from cardiovascular causes, particularly coronary or myocardial disease. For example, among single leg amputees with serious sepsis almost 32% of the deaths were attributed to coronary or myocardial disease, compared with only 22% among amputees with no record of serious sepsis. And over all the cases studied there were 5.5% more deaths from these cardiac causes among the serious sepsis cases than among the others.

As the analysis of causes of death was based on proportionate death rates, an excess of 5.5% from cardiac causes had to be balanced by a corresponding reduction in deaths from other causes, and we should expect the reduction to be distributed evenly among all of the other causes. But surprisingly it was found that in the serious sepsis group, where the 5.5% excess of coronary and myocardial deaths occurred, the excess was almost completely balanced by a deficit of 5.3% for one other main cause—namely, cancer. These figures prompt the suggestion that in some way serious sepsis had two long-term effects on those who suffered from it—some susceptibility to die from certain forms of cardiac disease and some resistance to the attack of cancer. The committee did not regard the deficit of cancer deaths as bearing on its terms of reference but thought it worthy of separate study. However startling to common sense

the demonstration of any causative connexion here would be, the decision that it is worth investigating is a sound one. The figures are not easily argued away. They may be a highly improbable coincidence, for the long-odds bet occasionally comes off. But they seem to be free from obvious fallacies, and the committee had the benefit of an analysis of them by Dr. Logan, chief medical statistician at the General Register Office. All the same, two members of the committee sign a minority report in which they doubt the possibility of serious sepsis having these dual long-term effects. They suggest that the basic classification of the cases according to the degree of sepsis suffered was unreliable and led to unwarrantable conclusions, but they do not explain exactly how the suspected fallacy has come about.

Neither the size nor the content of this report makes for easy reading, consisting as it does mainly of statistical tables with brief factual commentaries, but it records a vast amount of tedious though useful research in what is yet a practically unexplored field. The Ministry of Pensions is to be congratulated on its initiative in sponsoring the investigation. There must be plenty of interesting clinical information in the voluminous case records of this Ministry, and it is to be hoped that further research will follow based upon this exceptional store of carefully compiled material.

BETTER CONTROL OF FOOD INFECTION

Some of the infectious diseases have been made notifiable by Act of Parliament. From time to time others have been added to the list by regulations. In the Public Health (Infectious Diseases) Regulations, 1927, which added malaria, dysentery, acute primary pneumonia, and acute influenzal pneumonia to the list of notifiable diseases, provisions were included for reducing the danger of food-borne enteric fever and dysentery by enabling a local authority to prevent persons with these infections from engaging in the handling of food. It is these latter provisions which are affected by the new Public Health (Infectious Diseases) Regulations, 1953, which supplant the 1927 regulations, the provisions with regard to notification remaining unaffected.

As time passed it became apparent that the valuable precautionary measures provided by the 1927 regulations had two drawbacks which seriously limited their effectiveness. The first of these was the fact that the medical officer of health had to report to his local authority before action could be taken in suspending an infected person from an occupation connected with the handling of food. As speed in such matters is essential, it is a wise provision of the new regulations that a local authority may now authorize the medical officer of health to issue notices requiring persons to stop handling food without making a prior report to the local authority, though he is still required to report the circumstances at the earliest opportunity.

The power to deal with food-handlers who were carriers of enteric fever or dysentery naturally led to the desire for similar powers for use on the far more numerous occasions when food-handlers were found to be harbouring the causative organisms of food-poisoning.

The report of the Catering Trade Working Party of the Ministry of Food in 1951 suggested that consideration should be given to the desirability of amending the Public Health (Infectious Diseases) Regulations, 1927, by extending their scope, so far as was practicable, so that the provisions relating to typhoid and paratyphoid fevers and dysentery should become applicable to salmonella infections, staphylococcal food-poisoning, and other infections which may be spread by food. This advice has been taken into account in the framing of the new regulations. A local authority, or the medical officer of health, may now take action when any food-handler is found to be suffering from, or to be a carrier of, typhoid fever, paratyphoid fever or other salmonella infection, dysentery, or staphylococcal infection likely to cause food-poisoning. Moreover, if a medical officer of health has reason to believe that a food-handler may be a carrier of any of these infections, the local authority may give notice to the manager that a medical examination is necessary, and the manager shall give all reasonable assistance in the matter.

The period between 1927 and the present time has seen the establishment of the Public Health Laboratory Service, and nowadays far more food-poisoning outbreaks are fully investigated bacteriologically than formerly. This fact has led to an increasing demand from medical officers of health for the powers given to them in the new regulations. Their proper use will call for close co-operation with the laboratory, particularly in regard to "staphylococcal infection likely to cause food-poisoning."

TERRAMYCIN

Terramycin is now available in hospitals without restriction as to indications for use, and general practitioners will be able to obtain it from regional distribution centres for the treatment of brucellosis, ornithosis, atypical (virus) pneumonia, lymphogranuloma inguinale, and penicillin-resistant staphylococcal infections. Hospital doctors prescribing it for conditions other than these will need to consider how it may best be used. The ranges of activity of all three newer antibiotics, aureomycin, chloramphenicol, and terramycin, coincide closely. Typhoid fever is exceptional in that only chloramphenicol is useful in treating it. This superiority extends to other intestinal infections by Gram-negative bacilli generally, although in most of these the need for antibiotic treatment is not usually imperative. Other diseases for which these three antibiotics alone are valuable, other forms of chemotherapy being without effect, are comparatively rare or unheard of in Britain or difficult to diagnose. They are the virus infections mentioned above, brucellosis, and the typhus group of fevers. But the newer antibiotics have been extensively used for a variety of bacterial infections when these are, or are assumed to be, resistant to penicillin. Here the clearest indication is a serious and demonstrably penicillin-resistant staphylococcal infection: aureomycin and terramycin are both more active against this organism than chloramphenicol. These antibiotics

have also been used, where freely available as in the United States, for treating diseases, such as pneumonia, rather than infections by any particular and identified micro-organism, because their "broad spectrum" covers almost every aetiological possibility. Another indication is a mixed infection, such as peritonitis due to bowel perforation, where they are preferable for the same reason. It needs to be emphasized that, when time and facilities permit, treatment should be based on laboratory tests of bacterial sensitivity. Such tests ought to be made, for instance, in order to direct intelligently the treatment of an infection of the urinary tract.

When there are good reasons for believing that any of these three antibiotics will serve, and choice has to be made among them on other grounds, it will doubtless be borne in mind that chloramphenicol is alone among them in being capable of causing aplasia of the bone marrow. However rare a complication this may be—and, as we pointed out recently,¹ its true incidence remains to be determined—its possible occurrence cannot be ignored when other things are equal. Neither aureomycin nor terramycin has been known to produce this effect, but, of the two, aureomycin is rather more liable to cause the minor toxic manifestations of nausea, vomiting, and diarrhoea.

LEFT HEMICOLECTOMY

In the resection of rectal cancer increasing attention is now being paid to the advantage of dividing the main vascular pedicle as high up as possible. Miles,¹ in his classical description of the combined abdomino-perineal operation, advocated ligation of the inferior mesenteric artery below the point where it gives off its first sigmoid branch. According to the work of Goligher,² this level is on the average 1½ in. (3.75 cm.) distal to its point of origin from the aorta, and Grinnell and Hiatt³ have now suggested that attempts to remove this additional short length of artery (and, more important, its accompanying lymph vessels) may be worth while. These authors found no fewer than 10 lymph nodes in this small area. It is only by increasing, in this way, the upward limit of the lymph-node resection that surgeons will be able to save more patients with disease in the C2 category—that is, with metastases present in the glands up to the level of the ligation of the blood vessels.⁴ When the arterial ligature is placed on the inferior mesenteric artery at its origin the nutrition of the left side of the colon from above is dependent on the left branch of the middle colic. An adequate blood supply from this source can reasonably be expected to a point well down in the sigmoid, always provided care is taken to preserve the marginal vessels. Blood reaches the rectum and anus, however, only along the middle and inferior rectal arteries.

¹ *Lancet*, 1908, 2, 1812.

² *Brit. J. Surg.*, 1949, 37, 157.

³ *Surg. Gynec. Obstet.*, 1952, 94, 526.

⁴ Gabriel, W. B., Dukes, C., and Bussey, H. J. R., *Brit. J. Surg.*, 1935, 23, 395.

⁵ *J. Chir., Paris*, 1950, 66, 37.

⁶ *Rev. Chir., Paris*, 1951, 70, 70.

⁷ Dunphy, J. E., and Broderick, E. G., *Surgery*, 1951, 30, 106.

⁸ McKittrick, I. S., *Surg. Gynec. Obstet.*, 1948, 87, 15.

⁹ Grinnell, R. S., *Ann. Surg.*, 1950, 131, 494.

¹⁰ *Surg. Gynec. Obstet.*, 1908, 8, 463.

¹¹ Ault, G. W., Castro, A. F., and Smith, R. S., *ibid.*, 1952, 94.

that it may occur with boils on any part of the body as a result of a septic embolism. If cooks or others who touch food have boils, outbreaks of food-poisoning may occur. The precipitation of coma in a diabetic with boils or carbuncles has already been mentioned.

Diagnosis

In the diagnosis of recurrent boils there is little difficulty except to determine the cause, and this requires a full assessment of the underlying factors. Unless a careful history is taken and the patient is examined fully a blunder will occasionally be made. A bromide eruption with small papulo-pustules developing into sterile boils, pustular ringworm (kerion) with discrete lesions, papulo-pustular syphilide, and papulo-pustular tuberculide may all be mistaken for boils if care is not taken. Cutaneous anthrax, which is seen occasionally in this country in leather workers or others who handle hides, might be mistaken for a single boil but not for recurrent ones. A papule, rapidly becoming a pustule, appears usually on an exposed area of skin. There is intense local inflammation, necrosis of the pustule follows with the formation of a black slough, and secondary vesicles soon form around it.

General Treatment

The treatment of widespread boils clearly demands general measures, but even in grouped or localized boils these must not be neglected. The treatment of any patient with recurrent boils must be considered as a general medical problem and the underlying factors dealt with. We must think in terms of focal sepsis and the resistance of the patient to infection. Chemotherapy and the antibiotic drugs provide specific therapy and are most impressive in the treatment of boils. Those occurring on the face should always be treated in this way. Unfortunately, in suppressing the staphylococcus so effectively they do not allow the process of active immunity to be developed, and a relapse often follows cessation of treatment. Care must be taken that concentration on local treatment combined with injections of penicillin does not lead to neglect of the cause of the problem.

Whether the boils are localized in groups or whether they are widespread, the possibility of focal sepsis should be considered. Infection of the teeth, nose, nasal sinuses, or throat must receive appropriate treatment. Tinea pedis must not be neglected.

Whenever emotional or mental strain plays a part rest will be required, possibly a holiday from work or away from home. Mild sedation is helpful in such patients, and phenobarbitone, $\frac{1}{2}$ gr. (16 mg.) twice daily by mouth, may usefully be given.

The question of employment must be considered. The seborrhoeic type of individual tolerates heat and moisture badly, and skin sepsis is common in miners of this type who work under such conditions. After greasy work the skin should be washed thoroughly with soap and water. Sponging with cetrimide as a 1% solution in water removes grease and dirt from the skin and is actively bactericidal. It is inactive in the presence of soap and occasionally irritates the skin, but otherwise is helpful if the patient can be persuaded to go to the trouble of using it.

A balanced diet is important. Sweet cakes, suet puddings, fried potatoes, and other carbohydrates should be eaten in moderation. Chocolate is best avoided. Sugar in tea and coffee may be replaced by saccharin. Citrus fruits and fresh vegetables may be eaten in abundance. Additional vitamin-B complex is helpful. Yeast is not of much value unless it is fresh and taken in large quantities. Patients with boils are sometimes anaemic, and iron may be given—for example, one or two ferrous sulphate tablets three times a day after meals.

Active immunization by an autogenous staphylococcal vaccine or staphylococcus toxoid is found to be effective by some physicians, toxoid appearing to be the better. It is as well to start a course when there are no active boils. A combination of toxoid and a stock vaccine such as "vac-coid" may be used, 0.1 ml. of the weak preparation being enough for the first dose. The material is injected intradermally and the dose increased by 0.1 ml. each week until 0.5 ml. is reached, when the stronger preparation, containing five times the quantity of toxoid, may be used in a similar manner, beginning once more with a dose of 0.1 ml. Reactions, general or local, are to be avoided, and if such occur the dose for the following injection should not be increased.

If boils do not stimulate the production of active immunity it seems unlikely that vaccines will do so unless they provide a stronger stimulus, whether specific or non-specific. Some authorities believe the action of vaccines and toxoid to be one of desensitization to the staphylococcus and its toxins. However, treatment with vaccines or toxoid, or with manganese or tin, does not provide a cure, and, like antibiotic therapy, will prove disappointing unless the essential cause is found and treated.

Local Treatment

The principles of local treatment are rest, dry heat, and the minimum of interference. Because it is important to prevent, if possible, the infection of other follicles, the surrounding skin should be kept healthy and as sterile as practicable. The skin around a boil should be swabbed with spirit or brilliant green paint (perchloride of mercury 0.5%, brilliant green 0.5%, industrial spirit 99%). The topical application of antibiotics is only of temporary value, and may lead to sensitization of the skin. Hot fomentations and bread or kaolin poultices should be avoided, as these may burn the skin and certainly make it sodden and more liable to infection. Adhesive plaster dressings also make the skin unhealthy. Dry heat is useful; an infra-red lamp or an old-fashioned electric radiator or even a hot-water bottle over dry dressings may be employed. Short-wave diathermy, if available, is helpful. Local fractional doses of superficial x rays seem to abort the condition in the early stage and to prevent crops of boils appearing in the area treated.

The squeezing of boils is best avoided. Surgery has little place in the treatment, but when a boil becomes fluctuant, and not before, it may be incised. Large cruciate incisions and packing are quite unnecessary and do more harm than good. A dry dressing to absorb the pus may be applied and changed frequently, though if preferred magnesium sulphate paste may be used.

Widespread Boils

Once a boil has burst there is a great increase in the bacterial population of the skin near by and over the body as a whole. With lowered resistance this may result in recurrent widespread boils, and the condition must be treated as a contagious disease in which there is superficial external infection and reinfection. Every precaution possible to prevent the continuation of autogenous reinoculation must be taken. The bacterial increase can be controlled to some extent by bathing in or sponging with 1% solution of cetrimide or with 1 in 4,000 potassium permanganate. The permanganate must be dissolved in a little water before addition to the bath, as contact of a crystal with the skin may cause burning. Potassium permanganate discolours the bath, which is cleaned with difficulty, though the brownish stain can be removed with vinegar, oxalic acid, or some of the abrasive cleansers. Antiseptic soaps may be preferred, but they do not have the toughening and tanning effect of permanganate, and they may neutralize the acid mantle. After such antiseptic baths a dusting powder

containing 10% of calomel in zinc oxide is especially useful with widespread furunculosis, provided the patient is not sensitive to mercury. Cotton underclothes, changed daily, should be worn, as they can be boiled. Soiled dressings must not be allowed to touch skin areas which have not been protected by disinfectant solutions, and the hands of the patient and those attending him should be kept scrupulously clean.

The bacterial population of the skin remains high for weeks after a boil has healed, and these efforts to reduce the staphylococcal flora must be continued for some time. The nose of the patient is likely to be harbouring numerous virulent staphylococci, although physical signs are absent. Careful cleansing of the nasal vestibule with soap and water several times a day or a thin smear of ammoniated mercury 10 gr. (0.65 g.) in hydrous ointment 1 oz. (30 g.) reduces the danger from this source. In the presence of sinus infection this measure is, of course, purely palliative, and, as mentioned before, treatment of the nose and sinuses may be required.

Grouped Recurrent Boils

Hidradenitis suppurativa is an example of recurrent boils appearing as a local condition. The apocrine sweat glands develop at the time of puberty in the axillae, on the nipples, and in the region of the anus and genitals. They are subcutaneous and their ducts usually open into hair follicles.

A troublesome inflammation of these glands occurs occasionally and is more common in women. One or both axillae may be affected, and sometimes the perineum and groins. In these areas recurrent abscesses may result. A tender subcutaneous swelling appears, with redness of the overlying skin. Although it may settle down without suppurating, it often becomes fluctuant and discharges pus after bursting. Other glands become infected, and the condition may continue for weeks with great discomfort. Irregular scarring with cheloid formation may result.

It is probable that there is sweat retention followed by secondary infection. Although psychological and endocrine factors play an important part, mechanical causes may be present, such as maceration of the skin from sweat, especially when rubber dress protectors are worn. Damage to the duct openings by deodorant applications or depilatories may be a cause.

As with skin infection elsewhere, the cause of the breakdown of the patient's resistance must be determined. Antibiotics are only helpful temporarily, because a relapse often occurs when their use is stopped. The application of brilliant green paint (see above) to the whole of the axilla or other affected area, together with irradiation by x rays in a few fractional doses at intervals, will usually clear the disease rapidly, provided general causes are not neglected. As with other boils, fomentations are best avoided and dry heat should be applied. Short-wave diathermy is helpful. Incision may have to be considered, but it is wise to be conservative in order to avoid scarring and cheloid formation. Many of the swellings settle with treatment, and incision is justified only if there is marked fluctuation over an abscess. Full consideration of the treatment, which may involve endocrine therapy or even excision and grafting, is outside the scope of this article.

Conclusion

The objectives in the treatment of recurrent boils should be to keep the skin dry, clean, and free from irritation, to eradicate foci of infection, and to raise the general resistance of the patient.

Next Refresher Course Article.—"Prolapse," by Mr. A. J. Wrigley.

HEALTH SERVICE COSTS

[FROM A SPECIAL CORRESPONDENT]

A year ago, Mr. Crookshank, then Minister of Health, was being hard put to it to maintain the £400m. limit on the Budget's share of Health Service expenditure set by Labour Chancellors of the Exchequer. He could do it, in fact, only by imposing the charges on drugs, appliances, and dental treatment authorized by last year's National Health Service Act. But no sooner had his Health Service estimates been published in full than the Danckwerts award to general practitioners knocked the limit for six, mainly because of the back payments involved. This year's estimates are freed from this complication of back payments, but the effect of the award on the limit is clearly seen in the following table:

Health Service Estimates*

Total Net Cost to Taxpayer	£m.			
	1951-2 398	1952-3		1953-4 410
		Original 392	Revised 429	
Grants to local health authorities	18.6	20.6	21.2	21.6
General-practitioner service	48.4	48.5	86.9	58.2
Pharmaceutical service†	43.6	39.9	40.9	45.0
Dental service†	36.2	20.1	20.4	22.0
Supplementary ophthalmic service†	14.6	6.3	6.3	6.4
Grants to hospital boards	274.3	295.6	296.0	297.1
Of which maintenance	260.8	285.7	286.1	287.0

* Excluding civil defence. † Allowing for charges to patients.

Thus, compared with the pre-Danckwerts estimate, the total net cost of the Health Service to the taxpayer has risen by £18m. Of this, more than half is accounted for by the higher payments to general practitioners resulting from the award; but there are also small and, in one case at least, ominous increases in the other main items of expenditure.

Expenditure of Local Health Authorities*

	£m.		
	1951-2	1952-3	1953-4
Health centres	†	†	†
Care of mothers and young children	9.4	9.6	9.5
Midwifery	5.0	5.4	5.1
Health visiting	2.7	3.1	3.2
Home nursing	4.3	5.4	5.5
Vaccination and immunization	0.5	0.6	0.6
Ambulance service†	7.9	9.3	9.7
Prevention of illness and aftercare	1.7	2.1	2.2
Home helps	3.5	4.3	4.7
Mental health	1.8	2.1	2.2
Miscellaneous	0.2	0.3	0.3
	37.0	42.2	43.0

* Including estimated expenditure from rates.
† Less than £100,000 in England and Wales.
‡ England and Wales only.

Expenditure on the services of the local health authorities has virtually been stabilized. Indeed, it is impossible to see how it could be otherwise. The initiative in this branch of expenditure comes from the local authorities, and about half the total cost falls on the ratepayer. Already local authorities have had to raise their rates for the coming year—increases of as much as 2s. in the pound are common. They may well hesitate before expanding further any of their health services. And the argument that by so doing they might relieve the hospitals, and therefore the taxpayer, will, not unnaturally, carry no weight. Estimated expenditure on health centres in England and Wales is falling from £94,000 to £50,000, which must mean a virtual cessation of new centres. In Scotland, on the other hand, where the cost of health centres is borne on the executive councils' vote, although the original

estimate for 1952-3 was scaled down from just over £100,000 to £70,000, in 1953-4 an increase to £85,000 is budgeted for.

The effect of the Danckwerts award on the cost of the general-practitioner service has already been referred to. In terms of allocation of financial resources it means that family doctors now receive 12% of central Health Service funds, compared with 10% two years ago. There can be few people who would regard this proportion as too high.

The Pharmaceutical Service

There can be few people, too, who are undisturbed by the continued rise in the cost of the pharmaceutical service. A year ago the Minister of Health stated that it was running at more than £50m. a year. Through the shilling charge he hoped to bring the gross cost down to £47½m.—as a result of the deterrent effect of the charge—and to save another £7½m. by the payments made by those who were not deterred. This would bring the net cost down to £40m. As it turned out, the gross and net cost were put a little higher. But it is now known that the charge has not yielded so much as was expected. Recently Mr. Macleod, the Minister of Health, said that because of the fog and influenza the number of prescriptions issued in 1952-3 would not be less than in the previous year. It is therefore surprising that the yield from the charges has not risen *pro tanto*. According to Mr. Macleod, it was originally estimated that in England and Wales alone in a full year £6.8m. would be saved by patients' payments and £3.9m. by a reduction in the number of prescriptions. This would make a total saving of about £9m. in the ten months for which the charge was in force. But the total saving is in fact now estimated at only £5m. paid by patients. In the circumstances it is a little surprising that the reduction in the estimated yield from the charges in the coming year is not greater than it is.

Cost of Pharmaceutical Service

	£m.		
	1951-2	1952-3	1953-4
(a) Payments to pharmacists:			
Dispensing fees and rota payments	13.6	13.1	12.7
Cost of ingredients and allowance for containers	24.5	27.2	29.9
Allowance for overheads and profits	3.6	6.5	7.2
(b) Payments to doctors and dentists for drugs supplied:	1.9	1.5	1.9
Total gross cost	43.6	48.2	51.7
Patients' payments	—	7.3	6.7
Net cost	43.6	40.9	45.0

An interesting feature of the estimates is that the whole of the increase in costs is accounted for by the service in England and Wales. In Scotland, the total gross cost and the cost of ingredients are put at a lower figure than a year ago, and patients' payments are estimated to be slightly higher, so that there is a saving of about £500,000 in the net cost.

The Dental Service

The effect of the charge for treatment on the cost of the dental service is also interesting. The significance of these

Dental Service

	£m.		
	1951-2	1952-3	1953-4
Gross receipts of dentists	41.0	31.2	28.8
Payments by patients	4.8*	10.8	6.8
Net cost of service	36.2	20.4	22.0

* For dentures only.

figures is that the charge for dental treatment is evidently still acting as a deterrent, as was expected, and because of this the estimated gross receipts of dentists show a further fall for the coming financial year. But the estimated receipts from the charges were evidently wide of the mark a year ago, and have accordingly been greatly reduced for 1953-4. The net effect is a rise of £1.6m. in the cost of the dental service—with Scotland again managing to show a small reduction. But the proportion of the total cost of the Health Service taken by the dental service is down from nearly 10% in 1950-1, the year before the charge for dentures was introduced, to less than 5% in 1953-4.

The Hospital Service

By contrast the hospital service now accounts for a much larger share of Health Service costs (61%) than was originally contemplated. What is significant about the new estimates is that for the first time there has been virtually no rise in the estimated grants to hospital boards. Such rise as is shown is, in fact, mainly accounted for by Scottish hospitals. The teaching hospitals in England are actually to have a cut of over £1m. in their grants for maintenance.

The following Table compares the estimated expenditure on the main items of the running costs of hospitals in England and Wales:

Gross Hospital Maintenance Expenditure

	£m.		
	1951-2	1952-3	1953-4
Medical salaries (including specialists)	26.9	31.5	28.8
Nursing salaries	55.5	60.7	59.1
Other salaries and wages	62.7	71.7	76.0
Provisions	25.9	29.1	30.4
Drugs and dressings	9.4	10.4	11.3
Medical and surgical appliances	7.0	8.1	6.7
Fuel, light, and power	11.2	13.9	14.6
Maintenance of buildings	10.3	10.1	8.8
All other	31.9	33.5	33.4
Total	240.8	269.0	269.1

The interesting feature of this Table is the estimated fall in medical and nursing salaries in the coming financial year—the more interesting in view of the higher salaries recently granted to nurses, which were expected to cost £5m. in a full year. The fall may be connected with the freezing of hospital establishments, which has prevented hospital authorities from carrying out expansions planned a year ago. Whatever the reason, it evidently does not apply to Scottish hospitals, whose estimates show no such cut in medical and nursing establishments.

For the first time the Health Service estimates include a forecast of the numbers of staff to be employed by hospital authorities at the beginning of the financial year. They are given in the following Table:

Estimated Hospital Staff* on April 1, 1953

	England and Wales	Scotland†
Consultants	5,300	1,250
Other doctors and dentists	12,000	1,250
Nurses and midwives	148,000	21,400
Administrative and clerical staff	28,000	3,200
Other professional and technical staff; maintenance staff and tradesmen and craftsmen, including transport staff; all other staff	188,000	22,250
	381,300	49,350

* Including the approximate whole-time equivalent of part-time staff.
† Estimated averages for 1953-4.

This Table shows another difference between England and Wales and Scotland. South of the Border, only 30% of total medical and dental staffs are consultants. In Scotland consultants account for half the total.

COLLEGE OF GENERAL PRACTITIONERS

REGIONAL FACULTIES

It is proposed that the peripheral activities of the College shall be organized by a number of Regional Faculties.

Headquarters

Ideally the headquarters of these Regional Faculties should be situated near the offices of the undergraduate and postgraduate deans or directors of the medical schools and the university research departments, for educational purposes and to facilitate arrangements for postgraduate study and research. But in some places this may not be possible; or headquarters may be offered to the College elsewhere, as has already occurred in Birmingham and in Edinburgh. It is felt that a close link like this with the universities will underline the academic nature of the College's work.

In London the Director of the Postgraduate Medical Federation of the University of London has generously offered the College accommodation at his headquarters—2, Gordon Square, W.C.1. This arrangement will lead to close co-operation between the two bodies, and should be of considerable benefit both to general practitioners and to those organizing their postgraduate courses. It is hoped that similar co-operation may be arranged between the College's regional faculties and the postgraduate deans or directors of other university cities.

There are 19 universities with medical schools in the British Isles and Republic of Eire—Aberdeen, Belfast, Birmingham, Bristol, Cambridge, Cardiff, Cork, Dublin, Durham, Edinburgh, Galway, Glasgow, Leeds, Liverpool, London, Manchester, Oxford, Sheffield, and St. Andrews. Pilot faculties will be formed at once in London, Birmingham, Bristol, Cardiff, Edinburgh, Belfast, and Dublin. After the first annual general meeting, to be held in the autumn, a further 12 or more regional faculties may be set up in the British Isles: plans for these will be made soon. In areas far away from these university cities faculties may be needed in a few cities or towns that have no medical school (e.g., Plymouth and Inverness). Other regional faculties may be developed in parts of the Commonwealth. Further details will be published next month.

The Foundation Council has approved the establishment of a "Council of the College in Scotland" to co-ordinate the regional faculties and other local organizations in Scotland, and to maintain liaison with the council of the College. It is proposed to open an office in Edinburgh at once.

A meeting of general practitioners in Eire, held in Dublin on March 15, 1953, decided to form a Faculty of the College in Dublin; and an interim committee was set up to study this. Dr. John Fleetwood, of Dublin (chairman of this interim committee), has been elected to the Foundation Council of the College in London.

A meeting of the full Foundation Council, held in London on March 18, 1953, agreed that the College provisional by-law 1 (B) should be altered to read: "A 'registered medical practitioner' means a person holding a medical qualification which has been registered with the General Medical Council or with the equivalent organization of a country or State within the British Commonwealth of Nations and the Republic of Eire."

Status

The status of all Regional Faculties will be equal. For those in Scotland, Wales, Northern Ireland, and Eire it must be clearly understood that they will be free to form colleges of their own in the future if they wish to do so.

Duties

In general the duties of these Regional Faculties will be to relieve the central College council of local responsibilities connected with the activities of the College in the regions

concerned. For the first few years the main concern of the faculties will be to help (1) in the teaching of certain aspects of general practice to final-year students and those newly qualified, (2) in the postgraduate education of general practitioners in the region, and (3) in research in general practice. Later, many other functions of the College may devolve upon the Regional Faculties. Members of the board of each faculty will work in close liaison with the local medical school, the postgraduate departments of the university, and the university research departments, the local medical committees of the Ministry of Health, the local Divisions of the B.M.A., and the local medical societies.

Boards of the Regional Faculties

Each board will have up to 21 members—chairman (who may be a member of the College council or co-opted to the council), deputy chairman, member for undergraduate instruction, member for postgraduate study, research member, and honorary secretary. The secretary will keep in touch with members and associates of the College who work in the region, receiving information from them and providing them with information, so that the College and its regional faculty can give them all possible help in the academic field. There will be up to 15 other members, including two associates; and the boards will have power to co-opt further members from the university and elsewhere.

Members of the boards of the Faculties will be elected annually by the members of the College who live in each region. The officers will be elected by the boards themselves.

Meetings of the boards will take place about once a month. Five will be a quorum.

Copies of the minutes of the meetings of the boards will be sent to the College headquarters in London for filing and reference. Each year an annual report from each board will be sent to the College headquarters and incorporated in the College's annual report.

Subcommittees on undergraduate education, postgraduate education, research, etc., will be elected by the boards at any time for special purposes. These subcommittees will have power to co-opt members from the university departments concerned.

The secretarial expenses of the boards will be met by the College.

Will members or associates who care to make further suggestions or comments on the development of these regional faculties please write to the Secretary, The College of General Practitioners, 14, Black Friars Lane, Queen Victoria Street, London, E.C.4.

MATERNITY GRANTS

Over a year ago the National Insurance Advisory Committee (chairman, Sir Will Spens) recommended changes in maternity insurance benefits (*Supplement*, January 26, 1952, p. 28). A Government Bill—National Insurance Bill, 1953—has now been published giving effect to nearly all the recommendations of the advisory committee. A woman confined at home is to get a lump-sum grant of £12, and a woman confined in hospital a grant of £9 (both grants including an attendance allowance of £1 a week for four weeks). The arrangements for paying maternity allowances to women in employment are to be changed. At present a grant of 36s. a week is paid for 13 weeks beginning with the sixth week before the expected date of confinement, making £27 8s. in all when the maternity grant of £4 is added. The Bill increases the grant from £4 to the standard amount of £9 (or, when the confinement takes place at home, £12), and the maternity allowance, reduced from 36s. to 32s. 6d. a week, is to be paid for eighteen weeks, starting eleven weeks before the expected date of confinement. These

changes have the effect of increasing the total amount paid from £27 8s. to £38 5s., or in the case of home confinement to £41 5s. It is estimated that these proposals will cost an additional £2,500,000 a year.

Nova et Vetera

THE FIRST GREAT AMERICAN PHYSICIAN

Letters of Benjamin Rush. Edited by L. H. Butterfield. Published for the American Philosophical Society by Princeton University Press, 1951. Vol. I: 1761-1792, pp. lxxxvii+624. Vol. II: 1793-1813, pp. 625-1,295. Price for 2 vols. 97s. 6d. London: Geoffrey Cumberlege. 1951.

Benjamin Rush (1745-1813), of Pennsylvania, a signer of the American Declaration of Independence, was a figure highly characteristic of his time and circumstances. He was a graduate of Princeton and Edinburgh. At the latter university he had as teachers Cullen, Black, and Alexander Monro Secundus. In his own country he came to occupy a very important position both in politics and in the medical profession. He introduced clinical instruction in the Pennsylvania Hospital, to which he was physician for 30 years (1783-1813), and he was for long also Treasurer of the United States Mint (1799-1813). Despite these avocations he found time for some excellent first-hand research describing cholera infantum in 1773 and dengue in 1780, writing a first-class account of the Philadelphia yellow-fever epidemic in 1793, giving the first account of the diseases of American Indians in 1774 and 1798, and issuing a work on the hygiene of troops in 1777. He was a strong advocate of temperance, and emphasized the importance of diet and the necessity to health of the extraction of decayed teeth. He wrote and spoke freely on non-medical subjects, was a vigorous and magnetic personality, and had a full, balanced, and active mind. He left an autobiography which was edited in 1948 for the American Philosophical Society by Professor G. W. Corner.

Rush's vivid personality is much involved in his immediate environment. He was essentially a townsman and a Philadelphian, for he never took a holiday, and after his return to America he seldom left Philadelphia, and almost never by choice. In his *Autobiography* he says that he "by no means depended exclusively on books. I made, as far as was in my power, every person I conversed with contribute to my improvement." His correspondence was immense, and no American, and few English, writers furnish so many and such excellent pictures of city life in his era. As a writer he was studiously clear, and this induced many to elicit his views on a multitude of topics. His correspondence deals with subjects as diverse as psychiatry and forestry, veterinary science and ventilation of ships, the study of punishments and of chemistry, the training of children, the liberation of the Spanish colonies, university curricula, and how a stepmother should comport herself. Despite the positiveness of his opinions he remained on terms of intimate friendship with men of the most diverse views. The collection of letters in these two large volumes is thus a record of the many amiable traits in Rush's character which his deadly earnestness and his contentiousness have hitherto often obscured. Rush was essentially a communicative man, and his abundant personality can best be conveyed in his own words. For this reason the great length of these volumes fully justifies itself. Each letter and each reference in it is fully documented by Dr. Butterfield, their editor. The result is an admirable commemoration alike of Rush, of his *alma mater*, Princeton University, and of the American Philosophical Society.

It is, however, impossible within the limits of this column to give more than a couple of extracts from the hundreds of letters in these volumes, many of which are quite thrilling. Two of medical interest must suffice.

A Slave Freed

"To the Pennsylvania Abolition Society.

"Philadelphia, November 14, 1788.

"There is now in this city a black man of the name of James Derham, a practitioner of physic, belonging to the Spanish settlement of New Orleans on the Mississippi. This man was born in a family in this city in which he was taught to read and write and instructed in the principles of Christianity. When a boy, he was transferred by his master to the late Dr. John Kearsly, Jr., of this city, who employed him occasionally to compound medicines and to perform some of the more humble acts of attention to his patients.

"Upon the death of Dr. Kearsly, he became (after passing through several hands) the property of Dr. George West, surgeon to the Sixteenth British regiment, under whom, during the late war in America, he performed many of the menial duties of our profession. At the close of the war he was sold by Dr. West to Dr. Robert Dove, of New Orleans, who employed him as an assistant in his business, in which capacity he gained so much of his confidence and friendship that he consented to liberate him, after two or three years, upon easy terms. From Dr. Derham's numerous opportunities of improving in medicine, he became so well acquainted with the healing art as to commence practitioner at New Orleans under the patronage of his late master. He is now about twenty-six years of age, has a wife but no children, and does business to the amount of three thousand dollars a year.

"I have conversed with him upon most of the acute and epidemic diseases of the country where he lives, and was pleased to find him perfectly acquainted with the modern simple mode of practice in those diseases. I expected to have suggested some new medicines to him, but he suggested many more to me. He is very modest and engaging in his manners. He speaks French fluently and has some knowledge of the Spanish language."

Strong Armchair

"To John Redman Coxe.

"Dear Sir,

"September 5, 1810.

"In attending the maniacal patients in the Pennsylvania Hospital, I have long seen with pain the evils of confining them, when ungovernable, by means of what is called the mad shirt or straight waistcoat. It generally reduces them to a recumbent posture, which never fails to increase their disease. In this state they often lie whole days and nights, and sometimes in a situation which delicacy forbids me to mention. The straight waistcoat moreover renders it impracticable to feel their pulses or to bleed them without taking off the greatest part of it. To obviate these evils and at the same time to retain all the benefits of coercion, I requested, by permission of the sitting managers of the Hospital, Mr. Benjamin Lindall, an ingenious cabinetmaker in this city, to make for the benefit of the maniacal patients a strong armchair, with several appropriate peculiarities as noticed in the drawing which I have herewith sent you for your *Museum*. From its design and effects I have called it a TRANQUILLIZER."

And lastly, as a timely warning to all medical men, a letter to his son:

"To James Rush.

"My dear Son,

"Philadelphia, November 18, 1803.

"Herewith you will receive your boots. They will serve I hope two purposes: 1st, to keep your feet and legs warm during the winter, and 2ly, to remind you that you have a father and mother in Philadelphia who have never forgotten you for a *whole week* since you came into the world. O fie—O fie, James!

"I never knew an instance of a man becoming eminent, respectable, or even wealthy in the profession of medicine who was deficient in punctuality in letter writing.

"Adieu! From your affectionate though neglected parents,

"Benjn. and Julia Rush."

Let those who object to writing certificates take this to heart.

The reviewer feels that he must not end without assuring the reader, what he will have already gathered, that Dr. Butterfield has produced a work of first-class importance for the general history of the late eighteenth century. It is perhaps the most important contribution to American history that has been made for a good many years. It is impossible, however, to do justice to that aspect here.

CHARLES SINGER.

Correspondence

Modern Anaesthesia in Prostatic Surgery

SIR,—In the recent discussion on prostatic surgery in your columns, little has been said of the contribution to success made by modern anaesthesia. Indeed, it may well be that safe anaesthesia is every bit as important as the anatomical route of operation or the degree of operative precipitancy shown in these cases. In our department we have lately been using a combination of low spinal analgesia with regional analgesia of the abdominal wall for prostatectomy. This method was advocated by Gordon-Taylor.¹ Rowbotham,² who attributed the method to Jennings Marshall, emphasized its value in minimizing bleeding. It seems, however, that such a technique is not widely used at present.

Our procedure has been as follows: After a pre-operative injection of morphine $\frac{1}{4}$ gr., spinal anaesthesia is administered in the sitting position. The fourth/fifth lumbar space is used; 0.5 to 0.75 ml. of "nupercaine" (cinchocaine 1:200) is injected without barbotage. The patient is kept sitting for five minutes and is then placed in the supine position. The solution used for the infiltration of the lower abdomen is conveniently made by mixing 20 ml. of a 2% solution of "xylocaine" (lignocaine) with 140 ml. of normal saline, and then adding the contents of a $\frac{1}{2}$ -ml. ampoule of adrenaline 1:1,000. The injection is usually made by the anaesthetist, but, if not practicable on account of obesity, the solution is injected layer by layer by the surgeon.

In our short series of cases the operations have been either retropubic (6) or transvesical (14). One transvesical operation included a segmental bladder resection. Ten operations have been emergencies for acute retention of urine (transvesical, 6; retropubic, 4). The patients have ranged in age from 57 to 84 years, six being octogenarians. All have tolerated the procedure well, though one patient complained of some discomfort during enucleation of the gland by the retropubic method, where it was recognized that there had been an error in technique. In all the circulation has remained good and bleeding has been slight. All the patients have been able to drink copiously from the moment of their return to the ward.

Many authorities condemn spinal anaesthesia for prostatectomy on two grounds: (1) that the fall in blood pressure carries a risk of reactionary haemorrhage; and (2) that the bladder, for some hours after operation, loses its power to expel its contents through the drainage tube, so that the risk of clot retention is increased (Magill³). Rowbotham² stressed that with low spinal anaesthesia vasoconstriction in the prostatic bed and contraction of the prostatic cavity resulted from unopposed sympathetic action following paralysis of the sacral autonomic nerves. Forrester⁴ maintained that extension of the "low spinal" to include the third lumbar segment, planned to leave unaffected the sympathetic fibres arising in the first and second lumbar segments, still allowed incisions to be made in the lower abdomen. As the skin of the lower abdomen is innervated from the tenth thoracic to the first lumbar segments, it seems that spinal anaesthesia allowing such incisions to be made would of necessity inactivate some of the sympathetic outflow. The advantages of a sustained systemic blood pressure and of unopposed vasoconstrictor action in the prostatic bed would then be lost.

We favour the use of spinal analgesia confined to the sacral segments in order to diminish bleeding without depressing systemic blood pressure. The regional analgesia of the lower abdominal wall produces less disturbance than even the best general anaesthetic. The combination of both is well tolerated by the elderly, bad-risk prostatic patient and seems worth an extended trial.—We are, etc.,

H. W. LOFTUS DALE.

R. B. CLAYTON.

W. R. PROBERT.

Aylesbury.

REFERENCES

- ¹ *Proc. roy. Soc. Med.*, 1944, 37, 533.
- ² *Retropubic Urinary Surgery*, 1947. E. and S. Livingstone, Edinburgh.
- ³ *Anaesthesia*, 1946, 1, 70.
- ⁴ *Brit. J. Urol.*, 1947, 19, 176.

Sterility after Lumbar Ganglionectomy

SIR,—In his article (January 31, p. 247) Mr. S. S. Rose rightly draws attention to the fact that male patients are certainly by no means invariably sterile after a resection of the lumbar paravertebral sympathetic chain which includes the first lumbar ganglion. Indeed, he describes one of his cases of extensive sympathectomy who was later able to produce a seminal emission, and he mentions three cases in the literature. We should like to report a similar patient who not only has been able to produce semen but has achieved paternity.

This patient has been followed up for three and a half years after the operation of bilateral paravertebral sympathectomy and splanchnicectomy for hypertension. The resection included T₁-L₂ ganglion on the right side, but at the second operation two months later technical difficulties prevented the resection from being carried with certainty above the T₁₀ level, but the lower end included the L₂ ganglion. Three months after the operation on the right side and three weeks after that on the left, the patient was tested for residual sweating by the electrical skin resistance method after first heating until he was sweating freely. The patterns showed complete denervation in the L₁-S₂ dermatomes on both sides and in T₁ to approximately T₁₀ dermatomes on the right thorax, but only about T₁₀ and T₁₁ dermatome on the left thorax (Boyd, J. D., and Monro, P. A. G.).

Subsequent testing 19 months after the first operation showed an essentially similar pattern, except that the edges of the anhidrotic areas were less irregular and the area of anhidrosis on the left side after injection of carbachol consisted of a single belt on the flank extending to within about two inches of the midline front and back. At this time the patient stated that he thought he was producing semen on intercourse, but, though he experienced orgasm, this was not accompanied by *rhythmic* ejaculation. His child was born 16 months later. ABO grouping is not incompatible.

More recent testing 42 months after the first operation shows that the sweating pattern on the right side is unaltered, but on the left thermoregulatory sweating is now present in the axillary line in about a 2 in. (5 cm.) wide strip across the belt of previous anhidrosis in the T₁₀-T₁₁ dermatomes—thus indicating a partial recovery of sympathetic function at this level. The anhidrosis in the L₁-S₂ dermatomes remains unchanged on each side.

In an article (Boyd and Monro¹) it has been shown that the "escape area" in the L₁ and L₂ dermatomes—with probable overlap into the T₁₂ and L₃ dermatomes—is supplied by ganglion cells situated in the lumbar intermediate sympathetic ganglia which, because of their inaccessible position in close proximity to the nerve roots, have survived the paravertebral sympathetic resection. A sweating test will therefore not indicate whether or not any part, or whole, of the paravertebral sympathetic chain from the level of T₁₂ to L₃ has been left behind. In this particular case it seems to us more probable, in view of the partial return of sympathetic function to the left T₁₀-T₁₁ dermatomes after three years, that the recovery of sympathetic control of the pelvic viscera has been by regeneration of preganglionic pathways from T₁₁ nerve root (at the lowest) on the left side. A possible alternative pathway could be from intermediate ganglia related to either L₁ or L₂ nerve roots. Serial section of post-mortem material has shown that such a pathway from intermediate ganglia may be traced along the course of the lumbar arteries towards the aorta, and that these fibres had escaped section. Though it is possible that this pathway might contain preganglionic fibres to the mesenteric ganglia it appeared more probable that the fibres in this bundle, which was very small, were mostly distributed to the blood vessels (Monro²). Seminal anorrhoea is the usual finding after extensive sympathectomy, but the presence of lumbar intermediate sympathetic ganglia is invariable. It therefore does not appear that after paravertebral sympathectomy these intermediate ganglia easily establish functional communication with the pelvic viscera.

The upper level of sympathetic denervation to be found after bilateral resection of the paravertebral ganglia L₁, L₂, and L₃, as shown in Mr. Rose's paper, appears to lie at the lower edge of the L₁ dermatome. We cannot agree that

end of his course of chemotherapy the P.Z. insulin (as well as the isoniazid therapy) was discontinued. After two weeks without insulin or isoniazid the glucose tolerance test was repeated and showed:

	Blood Glucose (mg./100 ml.)
Before glucose	200
1 hr. after	304
2 hrs. "	366
2½ "	328
3 "	305

Urine specimens examined during the glucose tolerance test showed:

	Amount	Containing Total Glucose
Fasting	132 ml.	338 mg.
After 1 hr.	20 "	190 "
" 2 hrs.	45 "	2.1 g.
" 2½ "	56 "	3.1 "
" 3 "	46 "	2.9 "

Following this investigation, the patient was restabilized on insulin P.Z. 32 plus soluble 12 each morning and treated as an ordinary diabetic. He was allowed home for further bed rest only, but readmitted on January 19, 1953, for further reassessment over a period of a week as laid down for the M.R.C. isoniazid trial. This was six months after commencing his three months' course of chemotherapy.

On admission his clinical condition was very satisfactory and the sputum was negative on direct smear examination. The radiograph showed no further change in the tuberculous lesion. The insulin requirements had fallen and the patient was restabilized on P.Z. 24 units and soluble 6 units daily.—We are, etc.,

CYRIL EVANS.
PETER STRADLING.

London, W.12.

The Young Delinquent

SIR,—In the review of my book *Juvenile Delinquency*, Sir Cyril Burt (February 7, p. 317) very properly points out my slip with regard to Dr. H. H. Goddard. The corrected sentence should of course read: "Some of the more outstanding contributions to this development have been made by Sir Cyril Burt in this country; by H. H. Goddard, W. Healy, and . . . in the United States of America. . ."

I have not, however, fallen into the error, as he suggests, of saying that intelligence quotients and similar devices were not used in clinics for diagnostic purposes before World War II. What I have said is that since World War II intelligence quotients and personality profiles have for the first time been assessed in many hospitals and clinics as an essential part of any psychiatric diagnostic procedure. During the past few years there has been a great development in the use of these and similar techniques in clinical practice, as most medical practitioners know full well.—I am, etc.,

London, W.1.

J. D. W. PEARCE.

Sympathectomy for Recurrent Albuminuria of Pregnancy

SIR,—The problem of recurrent albuminuria of pregnancy with repeated stillbirth in the seventh or eighth month of successive pregnancies has long exercised the minds of obstetricians. Mr. G. W. Theobald is greatly to be congratulated upon his imagination and enterprise in devising a perivascular sympathectomy operation (February 21, p. 422) to increase the uterine blood supply and thus provide an answer. His pilot survey of three cases is at least suggestive that the operation deserves a more extensive trial. However, it is my experience that a young primigravida with toxæmia of pregnancy, as opposed to hypertensive disease, will almost invariably remain free from recurrence in her next pregnancy however early the albuminuria developed in her first. As hypertensive disease and

toxæmia are often difficult to distinguish, I believe that Mr. Theobald should have laid even more emphasis upon the need for two albuminuric stillbirths before his operation was indicated.

I have recently had under my care two young primigravidas with alarming toxæmia at the twenty-fourth week of pregnancy. In one case hysterotomy was undertaken, while the other delivered herself after the insertion of laminaria tents. Both were encouraged to become pregnant again without delay despite a residual hypertension of 140/90 in one case. Both had uneventful pregnancies without albuminuria one or two years later. Unless the strictest criteria are laid down for the indications for this operative procedure it will be impossible to assess its true value.—I am, etc.,

Birmingham.

W. G. MILLS.

Prophylaxis of Tetanus

SIR,—As a comment upon Dr. Leslie Cole's Refresher Course article on tetanus (January 17, p. 150), may I suggest that the real solution of the whole problem of prophylaxis lies in a combined diphtheria-tetanus toxoid given in the first year of life with a "boosting" dose later? I believe the public would readily accept this, and the cost would not, I think, be prohibitive even if it became universally accepted, for it would be spread out over the years. It should, if adopted, gradually wipe out the death rate from tetanus, which, after all, is about twice that from diphtheria at the present time, and there would at least be a great saving in respect of serum.

It is no reflection upon medical officers of health to suggest that pressure to secure this valuable extension of preventive medicine must come from the general practitioner, who is always in a potentially vulnerable position in regard to tetanus. If he sees the wound soon after it is inflicted and does not give serum, and the patient later develops tetanus, he is very likely to be blamed, whereas if anaphylaxis comes like a bolt out of the blue, as it can after a dose of serum, he is not likely to be popular.—I am, etc.,

London, N.W.7.

A. H. MORLEY.

A Journal and its Readers

SIR,—Surely your leading article on this subject (February 28, p. 496) must give rise to deep thought amongst many of your readers. To me, at any rate, it seems to be more an apology for the general layout and contents of the *Journal* than anything else. Certainly the original work is refreshing for those who have the time to read it; but how many of us have? The correspondence columns sometimes contain interesting letters when these are not crowded out by the uninteresting, and the *Supplement* when it was separated from the *Journal* was a ready guide to current medical politics.

Considering what an overwhelming number of your members are general practitioners, it is amazing how little of real interest to them appears therein. You may say there are the "Refresher Courses," but if you come to read them how many of them avoid the technical and keep to the simple and produce something easy to read and remember? Let me compare the article on "Tachycardia" in the *Journal* (February 28, p. 500) with that on "Recent Advances in Geriatrics" (*Medical World*, December 5, 1952), which was an object lesson in clarity and usefulness. I could give many more.—I am, etc.,

Worthing.

HAROLD LEESON.

SIR,—Dr. J. M. B. Morwood (March 14, p. 620) laments that the *Journal*, in his opinion, fails to produce very much for anybody.

Until qualified, the student's tastes in medicine must remain catholic. This being so, he is amongst the *Journal's* most important readers. Popular demand dressed the

"Refresher Course" series of articles in book form. The implied insult in this title is very hard to see. Whatever one's chosen path in the healing art and success on it, the most and best one can claim is to remain a student of it.—I am, etc.,

London, N.1.

DUNCAN D. MACDONALD.

Cross-resistance between "Daraprim" and Proguanil

SIR,—A letter from Drs. G. I. Robertson, D. G. Davey, and Sir Hamilton Fairley (December 6, 1952, p. 1255) reported that a proguanil-resistant strain of *Plasmodium falciparum* from Malaya had proved to be resistant also to pyrimethamine ("daraprim"). Proguanil-resistance in Malayan strains of *P. falciparum* has been recognized since 1949¹; and if a true cross-resistance exists, this might—as implied by Dr. J. S. K. Boyd (February 7, p. 337)—go far to explain the pyrimethamine failures described in our paper (January 31, p. 253).

Proguanil has been so widely used throughout Malaya for the past six years that there can be few strains of parasite which have not yet come into contact with it; thus there is little chance of deciding now how the "parent" strains (without previous contact with proguanil) might have responded to pyrimethamine. We have not, however, been able to confirm that there is any consistent cross-resistance between these two drugs in naturally acquired falciparum malaria since pyrimethamine was first used in Malaya in 1951. Pyrimethamine failures have been successfully treated with normal doses of proguanil, and proguanil-resistant infections have responded readily to pyrimethamine. In some of these cases an interval of several days was allowed to elapse between treatments, so the possibility of a combined action of the two drugs should have been small.

We consider that these apparently conflicting results can best be explained by assuming that some present-day strains of *P. falciparum* in Malaya possess a "natural" resistance to pyrimethamine, whether or not any particular strain is also demonstrably resistant to proguanil. With this species of parasite, a true cross-resistance has still to be proved.—We are, etc.,

Kuala Lumpur, Malaya.

T. WILSON.
J. F. B. EDESON.

REFERENCE

- ¹ *British Medical Journal*, 1950, 1, 147.

"Butazolidin"

SIR,—The first clinical report on butazolidin was made, not in the U.S.A., as you state in your leading article (December 27, 1952, p. 1401), but by Dr. John Currie at the European Rheumatology Congress, Barcelona, in September, 1951.¹

You ask whether butazolidin is merely a potent analgesic or whether it has specific anti-rheumatic action. The following considerations after 200 cases have left me in no doubt that it has a specific effect on rheumatic inflammation. Pains from sources other than joints and muscles, such as sciatic pain from carcinoma of pancreas, cellulitis, and psychogenic rheumatism, carcinoma of pancreas, cellulitis, and psychogenic rheumatism, have not been relieved. In five rheumatic patients acute gastric pain has been brought on by butazolidin, while joint pains have been relieved. In 20 cases acute swelling of a single joint has subsided dramatically at the same time that the pain has been relieved. The joints were not rested; several acutely swollen knees and ankles subsided while the patient continued to walk about.

I do not believe that we have any means—other than low dosage and careful clinical observation—of preventing or forestalling toxic side-effects. I have not found any abnormalities in the blood in 35 patients with nausea, rashes, or oedema. Therefore the patient's own symptoms are the safest guide to toxicity. Granulocyte counts have remained consistently normal in a total of more than 1,000 cases reported by various authors; Steinbrocker and others² detected five cases of neutropenia, but in three the count returned to normal with continued butazolidin treatment. Lowering of platelet counts—reported by Currie³ and Stephens and others⁴—was not associated with purpura or any

other untoward symptoms; in the single case of purpura reported by Rhys Davies and others⁵ the platelet count was normal.

Routine and repeated counts of platelets and granulocytes are laborious, and they may lead us astray because we do not know the hour-to-hour and day-to-day fluctuations of platelets and granulocytes in the normal subject. Laboratory observation of the blood should not be mandatory, and failure to observe this precaution should not be regarded as neglect.—I am, etc.,

Melbourne, Australia.

MICHAEL KELLY.

REFERENCES

- ¹ *Communications to Second European Rheumatology Congress*, 1951, p. 417.
- ² *J. Amer. med. Ass.*, 1952, 150, 1087.
- ³ *Lancet*, 1952, 2, 15.
- ⁴ *J. Amer. med. Ass.*, 1952, 150, 1084.
- ⁵ *British Medical Journal*, 1952, 2, 1392.

"Unfit for Military Service"

SIR,—May I endorse the letter of Dr. A. Barham Carter (February 7, p. 334) and take the point he raised one step further? As a regimental medical officer I am frequently called upon to interpret certificates given to Service personnel who are sick on leave which are either unreadable or couched in technicalities which give no indication as to the seriousness (or otherwise) of the soldier's illness.

It also does not appear to be widely known that Service personnel sick on leave must produce, on return to their unit, a certificate stating that they were *unfit to travel* at the termination of their leave. Failure to do so, or to provide other suitable evidence, may result in disciplinary action being taken against the man concerned. Minor ailments which do not prevent the man from travelling are not accepted as an excuse for absence.

May I therefore put in a plea to practitioners treating these patients to write their certificates in plain language, and state that the patient was fit, or unfit, to travel on the dates concerned, so that his commanding officer can assess the case in its proper light?—I am, etc.,

Walton-on-Thames.

C. D. ELTON.

Nicotinic-acid Deficiency in Psychiatric Practice

SIR,—Increasing attention is now being paid to the large numbers of psychiatric patients who exhibit signs and symptoms suggestive of deficiency of the vitamin-B group, and articles by Jolliffe *et al.*,¹ Wadsworth *et al.*,² Sydenstricker and Cleckley,³ Washburne,⁴ and Gregory,⁵ among others, are worthy of study. The following account of a recent psychiatric case admitted to hospital may be of interest as being illustrative of such deficiency states.

A man aged 43 was admitted to hospital in a stuporose condition on October 9, 1952. He was restless, agitated, and confused, and resisted all attempts to feed him, examine him, or converse with him. He was also depressed, emotional, and actively suicidal. Physically he was in an extremely weak and emaciated condition, quite unable to stand, and with a coarse tremor of his tongue and limbs. His skin was dry, scaly and atonic, and there were large patches of dermatitis on his abdomen and back, and smaller ones on the backs of his knees and elbows, and also on his wrists, hands, and feet. His lips were dry, sore, and cracked. His tongue was dry, red, raw, and fissured, and his teeth and gums were unhealthy and neglected. His stools were loose, he was doubly incontinent, and there was a huge bedsore as large as a tea plate over his sacrum.

His wife gave a history of gastric carcinoma first suspected in 1943 and successfully treated by partial gastrectomy. Early in 1952 he complained of dyspepsia, began to lose weight, and developed a terrible fear of recurrence of cancer. Despite negative findings with x-ray examination and reassurance he became increasingly depressed and introspective, refused all food, and finally was admitted to hospital because he was suicidal. He did not use his voice for some months prior to admission to hospital, but his speech was confined to incoherent whisperings about "cancer." He was diagnosed as suffering from a confusional state with marked depressive and phobic features, and on purely clinical grounds he was thought to have a nicotinic-acid deficiency of such a degree as to present almost a classical picture of pellagra. He was immediately given nicotinic acid 1,500 mg. intrapellagra. He was immediately given nicotinic acid 1,500 mg. intrapellagra. He was immediately given nicotinic acid 1,500 mg. intrapellagra. The solution was injected slowly into a vein at the bend of the elbow,

and after an interval of two and a half minutes there was an intense reaction with marked flushing, first of the face and then of the trunk and limbs. The patient appeared to awaken from his lethargic state, conversed normally for about 15 minutes, and then slipped back into a state of torpor again. This treatment was continued daily, and after 24 hours he was co-operative and willing to take food and drugs orally. As his condition improved his diet was supplemented, and by the tenth day of treatment he had full volition and was co-operating well and conversing normally. Nicotinic-acid therapy was continued for 28 days, supplemented by oral vitamin "B-complex," and afterwards combined oral therapy was continued.

The results have been most gratifying. The patient is now up all day, is usefully employed in the hospital, and is bright and optimistic about the future. He has a good appetite, and his weight has increased by 2 stone (12.6 kg.) since admission. Within a month all his skin and mouth lesions had cleared up completely, and the huge ulcer crater over his sacrum is almost completely healed. He is now fit enough to return to his former employment.

Such a case is probably met with very infrequently in clinical practice, but minor degrees of nicotinic-acid deficiency are comparatively common in pre-senile and senile depressive and confusional states, and the signs and symptoms should be looked for and treated early, as the response is usually very gratifying.

I am indebted to Dr. L. Barber for permission to publish this case, and to Dr. D. C. Dewar for his help and advice.—I am, etc.,

Walton-on-Thames.

G. H. COLLINS.

REFERENCES

- ¹ J. Amer. med. Ass., 1940, 114, 307.
- ² Amer. J. Psychiat., 1943, 99, 807.
- ³ Ibid., 1941, 98, 83.
- ⁴ Ann. intern. Med., 1950, 32, 261.
- ⁵ Amer. J. Psychiat., 1952, 108, 888.

Attitude Surveys with Patients in Hospitals

SIR,—Since a contented patient is likely to regain physical health more quickly than one who is unhappy or frightened, it is important for responsible staff in hospitals—medical, nursing, and administrative alike—to know in detail the views of their patients. But hospitals are complex organizations, and it is difficult for the staff to obtain an accurate picture of the patients' attitudes towards all the various aspects of their stay in hospitals. The vocal patient is not necessarily the typical one. Whether the patients' views are favourable or unfavourable, whether they are based on fact or on misapprehension, they are equally important in their effect.

One method of gaining this information is by conducting attitude surveys by the "confidential individual interview method" with a representative sample of patients shortly before they are discharged. Such surveys are best conducted by an impartial outsider who can inspire confidence in the promise of anonymity, who has time to devote to the inquiry, and who has the special training and skill to get a flow of information without prompting or question. The procedure of conducting attitude surveys in hospitals would at first have to be experimental, but might follow some such lines as those indicated below.

The co-operation of the staff, medical, nursing, and administrative, would first be obtained so that they realized that the purpose of the survey was to give constructive help. Then a representative sample of patients would be interviewed, each as near to the time of discharge as possible. Before each patient was interviewed he would receive a letter from a senior member of the hospital staff urging him to co-operate. He would be asked to comment on all aspects of his stay in hospital, and told that what he said would be reported, but with no name mentioned. An account of the survey would give the hospital information on the views of its patients, analysed by ward, age, length of stay, etc. When a number of surveys had been made in different hospitals a general report could be prepared which, while preserving the anonymity of the hospitals concerned, would indicate matters found common to many hospitals that could be altered for the benefit of the patients.

Considerable interest has been expressed in this scheme by the doctors, nurses, and administrators with whom it has been discussed, and a pilot survey has been undertaken. It is hoped that more hospitals will be ready to collaborate in it.—I am, etc.,

London, W.1.

WINIFRED RAPHAEL,
Assistant Director,
National Institute of Industrial Psychology.

Bilateral Cough Fractures

SIR,—Articles by Dr. J. B. Mitchell¹ and Dr. N. Wynn-Williams² and subsequent correspondence drew attention once again to cough fractures as a cause of pain in the chest. There has been no mention of the fact that these fractures can, on occasion, be bilateral: a search of the literature shows that no cases of this type have been described in this country and only four articles in the American literature record such fractures. Howson³ quotes one case with three fractures on the right side and one on the left. Richardson,⁴ reviewing 1,903 patients, found 30 cases with cough fractures, in which four were bilateral. Swineford and McKinnon⁵ quote a patient who fractured eight ribs in six months, three on the left side and five on the right. Bodenheimer,⁶ reviewing the literature up to that date, gives a figure of 4% as the incidence of bilateral fractures. Details of two further cases are given below.

The first patient, a woman schoolteacher aged 25, became ill early in December and was sent to the school sanatorium: she was told she had "congestion of the lungs." About December 8 she coughed while bending over to pick up her bedroom slippers from under the bed, and felt an acute pain in her left side. This was treated with poultices. On December 15 she was allowed up to help pack her luggage for the Christmas holidays, and while bending over her case she coughed and had quite severe pain in her right side. She came home on holiday and was sent to hospital for an x-ray examination of her chest on January 2. This showed recent fractures of the 8th and 10th right ribs and the 10th left rib. The patient was quite unaware of these fractures and had felt no pain since Christmas.

The second patient was a woman aged 39 who had "bronchitis" for several weeks and developed pain in the left side of her chest. X-ray examination in January showed fractures of the 5th, 6th, 7th, and 8th left ribs and fractures of the 6th and 7th right ribs. Those on the right side were healed and had probably occurred several months or more before the fractures on the left side, all of which were recent fractures. She had suffered from a persistent cough for several years and could remember an attack with some pain in the right side much earlier in the year. The pain in the left side had started after a bout of coughing which had occurred when she was lifting some heavy washing. In both patients the fractures were antero-lateral.

Both these cases have one factor in common: the ribs were fractured when coughing occurred as the patient was bending—i.e., when the diaphragm was pushed up by the abdominal contents; they are in this respect similar to the cough fractures occurring in late pregnancy. In neither case did the patients show any radiological signs of either pulmonary tuberculosis or of any other abnormality of the ribs.

It is difficult to assess the incidence of bilateral cough fractures. The figure of 4% quoted by Bodenheimer is probably high, but it is certain that the condition is much commoner than the literature would suggest. It adds one further possibility to the list when the differential diagnosis of pain in the chest is being considered—and casts doubt on the diagnosis of "intercostal myalgia" or "fibrositis" when the pain is bilateral; in all respects the clinical features are similar to those found with unilateral fractures.

My thanks are due to the Librarian of the B.M.A. for his help with the references, and to Miss Marjorie Collins for secretarial assistance. Dr. C. B. Lanyon and Dr. J. Deighton kindly referred the patients to me.—I am, etc.,

Falmouth.

P. E. S. PALMER.

REFERENCES

- ¹ British Medical Journal, 1951, 2, 1492.
- ² Ibid., 1951, 2, 1494.
- ³ Amer. Rev. Tuberc., 1934, 30, 566.
- ⁴ J. Amer. med. Ass., 1936, 106, 1543.
- ⁵ Ann. intern. Med., 1945, 23, 442.
- ⁶ New Orleans med. surg. J., 1948, 100, 474.

POINTS FROM LETTERS

Tetanus

Dr. K. M. HAY (Birmingham) writes: I have seen a case of tetanus recently in a young man which might be of interest. The patient pricked his finger on his wife's sewing about ten days before the onset of tetanus, but no blood was drawn. There was no other history of injury, nor had the patient ever suffered a severe laceration. Minor injuries of this sort are so common that it would be impossible to give antitoxin whenever they occur. . . . As things stand, it would seem that a doctor who fails to give serum in every case of injury, however trivial and whether blood is drawn or not, is likely to face considerable medico-legal trouble if tetanus should supervene, in spite of its rarity. The best solution would be for all the active members of the population to be immunized, as in the Services.

Dummies for "Air Babies"

Dr. MARY E. BUDDING (Tavistock) writes: Sir Harold E. Whittingham in Part I of his Refresher Course article (March 7, p. 556) on air travel makes a suggestion that mothers with babies should perhaps be instructed to give them a dummy to suck during ascent and descent. Perhaps unwittingly this might have the effect of once more increasing the sales of the undesirable dummy, which has at long last fallen into disrepute, even among mothers. . . . I myself have always appreciated the excellent brands of chewing-gum and peppermint ("extra strong") provided by the airlines, and wonder if Sir Harold Whittingham can use his influence to persuade them to provide our babies, when travelling, not with dummies, but perhaps with glycerin-based rapidly dissolved once-used-only large sweets?

Litigation Against Doctors

Dr. LESLIE HARTLEY (Camberley) writes: Under the new regulations a newly qualified doctor must take an appointment in a hospital. If he feels that the stigma of an action for damages against him may be attached to him at the very beginning of his career, the medical student may become as rare a bird as the infallible doctor. Actions such as these are bound to react ultimately on the public themselves, as medical men will refuse to take responsibility and will pass more and more work to the specialist if they feel that they are liable to be involved in litigation. A doctor friend of mine told me that when he got a foreign body underneath his upper eyelid in New York he had to put up with it for three hours before he could contact an ophthalmic surgeon to evert his lid and remove it, as no nurse or doctor would touch his eye. When he told the ophthalmic surgeon that any trained nurse or doctor in England would have done it for him, he said, "Ah, yes, but they do not litigate in your country." A High Court judge recently called attention to the increasing amount of litigation in this country since the introduction of free legal aid, which means that people can bring actions at the taxpayer's expense.

Misuse of Words

Dr. R. T. D. FITZGERALD (Eastbourne) writes: May I add to your collection of misused words two favourites from my own collection? In the days when doctors wrote English and confectionery was rife it was not uncommon for patients to suffer from Hutchinson's triad, but now that doctors follow the artists in their search for novelty for novelty's sake, and write indifferent journalese and ambiguous jargon, congenital syphilis has given way to congenital heart disease and patients suffer from Fallot's tetralogy. Let us remember that, however interested we may be in Fallot's tetralogy, our patients can only suffer from Fallot's tetrad. The anthropoid pelvis has recently been so called from its resemblance to that of the ape, but it so happens that our learned fathers called the apes anthropoids from their resemblance to the human species.

A Coroner's Remarks

Dr. M. G. L. LUCAS (H.M. Coroner for the North District of the County of Bedford) writes: My attention has been called to the literature which accompanies a current advertisement of the "Bedford" Corporation. It quotes remarks made by the "Bedford" Corporation on September 23, 1952, and the suggestion is made in an accompanying letter from the medical director of Clinical Products, Ltd., that he is entitled to use the remarks of the "Bedford Coroner" as testimony of the advantages and safety of the tablets in question. I wish to make it clear that I did not take up office here until October 1, 1952. The verdict was not mine and I cannot associate myself with the opinions expressed.

Obituary

LEO DOYLE, M.B., M.S., F.R.A.C.S.

The sudden and unexpected death of Mr. Leo Doyle at the close of an operation which he had been performing at the Mercy Hospital, Melbourne, has robbed the Australian continent of one of its foremost surgeons. We are indebted to Sir Gordon Gordon-Taylor for the following appreciation:

Born in 1891, Leo Doyle graduated in medicine at the University of Melbourne in 1913, and served in the Royal Australian Navy in the 1914-18 war. He had belonged to the first batch of undergraduates who joined St. Vincent's Hospital when it became recognized by the University of Melbourne as a clinical school; he subsequently became its first registrar, and lived to be senior surgeon for a number of years to the hospital of his choice. Doyle was never afflicted with any *furor scribendi*, and his name is therefore less well known than some of his compatriot colleagues', save to those of this country to whom has been vouchsafed the privilege of visiting the great surgical centre of Melbourne and to the many young surgical aspirants in London and Britain to-day—a goodly proportion from "Vincent's"—by whom the name of Leo Doyle is respected and esteemed and to whom the man himself was a veritable surgical father.

Leo Doyle's reputation will not rest upon his teaching, nor was he one "to be sought for in the council of the people": he was a man of few words, a flair for diagnosis, and a sharp knife—not that he contemned the diathermy, for there were some who regarded his diathermy gastrectomy for peptic ulcer, without the employment of clamps, as one of the very best examples of his superb surgical technique. He was never satisfied with himself, always wanting to do something better:

Who, not content that former worth stand fast,
Looks forward, persevering to the last,
From well to better, daily self-surpass.

Like the artificer of Ecclesiasticus, he "set his heart upon perfecting his works, and he will be wakeful to adorn them perfectly," so that of Leo Doyle it may be truly said that he was *simplex munditiis*, a worker simple in his elegance.

I believe that most Australian surgeons would share the writer's view and acknowledge Doyle's supremacy in the operative treatment of malignant disease, and I have memories, on my many visits to Melbourne, of cases in his wards convalescing from operations as diverse as pharyngectomy, laryngectomy, pharyngolaryngectomy, oesophagectomy, total gastrectomy, and the "hindquarter" amputation, of which he had done several. He was proud of having been house-surgeon to that great pioneer of thyroid surgery, Sir Thomas Dunhill, and never tired of expressing his indebtedness to his old chief. A true exemplar of Cromwell's hope—"To be a Seeker is to be of the best sect next to a Finder"—he remained a humble student to the end.

His home life was a happy one, and loyal assistants like Lorna Sisely and Ellery Ryan, who each remained with him for many years, virtually belonged to the family. Leo Doyle worthily maintained the prestige and lustre of a hospital which could boast of Dunhill and of Devine as having served on its staff, but by his intense humanity he also proved himself a true disciple of that

Father Vincent, dead nearly 300 years ago, whose name attaches to hospitals on either side of the Equator, but whose spirit and example pervade a far larger number who lack the title of "Vincent's." From the manner of his passing he was not destined to repine the dwindling activities of advancing years, when in the words of Adam Lindsay Gordon, whose statue finds a place only a few yards from Leo Doyle's hospitable home in Spring Street:

The songs are ended, the deeds are done,
There shall none of them gladden me now, not one,
There is nothing good for me under the sun,
But to perish, as these things perished.

Leo Doyle lived and died "the happy Warrior . . . that every man in arms should wish to be."

Mr. J. W. WALKER, who was well known in the West Riding as a surgeon and as an archaeologist, died at his home near Bristol on February 17 at the age of 93. John William Walker was born at Wakefield on October 15, 1859, the son of Thomas Walker, J.P., and was educated at Rossall School and at University College, London. After qualifying in 1882 he worked in London for a time and held appointments at University College Hospital. Later he settled in practice at Wakefield, where he became surgeon to the Clayton Hospital. During the war of 1914-18 he served in the R.A.M.C. at the 2nd Northern General Hospital at Leeds. For his war services he was appointed O.B.E. in 1920. Mr. Walker was admitted to the Fellowship of the Royal College of Surgeons of England in 1941, at the age of 81, as a Member of 20 years' standing, and thus joined his two sons, R. Milnes Walker, now professor of surgery in the University of Bristol, and J. H. Milnes Walker, of Crewe. He took a leading part in local affairs, being a J.P., a governor of Wakefield High School, and an honorary life member of the St. John Ambulance Association. But outside his profession his main interest was in local history. His association with the Yorkshire Archaeological Society, of which he was the oldest member, dated back to 1882, and in 1924 he was elected a vice-president, later becoming president. He was also a member of the council of the society and had been its records secretary. The Wakefield Historical Society also paid him the honour of electing him its president. In his book, *Robin Hood Identified*, published in 1946, he endeavoured to prove that the Sherwood Forest outlaw was a certain Robert Hood, of Wakefield. He also wrote several other books and monographs, including *The Cathedral Church of Wakefield* (1888), *Handbook for Yorkshire* (1904), *The Church Plate of Berkshire* (1927), and *Wakefield, Its History and People*, a book which required a second edition in 1939. Mr. Walker retired from practice in 1921, and then lived in Berkshire, where he joined the Berkshire Archaeological Society and served on its council. After a move to Cheshire he finally settled at Churchill Court, near Bristol, where he died. He married Miss Constance E. Holdsworth, daughter of Samuel Holdsworth, J.P., in 1885, and in 1945 they had the satisfaction of celebrating their diamond wedding. Mr. Walker is survived by his two sons and two daughters.

By the death of Dr. J. G. BENNETT at his home at Woodley, Cheshire, on March 11 in his 64th year, the profession has lost a member of extensive experience, both as a general practitioner and as an officer in the public health service. John George Bennett was born on November 14, 1888, and he received his medical education at the University of Manchester, graduating M.B., Ch.B. in 1913, having gained the Tom Jones scholarship in anatomy and a distinction in medicine. His immediate postgraduate training included

the holding of posts as house-surgeon at the Manchester Royal Infirmary and at Pendlebury Children's Hospital. He then entered the R.A.M.C. and served throughout the war of 1914-18, being sent first to France and then to India and Mesopotamia. For his services he was awarded the Military Cross in 1919. Upon his return to civil life he was appointed assistant lecturer in the anatomy and physiology department of Manchester University, and in 1920 he proceeded to the degree of M.D. after writing a thesis describing his investigations into the embryological and pathological relationships of the lesser sac in the newborn. He also served for a short period as chairman of a pensions board, for which his experience in tropical diseases was particularly valuable. In 1922 Dr. Bennett married Miss Kathleen Ward Siddell, and in the following year he began his career as a general practitioner at Hyde. His general good will towards his patients and his keen interest in their well-being soon enabled him to build up the extensive practice which he conducted for 17 years. During this stage of his career he was a complete success, being held in high regard both by his patients and by his professional colleagues who elected him chairman of the Hyde Division of the British Medical Association from 1937 to 1939. After many years of strenuous work he retired from general practice for reasons of health just before the last war. But when the need for medical men became so essential, he was eager to serve his country again and found scope for his enthusiasm by acting as a medical referee, as a member of the recruitment medical board at Stockport, and as chairman of the pensions board at Manchester. During the last nine years of his life he turned his attention to preventive medicine by accepting the appointment of assistant medical officer of health to the Borough of Hyde, where his work was that of a clinician in the maternity and child welfare and school medical field, and as deputy superintendent at the Hyde Isolation Hospital. With the inauguration of the National Health Service his post was redesignated as that of assistant county medical officer in Cheshire, an appointment which enabled him to continue in the same field of operations. His work in the public health service, like his earlier work as a general practitioner, was most impressive. He was a grand colleague and a good man, and his death has left his associates with a sense of personal loss. His last illness was of short duration, rendered more short through a great determination to remain at duty upon many occasions when most men would have taken the easier course of obtaining a much-needed rest. He died in harness, as seemed to be his intent. Apart from his work, Jack Bennett had a keen interest in gardening and in painting water colours, and he loved a day's shooting. He is survived by a widow and a daughter, Mrs. Mary Howard, wife of Dr. Brian Howard, and to them we offer our deepest sympathy. —F. W. C. B.

Dr. HERMAN BARUCH, a former United States Ambassador to the Netherlands and to Portugal, and brother of Mr. Bernard Baruch, the statesman, died in Long Island on March 15. Herman Benjamin Baruch was born on April 28, 1872, the son of Simon Baruch (1840-1921), a well-known surgeon. He qualified in medicine at Columbia University, New York, in 1895, and spent the next eight years in general practice. He forsook medicine for finance in 1903 when he joined the New York stock exchange as a member of the firm of Baruch Brothers. During the last war he was appointed special representative of the Board of Economic Warfare in Brazil and special economic adviser to the U.S. Ambassador to Brazil. From 1945 to 1947 he was U.S. Ambassador to Portugal, and from 1947 to 1949 Ambassador to the Netherlands. He then retired from the diplomatic service. He was president of the Simon Baruch Foundation (so named in honour of his father), and he devoted the last years of his life to directing the Foundation's research into the aetiology and treatment of poliomyelitis.

Medico-Legal

DRUNK IN CHARGE

BY

A. E. M. HARTLEY, M.B., B.Ch.

The examination of the alleged drunk in charge usually falls to the general practitioner. To many it is one of the nightmares of general practice. It occurs so seldom that occasionally the doctor is not prepared for it, and his examination at the time may be incomplete so far as the law is concerned. He may therefore be cross-examined at length both in the magistrates' court and later at the quarter sessions. Bitter experience of this has prompted me to compile the proforma below. If properly completed at the time of the examination it should ensure that the examining doctor is standing on firm ground at any subsequent cross-examination.

I have had a number of these proformas duplicated by the police, and they are kept at the police station. Whenever a case turns up, one of these forms is produced for me at the time and my notes are made on it. These I am allowed to produce in court. I submit this form in the hope that it may be of some use to those practitioners who see little of this type of medico-legal work, and also in the hope that anyone who can suggest any improvement to it will write to me. Is it too much to suggest that this or some similar form should be available at every police station in the country for the use of examining doctors? The spacing on the form allows for short notes to be made at the time.

OXFORDSHIRE CONSTABULARY

Examination at:

Date:

Time arrived:

Time called:

Warning: (Tell him who you are and inform him that he is entitled to call his own doctor if he wishes. Obtain his consent to the examination.)

Name and address of person examined:

Essential Questions

1. Ask him date and time.
2. History for the day. (Note memory for recent events.)
3. What drinks? Type, amount, and time of consumption.
4. What food? When and where consumed? What did he eat?
5. Medical history:
 - (a) Any serious illnesses. (Diabetes, heart, blackouts, epilepsy.)
 - (b) Any recent illness.
 - (c) Any operation.
 - (d) Any deformity; spine or joints.
 - (e) Any loss of member; arm, leg, eye.
 - (f) Does he take drugs (1) habitually, (2) that day?
 - (g) Is his eyesight normally good? Does he wear glasses?
 - (h) Has he vomited?
 - (i) Does he wear dentures? Are they in place?
 - (j) Has he suffered any injury that day? Blow on head?

Examination

1. Take specimen of handwriting. Separate sheet to be used as exhibit.
2. Visual acuity. With glasses if worn.
 - (a) Snellen's Types.
 - (b) Newsprint.
3. Eyes:
 - (a) Bloodshot.
 - (b) State of pupils.
 - (c) Reaction to light.
 - (d) Accommodation.
 - (e) Ocular movements.
4. Smell of breath:
 - (a) Alcohol.
 - (b) Disease.
5. State of tongue.
6. Teeth and throat.

7. Facies:
 - (a) Flushed.
 - (b) Pale.
 - (c) Cyanosed.
 - (d) Sweating.
8. General demeanour (abusive, hilarious, talkative, truculent). Disorder of dress. Signs of vomit.
9. Specimen of urine: albumin, sugar, blood, alcohol, or drugs.
10. Signs of shock.

General Medical Examination

1. Pulse: rate, character, rhythm.
2. Temperature.
3. Respirations; rate and type.
4. Blood pressure.
5. Heart: signs of disease.
6. Lungs: signs of disease.
7. Abdomen: scars or signs of disease.
8. Deformity or artificial limb or eye.
9. Scalp and head. Any injury, old or recent.

Special Tests for Co-ordination

1. Tip of nose test.
2. Romberg's test.
3. Walking a line.
4. Speech: mumbling, slow, indistinct, slurred, or shouting. Read short paragraph aloud. Simple spelling test.
5. Picking up coins:
 - (a) Distinguish them.
 - (b) Count number of coins.
 - (c) Add to correct amount.

Opinion

Inform him of your opinion at the time and tell him again that he is entitled to call his own doctor.

Note.—See that the examination is carried out in a quiet room with good light and always in the presence of a police officer.

Medical Notes in Parliament

Smoking and Cancer

Mr. HARRY HYND used the adjournment motion in the House of Commons on March 19 to discuss the relationship between smoking and lung cancer, and to seek some authoritative pronouncement from the Ministry of Health on the subject.

He based his argument on the investigations carried out by Dr. Richard Doll and Professor Bradford Hill, whose reports in 1950 and December, 1952, were published in the *British Medical Journal*, and quoted the comment of the *British Medical Journal* (December 13, 1952, p. 1299) in a leading article: "Tobacco has been incriminated as the vehicle conveying an agent responsible for a large proportion of the cases. Out of any random sample of 400 men now aged about 55, at least 10 must be expected to die of cancer of the lung within the next 20 years. Intensive research on the chemical constituents of tobacco and tobacco smoke is now needed." This, Mr. Hynd said, was bad enough, but similar investigations in Germany and the U.S. had led to similar conclusions. The stage had been reached when the medical profession must make up its mind about the cause of this dread disease, and whether it really was related to smoking; and it was part of the responsibilities of the Ministry of Health to guide the public in these matters.

Miss HORNSBY-SMITH, Parliamentary Secretary to the Ministry of Health, acknowledged that the subject was one of great public concern, and quoted from the 1950 report of the Chief Medical Officer of the Ministry that "cancer, and especially cancer of the lung, remains the greatest problem of medicine." But the figures given by Mr. Hynd of the rise in the number of cases of cancer of the lung from 2,281 in 1931 to 13,247 in 1951 must be qualified by taking account of the vastly improved diagnosis, the universal use of x rays, and the increased education of prac-

tioners on cancer work which had taken place during those 20 years. In view of the gravity of the statistical evidence the Ministry and the Medical Research Council were examining carefully what lines of research into the incidence and causative factors were most promising and should be encouraged, and had also taken the initiative in stimulating new lines of research.

The information so far received from the advisory committee of the Medical Research Council showed that, while it accepted that research had shown a statistical relationship between tobacco smoking and lung cancer, it did not necessarily accept that that relationship meant a causal relationship also.

She gave a résumé of the research activity that was in progress. An example of the new lines of research was the experiments in nuclear physics. A new cobalt-60 beam unit, a generous gift from Canada, had been accepted a few days previously by the British Empire Cancer Campaign (see *Journal*, March 21, pp. 666 and 669). In the N.H.S. hospitals there was intensive research. It was going on in the Royal Cancer Hospital and the Chester Beatty Research Institute, the Christie Hospital and the Holt Radium Institute, and in the Hammersmith Hospital, where some of the most modern equipment was being used to find a new means of diagnosis and cure. At St. Bartholomew's Hospital Sir Ernest Kennaway was examining the ingredients of tobacco smoke for cancer-producing substances. At the Pneumoconiosis Research Institute in Cardiff the Medical Research Council was carrying out experiments on the effect on mice of living for long periods in tobacco smoke. At the cancer research unit of the Royal Beaton Memorial Hospital in Glasgow further extensive research was in progress into cancer-producing agents, again related to tobacco smoke, and the possible carcinogenicity of alkaloids in tobacco or its smoke. Similar research was being conducted in America. Fortunately there was no iron curtain in research on this subject, and the best brains throughout the world were co-ordinating their work. In regard to atmospheric pollution and its relation to cancer of the lung, Dr. Percy Stocks was conducting an investigation for the Medical Research Council. The difference between the incidence of cancer of the lung in rural areas and in densely populated industrial areas was dramatic. All the evidence so far on the arsenic content of some tobaccos as a causation of lung cancer showed that the amount was too small to be effective in carcinoma.

She concluded that they must see that nothing was done to panic the public, while assuring them that everything was being done to find a cure for this disease. Research had not been abandoned into exhaust gases from petrol and diesel engines as a possible source contributing to lung cancer. The Ministry's attitude was that it could act only on the best medical advice available, and while the advisory committee had not come to any conclusion going beyond the correlation between tobacco smoke and cancer of the lung the Ministry could only be non-committal. Research was proceeding all the time. It was a long-term matter requiring careful sifting of results and highly complicated experimental work over a long period and the collection of vital statistical data.

The Medical Research Council would have no hesitation in carrying further research into any line which showed promise, and would do everything in its power to find a solution and a cure of this dread disease.

Group Practices

Mr. HILARY MARQUAND on March 19 asked the Minister of Health whether he had drawn the attention of executive councils and their medical committees to the fact that both he and the General Medical Services Committee had accepted the encouragement of group practice as a desirable objective. Mr. IAIN MACLEOD replied that he had received advice from the Central Health Services Council on the definition of group practice, and proposed shortly to discuss with representatives of the medical profession how best to implement the recommendation on group practice of the

Working Party on the distribution of remuneration of general practitioners. He added that he had received the report only the previous night, and he would consider what publicity should be given to the committee's conclusions.

Medical Auxiliaries

Mr. M. TURNER-SAMUELS asked the Minister of Health on March 19 if he would make a statement at an early date on the implementation or otherwise of the Cope Report. Mr. IAIN MACLEOD stated that, following discussions with the professional bodies of medical auxiliaries, the Secretary of State for Scotland and he were satisfied that there was insufficient agreement on fundamental matters to proceed with statutory registration on the lines proposed by the Cope Committees. They intended, therefore, as soon as possible to make regulations using the power of Section 66 of the National Health Service Act, 1946, and Section 65 of the National Health Service (Scotland) Act, 1947, to prescribe qualifications for medical auxiliaries for the purpose of employment in the National Health Service. They would shortly give the professional and other bodies concerned an opportunity to comment on an outline of the regulations proposed. He added that he intended when making the regulations to withdraw the temporary instructions given in August, 1951. He would do everything he could to see that the regulations he proposed were fair to all the associations concerned.

Sickness in the Post Office

Mr. C. OSBORNE asked the Assistant Postmaster-General on March 18 what had been the sick rate amongst Post Office employees in terms of days' absence per person for the years 1952 and 1951, and how this compared with the pre-war figure. Mr. L. D. GAMMANS informed him that the average number of days' sick absence per person for non-disabled established staff was as follows: In 1938, 8.1 days for men and 9.3 for women; in 1951, 15.0 days for men and 18.4 for women. The corresponding figures for 1952 were not yet available. Mr. Gammans added that successive administrations had been disturbed about this alarming increase. It was estimated that if the figures were the same as before the war there would be a saving in staff of at least 6,500. Before the war the Post Office had its own doctors, whereas now the staff came under the National Health Service. He also said that the matter was under careful consideration in co-operation with the trade unions.

Prescription Costs

Mr. A. BLENKINSOP on March 19 asked the Minister of Health what was the estimated average number of prescriptions on each form and the average cost of each prescription at the latest available date, and how these figures compared with those before the introduction of the prescription charge. Miss PAT HORNSBY-SMITH replied that in England and Wales the estimated average number per form was 1.71 in February, 1953, 1.57 in May, 1952, and 1.59 in February, 1952. The estimated average cost was about 4s. 2½d. in December, 1952, compared with an average cost of 4s. 1½d. in May, 1952, and 3s. 10½d. in December, 1951.

Mr. BLENKINSOP suggested that the figures implied that the prescription charge had added to the cost per prescription in many cases, and had encouraged doctors, for understandable reasons, to add to the amount of drugs prescribed, and thereby increased considerably the amount of wastage. Miss HORNSBY-SMITH said the Minister could not accept that as the sole explanation. The main cause was increasing prescribing and expensive new drugs.

Mr. LESLIE HALE asked the Minister of Health on March 17 what was the estimated total net saving to the Exchequer, after making allowances for administrative costs and for the extra cost to the National Assistance Board, both direct and administrative, of the charge of 1s. on prescriptions from the time of its introduction to the nearest most convenient date for computation.

Mr. IAIN MACLEOD replied that the estimated net saving to the Exchequer from the prescription charges paid by patients in England and Wales between June 1 and

December 31, 1952, after the deduction of refunds made by the National Assistance Board, was about £2½m. Administrative costs, though not known in detail, would not materially affect this estimate. In addition there was a saving to the Exchequer during this period of about £1½m. because fewer prescriptions were dispensed than would have been expected if charges had not been introduced, though it was possible that other factors contributed to this decrease.

Doctors' Surgeries

Mr. A. BLENKINSOP on March 19 asked the Minister of Health what action he was taking to secure an improvement in the condition and equipment of general practitioners' surgeries. Dr. SANTO JEGGER also asked the Minister what regulations he had made on the standard of surgery and waiting-room accommodation in doctors' premises under the National Health Service, how many had been inspected by executive councils, and how many had been declared unsuitable.

Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, informed them that the relevant regulation was paragraph 7(4) and (5) of Part I of the First Schedule to Statutory Instrument 1948, No. 506. The Minister had no details of inspections by executive councils. He was, however, hoping shortly to discuss the best way of securing an improvement, where necessary, in the condition and equipment of general practitioners' surgeries and waiting-rooms with representatives of the medical profession.

Provision for Mental Hospitals

Mr. KENNETH ROBINSON asked the Minister of Health on March 19 what special capital allocation he was making for the coming financial year to meet the needs of the mental hospitals.

Mr. IAIN MACLEOD stated that it was for regional hospital boards to decide what particular projects should be included in their capital programmes, but he had again asked them to devote at least 20% of their allocations to mental health projects. In addition, two major mental health schemes were being financed from a special central reserve.

Mr. ROBINSON insisted that 20% was quite insufficient. Mr. MACLEOD agreed that this was probably the most serious problem facing the National Health Service, and it was precisely for that reason that he had insisted on the minimum figure he had given. The position would have been a great deal easier if in the first year or two of the Service a larger proportion of the resources had been devoted to mental health purposes.

Students' Suicides

Lieutenant-Colonel M. LIPTON on March 19 asked the Minister of Health whether he would appoint a committee of medical and other experts to investigate the high number of suicides in recent years among schoolboys and undergraduates. Mr. IAIN MACLEOD replied that the figures for suicides among boys between 10 and 14 were too small to be statistically significant. Separate figures for older students were not available. He was, however, aware of the concern about this problem, and, while he did not think it would be appropriate for him to set up a special committee, he was sure the problem would be carefully watched by all concerned.

He said in a further reply that the general suicide rate for boys and men between 15 and 24 was lower than the general rate and had been falling in recent years. The fullest facilities were available to universities for dealing with the general problem, and he thought the matter was best left to them. If they asked for his help he would be delighted to assist.

The Committee on the Disabled set up by the Ministers of Labour and Health and the Secretary of State for Scotland has two medical men as members, Sir Claude Frankau and Dr. C. G. Magee.

Help for Disabled.—Sixty-five local authorities in England and Wales have submitted schemes for promoting the welfare of physically handicapped persons. Other schemes are still coming in, and the Minister of Health does not propose to issue directions to authorities yet.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 7 (No. 9) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	22	1	8	0	4	33	2	24	0	1
Dysentery ..	289	39	97	0	5	647	82	82	10	
Encephalitis, acute ..	8	1	0	0		3	2	0	0	
Enteric fever: Typhoid ..	6	1	1	0		4	2	0	0	2
Paratyphoid ..	6	0	0	0		12	0	3(B)	0	
Food-poisoning ..	183	24		0		74	13		0	
Infective enteritis or diarrhoea under 2 years ..				9	24				12	16
Measles*	27,638	1621	465	135	369	6,233	153	512	192	158
Meningococcal infection ..	35	6	17	1	2	34	3	24	4	5
Ophthalmia neonatorum ..	42	3	7	0		31	1	9	0	
Pneumonia†	1,301	55	387	21	23	1,061	36	544	20	3
Poliomyelitis, acute: Paralytic ..	12	1		0	4	15	0		1	0
Non-paralytic ..	5	0				4	1			
Puerperal fever§	265	55	11	2		274	40	14	2	1
Scarlet fever ..	1,534	83	202	32	58	1,506	153	229	19	71
Tuberculosis: Respiratory ..			157	31				171	32	
Non-respiratory ..			33	3				36	2	
Whooping-cough ..	2,758	187	278	26	87	2,789	116	252	106	42

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	1	0	1	0	0	0	0	0	0	0
Dysentery ..	2	0		0		0	0		0	
Encephalitis, acute ..		0		0		0	0		0	
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	15	6	4	2	1	15		0	0	0
Influenza ..	193	19	10	3	5	49	3	18	0	0
Measles ..		0	1	0	0		0		0	0
Meningococcal infection ..		0	0				1			
Pneumonia ..	469	72	28	17	9	354	48		14	19
Poliomyelitis, acute	2	0		0		1	0			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis: Respiratory ..	134	10	16	2	7	170	30	32	3	17
Non-respiratory ..		4	3	2	0		3	4	0	2
Whooping-cough ..	3	0	2	0	0	0	0	1	0	0
Deaths 0-1 year ..	244	25	24	14	18	278	31	39	17	28
Deaths (excluding stillbirths) ..	6,706	915	721	159	207	6,630	975	739	150	238
LIVE BIRTHS ..	7,861	1173	864	197	485	7,756	1138	875	224	391
STILLBIRTHS ..	199	23	27			220	16	28		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

§ Includes puerperal pyrexia.

Vital Statistics

Smallpox in the North Country

The outbreak of smallpox which began earlier this month in Todmorden M.B. (Yorkshire, West Riding) and Bacup M.B. (Lancashire)—see last week's *Journal* (p. 682)—is continuing. Up to March 23 11 cases have been diagnosed. The districts affected are as follows:

TODMORDEN M.B.

There have been 9 cases with 1 death (on March 20). In addition to the 3 cases mentioned last week there have been 6 more secondary cases, all in the two households originally involved. These 6 patients were all under surveillance when they sickened and were promptly removed to hospital. Details of these cases are as follows:

Case 5. Female aged 13, daughter of Case 1. Unvaccinated until March 13. Illness began on March 17, and she was admitted to hospital on the following day. The rash appeared on March 20.

Case 6. Female aged 40, wife of Case 1. Vaccinated in infancy and revaccinated on March 13. Onset of illness on March 19 and admitted to hospital on that day. The rash appeared on March 20.

Case 7. Female aged 35. Lodged with Cases 2 and 3. Unvaccinated. Primary vaccination on March 15 and revaccinated on March 18. Onset of illness March 19 and admitted to hospital same day.

Case 8. Male, 19, son of Cases 2 and 3. Unvaccinated. Primary vaccination on March 15. Onset of illness on March 19 and admitted to hospital same day.

Case 9. Male, 14, son of Cases 2 and 3. Unvaccinated. Primary vaccination on March 15. Onset of illness March 19 and admitted to hospital same day.

Case 11. Male, 53. Contact with Case 1 for 30 minutes on March 11. Vaccinated in infancy and during 1914-18 war. Revaccinated on March 13. Onset of illness on March 21 and admitted to hospital on the following day.

BACUP M.B.

There have been no further cases since the first case reported last week. This patient died on March 13 in the Florence Nightingale Hospital, Bury C.B., and there have been no reports of illness among contacts under surveillance at Bury.

OLDHAM C.B.

An unvaccinated man of 26 living in this district and working as a cotton operative at Hollingwood, Chadderton M.B., fell ill on March 13. A rash developed on March 18 and he was admitted to hospital with smallpox on March 20 (Case 10). So far no human link with the other cases has been found. The mill in which this man worked may have received cotton waste or part of a consignment of raw cotton from the Todmorden mill at which the first 3 patients were employed, but it is too soon to say whether or not an extra-human source of infection is involved. This patient was living in a lodging-house in Oldham and unprotected contacts are numerous.

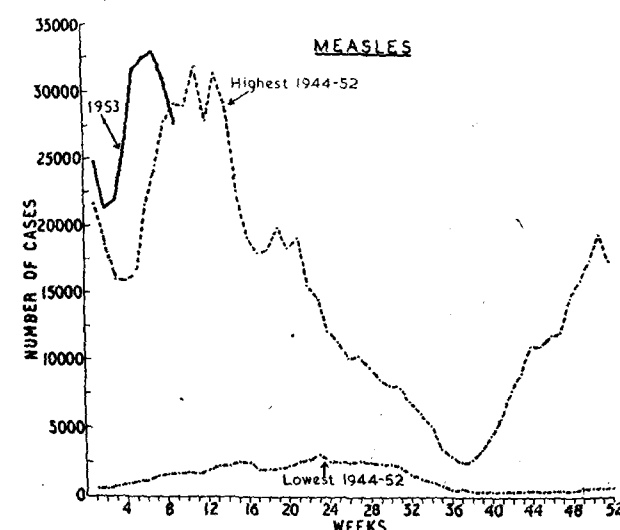
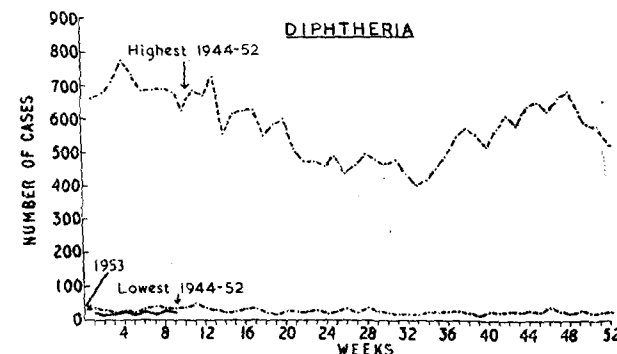
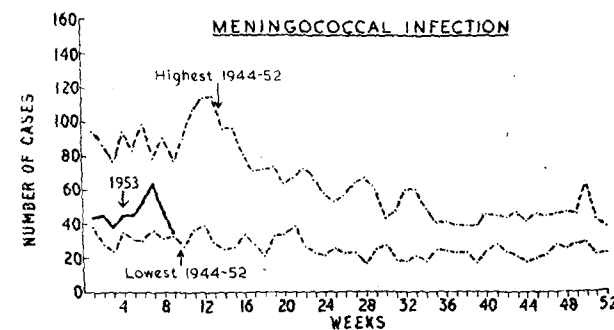
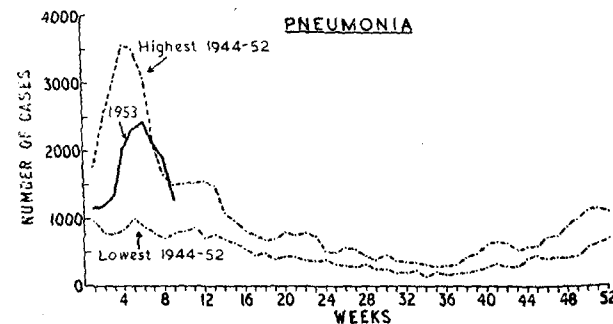
Of the 9 patients at present in hospital 2 are recovering and 3 are seriously ill. Eight are in the Oakwell Smallpox Hospital and 1 is in hospital at Ainsworth, near Bury. So far there are no reports of illness among contacts under surveillance at Halifax. The first of the Todmorden patients was originally admitted to the Halifax General Hospital.

Week Ending March 14

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,675, whooping-cough 3,072, diphtheria 31, measles 26,924, acute poliomyelitis 17, dysentery 362, paratyphoid fever 6, and typhoid fever 1.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The only large variations in the trends of infectious diseases in England and Wales during the week ending March 7 were falls of 3,246 in the notifications of measles, from 30,884 to 27,638, 596 for acute pneumonia, from 1,897 to 1,301, and a rise of 79 for scarlet fever, from 1,455 to 1,534.

The largest decline in the number of notifications of measles was 374 in Lancashire, from 1,829 to 1,455. In seven other counties a decrease of over 200 was recorded. Only small variations were recorded in the local trends of scarlet fever. The notifications of whooping-cough were 12 more than in the preceding week, rising from 2,746 to 2,758. With the exception of a fall of 145 in Lancashire, from 682 to 537, only small fluctuations occurred in the local trends of whooping-cough. 22 cases of diphtheria were notified during the week, being 5 fewer than in the previous week. The chief feature of the returns for diphtheria was a decline from 4 to 1 in both the counties of Devonshire and Warwickshire. The largest falls in acute pneumonia were 78 in Warwickshire, from 155 to 82, and 58 in Middlesex, from 104 to 46.

17 cases of acute poliomyelitis were notified during the week. Paralytic cases numbered the same and non-paralytic cases 4 more than in the preceding week. 3 cases were notified in the counties of Surrey and Huntingdon.

The notifications of dysentery, 289, were 37 more than in the preceding week. This rise was mainly due to an increase of 33 in Lancashire, from 58 to 91. The chief centres of infection in this county were Preston R.D. 53 and Liverpool C.B. 22. The other large returns were London 39 and Yorkshire West Riding 23 (Leeds C.B. 11). Only 5 cases of dysentery were notified during the week in Grimsby C.B., where 533 cases have been reported since September.

193 deaths from influenza were registered in the great towns, 120 fewer than in the previous week.

Medical News

Local Medical Societies.—Recent meetings have included the following: *Manchester Medical Society.*—On February 4 Dr. J. H. Kellgren opened a discussion in the section of medicine on "Clinical Uses of Cortisone and A.C.T.H." He was followed by Dr. S. Oleesky, and by Mr. A. S. Scott, who considered ophthalmic conditions. On February 5 Dr. R. G. Gordon Jones read a paper to the section of anaesthetics on "Epidural Anaesthesia." Multiple paravertebral blocks, he said, could be produced with a single injection of local analgesic into the epidural space. The solution escaped through the intervertebral foraminae into the paravertebral spaces, where it produced its effect on the spinal nerves. Dr. P. D. Kelsall followed with a paper on anaesthesia for bronchoscopy, and Dr. J. P. Payne with one on arteriotomy in neurosurgery. On February 25 Dr. C. M. Fletcher read a paper to the section of medicine on research into occupational dust disease, discussing the investigations carried out by the Medical Research Council's Pneumoconiosis Research Unit since it was set up in 1945. He said that two outstanding lessons had been learned: (1) the great importance of observer error in all clinical and radiological estimates of the severity of any disease; and (2) the distorted picture of the prevalence and the severity of a disease given by a hospital population compared with of a disease given by the same disease outside hospitals. *Liverpool Medical Institution.*—At a meeting on February 19 Dr. J. Berkson discussed "Oxygen, the Premature Baby, and Retrolental Fibroplasia." He suggested that as oxygen was a drug with certain toxic effects it should be given only in the lowest concentration required by the particular

patient. The discussion was continued by Mr. A. MacGregor, Reid and Dr. E. Dunsby. Mr. A. Sutcliffe Kerr then read a paper on "Unilateral Proptosis." *Chelsea Clinical Society.*—The sixth meeting of the 56th session was held on March 10 with the president, Mr. Eric Steeler, in the chair. A discussion on "The Medical Aspects of Road Accidents" was opened by Mr. K. L. Kelly, deputy secretary of the Automobile Association, and was continued by Sir Hugh Griffiths and Drs. L. G. Norman, David Matthews, Simpson Harvey, Skene Keith, and Brunton Blaikie. The date of the annual dinner was announced for May 12.

Sport and Medicine.—The British Association of Sport and Medicine had its first general meeting on February 27, with Sir Arthur Porritt in the chair. The president, Sir Adolphe Abrahams, told the meeting that the association, had been founded with the aim of making it the authoritative body on every medical aspect of athletics and exercise. It would advise on all the general principles of athletic training and on the various medical conditions which would and would not prohibit participation in sport. It would have to study the inevitable injuries of sport and its dangers, with particular reference to such problems as the effect of violent exercise during the incubation period of poliomyelitis and other infections, and the dangers of boxing, since so many fatalities in the ring had given rise to some alarm. Research would play an important part in the association's activities, and he hoped that this would break new ground—as, for example, the biopsy of the muscles of athletes.

Family Doctor.—A wide variety of interests are catered for in the April issue of *Family Doctor*, which is now on sale. The opening article presents the facts about smoking and health fairly and squarely: the reader can draw his own conclusions from them. Other informative and helpful articles are about the eyes (by Professor A. M. Low), tuberculosis (by Dr. Harley Williams), the chemistry of life (by Dr. J. Gordon Cook), accidents to children (by Professor John Craig and Dr. M. S. Fraser), toothpastes (by Mr. A. B. MacGregor), and "good health" (by Dr. Cuthbert Dukes). As usual there are a number of articles of special interest to mothers, besides the popular features—such as "Expert Advice," "Beauty and Health," "Family Doctor Speaking"—which now have an established place in the magazine. On nearly every page of the April issue there is useful information on subjects, of one sort or another, about which patients are so often inclined to ask questions of their doctor.

Faculty of Anaesthetists.—The Dean, Dr. Bernard Johnson, presided at the fifth anniversary dinner of the Faculty which was held at the Royal College of Surgeons on March 18. The Minister of Health, Mr. Iain Macleod, proposed the toast of "The Faculty," and drew attention to the great advances made in the art of anaesthesia. Anaesthesia, he said, was no longer the handmaiden of surgery but a true partner. The Dean, replying, referred to the great value of postgraduate teaching in anaesthetics in Britain. He announced that £5,000 had been given to the Faculty by John Wyeth & Brother to be used as scholarships for any overseas students in need of financial assistance. Dr. Johnson made a plea for a research department in anaesthesia which would be free from any other demands on its time. The toast of "The Guests," proposed by Dr. T. Cecil Gray, vice-dean of the Faculty, was acknowledged by Mr. A. A. Gemmell, P.R.C.O.G., and Mr. L. Farrer-Brown, secretary of the Nuffield Foundation.

Aetiology of Rheumatoid Arthritis.—A few copies of *The Aetiological Factors Associated With Rheumatoid Arthritis*, a report of the Empire Rheumatism Council Scientific Advisory Committee, are still available at the original price of 7s. 6d. It was published as a supplement to the *Annals of the Rheumatic Diseases*. Copies may be had on application to the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1. The report was prepared under the supervision of Dr. E. Lewis-Faning, statistician to the department of preventive medicine in the University of Wales. It is arranged in two parts—etiological factors and clinical

pattern. The conclusions are based on a total of 532 questionnaires completed at nine centres in England and Scotland, each patient being paired with a control subject of similar age, sex, and marital status. Other investigations carried out on large series of arthritic patients in Great Britain and abroad may usefully be compared with this national undertaking.

COMING EVENTS

Wessex Rahere Club.—The Spring Dinner of the Wessex Rahere Club will take place at the Castle Hotel, Taunton, on April 18. Further details may be obtained from the hon. secretary, Mr. A. Daunt Bateman, 3, The Circus, Bath.

British Association of Physical Medicine.—Annual meeting at University College Hospital Medical School, Gower Street, London, W.C.1, on April 17-18, 10.30 a.m. to 4.30 p.m. Lunch available each day (5s. 6d.). Annual dinner at Royal College of Surgeons on the Friday (tickets 35s.). Tickets must be applied for by April 4.

The Biochemical Society.—The 317th Meeting of the Biochemical Society will be a joint meeting with the Société Belge de Biochimie and will be held in the Faculty of Medicine, Brussels University, 115, Boulevard de Waterloo, Brussels, at 9 a.m. on April 11, when scientific papers will be read.

NEW ISSUES

Thorax.—The next issue (Vol. 8, No. 1) will be available in a week's time. The contents include:

- A STUDY OF THE ORIGIN AND DEVELOPMENT OF LUNG CANCER. C. Raeburn and H. Spencer.
CARCINOMATOUS ABSCESS OF THE LUNG. C. Strang and J. A. Simpson.
CERTAIN UNUSUAL RADIOLOGICAL APPEARANCES IN THE CHEST OF COAL-MINERS SUFFERING FROM RHEUMATOID ARTHRITIS. Anthony Caplan.
THE PHYSIOLOGICAL BASIS OF REFLEX OESOPHAGITIS IN SLIDING HIATAL DIAPHRAGMATIC HERNIA. John A. Aylwin.
THE BRONCHIAL ARTERIES IN PULMONARY EMPHYSEMA. L. Cudkovic and J. B. Armstrong.
FARMER'S LUNG: A REVIEW OF PRESENT KNOWLEDGE. C. J. Fuller.
ANOMALOUS PULMONARY VENOUS DRAINAGE. Alan R. Muir.
THE INFLUENCE OF STREPTOMYCIN ON THE INCIDENCE OF PLEURAL EFFUSION COMPLICATING THE DIVISION OF ADHESIONS. D. C. Beatty and A. Wiener.
A PRACTICAL MEASURE OF THE MAXIMUM VENTILATORY CAPACITY IN HEALTH AND DISEASE. M. C. S. Kennedy.

Published quarterly; annual subscription £2 2s., single copy 12s. 6d.

Annals of the Rheumatic Diseases.—The next issue (Vol. 12, No. 1) will be available in a week's time. The contents include:

- RHEUMATIC COMPLAINTS IN AN URBAN POPULATION. J. H. Kellgren, J. S. Lawrence, and Jean Aitken-Swan.
INTRAVENOUS COLCHICINE IN THE MANAGEMENT OF GOUTY ARTHRITIS. W. Graham and J. B. Roberts.
CLINICAL STUDIES OF PHENYLBUTAZONE (BUTAZOLIDIN) AND BUTAPYRIN IN RHEUMATOID ARTHRITIS, RHEUMATOID SPONDYLITIS, AND GOUT. E. G. Kidd, K. C. Boyce, and R. H. Freyberg.
RADIOTHERAPY IN ARTHRITIS. M. H. L. Desmarais.
GOLD, SODIUM, AND LIVER PUNCTION IN RHEUMATOID ARTHRITIS. G. D. Kersley, L. Mandel, and M. R. Jeffrey.
RHEUMATOID ARTHRITIS TREATED WITH "IRGAPYRIN." ANALYSIS OF TWENTY CASES. G. Achari, B. Mukopadhyay, and P. Sengupta.
PROSEPTASINE IN THE TREATMENT OF RHEUMATOID ARTHRITIS. L. J. Barford.
EFFECT OF AN ANTIHISTAMINE IN RHEUMATOID ARTHRITIS. D. C. Wilson.
MARIE-STRAUMPELL SPONDYLITIS IN WOMEN. T. Lloyd Tyson, W. A. L. Thompson, and Charles Ragan.
EFFECTS OF ACTH ON THE PERIPHERAL BLOOD FLOW IN RHEUMATOID ARTHRITIS. J. W. Beattie and A. Woodmansey.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d.

These journals are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, March 30

- HUNTERIAN SOCIETY.—At Talbot Restaurant, 7 for 7.30 p.m., dinner meeting. Discussion to be opened by Dr. Keith Simpson, Dr. Robert Forbes, and Mr. D. C. Norris: Professional Pitfalls.
ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: Myopia and the Care of the Myopic Patient.

Tuesday, March 31

- INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. D. F. O'Neill: Diagnosis and Management of Stress Disorders of the Skin.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor F. A. Henley: Gastrectomy with Replacement.

Wednesday, April 1

- INSTITUTE OF UROLOGY.—At St. Paul's Hospital, W.C., 4.30 for 5 p.m., Dr. W. N. MacCall: Diagnosis and Treatment of Gonorrhoea.

APPOINTMENTS

COLLINS, MICHAEL JOSEPH, M.B., B.Ch., D.P.H., Deputy Medical Officer of Health, County Borough of Doncaster.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—R. Lindsay, M.B., Ch.B., Anaesthetic Registrar, Norfolk and Norwich Hospital; Alice M. Creamer, M.B., B.Ch., D.P.H., D.P.M., Registrar in Psychiatry, Fulbourn Mental Hospital and Psychiatric Department, Addenbrooke's Hospital; J. Littlejohn, L.R.C.P.S.Ed., Registrar in Psychiatry, Fulbourn Mental Hospital; P. R. B. Noel, M.B., B.S., Medical Registrar, East Suffolk and Ipswich Hospital and Ipswich Borough General Hospital; D. J. Brewer, M.B., B.S., Medical Registrar, Foxhall Hospital, Ipswich; P. H. Cima, M.B., B.S., Medical Registrar, North Cambridgeshire Hospital and Clarkson Hospital, Wisbech.

HALL, T. S., M.D., D.P.H., D.Obst.R.C.O.G., County Medical Officer of Health and School Medical Officer, Shropshire County Council.

HELLER, ARTHUR DAVID, M.D., D.P.M., Assistant Psychiatrist, Deputy Medical Superintendent (Senior Hospital Medical Officer), Prudhoe and Monkton Hospital, Northumberland.

LAIDLAW, ALLAN JAMES, L.R.C.P.&S.Ed., L.R.F.P.S., Police Surgeon, City of Worcester.

NORTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD.—The following consultant appointments at the hospitals indicated in parentheses are announced: F. E. McLaughlin, L.R.C.P.&S.I., D.O.M.S., Part-time Ophthalmic Surgeon (Tilbury and Riverside); W. A. Hamer, M.B., B.S., F.R.C.S., Part-time Surgeon, and H. A. Pearce, M.B., B.S., F.R.C.S., Part-time Orthopaedic Surgeon (South-east Essex Group of Hospitals); J. N. T. Hutton, M.B., B.S., D.A., and H. R. Blades, M.R.C.S., L.R.C.P., D.A., Part-time Anaesthetists (St. Leonard's and St. Matthew's); Elizabeth H. Milne, M.B., Ch.B., D.A., Part-time Anaesthetist, St. Margaret's Hospital, Epping; Elizabeth D. S. Stephen, M.B., Ch.B., D.A., Part-time Anaesthetist, Broomfield Hospital, near Chelmsford; L. Citron, M.B., B.S., F.R.C.S., D.L.O., Part-time Ear, Nose, and Throat Surgeon, Chase Farm and other hospitals in Enfield Group; C. S. Savage, F.R.C.S., Part-time Ear, Nose, and Throat Surgeon, Southend-on-Sea Group of Hospitals; D. C. Arnott, M.B., B.S., D.C.H., D.Phys.Med., Part-time Physician in Physical Medicine, Queen Elizabeth Hospital for Children, London, E.

WARWICK, ELSPETH MARGARET, M.B., Ch.B., D.P.H., Deputy Medical Officer of Health, County Borough of Nottingham.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

- Brearley.—On March 17, 1953, at Mill Road Hospital, Liverpool, to Joyce Mary (formerly Hewitt) and Roger Brearley, F.R.C.S., of 55, Meadow Lane, West Derby, Liverpool, a son.
Green.—On March 7, 1953, to Dr. Elizabeth (formerly White), wife of Dr. D. M. Green, 3, Coupar Angus Road, Dundee, a daughter.
Jackson.—On March 15, 1953, at Glasgow, to Barbara, wife of C. R. S. Jackson, F.R.C.S., a son.
McCrath.—On March 18, 1953, at Freedom Fields Hospital, Plymouth, to Isabel (formerly McDonald), wife of Dr. John Anthony McCraith, a son—Nicholas Stuart.
Power.—On March 19, 1953, at Radley Lodge, Wimbledon, London, S.W., to Joy (formerly Parkes), wife of Dr. Norman Power, a second son.

MARRIAGES

- News.—Christmas.—On February 28, 1953, in Norwich, Norfolk, George Reginald News, M.B., M.R.C.P., to Patricia Mary Christmas, M.C.S.P.
Straschnov.—Hodgson.—On March 26, 1953, at St. Hilda's Church, York, George J. Straschnov, M.R.C.S., L.R.C.P., R.A.F., St. Eval, Cornwall, to Pauline M. Hodgson, S.R.N., of 25, Millfield Lane, Hull Road, York.

DEATHS

- Bartholomew.—On March 2, 1953, in a nursing-home, Francis Bartholomew, F.R.C.S.Ed., of Khartoum, Sudan.
Fielding.—On February 17, 1953, at Kelsall, Cheshire, Charles Robert Fielding, M.B., Ch.B., aged 56.
Horne.—On March 7, 1953, Walter Jobson Horne, M.D., M.R.C.P., of Highlands, Mereworth, Kent, formerly of Harley Street, London, W., aged 87.
Hutchinson.—On March 4, 1953, at Laverstock Nursing Home, Kingswood Road, Tunbridge Wells, Kent, Samuel Hutchinson, M.R.C.S., L.R.C.P., Hon. D.A., aged 70.
Lewellyn.—On February 25, 1953, at Manor Farm, Sutton Mandeville, Wilts, John Woodruff Lewellyn, M.R.C.S., L.R.C.P., formerly of Kingswood, Bristol, aged 74.
Lomax.—On March 6, 1953, at the Royal Infirmary, Liverpool, Harold Aloysius Lomax, M.B., Ch.B., J.P., of Bute House, St. Helens, Lancs.
McBean.—On March 3, 1953, at 352, Upper Richmond Road, Putney, London, S.W., Samuel Leslie McBean, M.B., B.S., aged 70.
MacDonald.—On March 1, 1953, in a nursing-home, Edinburgh, William Fraser MacDonald, M.B., Ch.B., of Olive Lodge, 42, Polwarth Terrace, Edinburgh.
Mason.—On February 28, 1953, Maurice Charles Mason, M.R.C.S., L.R.C.P., D.O.M.S., Surgeon Commander, R.N., retired, of Quarry Cottage, St. Leonards-on-Sea, Sussex, aged 67.
Moorhead.—On March 1, 1953, at Chipping Campden, Glos, the result of an accident, Charles Edward Moorhead, O.B.E., M.B., Ch.B.
Popham.—On March 1, 1953, at The Croft, Wrekenton, Co. Durham, Henry Nicholas Popham, M.B., B.S.
Russell.—On March 5, 1953, at Northcote House, Blackwater, Camberley, Surrey, Walter Ralph Russell, M.R.C.S., L.R.C.P., D.Obst.R.C.O.G., D.C.H.
Sawyer.—On February 22, 1953, James Edward Hill Sawyer, M.D., M.R.C.P., Lieutenant-Colonel, R.A.M.C., T.A.R.O., retired, of Little Holton, Burwash, Sussex, aged 78.
Skrimshire.—On March 2, 1953, at Hill House, Holt, Norfolk, Henry Finch Skrimshire, M.R.C.S., L.R.C.P., aged 79.
Star.—On February 19, 1953, Paul Hohling Mills Star, O.B.E., M.R.C.S., L.R.C.P., Surgeon Captain, R.N., retired, of Long Ashton, Somerset, aged 82.
Trimmer.—On February 27, 1953, at Orplington Hospital, Kent, Francis Inman Trimmer, M.R.C.S., L.R.C.P., late of 22, Sherard Road, Eltham, London, S.E.
Willcox.—On February 25, 1953, in a Glasgow nursing-home, Leonard Stephen Willcox, M.D., D.P.H., of Leabank, Dumbarton.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Wassermann Test in Infancy

Q.—What is the earliest age at which the result of a Wassermann test on a newly born infant can be regarded as conclusive? This is a problem when babies are offered for adoption.

A.—It is assumed from the question that the child's mother has suffered from syphilis. If this is the case, the result of one blood test would not be conclusive evidence. If a Wassermann reaction done within a week of birth is negative, it is almost certain to remain so when tested later. Nevertheless, a second test should invariably be carried out when the child is 3 months old.

If the first test is positive it may be due to: (1) A "carry over" of reagin from the mother, in which case the child's Wassermann titre will usually be lower than its mother's. On serial quantitative testing the positive serum titre of the child will show a progressive and uninterrupted fall, until it finally becomes negative at about 1 to 3 months, depending on the amount of reagin present at the time of the first test and the sensitivity of the serum tests employed. (2) Infection: in this case the Wassermann titre of the child's serum will remain stationary or rise during the course of a series of fortnightly quantitative blood tests.

Specimens of cord blood should never be sent to a laboratory for testing, because a positive result may be of no significance owing to the presence of its mother's reagin; also, many such specimens have an anticomplementary action due in most cases to infection, but in some to an inherent property of this type of serum.

Iodine for Water Sterilization in the Field

Q.—I understand that American forces in Korea have been using iodoglobulin for water sterilization. Please describe the method and compare its advantages and disadvantages with chlorination.

A.—The American specification (Mil-T-283A, dated December 7, 1950) for "Tablets, Water Purification, Individual, Iodine" requires each tablet to weigh not more than 120 mg. The tablets are to contain tetraglycine hydroperiodide 19.3 to 21.3 mg., sodium acid pyrophosphate 82.5 to 92.3 mg., and inert materials to be not more than 5% by weight. Each tablet must contain between 7.6 and 9.0 mg. of titratable iodine. The instructions for use require the addition of one tablet to a quart (about a litre) of water, and a wait of 10 minutes, or 20 minutes if very cold, before drinking. Two tablets are used instead of one if the water is dirty and discoloured. The tablets are packed in bottles of six, twenty-five, or fifty. So far as we are aware no other iodine preparations are being supplied to the American Army.

The advantages of iodine compared with chlorine are: (a) it does not form with ammonia slow-acting (on organisms) ammonia compounds—for example, chloramine; (b) it is not affected in its sterilizing properties by the reaction (pH value) of the water; (c) it is not so easily deviated by organic and other constituents of the water as is chlorine; and (d) it is reported to be more lethal to cysts of *Entamoeba histolytica* than chlorine.

Neither chlorine nor iodine has any bad physiological action when consumed in small quantities. Recent human feeding tests by the Americans have shown that a human being can tolerate 70 mg. of iodine daily without untoward effects. Iodine has the disadvantages that it is expensive and it colours the water yellow. This is regarded as an advantage by some people, as it shows that the water has been treated with iodine and is presumably safe to drink.

Exercises in Bed after Operation

Q.—What routine bed-exercises are recommended to forestall thrombotic and pulmonary complications in patients after abdominal and thoracic operations, from the operation to the fourteenth day?

A.—Post-operative bed-exercises can be divided into three main groups—breathing, leg, and abdominal. These are sometimes supplemented by arm and back exercises, but the latter will not be described here.

The details of treatment must obviously be varied according to the general condition and age of the patient. With a really ill patient the usual routine is: breathing; ankle, foot, and quadriceps exercise; further breathing; gentle hip and knee exercises; final breathing, with percussion if needed. For a recovering patient this routine is made gradually more vigorous up to the convalescent stage. The three main groups of exercises are carried out as follows:

Breathing.—The physiotherapist gives three types of breathing exercise—abdominal, lower thoracic, and upper thoracic. The first two increase diaphragmatic movement, and by giving the exercise against manual resistance the physiotherapist encourages the patient to "feel" the type of movement required. Breathing must be done slowly and deeply about six times and followed by a rest. The patient should concentrate upon the fullest possible inspiration and expiration. This is of real value in assisting the venous return as well as in preventing pulmonary collapse. Coughing should be encouraged, especially if there is any sputum, early rise of temperature, or other signs of pulmonary collapse. Springing the chest smartly (with hands on the ribs at each side, or with one hand over the sternum), especially during expiration, assists in expulsion of the bronchial secretions. It is best for the patient to sit up, leaning slightly forward and supporting the abdominal wound with his own hands. An alternative to springing the chest is clapping over the back with cupped and relaxed hands. Slapping the back can be painful and may cause the patient to tense his muscles. The great secret of all these coughing and springing exercises is to work away at them gradually until the patient attains confidence. There is little difference in the management of cases with abdominal or thoracic wounds, although special posturing and intensified physiotherapy may be needed in certain chest cases, such as following pulmonary resection for bronchiectasis.

Leg Exercises.—In the ill patient these are limited to bending and stretching of toes, pedalling the feet up and down, and ankle-rolling exercises. This may be followed by simple quadriceps drill: alternate lifting of the legs off the bed with knees straight, and sliding the heels up to the buttocks and down again. In the recovering patient these exercises are increased in range and vigour to include leg raising and circling, elevation and abduction of the straight leg, and sitting over the edge of the bed with legs swinging.

Abdominal Exercises.—Gentle exercises are done with the patient supine and the knees crooked up: the head and shoulders are then gently raised and lowered. More vigorous exercise of the oblique muscles is given by trunk-turning with arms stretched out sideways, and the patient then alternately touches each side of the bed with his hands. These can be supplemented by lateral bending of the trunk and back arching in the supine position.

The questioner has asked for information about bed-exercises from the operation to the fourteenth day, but it should be emphasized that it is of the utmost importance to train the patient before the operation. The amount of training required will vary both with the individual patient and with the operation. Full instruction in breathing exercises, and especially the diaphragmatic ones, is extremely important for male patients.

No answer would be complete without reference to the value of early ambulation as a supplement to these bed-exercises. The patient must, however, be up and active. It is certainly better for an ill patient to remain warm and gently exercising in bed than to be got up and allowed to slump in an armchair with bent and inactive legs. Although there is some difference of opinion about the value of early ambulation in preventing thrombo-embolic complications, there can be no doubt about its general moral and physical value to the patient. It is doubtful whether fatal embolism is much reduced, but troublesome leg thromboses are probably less frequent. In general, rising should begin between the second and fourth post-operative days; there is no

real virtue in immediate ambulation after operation. The subject of early ambulation was fully discussed in a leading article (*British Medical Journal*, 1948, 2, 1026).

Mixtures of Antibiotics

Q.—What mixtures of antibiotics can be given at the same time? Are any pharmacologically incompatible, and do the antibacterial actions of some neutralize those of others?

A.—There is no incompatibility between antibiotics in a pharmaceutical sense, but if by "pharmacologically" is meant an interference by one with the action of another this undoubtedly can occur. Such effects can readily be demonstrated *in vitro* and in some conditions experimentally *in vivo* when an antibiotic the action of which is mainly bacteriostatic or growth-inhibitory (aureomycin, chloramphenicol, or terramycin) is added to one which is bactericidal or directly lethal to bacteria (penicillin or streptomycin). Antibiotics of the latter class act only on multiplying bacteria, and if multiplication is prevented by the presence of a bacteriostatic substance their lethal effect is naturally delayed. This interference is closely conditioned by antibiotic concentration, bacterial sensitivity, and dose-time relationships, and it is uncertain how often it operates in the clinical field. A clear example of interference seems to be afforded by the experience of Lepper and Dowling,¹ who treated 43 patients with pneumococcal meningitis with large doses of penicillin only, of whom only 13 died (30%); of 14 patients also given aureomycin, 11 died (79%).

REFERENCE

¹ *Arch. intern. Med.*, 1951, 88, 489.

Cats at Night

Q.—How do cats see in the dark?

A.—No animal, not even a cat, can see in the dark, because if visual rays are completely absent the retinae cannot receive adequate stimulation. At the same time it must be admitted that many animals may be able to see under conditions which would not permit a human observer to do so. A number of different factors may act in combination in producing this difference. Of all the light which falls on the front of the eye from external objects probably little more than one-tenth finds its way in through the human iris even when this is widely dilated. This is because the F value (the ratio of focal length to aperture) in man seldom exceeds two. In cats, on the contrary, it may equal one, and, since the brightness of the image on the retina is inversely proportional to the square of the F value, it follows that in a cat this may be four times as bright as in a man. Having passed in at the pupil, a certain proportion of the light is absorbed by the crystalline lens and by the vitreous humour. In those animals which have small eyes with short paths through crystalline and vitreous these losses are less than they are in a human eye. Thus in this respect a cat is better off than a man and a mouse better off than either. It is possible that rays at the extreme ends of the spectrum, that is in the red and in the violet, may be made use of by small animals for visual purposes, whereas to a man they are practically useless because of their low intensity. In this connexion it may be of interest to recall the fact that patients who have had to suffer the loss of a crystalline lens are compensated to some extent by being able to see by means of violet and even by ultra-violet rays, which they were never able to do while the eye was intact. Having reached the human retina, most of the light is absorbed, in part by the photosensitive pigments, such as visual purple, on which sight depends, and in part by the pigment in the outermost layer of the retina. In many animals this layer constitutes a reflecting screen, or tapetum, by means of which the light is returned through the retina a second time. It is thought that this increases sensitivity to light at the expense of fine definition. Theoretically there are two other ways in which the retina could be made more sensitive still, by concentration of the photosensitive pigments, and by linking more receptor cells to each of the optic nerve fibres. Now, suppose that all these modi-

fications are to be found in the eyes of a particular category of animal, to what extent should we expect its eyes to show an improvement in performance? Only a very rough guess is possible—namely, that the animal in question may require no more than one-tenth of light than is required by a man for the same visual performance under twilight conditions. It should be emphasized that this advantage is not obtained without the introduction of disabilities. Usually it is visual acuity which is sacrificed. Thus the employment of a large F value means that the more peripheral zones of the lens system are brought into use, and these have more marked aberrations than the central zones, thus reducing visual acuity. The situation may perhaps be summed up as follows: In the design of the human eye resolving power has been given prior consideration, but in the design of other eyes other factors appear to have been more important. In the case of cats this seems to have been the ability to see in very poor light.

Efficacy of Abortifacient Drugs

Q.—How effective are the drugs commonly used in criminal attempts to secure abortion, in particular extract of ergot?

A.—Drugs such as strong aperients, lead, quinine, oxytocin and ergot preparations are almost completely ineffective as abortifacients in normal women, although they might disturb a pregnancy in a woman who has an unusual susceptibility to abortion. The ineffectiveness of such preparations by themselves is well illustrated by the fact that they are now rarely, if ever, even tried when therapeutic abortion is indicated. Moreover, it was not uncommon in the past to see pregnancy continue unaffected in women who had taken so much in the way of drugs that they themselves suffered from lead, quinine, or ergot poisoning. Again, quinine is given with impunity in malaria-infested countries, and ergot preparations can be safely used for migraine up to the last few weeks of pregnancy.

The oxytocics mentioned become more effective if they are used as supplements to local interference in the uterus—for example, rupture of the membranes, dilatation of the cervix, or intrauterine injections.

Safety of the Safe Period

Q.—What are the chances of conception occurring as a result of intercourse during the "safe period" in a young married woman with a regular menstrual cycle?

A.—In such circumstances conception is very unlikely, but it is always possible. The chances cannot be stated statistically, and they may, well vary according to the exact day in the "safe period" on which coitus takes place.

NOTES AND COMMENTS

Corrections.—Dr. J. R. HINDMARSH writes to say that in the article by him and Dr. D. Emslie-Smith (March 14, p. 593) the second paragraph should read: "Uncomplicated leukaemia presenting as acute polyarthritis has been described by many authors, and its rarity outside childhood . . ." not "in childhood."

The *Textbook of Medical Treatment* edited by Dunlop, Davidson, and McNee referred to in our review columns in the issue of March 21 (p. 661) was incorrectly entitled *Textbook of Medical Practice*.

"Any Questions?" Book: Second Series.—This is now available, price 7s. 6d. (postage 6d. extra), from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Brimedads, Westcent, London.* MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London.* B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh

BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 4 1953

THE SURGEON AND ISCHAEMIA*

BY

Sir JAMES LEARMONTH, K.C.V.O., C.B.E., Ch.M., F.R.C.S.Ed.

Regius Professor of Clinical Surgery and Professor of Surgery, University of Edinburgh

I am very conscious of the honour which the Horsley Trustees have done me in inviting me to deliver this Horsley Memorial Lecture. I have always regarded Victor Horsley as an Olympian. Indeed, I have a curious second-hand knowledge of him, for on more than one occasion the late Sir Charles Ballance, who assisted Horsley at the operation, recounted to me the dramatic story of the first removal of a tumour of the spinal cord. When I began to practise neurological surgery, many years ago, this led me to peruse Horsley's account of the operation, which was and is a model of orderly reasoning from physiological principles to practical therapeutics: to-day I can think of no better intellectual exercise for a student in the transitional period from preclinical to clinical work than a study of Horsley's procedure on that occasion, and of his reflections upon his own diagnostic problem and upon the technique which he used. That report exemplifies the aspect of Horsley's outlook and life's work which has always appealed to me most: his insistence that physiological hypotheses, and so far as possible operative procedures, should be tested experimentally before being incorporated into surgical techniques. How characteristic of him is the comment in his report that the choice between stitching the spinal dura and leaving it open is one which "requires experimental investigation at the present time." Here was a problem: it must be attacked—and when Horsley was concerned attacked is the right word—without any delay.

I deprecate any tendency to consider Horsley's great contributions to medicine as twofold—the physiological and the surgical. There was no dividing-line between the two. He passed from laboratory problem to clinical problem, and from clinical problem to laboratory problem, with the confident ease of one who was equally talented and equally skilled in both spheres. Possibly the only matters to which he did not apply the rigorous tests of the experimental method were certain of his own passionately cherished beliefs. That is the way of crusaders; and Horsley died, as he might well have chosen, in the midst of a crusade.

Perhaps it would have been more appropriate if I could have selected as the subject of this lecture some neurological topic. On the other hand, it seemed to me that Horsley would not have disapproved of my choosing to speak of some practical aspects of the vascular supply of tissues, to the clarifying of which contributions

have been made from laboratory, ward, and operating theatre. It seemed to me also that I might most conveniently approach my subject by considering first that ischaemia which is desirable.

DESIRABLE ISCHAEMIA

The objective of checking bleeding from injured tissues is quite understandably older than any attempt to provide the surgeon with a bloodless field for a planned intervention, and efforts to secure it did not necessarily depend upon a knowledge of the circulation of the blood. About the second century A.D., Heliodorus applied a bandage above the level of an amputation for gangrene in order to compress the vessels of the limb. This innovation could not have been based on pathological principles, for at the time the accepted technique was to amputate through the gangrenous and therefore presumably bloodless part of the limb. Probably about the beginning of the sixteenth century the site of amputation of a gangrenous extremity was moved to be proximal to the line of demarcation, a change in technique which soon produced the first of the special tourniquets (designed by Fabry) for use at amputations, and this original tourniquet has had many ingenious mechanical successors.

However, until the middle of the nineteenth century the tourniquet was merely a constricting band, and sometimes a destructive one at that. In order to provide a field in which the surgeon could operate upon an extremity unhampered by bleeding, in the eighteenth century Esmarch introduced his method of forcing the blood out of a limb by the centripetal application of an elastic bandage and the application of a second similar bandage at the root of the limb before the first was removed. This was, of course, a highly effective method of providing a bloodless field; but it was a purely mechanical one. An alternative method based on physiological principles deduced from both animal and hominal experiments was introduced about the same time by Lister (1879). Lister showed that on elevation of a limb its veins emptied by gravity and that after a few minutes its arteries underwent reflex contraction, so that the volume of blood entering the extremity was minimal; a tourniquet was then applied to the root of the limb. This was the kind of preliminary physiological investigation of a problem, carried out both in man and in animals, which finds many parallels in Horsley's investigations.

* Victor Horsley Memorial Lecture delivered at B.M.A. House December 11, 1952.

Tourniquet Paralysis

The occasional occurrence of paralysis after the application of tourniquets became too high a price for a proportion of the patients to pay for the surgeon's bloodless field, and posed the problem of the causation of the paralysis. The time during which it is possible to occlude the circulation to a limb without pathological consequences in the tissues distal to the constricting band might appear to be a figure which could be determined by a series of experimental observations on normal individuals; and indeed much work has been done on the subject. The times recorded by different workers, under different conditions, have been so variable that this is a problem to which the experimental method has not as yet provided a uniform solution.

In most of the reported cases of tourniquet paralysis the arm has been the site of application, at a level where the radial nerve is unusually exposed to pressure, and the pressure had often been concentrated by the use of too narrow a constricting band, which introduced the possibility of direct physical trauma to the underlying nerves. It seems to me of great significance that in those cases of tourniquet paralysis which have been investigated by surgical exploration the band employed has been narrow and unyielding, and that the operations have disclosed neuromata at the site of pressure (e.g., Speigel and Lewin, 1945).

Lewis stated that a nerve could withstand total ischaemia for at least 12 hours and possibly even for 20 hours, a period much in excess of that required for any operative procedure on the limbs; and I have seen complete recovery of the nerves of the lower limbs after acute aortic obstruction had existed for nine hours. It might be surmised that nerves which possessed an arteria comitans (median, sciatic) would be particularly vulnerable to ischaemia, and, indeed, in the arm Sinclair (1948) found the sensory territory of the median nerve to be first affected; but tourniquet paralysis of the sciatic nerve is rare, possibly owing to the diffuse pad provided for it by the overlying muscles. After the release of the cuff of a sphygmomanometer which has been inflated to above systolic pressure for periods up to at least 30 minutes, return of function in the nerves of the arm is usually rapid (within a minute or so); but, as I have said, there are considerable differences between patients in the effect of ischaemia upon nerves, so that individual susceptibilities, which cannot be assessed in advance, may lead to considerable divergences from this average figure.

Reactive Hyperaemia

There is a practical objection to the use of any tourniquet. After its release, and, as shown by Lister, whether the limb is elevated or not, there ensues in the distal part of the limb a period of reactive hyperaemia during which free bleeding occurs from innumerable tiny dilated vessels which do not lend themselves to forcipressure or ligation. Thus, at the end of an operation during which a tourniquet has been constantly applied, time must be allowed for this reaction to disappear, and for the effect of such simple haemostatic measures as the gentle pressure of warm moist packs. Because of the possibility of ischaemic lesions after the application of tourniquets, it is natural that techniques have been suggested by which the cessation of circulation in a limb is made intermittent by the timed removal and reapplication of the constricting band. But there are then a series of episodes of reactive hyperaemia, and a further serious objection to this method is provided by the observation of Barlow and Pochin (1948) that a

second subsequent period of ischaemia induced by reapplication of a tourniquet appears to interfere (even after a short—25 minutes—period) with the complete recovery of conduction in the nerves under the band.

Another objection to interrupting the time during which a limb is constricted by a tourniquet is one which has given me some thought. It is that at ordinary temperatures adequate metabolic exchange is maintained in a part only while flow is occurring in its capillaries. Temporary release of a tourniquet can be effective in supplying only one physiological requirement—the removal of accumulated metabolites; these must reaccumulate as the haemoglobin brought by the second and subsequent releases is reduced. I have come to hold the view that if the possibility of local trauma to nerves can be eliminated by the selection of a suitable tourniquet it is best to complete an operative procedure without releasing it, provided that at the termination of the operation time is allowed for the disappearance of reactionary hyperaemia before haemostasis is considered to be satisfactory and the wound is closed. The broad, soft segment of compression provided by the cuff of a sphygmomanometer is the method of choice. My experience leads me to believe that, provided that the tourniquet be properly selected and provided that the patient's arteries are normal, any undesirable after-effects of its use are due to ischaemia. They will occur only if the survival time for any tissue cut off from its blood supply is exceeded, and therefore should not happen after operations upon the limbs. In many peripheral operations a tourniquet is extremely useful, and sometimes it is indispensable.

Partial Ischaemia

The practice of securing *partial* ischaemia for operative procedures was sanctioned by Paré, who had the idea from Galen. Paré directed that vessels should be tied towards their "roots," and the technique was developed by various surgeons who had found that aneurysms could often be dealt with by tying the affected artery on the cardiac side of the aneurysm: in this matter surgical practice preceded physiological knowledge of the circulation of the blood. After the discovery of the collateral arterial circulation it was inevitable that attempts should be made to devise instruments which could compress percutaneously the artery feeding an aneurysm, without constricting the remainder of the extremity and so obstructing alternative arterial routes. This was obviously a technique which could be put to the test of experiment; and it was soon shown that local pressure exerted for four hours upon the radial artery of the horse led to the obliteration of the vessel by periarterial exudate.

This knowledge was applied to the treatment of aneurysms in man; but it has always been incomprehensible to me that it did not occur to anyone to test, on man, one very practical point—whether such concentrated local pressure could be endured. The literature abounds with reports of cases in which the method had to be abandoned because of the torture it occasioned. This is hardly surprising: one such instrument, employed by Sir William Blizard, was supported on "the outer part of the knee and the great trochanter, a piece of steel passing from the one to the other; and to the middle of this a semicircular piece of iron was fixed, which projected over the femoral artery, having a pad at its end moved by a screw, by turning which the artery was readily compressed and the pulsation in the aneurysm stopped, without any interruption to the circulation in the smaller vessels. But, although this patient possessed unusual fortitude of mind and indifference to pain, he was incapable of supporting the pressure of the instrument longer than nine hours."

The method of proximal arterial occlusion by ligature or by clamp was subsequently adapted to the temporary control of arterial flow when a lesion requiring operation was so near the root of a limb that the application of a tourniquet was impossible; but as a method of providing a bloodless field it suffered from the considerable disadvan-

tage that, when a collateral circulation was well developed, even high temporary proximal arterial occlusion might not secure a worth-while diminution in total arterial flow: and it was in these very cases—for example, proximal arteriovenous fistulae in the limb—that a bloodless field was always desirable and indeed often indispensable. When a tourniquet could not be applied to a limb there was until recently only one satisfactory alternative method, and it was applicable only to the lower limbs: on several occasions in the treatment of both urgent and chronic vascular lesions I have used with complete success Macewen's method of compression of the abdominal aorta by the pressure of the closed fist of an assistant, a manoeuvre which allows one to deal without haste with lesions involving the great vessels supplying the lower extremity.

Advantages of Induced Hypotension

It is not surprising that efforts have been made to secure ischaemic or partly ischaemic operative fields in the head and neck and in the trunk. My own experience has been confined to testing the usefulness of these efforts during operations on the trunk. It is obvious that in this region a relatively bloodless field can be produced only by some technique other than local—for example, by lowering the systemic blood pressure. Before describing briefly the technique evolved by my colleagues in anaesthesia, Dr. Gillies and his staff, I must first examine the question whether such hypotension is in the interests of the patient. There is no doubt that in the ischaemic field provided by induced hypotension the surgeon can perform an operation with great precision and speed, as a result of the ease with which structures can be displayed and identified. This is naturally for the good of the patient, who spends a shorter period with both *milieu intérieur* and *milieu extérieur* abnormal. Tissues can be disturbed with the maximum gentleness, and loss of blood is reduced to the minimum. On the other hand, before adopting any such hypotensive technique, the surgeon must be equally sure that certain hypothetical undesirable sequels will not occur.

First he must be certain that systemic hypotension of the duration proposed will not impair, temporarily or permanently, the function of any organ or any tissue, and particularly of any essential organ or tissue which is known to be unduly sensitive to ischaemia, such as the central nervous system, the heart, the liver, and the kidneys. Secondly, he must know that, after the period of hypotension is over, the return to normal of systemic blood pressure will not be followed by reactionary bleeding. It will be convenient to dispose of this second point by saying that in my experience the very bloodlessness of the field makes it easy to secure any vessel which may require occlusion, and that reactionary bleeding of sufficient degree to call for reintervention, or to complicate convalescence, has occurred in only 4 out of a total of 802 operations; in one case (haemorrhage from the middle sacral artery after excision of the rectum) it was fatal.

Thirdly—and Mr. Julian Taylor called my attention to this point—he must know that, especially in procedures which require large operative fields, sufficient circulation will be soon enough established after the wound is closed to provide adequate humoral defence-mechanisms against the multiplication and invasion of any stray organisms (whatever their origin) which may have gained access to it. In the method we use, the period of hypotension can be regulated by the anaesthetist, and can be shortened, if it be desirable, by the administration of such a drug as methylamphetamine hydrochloride. The total duration of the designed period has never exceeded three hours.

The first point—the general and local effects of hypotension—is of fundamental physiological importance. The integrity of any tissue depends upon its receiving an adequate quantitative and qualitative supply of blood. This is primarily a function of the cardiac output, which depends among other factors upon the maintenance of adequate total blood volume, a sufficient proportion of which reaches the

heart through the great veins. Fortunately there is now a large body of evidence, derived from both laboratory and operating theatre, that, at least for the periods required for the completion of most ordinary procedures, the fall of blood pressure and reduction in cardiac output do not result in impairment of function of vital tissue, provided that full oxygenation is maintained: with the stipulation that one has—as I am fortunate to have—anaesthetists of physiological outlook and of great skill.

The Hypotensive Technique

In my unit the method employed by Dr. Gillies and his staff to secure hypotension has been the production of generalized vasodilatation by paralysing, with a spinal anaesthetic, the preganglionic fibres of the whole thoracolumbar sympathetic outflow; the precise details of the method have been recorded (Griffiths and Gillies, 1948; Gillies, 1950). This method has the advantages of combining analgesia and muscular relaxation with the hypotensive state.

The association of hypotension with extensive spinal anaesthesia was noted as long ago as 1928 by Koster, so that the method is not a new one, but one which, as so often happens, represents the application of an old technique refined by the methods so often used by Horsley—laboratory experiment and clinical trial. First, the effect on the experimental animal of ablation of the spinal cord, segment by segment from its caudal towards its cranial end, has been studied from the points of view of increase in local circulation in the limbs and of reduction in systemic blood pressure (Hermann *et al.*, 1936). The former occurs when the segments supplying preganglionic fibres for the respective limbs are removed, the latter when the destruction of these segments is nearing completion. Secondly, it is now known that preganglionic sympathetic fibres emerging from the spinal cord in its anterior roots can be blocked by a concentration of anaesthetic—for example, procaine—approximately one-tenth of that required to paralyse the motor fibres with which they mingle; thus it can be easily arranged that sympathetic paralysis is more extensive than the anaesthesia and muscular relaxation actually required for any given operation.

Peripheral circulation in the limbs and reduction in blood pressure have also been investigated in man by noting their values at suitable intervals while the level of analgesia induced by lumbar puncture was allowed to spread cranially (Sarnoff and Arrowood, 1946; personal observations). Sarnoff and Arrowood added the important observation that the fall in blood pressure was not increased by any procedure which paralysed the skeletal muscles. The fall in blood pressure is the result of vasodilatation, which affects both arteries and veins. Arteriolar vasodilatation reduces total peripheral resistance; venous vasodilatation increases venous capacity, reduces return flow to the right heart, and diminishes cardiac output (Shackman *et al.*, 1952). Whether this is of itself deleterious depends upon its effect upon the flow in the capillaries, which since Krogh's time has been recognized to be the essential nourishing and oxygenating stage in the circulation of the blood. When hypotension is not the result of loss of blood or of plasma—that is, when the blood volume remains at a normal level—it does not affect capillary circulation adversely: indeed, our anaesthetists find that the rapidity with which cutaneous capillary circulation is restored after local pressure is one reliable index of the general condition of the patient.

It has been shown in our unit that the oxygen requirements of the tissues are related to the state of unconsciousness, and not to the plane of anaesthesia, and that when the cardiac output is lowered during the period of hypotension it is still sufficient to provide an adequate supply of oxygen. Moreover, the dilatation of the smaller arteries and arterioles prevents the occurrence of the phenomenon termed by Krogh (1922) "plasma skimming," in which during contraction of the vessels their branches receive only the

peripheral flow of plasma, the erythrocytes as they pass in the axial stream escaping the mouths of lateral branches. Plasma skimming results in local anoxia.

The intracranial structures can be selectively protected from the effects of hypotension by maintaining a "head-down" position. The veins in the field of operation can be emptied by gravity by so placing the patient upon the operating table that this area is at a higher level than the rest of the body. A further diminution of blood pressure may be secured by arranging the patient in such a posture that blood is "pooled" in the legs: an advantage of this arrangement is that, if the need arises, by elevating the limbs some or all of this pooled blood can be rapidly returned to the circulating component of the blood volume.

The orthodox view is that filling of the coronary arteries is maintained at a pressure which is the mean of systolic and diastolic pressures. In the hypotensive stage, in which we aim at a systolic pressure of approximately 60 mm. of mercury, the pressure available to fill the coronary arteries is greatly reduced; and, when atropine is not given before operation, paralysis of their sympathetic innervation exposes them to the unopposed constrictor action of the vagus nerves. Nevertheless, we have never found any clinical evidence at or after operation that, at least after periods of hypotension lasting up to three hours, the myocardium suffers any damage. Nor have we seen clinical evidence of hepatic damage; we realize that it is difficult to be sure of this, and consequently have seldom used the hypotensive technique in cases of known or suspected hepatic insufficiency. On four occasions we have encountered oliguria for 36 hours, after which normal urinary output was restored. We encountered four fatal cerebrovascular complications in a series of 16 patients who were operated upon for malignant hypertension; these operations were undertaken as a last resort. It is quite possible and even probable that the hypotension contributed to this complication, but not absolutely certain; we have had a similar complication appear in cases operated upon under a different technique of anaesthesia, by which every care was taken to maintain the blood pressure during operation at its preoperative level.

Other Ways of Producing the Hypotensive State

The hypotensive state may be induced by certain other methods. Hypotension follows the administration of suitable doses of ganglion-blocking drugs such as hexamethonium (Paton, 1952); the state produced is somewhat similar to that after the spinal blockade of preganglionic fibres, in that the blood volume is not reduced. In ganglion-blockade hypotension the blood pressure may be influenced by changes in posture and by the administration of sympathetomimetic drugs such as *noradrenaline*; obviously, additional provision must be made for analgesia and for adequate muscular relaxation. According to another technique, blood is removed by arteriotomy and returned to the circulation by intra-arterial transfusion as and when required (Gardner, 1946). In this method bleeding in the field of operation is reduced as a result of the general vasoconstriction which follows the abstraction of large quantities of blood from the circulation; in my view intense general vasoconstriction increases anoxia as a result of plasma skimming by the terminal arterioles.

The production of an ischaemic field in the trunk by the employment of a hypotensive technique should not be routine even when both anaesthetist and surgeon are familiar with it, although it provides conditions so favourable that I for one must regularly remind myself of this. It is unsuitable for the elderly and for those suffering from organic cardiac disease. The surgeon must take the greatest care to control what bleeding there is, and must remember that any loss of blood is badly borne by patients in the hypotensive state, especially if it be a rapid loss consequent on some unforeseen operative complication. Any such loss should be at once replaced by transfusion: usually transfusion is not required, and indeed one advantage of the method is that

it reduces demands upon the transfusion service. I regard hypotensive anaesthesia, when used with judgment, as a major contribution comparable to the introduction of the safe tourniquet.

Cooling Technique

Earlier I emphasized that in ordinary conditions and at ordinary temperatures each tissue had a minimum requirement of oxygen. This oxygen requirement is not always a fixed one: thus in man it can be lowered by producing a state of unconsciousness, and in many other animals it is drastically reduced during states of hibernation. It would be of great physiological interest, and possibly of clinical importance, if methods could be devised by which an organism could be brought into a condition in which its requirements of oxygen were reduced to a level so low that its tissues would withstand abnormally long periods of ischaemia without any subsequent interference with function. The first stages of an investigation of this speculative kind must obviously be carried out in the experimental laboratory; and a possible approach is the application of the knowledge that the speed at which physico-chemical reactions (and therefore metabolic processes) are completed is retarded by reducing the temperature at which they are occurring. Much highly important fundamental work on these lines has been originated in Toronto by Bigelow and his co-workers (1950), who have subjected dogs to surface cooling; they found that their animals did not develop an oxygen debt.

In the Wilkie Surgical Research Laboratory in Edinburgh, Dr. Delorme (1952) has cooled dogs by passing arterial blood through an extracorporeal cooling system and returning the cooled blood to a vein. By this procedure the temperatures of the animals were stabilized at between 22 and 26° C., the normal temperature of the dog being 38° C. At temperatures of this order he found that tissues such as those of the central nervous system and the viscera could be completely deprived of their blood supply, as by a tourniquet, for periods in excess of those lethal at normal temperatures, and that without any transient or permanent evidence of loss of function. As Delorme remarks, a combination of the hypotensive and cooling techniques has many possibilities in facilitating and extending surgical procedures, particularly perhaps those employed in cardiac surgery. This work is continuing: there are some technical problems and clearly many physiological problems still to be investigated.

These, then, are some aspects of desirable ischaemia. Some are long-established as useful, some only recently so: still others have to prove their applicability to practical surgery. All have lent themselves to the combination of investigation and trial in both laboratory and clinic which was so faithfully pursued by Horsley throughout his professional life.

UNDESIRABLE ISCHAEMIA

For the remainder of this lecture I shall deal with certain aspects of ischaemia which are known or suspected clinically, and about the genesis of which fundamental information is almost completely lacking. Any observations I make must therefore be highly speculative, and confined to generalities.

It is well known that the local reaction of any tissue to noxious stimuli—which include incisions made by the surgeon's knife—is made up of two main components (Lewis, 1927). These are: (1) at the site of application of the stimulus, dilatation of minute vessels and swelling which results from the outpouring of plasma from capillaries; and (2), in the vicinity of the site of the stimulus, a "flare" which results from dilatation of the neighbouring arterioles, a dilatation mediated through an axon reflex involving local sensory nerve fibres. Both these components are factors in the humoral mechanism of tissue-defence and tissue-repair. When the lower sensory neurones supplying an area have been interrupted—or, to be more accurate, after they have

undergone Wallerian degeneration—the flare no longer occurs when a stimulus is applied to the denervated area. Thus even when the blood supply to such an area is intact its tissues may be regarded as relatively ischaemic so far as local defence and local repair are concerned*; and this is the minimum degree of ischaemia which can be recognized clinically.

This lack of completeness of the local vascular reaction no doubt accounts for the indolent appearance so characteristic of the small cutaneous lesions which may occur in an area of anaesthesia resulting from the division of a peripheral nerve. The same appearance is seen in the ulcers of the face which may occur after section of the posterior root of the trigeminal nerve, although in such circumstances the peripheral sensory axones are still in continuity with their parent cells in the Gasserian ganglion: it would seem that, in these circumstances also, the functional capacity of peripheral axones is seriously impaired, if not abolished (N. M. Dott, 1952, personal communication). Professor Dott has found that the appearance of such facial ulcers may be prevented by preliminary cervical sympathectomy, and that, if one is present, rapid and permanent healing is assured after cervical sympathectomy. In such cases the primary operation of posterior root section does not interrupt the vasoconstrictor fibres destined for the face, which reach the skin supplied by the trigeminal nerve by way of the periarterial plexuses round the branches of the external carotid artery. On the other hand, when a peripheral nerve is divided, the vasoconstrictor fibres which are ultimately distributed by way of its sensory branches are interrupted: the denervated part remains warm until Wallerian degeneration has occurred, and thereafter is consistently colder than normally (Richards, 1951).

This peripheral sympathectomy does not seem to reduce the incidence of cutaneous lesions in the denervated area or to favour their repair. In such an anaesthetic area, what modification, if any, occurs in the healing of lesions, accidental or made by the surgeon, as a result of the curtailing of the vascular response to injury? From a not inconsiderable experience of such cases I agree with the view that the process of repair is retarded. A somewhat similar problem is posed when amputation becomes necessary in a lower limb, the distal parts of which are anaesthetic as a consequence of congenital lesions of the cauda equina. In such cases it is, I believe, wise not to include anaesthetic skin in the flaps. I do not base this view on the inevitable instability of the anaesthetic skin when it is ultimately sheathed in a prosthesis. Even when complete protection is afforded to the original wound by encasing the stump in plaster-of-Paris, its union is slower than normally, and its edges are more apt to show localized patches of necrosis in the neighbourhood of stitches. Lumbar sympathectomy will improve the blood supply to such anaesthetic areas, because their vasoconstrictor fibres join the peripheral nerves which supply them distal to the level of interruption of their sensory fibres.

Although we may attribute them to relative ischaemia, we are quite ignorant of the ultimate cause of these variations in healing, and even of the stage or stages at which the delay in healing occurs. Thus it may be that the initiation of the process of repair is delayed, or that the ultimate production of collagen fibrils and the return of fibroblasts to the resting phase is postponed. It is true that in man (although not in many other animals) the end-stage of repair of many tissues is often fibrosis; but in the majority of clinical cases this is the direct result of impairment of blood supply from organic arterial disease, whereas in the conditions to which I have been referring the vascular tree is normal, although its response to a demand for tissue repair is incomplete. Defects in a process so species-specific should obviously be studied by observations on man.

*Nevertheless accurate measurements of the temperature of the skin around such lesions (Doupe and Cullen, 1943) have shown that the purely local reaction leads to increased warmth.

Some Problems

There are many gaps in our knowledge of the more common problems which may confront surgeons in those forms of ischaemia which are due to definitive lesions of arteries—problems so numerous that I shall have to select some which have interested me most. First let me consider one aspect of acute diminutions of arterial supply. It has seemed to me that when there is no organic disease of the arterial tree the most striking recoveries after surgical relief from potentially dangerous situations have occurred in patients who have not ceased to grow, or have only lately ceased to grow: and in addition I should place in this favourable group young women who have recently borne children. This is a personal view, and a clinical view at that, and I realize that I cannot offer you scientific proof of it. Nevertheless I believe that it is not outside the bounds of possibility that these patients have something—call it what you will—circulating in their blood which potentiates the recovery and repair of ischaemic tissues to a degree not found in other groups; including, for example, the reduction of loss of tissue to an unexpected minimum and the taking of skin grafts placed upon indubitably ischaemic areas. This is the sort of hypothesis that might come to trial; and, if it prove to be soundly based, might be found to depend upon some asset of a general biological nature common to animals—including man—at these stages of life.

When I come to consider chronic and acute-on-chronic ischaemia I must confess that again we lack much fundamental information. In most situations man is so overarterialized that arterial obstruction may progress unnoticed until—and perhaps suddenly—the supply of blood is reduced below minimal requirements. The results of this reduction range widely from death of the individual to death of a small block of tissue. We are still two stages distant from having complete knowledge of the whole process.

The penultimate stage is the ability to recognize ischaemia before it is clinically evident. It is true that in the case of the limbs, which are the most accessible for such measurements, we now have instruments of precision such as plethysmographs which greatly increase the delicacy of estimations of the blood flow. Yet we have still to apply to the problem the method of mass observation, introduced to the profession by Jenner, in which a sufficient sample of the population would be observed over a sufficient length of time in order to determine the earliest change measurable by the apparatus at present available.

The ultimate stage, which may and probably does follow the penultimate after a considerable interval, is the determination of the pathological physiology which initiates obliterative processes in the arterial tree, the established morphological details of which are well enough known. As Leriche has said, the initial changes are so minute that they are probably of an order at present undetectable. Indeed, the search must be to some extent a blind one, for we do not really know what to look for. Any investigation on these lines must also take cognizance of many variables—for example, the appearance of degenerative processes in infancy, the beginnings of which must be during intra-uterine life; and the strange immunity to degenerative changes possessed by certain vessels, such as the peroneal artery of the leg and the interosseous arteries of the forearm, whose ageing, if ageing it be, is so much slower than that of arteries running within a centimetre or two of them. When we acquire this information, our next objective should be to find some way of preventing the changes in the walls of arteries which sooner or later lead to the presentation to blood, as it circulates, of mural areas which favour thrombosis, with all its possible disastrous sequels—loss of intellect and power, loss of cardiac muscle, loss of limb.

Although this must remain the correct objective, if we were able to detect pre-ischaemia, and if we had the opportunity of looking for examples of it in the population, we might possibly reduce the number of clinically evident cases,

and mitigate the severity of those which do occur, by bypassing the morphological issue and, as an expedient, raising to prophylactic levels the amount of anticoagulant substance derived from humoral sources normally circulating in the blood. At the present time this is possible experimentally: when introduced into the portal circulation, curare increases the output of heparin from the liver. Unfortunately, even if a suitable pharmacological preparation were available, therapy of this kind would need to be continuous, for we do not know whether a tendency to clotting—"pre-clotting"—precedes episodes of thrombosis by a long period or a short one. Moreover, investigation along such lines might not commend itself, because on occasion clotting is a valuable protective mechanism, and to suggest its abolition transgresses a clinical precept which is usually sound enough—that one must never try to correct one pathological process by substituting another; although in this particular problem I should not subscribe to that view.

Conclusion

I fear that, by selecting so vast a subject as ischaemia to be the topic of this Memorial Lecture, I have been constrained to be so eclectic that it may seem to lack continuity. If that be so, the fault is mine.

While I was engaged in preparing the address, more than once I had the feeling that here was a matter on which I should have liked to enlist Horsley's advice and help. I venture to repeat that the lecture has been designed to illustrate that oneness of the laboratory, the ward, and the operating theatre so well exemplified by Horsley's life's work. Indeed, there is something more than oneness. For there is holism in surgery as well as in philosophy—the tendency for the final accomplishment to be greater than the sum of the contributions from each of these three arbitrary divisions of our efforts.

To few in our profession have been given those twin gifts without price: the genius to produce ideas, and the steadfastness of purpose to pursue their ideas as ideals. Such a one was Victor Horsley.

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Two new American journals were published in January, —*Applied Microbiology* and the *Journal of Histochemistry and Cytochemistry*. The agents in this country are Messrs. Baillière, Tindall and Cox, and orders for the journals may be sent direct to them or placed with any bookseller. Annual subscription for *Applied Microbiology* is 63s. post free, and the journal will be published bi-monthly. The other journal is the official organ of the Histochemical Society of America, costs 60s. per annum, and will also appear bi-monthly. The *American Surgeon* is the new name given to the *Southern Surgeon*, official publication of the South-eastern Surgical Congress of America, to mark its widened scope as a general surgical journal. It is published monthly, annual subscription 82s. Messrs. Baillière, Tindall and Cox are the British agents.

HEALTH OF PREMATURE CHILDREN FROM BIRTH TO FOUR YEARS*

BY

J. W. B. DOUGLAS, B.M.

AND

C. MOGFORD, B.Sc.

This paper describes the health of a national sample of premature children who have been observed during the first four years of their lives and compared with a carefully chosen group of "controls." Details of their growth and development will be published in subsequent papers.

Some 40,000 of the babies born each year in Great Britain weigh at birth 5½ lb. (2.5 kg.) or less, and by international agreement are classed for statistical purposes as premature. Approximately a quarter of them die before they are a month old, and it has been claimed that many of the survivors, as a consequence of prematurity itself or of the antenatal conditions leading to it, are sickly, stunted, or mentally retarded. It is probable that in the future we will be able to save the lives of more of these babies, and it is important to know how large a proportion will be handicapped in later life and what institutional or other special care they will need.

At first sight it seems that these questions could be easily and directly answered by tracing in later life children who had been prematurely born. Many studies of this type have in fact been made, the majority being concerned with growth and development rather than with health. But the results have been conflicting. Some reveal prematurity as a major cause of mental backwardness and dwarfed growth, whereas others show premature children as retarded only to the extent that they were born before term.

The difficulties of tracing children after a lapse of years are great, and few investigators have found more than half the survivors for whom they were looking. Moreover, depending on the channels through which they have had to work, some appear to have been more successful in tracing the abnormal children and others in tracing the normal ones. They have also, in general, been content to compare the health and development of premature children with "national averages," often obtained many years earlier from highly selected groups and by methods differing widely from those used in their own inquiries. A few have compared premature children with a random sample of children born at term during the period of their inquiry, and others have compared each premature child with its sibs. None of these methods is satisfactory, because prematurity is not distributed at random in a series of births. Premature children tend to be female, to be first-born, to come from the poorer classes, and to have mothers who are above the average age for child-bearing. And unless they are

*This follow-up survey of premature children is being made by a joint committee of the Institute of Child Health (University of London), the Society of Medical Officers of Health, and the Population Investigation Committee. The chairman of the Committee is Professor James Young, the vice-chairman Professor A. A. Moncrieff, and the secretary Professor D. V. Glass. The Nuffield Foundation has financed this inquiry during the pre-school years, and a grant for continuing it in the primary school period has been made by the Board of the Hospital for Sick Children, Great Ormond Street, through the Institute of Child Health.

compared with mature children chosen to conform to this pattern it is doubtful what weight can be attached to any differences in growth or health that are observed. It is likely, then, that the conflicting results of previous studies have arisen from the difficulties of obtaining an adequate sample of prematurely born children and of finding a suitable group of children born at term to compare them with.

Description of the Present Survey

We have had the good fortune to follow up over a period of four years the health and development of a national sample of children who weighed at birth 5½ lb. (2.5 kg.) or less and to compare them with a carefully selected group of children who were heavier at birth.

This sample was obtained in 1946, when a Joint Committee of the Royal College of Obstetricians and Gynaecologists and the Population Investigation Committee, with the help of medical officers of health and health visitors throughout the country, investigated all confinements taking place in England, Wales, and Scotland during the first week in March of that year. Out of a total of 458 maternity and child welfare authorities, 424 took part in this inquiry, and detailed medical and social information was obtained about 91% of the births notified in these authorities during the chosen week. In all, 13,687 women were interviewed by health visitors eight weeks after the birth of their babies. The information given by them and obtained from their records formed the basis of a report on the maternity services (Royal College of Obstetricians and Gynaecologists, 1948).

We have chosen as our sample of premature children all legitimate singletons who were notified to us during the survey week and who weighed 5½ lb. or less at birth. We are, of course, aware that not all babies of this weight are premature in the sense that they are born before term. But the weight standard of prematurity is generally accepted, and has been used in the more recent studies of the health, growth, and development of premature children; and it would be foolish to present our material in a form that could not be compared with the results of many of the studies that had preceded it. To talk about "children weighing 5½ lb. or less at birth" is clumsy, and we have preferred to use the term "premature" to describe them, since, although inaccurate, it is established by long usage. For the same reason we have not attempted to use different weight standards of prematurity for the two sexes.

Each premature child in the sample was paired with another child selected from the remaining legitimate single-born children in the sample, who was of the same sex, age, and place in the family, who came from the same type of home background, lived in the same locality, and had parents of the same age and social class. We have been able to match the majority of the pairs very closely owing to the large numbers of children from whom we could draw; even so, a perfect match was not always forthcoming, and a certain latitude has been allowed. For example, if a suitable match for a premature child could not be found within the area of the authority where he was born, the search was extended to other similar authorities in the same geographical region; 17% of the pairs were matched from different authorities. It was also not always possible to match exactly for birth order. While first births were always paired with first, second births might be paired with third, and third births with second or

fourth, etc. During the course of the inquiry a few mistakes in matching were found, and then the original control was discarded and a new one chosen. A premature child was also re-matched when his paired control had left the country; but when either member of a pair had died the survivor was retained in the survey.

Health visitors saw these children and interviewed their mothers on three occasions—when they were 2 months, 2 years, and 4½ years old. At these interviews information was obtained on home conditions, hospital admissions, colds, and certain specified illnesses, and arrangements were made to weigh and measure the children at welfare centres. Information about the course and duration of pregnancy and the care given to the child after birth was obtained from the records of hospitals and midwives.

This comparative study of children born prematurely and at term is part of a much larger inquiry into the health, growth, and development of a national sample of children. This larger inquiry (which will be referred to as the "main survey") is mentioned here because it provides figures on deaths and illnesses which are referred to in this paper. The detailed planning of it has been described elsewhere (Douglas, 1951).

Loss from the Sample

Birth weights of 5½ lb. or less were recorded for 851 single-born children in the 1946 sample, of whom 67 were stillborn and 72 were illegitimate, and accordingly excluded from further study. Five of the remaining 712 children were later found to have weighed more than 5½ lb. at birth, and a further 31 were excluded because so little was known of their home backgrounds that they could not be satisfactorily paired with controls. In retrospect we feel it was a mistake to exclude these 31 children, since much of the missing information would have been obtained during the later surveys. We were left with 676 premature children and 676 paired controls, and we have had considerable success in tracing the survivors (Table I).

TABLE I.—Losses of Premature and Control Pairs, 1946–50

		No. of Pairs
Unavoidable loss	Death	173
	Emigration (1946–8)	21*
Avoidable loss	Refusal	6†
	Untraced	2†
Still in survey		464

* Alive at time of emigration.
† All known to be living in 1950.

In this paper our main interest is in the 472 pairs both members of which were still living in this country in June, 1950, when they were 4½ years old, and the 10 pairs emigrating in 1948–50. Of these 482 pairs, 474 (98.3%) have been successfully retained in the sample, and we have been able to check from official sources that the two children who could not be traced and the six children whose parents refused to help were still living at the time of the last survey. The losses through death and emigration are heavy, but represent a natural decrease in the sample which can hardly be said to have biased it. There is, moreover, no reason to believe that the children who emigrated with their families left this country owing to ill-health; on the contrary, they are likely to be a particularly healthy sample, as all emigrants, including babies, undergo a strict medical examination.

The actual loss of information is rather greater than the figures in Table I suggest. When their mothers were ill or working, the forms for some children were only partly filled in. Other mothers were unable or unwilling to answer certain questions. The loss from these causes varies from table to table, as will be seen below, but for most illnesses it is small.

Survival and Health

(a) Survival

Before describing the illnesses encountered by the 474 pairs of children surviving at 4½ years, it is appropriate to make a brief comparison of the mortality rates in the premature and control samples. These are shown in Table II, which also gives the equivalent rates for all children in the "main survey sample" who weighed over 5½ lb. This further comparison is required because the mortality rates for the controls, being based on few deaths, are of low precision; but in fact they are similar to and not significantly different from the rates derived from the larger sample.

TABLE II.—*Death Rates of Premature Children, Their Controls, and Mature Children in the "Main Survey"*

Age	Monthly Death Rates per 1,000 Survivors			Significance (n=1)
	Premature Live Births (676)	Control Live Births (676)	Live-born Mature Singletons in "Main Survey" (5,033)	
Neonatal ..	211.84*	9.11	10.79	0.02-0.01
1-12 months ..	3.37	1.81	1.09	
13 months-4½ years ..	0.36	0.15	0.19	

* Comparing premature children and controls.
For neonatal deaths, $\chi^2=139.34$, $n=1$, $P<0.001$.
For later deaths, $\chi^2=5.27$, $n=1$, $0.05>P>0.02$.

These figures support the view that the high mortality of premature children extends beyond the first month of life. At ages between 1 month and 4½ years these children appear to be abnormally likely to die from lower respiratory infections, congenital defects, and nephritis, as Table III shows. They are compared, in this table, with the mature children of the main sample and not with their controls, in order to have a greater number of deaths on which to base the comparison. Even so, the numbers are relatively small and the differences in death rates, though statistically significant, need confirmation.

TABLE III.—*Causes of Death Between 1 Month and 4½ Years*

Causes of Death	Yearly Death Rates per 1,000 Survivors			Significance (n=1)
	Premature Children (543 Surviving at 1 Month)	"Main Sample" (4,979 Mature Singletons Surviving at 1 Month)		
Bronchitis and pneumonia ..	4.88	1.35	10.90	<0.01
Other infections ..	2.17	1.83	0.002	
Congenital defects ..	4.33	0.58	23.00	<0.01
Nephritis ..	1.08	0.05	7.00	
Other causes ..	1.62	0.63	1.18	0.3-0.2

(b) Nature and Reliability of Our Information on Sickness

Our information on the illnesses of these children was obtained during interviews with their mothers when they were 2 years and 4½ years old. No comprehensive account of ill-health could be expected to result from this method of approach, and our inquiries were confined to certain specified events and conditions that the mothers would be likely to remember. The following information was asked for and has been used in this paper:

(1) Details of all accidents or illnesses that resulted in admission to a hospital or nursing-home. Mothers were asked to give the reason for admission, the age of the child when admitted, the length of stay, and the name and address of the hospital or nursing-home.

(2) Details of all lower respiratory infections and infectious diseases of childhood which were treated by the family doctor or in an out-patient department of a hospital.

(3) Estimates of the number of colds experienced by each child during the months immediately preceding each interview.

The questionnaire method is open to several sources of error. Events may be forgotten or they may be so garbled that no useful purpose is served by recording

them. They may be remembered but wrongly dated, or they may be attributed, in large families, to the wrong child. We are fortunate in having, for illness resulting in hospital or nursing-home admissions, an absolute check on the extent of these different types of error. During the survey the mothers were asked to give the names of the institutions to which their children were admitted, and we have been able to trace the records of 151 out of the 186 admissions of children in the premature and control sample. Some hospitals had destroyed their records, some have not yet replied, and the addresses of a few others were indecipherable; but the 35 admissions which were not directly checked with the hospitals for these reasons have been confirmed again by further questioning of the mothers, and we are satisfied that the information relating to them is now correct.

When the hospital and nursing-home records are compared with the accounts given by the mothers of the 151 children admitted to them, it appears that 70% of dates were remembered correctly to within a month of the actual time of admission. A further 19% were between two and six months out, and 11% were less accurate than this. A cluster of errors of twelve months suggests that some of the larger discrepancies arose from verbal or recording mistakes rather than from faulty memories. The admissions were as often antedated as post-dated, and Table IV shows that

TABLE IV.—*Ages of Admission to Hospital and Nursing-home*

Source of Information	Age at Admission (Months)				Total
	0-13	14-25	26-37	38-51	
Mother* ..	42	38	28	43	151
Records† ..	42	35	32	42	151

* As remembered by the mothers.

† As given by the institutions.

there is a remarkable similarity between the age distribution of admissions obtained for the same children from the records and from the mothers themselves.

The analysis of hospital admissions given in the next section was based in the first place on the mother's information. It was then repeated when the hospital records became available. None of the original conclusions has had to be altered in the light of this re-analysis, and it would seem that for relatively large samples of children satisfactory information on major conditions of ill-health may be collected by the questionnaire methods used in this survey. On the other hand, it would clearly be unwise to base discussions of the health of an individual child on information of this type.

The admission of a child to hospital is a major event in his life and in the life of his family, and it may be that less serious events are less well remembered. But for the information we have been able to check (covering such diverse subjects as weaning from the breast, immunization, and post-natal examinations) it seems that we can rely on mothers' memories to bridge even a two-year gap (Rowntree, 1950; Douglas, 1951).

(c) Hospital and Nursing-home Admissions

This analysis is limited to the hospital and nursing-home admissions of the surviving children. Those who died were excluded because it was seldom possible after their death to question their parents about their past illnesses. Thirty-nine of the surviving pairs also were left out because information was lacking for one or both of them; among those excluded were five premature children and three controls who had been admitted to hospital but were paired with children whose mothers failed to answer the questions on hospital care. Accordingly there are 435 surviving pairs for whom we have information.

The fact that premature children are often retained in maternity hospitals for several weeks after birth is well known. In the present sample 39% of the surviving premature children, as compared with 11% of their controls,

were kept in hospital until they were more than 14 days old, the mean lengths of stay for all those born in hospital being respectively 17.7 days and 12.6 days ($t=6.91$, $n=593$, $P<0.001$). At this time maternity beds were in short supply, and it may be a reflection of this shortage that as many as 26% of the premature children sent home during the first fourteen days after birth weighed 5 lb. (2.3 kg.) or less on leaving hospital. For this reason it is likely that the mean stay of 18 days found for premature children in this survey is an underestimate of their need for hospital care in the immediate post-natal period. Hospital stay directly related to labour or the special nursing needs of infants during the early weeks has been excluded from the following discussion for obvious reasons, and the figures given below refer with four exceptions (two premature children and two controls) to admissions occurring after the neonatal period.

Ninety-one premature children (21%) and 64 controls (15%) were admitted to hospital on at least one occasion during the first 4½ years of their lives ($\chi^2=5.75$, $n=1$, $0.02>P>0.01$). If the number of admissions is counted instead of the number of children admitted, then the proportions are respectively 26% and 17% in the two groups ($\chi^2=9.87$, $n=1$, $P<0.01$). In each instance the admission rates are significantly higher for premature children. Three of the premature children, but none of the controls, spent a great part of their first four years in hospital. (See footnote to Table XV.) One is a spastic microcephalic who was kept in hospital because there was nowhere else for him to go; the second has pulmonary tuberculosis; and the third has bilateral cataracts and is now totally blind. These three children alone received 1,520 days of hospital care, which is more than the total number of days spent in hospital by all the controls during the same period. It is also nearly half the total amount of care given to all the premature children. For the following description of hospital care we propose to exclude these three children, since the extent of their disabilities would otherwise obscure the pattern of hospital care among those who were less handicapped.

Table V shows the average number of days spent in hospital during different age periods by premature children and their controls.

TABLE V.—*Average Number of Days per Child Spent in Hospital at Different Ages (Excluding Maternity Care)**

Age (in Months)	Average No. of Days per Child (432 Pairs)		Significance (n=862)	
	Premature Children	Controls	t	P
0-12	1.54	0.39	2.59	<0.01
13-24	1.42	0.44	2.82	<0.01
25-36	0.62	0.68	0.21	0.9-0.8
37-51	0.79	0.69	0.39	0.7-0.6

* Three premature children permanently in institutions have also been excluded (see text).

During the first two years premature children spend on the average three and a half times as many days in hospital as their controls do, a total of 1,269 days as compared with 359 for the controls. In the third and fourth years there is no difference between them, the total stay being respectively 608 days and 595 days.

The average stay per illness tends to be greater among premature children; 48% of those admitted to hospital stayed there for more than two weeks, as compared with 36% of the controls ($\chi^2=4.40$, $n=1$, $0.05>P>0.02$). Moreover, the premature children during the first two years show a much greater variability in the time they spend in hospital. In the third and fourth year, on the other hand, there are no significant differences either in the average stay or in the range of variation of the length of stay for each illness. For the remainder of this section, therefore, we will consider only admissions in the first two years of life.

*For convenience the term "hospital admission" is used to include both hospital and nursing-home admissions.

Table VI shows that there is a marked relationship between the birth weight of premature children and the likelihood of their being admitted to hospital.

TABLE VI.—*Hospital Admissions in First Two Years by Birth Weight of Premature Child*

Birth Weight of Premature Child	% Admitted to Hospital			Significance (n=1)	
	Premature Children	Controls	No. of Pairs	χ^2	P
4½ lb. (2 kg.) or less	19.05	5.95	84	5.44	0.02-0.01
4½-5 lb. (2-2.3 kg.)	15.52	5.17	116	5.62	0.02-0.01
5-5½ lb. (2.3-2.5 kg.)	9.36	7.23	235	0.70	0.5-0.3

In each group the admission rate is lower for the controls, but the differences are significant only for premature children weighing 5 lb. (2.3 kg.) or less.

In Table VII the hospital admission rates of male and female pairs are shown separately. While premature

TABLE VII.—*Hospital Admissions in First Two Years by Sex*

Sex	Hospital Admissions in First Two Years			Significance (n=1)	
	Premature Children %	Controls %	No. of Pairs	χ^2	P
Male ..	17.98	7.87	178	8.07	<0.01
Female ..	9.34	5.45	257	3.05	0.1-0.05

children of both sexes tend to be admitted to hospital more often than their controls, the difference is significant only for the males. It is of interest that females, both premature and controls, are less likely to be admitted than are males.

The excess of hospital admissions among premature children is no greater when they have resulted from pregnancies complicated by toxæmia or ante-partum haemorrhage. Nor is it greater among those born more than two weeks early than among those born nearer term.

Table VIII shows the causes of admission to hospital among premature children and their controls. In preparing

TABLE VIII.—*Causes of Admission to Hospital During the First Two Years*

	% Admitted for Specified Illnesses (435 Pairs)			Significance (n=1)
	Premature Children	Controls		
Bronchitis and pneumonia ..	3.22	0.69	$\chi^2=6.06$, $n=1$, $P<0.01$	
Other infections ..	2.99	2.76		
Cataract ..	0.69	Nil	$\chi^2=2.28$, $n=1$, $0.2>P>0.1$	
Inguinal hernia ..	1.38	0.23		
Epilepsy and convulsions ..	0.46	Nil		
All other illnesses ..	2.99	2.30		
Accidents ..	0.92	0.69		

this table successive attacks of the same type of disease—for example, pneumonia—were counted separately, whereas repeated admissions for continuing disabilities—for example, cataract, congenital dislocation of the hip—were treated as single incidents.

A number of conditions are more common among the premature children than among the controls, but, considering them individually, only lower respiratory infections are significantly more common, 42% of the excess of hospital admissions being attributable to infections of this type. The greater occurrence in the sample of premature children with cataract, hernia, and convulsions is of interest in the light of previous work, but a very much larger inquiry would be needed for a profitable statistical analysis to be made.

The higher incidence of lower respiratory infections among premature children admitted to hospital does not necessarily imply that they are, as a group, more likely to contract these diseases. It might mean, for example, that

once they fell ill they were more severely affected. In the following sections, therefore, we will consider the total incidence of upper and lower respiratory infections, whooping-cough, and measles.

(d) Infections of the Upper Respiratory Tract

Our information on upper respiratory infection is limited to an estimate of the number of colds caught by the survey children in the three months preceding their second birthday and in the six months centring on their fourth birthday. These estimates, which were made by their mothers, are of unknown accuracy and have therefore been used only to separate those with reputedly constant or frequent colds from those who seldom or never had them.

Table IX shows that at both 2 and 4 years prematurely born children tend to have more frequent colds than their controls, though the difference is significant only in the

TABLE IX.—Proportion of Children with Frequent Colds

	Premature Children %	Controls %	No. of Pairs	Significance (n=1)	
				χ^2	P
More than 2 colds between Dec., 1947, and Feb., 1948	20.3	14.4	395	4.67	0.05-0.02
More than 3 colds between Dec., 1949, and May, 1950	18.6	15.4	408	1.47	0.2-0.1
Frequent colds in both periods	6.4	3.8	344	2.44	0.2-0.1

younger age group. There are, moreover, among the premature children nearly twice as many who suffered from frequent colds in both years.

(e) Lower Respiratory Infections

Our information on lower respiratory infections covers only the incidence of first attacks during the first two years of life which were treated by a doctor at home or in hospital. Accordingly the following figures are not directly comparable with those given for hospital admissions which include as separate illnesses successive attacks in the same child. Table X shows the mean incidence of first attacks of lower respiratory infections at different ages.

TABLE X.—First Attacks of Lower Respiratory Infections Treated Either by a Doctor at Home or in a Nursing-home or Hospital

Age at Attack (in Months)	Mean Monthly Rate per 1,000 Children Exposed (445 Pairs)		Significance (n=1)	
	Premature Children	Controls	χ^2	P
0-7	16.64	8.26	8.49	<0.01
8-13	33.33	18.43	9.92	<0.01
14-24	10.06	7.55	1.33	0.3-0.2
All ages	17.58	10.53	17.28	<0.01

During the whole of the first year there is an excess of bronchitis and pneumonia among premature children; in the second year the same trend is apparent but the differences are not statistically significant. Further subdivision according to the birth weight of the premature member of each pair (Table XI) shows that the greatest difference

TABLE XI.—Lower Respiratory Infections by Birth Weight of Premature Child

Birth Weight	Mean Monthly Rate per 1,000 Exposed for First Two Years		Significance (n=1)	
	Premature Children	Controls	χ^2	P
4½ lb. (2 kg.) or less	27.78	7.94	92	21.88
4½-5 lb. (2-2.3 kg.)	15.49	9.87	118	3.15
5-5½ lb. (2.3-2.5 kg.)	14.58	11.96	235	1.29

between the premature children and their controls is found in the groups of lightest weight. This relationship is of the same order as that found for hospital admissions.

Sex differences in the incidence of lower respiratory infections (Table XII) are similar to those for hospital admissions. In both sexes there is a higher incidence among the premature children, the difference being smaller for females.

TABLE XII.—Lower Respiratory Infections by Sex

Sex	Mean Monthly Rate per 1,000 Exposed for First Two Years		No. of Pairs Exposed	Significance (n=1)	
	Premature Children	Controls		χ^2	P
Male	19.52	10.83	187	9.89	<0.01
Female	15.75	10.35	258	6.32	<0.01

Lastly, we have related the incidence of lower respiratory infections to the length of gestation, and found that the excess of these diseases among premature children was just as great among those delivered two or more weeks early as among those delivered later than this.

(f) Whooping-cough and Measles

The proportions of children who during the first four and a quarter years of life suffered from whooping-cough or measles are shown in Table XIII. From these figures it

TABLE XIII.—Incidence of Whooping-cough and Measles

	% Falling Ill During the First 4½ Years		No. of Pairs Exposed	Significance (n=1)	
	Premature Children	Controls		χ^2	P
Whooping-cough	30.43	28.38	437	0.45	0.7-0.5
Measles	41.76	45.24	431	1.06	0.5-0.3

appears that premature children are no more likely to contract these two diseases; nor does a closer examination of the data suggest that they are more susceptible than the controls to either of these diseases in early infancy.

Discussion

While many papers on the physical growth and mental development of premature children have been published, few studies have been made of their health. Capper (1928) thought that during the first year a premature child has little resistance to infection of the respiratory tract, whereas after the first year his resistance is not unlike that of a mature child. Mohr and Bartelme (1934) likewise noted the frequent occurrence of respiratory infections, particularly colds, among the prematurely born. But in neither of these inquiries was there an adequate group with which to compare the premature children, though Mohr and Bartelme attempted to use brothers and sisters as controls. Owing to the difference in age between the siblings, however, no useful comparisons could be made.

Drillien (1948), studying a series of premature deliveries, found that the smaller premature infants were particularly susceptible to septic skin infections and discharging eyes. She followed up some of these children when they were age 1½-4½ years and compared their illnesses with those of a sample of children born in the same hospital at term. Her analysis is complicated by the varying ages of the children, and by the fact that she was able to trace only 40% of them. It remains, however, the most serious general study of the health of premature children that has so far been made. Nasopharyngeal and respiratory infections were found to be more common among premature children, who also had a significantly higher incidence of pneumonia and whooping-cough than their controls. For

measles and discharging ears, on the other hand, the controls were apparently the more susceptible. These differences were greatest in the first year and of little importance in the second.

Ferguson, Brown, and Ferguson (1952) report that nearly 25% of premature children in Glasgow received hospital treatment during the pre-school period, for conditions other than prematurity. The amount of hospital treatment was "high among infants who had weighed not more than 4½ lb. (2 kg.) at birth." It is difficult to interpret these observations, because corresponding figures for children born at term are not given, the losses from the premature sample are not stated, and the standard of prematurity adopted appears to have been length of gestation rather than birth weight.

A specific defect that has been receiving increasing attention during recent years is retrolental fibroplasia, first described by Terry in 1952. It is said to affect 12% of surviving children of birth weight of 3 lb. (1.36 kg.) or less (Terry, 1945) and to account for more than a third of the blindness in young children in the U.S.A. (Reese, 1949). Its incidence is increasing and seems to be associated with changes in the post-natal care of small premature babies. In England few cases were recorded before 1949, and most of those recorded since have been among children cared for in premature baby units. There is some evidence that the increased use of oxygen is associated with this condition (Kinsey and Zacharias, 1949; Crosse and Evans, 1952). In the present series of premature children no instance of retrolental fibroplasia was recorded, and the three children with grossly defective sight were all of too high a birth weight for this condition to be a likely alternative diagnosis.

The results of the present inquiry confirm these earlier studies by showing that hospital admissions and both upper and lower respiratory infections are proportionately more common among premature children. They also answer the criticism that, since premature children are on the average drawn from poorer homes, the greater morbidity among them is a reflection of their environment rather than of any physiological or immunological deficiency. They show that these differences in ill-health persist even when the premature children are compared with controls drawn from similar homes. Moreover, the differences are just as pronounced among those who have been brought up in relatively favourable home environments. Thus it will be seen in Table XIV that the excess of colds and lower

TABLE XIV.—Upper and Lower Respiratory Infection Among Premature Children and Their Controls in Two Social Groups

Occupation of Father	% With Frequent Colds at 2 Years		% With Lower Respiratory Infections in First 2 Years	
	Premature	Control	Premature	Control
Professional or clerical worker	19.6	12.8	25.7	13.6
Manual worker	20.5	15.0	33.5	17.9

respiratory infections is as great among premature children coming from the families of professional and clerical workers as among those from the families of manual workers.

Upper and lower respiratory infections, as would be expected from previous studies, are more common among the children of manual workers, whether they are prematurely born or not; but the excess of illness among the premature children is of the same order of size in each type of family.

This inquiry also enables us to state in roughly quantitative terms the burden that premature children throw on the hospital services. Table XV gives the actual number of days spent in hospital by premature and control children of different ages.

While it is evident that in the first two years premature children need considerably more care than those born at

TABLE XV.—Number of Days Spent in Hospital at Different Ages (Premature Children and Controls)*

Age	Premature Children	Controls	Difference
1st year { Maternity ..	5,279	4,016	+1,263
{ Other ..	657	169	+488
2nd year ..	612	190	+422
3rd ..	266	296	-30
4th ..	342	299	+43

* Three premature children who spent a great part of their first four years in hospital have been omitted, = 1,520 hospital days (see p. 751).

term, they do not, in fact, make any great call on the hospital services. Related to the whole survey population and not only to their controls, they received approximately 8% of the total maternity hospital care, 11% of all hospital care in the first two years, and 3% in later years.

The above figures do not fully describe the special needs of premature children, for there are a number who, although living at home, are to a varying extent incapacitated and likely to be an enduring burden on their parents and the community. The question of mental defect and epilepsy will be considered in a later paper; we are here concerned only with physical defects. It may well be that some potentially disabling conditions have been missed by the relatively crude methods used in this survey and, if so, we may hope to make a more accurate statement of the disabilities of these children when the results of the school clinical examinations are available. In the meantime it appears that the only serious physical defect that is more common among premature children is impaired vision. While there is no child in this series of births suffering from retrolental fibroplasia—perhaps owing to the rarity in 1946 of oxygen therapy—there are three with congenital cataract, all of whom weighed more than 4½ lb. (2 kg.) at birth. Two of these children are now completely blind and the third has some sight. Among the control children, on the other hand, there is no instance of blindness or grossly defective sight. Gross congenital defects, other than cataract, are equally common among the surviving premature children and their controls. Of the former, two had spina bifida and one transposition of the viscera; of the latter, one had spina bifida, one a congenital heart lesion, and one congenital dislocation of the hip. Less severe congenital defects, such as hare-lip, webbed toes, etc., were also found as often in the one group as in the other. In view of the high mortality from congenital defects among premature children, this similar incidence in the premature and control pairs is unexpected.

Summary

676 live-born premature singletons drawn from one week's births in 1946 in 424 maternity and child welfare authorities have been matched with 676 children born at term during the same week and drawn from similar home environments. This paper describes the health and survival of these children during the first four years of their lives.

Apart from unavoidable losses from death and emigration, only eight pairs have fallen out of the inquiry.

The high mortality of premature children extends beyond the first month of life, and between the ages of 1 month and 4 years is largely accounted for by deaths from congenital defects and lower respiratory infections.

During the first two years premature children show a higher incidence of hospital admissions, many of which are for bronchitis and pneumonia. At later ages they are no more likely to be admitted than are children born at term.

Upper and lower respiratory infections, including those treated at home as well as those treated in hospital, are more common among premature children

during the first two years. This greater susceptibility to infection is found among premature children even when they are reared in an apparently favourable home environment.

In general, premature children—after they have reached the age of 2—appear to be as healthy as those born at term.

We wish to thank the chairman and members of the Joint Committee for their help and advice, especially Professor Aubrey Lewis, Professor I. G. Davies, and Professor R. M. Titmuss; the medical officers of health and the health visitors whose generous co-operation made this survey possible; and the mothers in all parts of the country who willingly answered numerous and detailed questions on their children's health.

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REPORT OF TUBERCULIN SURVEY IN THE RHONDDA FACH

BY

T. FRANCIS JARMAN, M.D.

Medical Director, Mass Radiography Service, Welsh
Regional Hospital Board

The tuberculin test has long been recognized not only as a useful measure in clinical diagnosis but as an essential part of epidemiological investigations appertaining to tuberculosis (Ustvedt, 1942). Myers (1946) declares that "as an epidemiological agent, the test excels every other procedure of examination," and he regards repeated testing of special groups as an excellent method of determining the effectiveness of a tuberculosis control programme. Though a more accurate index of the success of such control measures is undoubtedly the number of new cases of tuberculosis occurring in a community subject to intensive and repeated mass x-ray surveys, the tuberculin-testing of large groups does provide evidence on the existing degree of total communal infectivity. It was therefore decided to carry out skin tuberculin-testing of the school population in the Rhondda Fach as an integral part of the research scheme.

This scheme has as one of its main objectives the determination of the total prevalence of pulmonary tuberculosis in a defined community, the isolation and treatment of all known active cases, and the estimation of the rate of occurrence of new cases subsequent to the application of such measures (Cochrane, Cox, and Jarman, 1952).

The schoolchildren in the Rhondda Fach were tuberculin-tested during the months of February, March, and April, 1951, and a sample of the schoolchildren in another valley were tested during September, 1951. When the Rhondda Fach is resurveyed radiographically in 1953 the school population will again be

tuberculin-tested and the results of such retesting will be compared with those of the 1951 survey. A sample of the schoolchildren in the "control" valley, drawn from the same schools as were those in this 1951 survey, will also be retested in 1953, and the results will serve for comparison with those obtained from the Rhondda Fach.

Such retesting will be combined with a follow-up study of children who were tuberculin-negative in 1951, and this will permit a determination of the attack rate of infection in the two valleys.

Method of Testing

In 2,301 cases the usual Mantoux technique was employed: 0.1 ml. of a 1/10,000 dilution of standardized O.T.—that is, 1 T.U.—was injected intradermally, and all negative reactors were retested with 0.1 ml. of a 1/100 dilution—that is, 100 T.U. The criteria adopted for the reading of these tests was that any reaction producing less than 5 mm. diameter of induration was regarded as negative. The reactions were recorded as measurements in millimetres of induration wherever this was possible, even when they were less than 5 mm. and, qualitatively, negative tests.

In 1,109 cases the initial test used was the multiple puncture test, employing standardized, adrenaized O.T. This is a modification of the Finnish Trambusti (1928) test and that described by Chester Stewart (1928). The reason for using this method, and the possible source of error involved, are discussed later.

A preliminary report on the multiple puncture test has been made recently (Heaf, 1951). The test is performed as follows: a drop of undiluted adrenaized O.T. is spread over an area on the forearm about the size of a shilling by means of a sterilized platinum loop; the multiple puncture instrument is then applied and pressed home; any excess of O.T. is wiped away with cotton-wool and the test is read at the end of 48 hours. The criteria adopted for the reading of this test were as follows: 0=no reaction,

TABLE I.—Results of Tuberculin-testing of School Children

Age in Years	No. who Completed Tests	No. Positive to 1/10,000 O.T.	No. Positive to 1/100 O.T.	No. Positive to Multiple Puncture Only	Total Positive	% Positive
(a) Rhondda Fach						
3	97	2	3	1	6	6.2
4	208	4	4	4	12	5.8
5	263	9	8	7	24	9.1
6	294	13	12	10	35	11.9
7	323	12	30	10	52	16.1
8	348	15	14	12	41	11.8
9	251	14	23	21	58	23.1
10	296	16	40	24	80	27.0
11	313	31	31	29	91	29.1
12	334	23	36	49	108	32.3
13	255	23	39	29	91	35.7
14	280	38	48	31	117	41.8
15	78	11	16	4	31	39.7
16	43	9	12	—	21	48.8
17	21	5	7	—	12	57.1
18	6	3	3	—	6	100.0
	3,410	228	326	231	785	23.0
(b) Other Valley						
3	16	2	1	—	3	18.8
4	56	2	3	—	5	8.9
5	96	1	3	—	4	4.2
6	83	3	5	—	8	9.6
7	112	9	5	—	14	12.5
8	115	6	9	—	15	13.0
9	104	13	7	—	20	19.2
10	139	21	7	—	28	20.1
11	179	34	19	—	53	29.6
12	232	40	22	—	62	26.7
13	225	41	27	—	68	30.2
14	203	53	26	—	79	38.9
15	111	39	19	—	58	52.3
16	58	11	3	—	14	24.1
17	26	7	5	—	12	46.2
18	10	3	2	—	5	50.0
19	3	1	1	—	2	66.7
	1,768	286	164	—	450	25.5

or small points of trauma or commencing induration; 1=larger but discrete circles of induration; 2=a ring of induration; 3=a plaque of induration. Reactions up to and including category 1 were regarded as negative and retested with an intradermal injection of 0.1 ml. of 1/100 dilution of O.T. (100 T.U.).

Results.—The results of tuberculin-testing in the Rhondda Fach are summarized in Table 1 (a) and represented graphically in Fig. 1. The tuberculin-testing carried out in

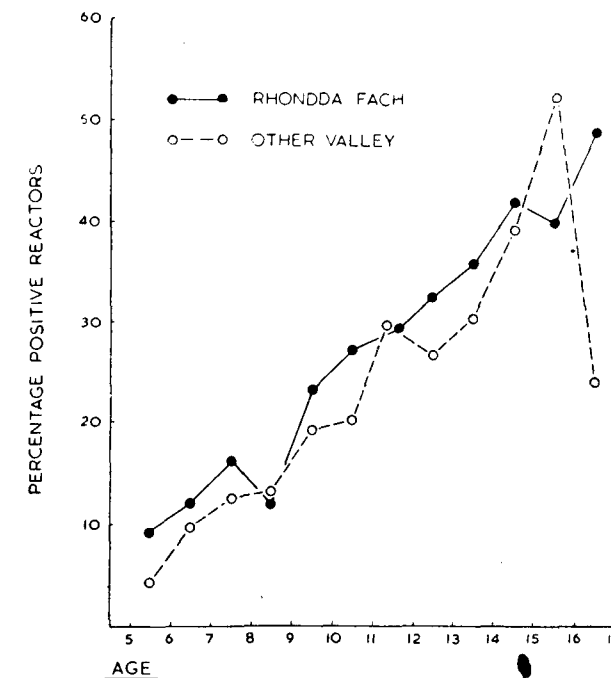


FIG. 1.—Results of tuberculin-testing in the Rhondda Fach, compared with those of a similar valley in South Wales.

another mining valley comparable to that of the Rhondda Fach, but in which no intensive survey technique is being carried out, is summarized in Table 1 (b) and represented graphically in Fig. 1, and the results serve for comparison with those obtained in the Rhondda Fach.

Number Tested and Analysis of Lapses

It was ascertained that 4,743 schoolchildren were on the school register in the Rhondda Fach area. Of these, 4,522 (95.3%) were x-rayed, but only 3,410 (71.9%) completed the tests. This illustrates the difficulties encountered during mass tuberculin surveys. The lapses resulting from absenteeism occurred at all stages of the survey. It should be noted here that most of the tuberculin-testing was done during the winter months, when thick snow lay on the ground.

Many children who were absent for the reading of the second test were visited at home for this purpose. The

TABLE II.—Stages at Which Lapses Occurred During Tuberculin Survey. Number of Children on School Register, 4,743

Reason for Lapsing	No. Not Tested	No. Remaining	%
Absent from school ..	259	4,484	4.9
Test refused	480	4,004	10.5
Absent at reading of first test	287	3,717	6.5
Absent at reading of second test (excluding those positive at the first test)	307	3,410	6.2
Completed tests		3,410	
Total	1,333 (28.1%)	3,410 (71.9%)	(28.1%)

stages at which lapses occurred during the survey are summarized in Table II. The 480 children who were x-rayed but not skin-tested represent parents' refusals.

The ages of the 259 who were absent for the first test were unfortunately not ascertained at the time of the survey, but it can be stated that they are distributed in a relatively equal manner throughout every type of school, and were therefore not confined mainly to one or two age groups.

The ages of the remaining 1,074 who lapsed are known, and the percentages of those available for the initial skin test who completed each stage of the course are represented graphically by age groups in Fig. 2.

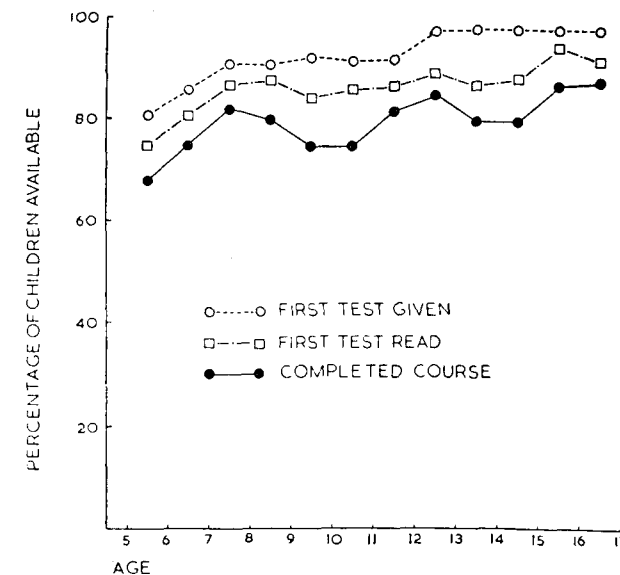


FIG. 2.—Percentage of children available for first test who completed each stage of the course.

Reference to this graph shows that most of the lapses occurred in the age group 5 to 6, and it would appear that the refusal of parents to have their children skin-tested is mainly determined by the age of the child. It is interesting that the percentage lapse rate of those available for skin-testing is fairly equally distributed between each stage of the course and between the different age groups. This suggests that the 3,410 children who completed the test do represent a truly random sample.

Comparison between Tuberculin-testing in the Rhondda Fach and the M.R.C. Surveys of England and Wales

Fig. 3 shows the comparison between the prevalence of positive tuberculin reactions among schoolchildren in the Rhondda Fach and those in the M.R.C. surveys in England and Wales (Daniels, 1952). This comparison suggests that if tuberculin surveys do in fact reflect the total amount of human tuberculous infectivity in a community the amount of such infectivity in the Rhondda Fach is rather less than that in the urban areas of Northern England and Wales and rather more than that in the urban area of Southern England. As the total prevalence of cases of active tuberculosis among those over 15 years of age in the Rhondda Fach was found to be 12 per 1,000, out of which 6 per 1,000 were infectious, the conclusion might reasonably be drawn that estimated prevalence figures for active disease in England and Wales based on these findings are likely to be nearer the truth than those based on findings in routine mass radiography surveys (Cochrane, 1952). Such an estimated prevalence rate, based on a population at June 30, 1952, of 34,000,000 persons over 15 years of age, would mean that there are about 400,000 cases of active tuberculosis in England and Wales, of which 200,000 are infectious.

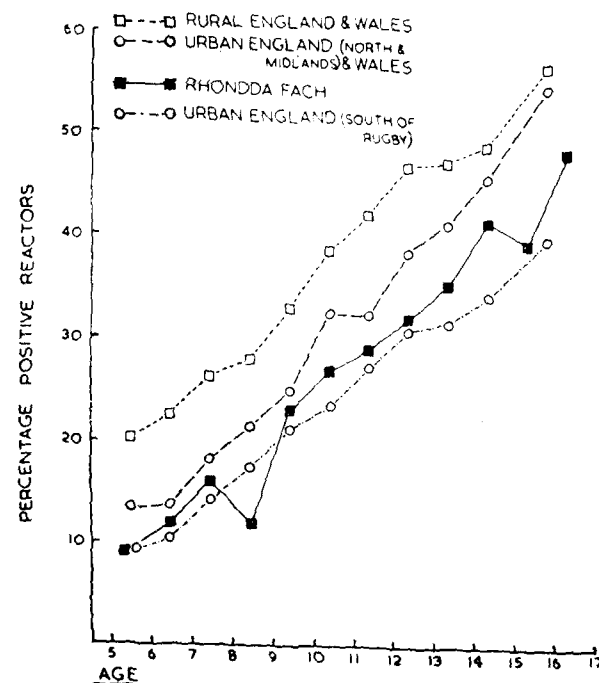


FIG. 3.—Results of tuberculin-testing in the Rhondda Fach compared with those of the M.R.C. surveys in England and Wales.

The Rhondda Fach and the Control Valley

Fig. 1 shows the prevalence of positive reactors among schoolchildren in the Rhondda Fach and in the control valley, and this reveals that there is a somewhat lower rate of conversion at comparable age groups in the control valley. Presumably there is rather less tuberculosis in this valley than in the Rhondda Fach. It will be noted that there is a sharp drop in the percentage of reactors in the Rhondda Fach at age 8. It is possible that this may be due to some error the nature of which has not been ascertained. Several re-checks on the sorting and counting of the appropriate cards were carried out in this connexion. Table I (a) shows, however, that more children were tested in this age group than in any other, while Fig. 2 shows that the percentage of lapses which occurred at this age is about the average of all age groups from 6 to 16 years. The source of error, therefore, if such exists, remains unexplained.

Sources of Error

(1) Observer Error

Error can arise in the performance and reading of the tests. It has been shown (Meyer *et al.*, 1951) that in duplicate Mantoux tests performed on the right and left arms in which the reactions were read independently but by one person there was disparity in the reading of negative and positive tests in 8% of cases. Sources of error here, however, were both in the performance of separate tests and in the reading of them. In the present survey the only error studied was that involved in the qualitative reading of single tests given by one person.

Double-observer readings were carried out in a sample of Mantoux tests in order to ascertain whether two observers would be necessary throughout the whole survey in order to achieve scientific accuracy. A total of 1,228 Mantoux tests were read by two observers (Dr. V. W. J. Hetreed and myself) reading independently and using the agreed criteria of 5 mm. or more of induration to indicate a positive reaction. The two observers were in a large room out of earshot from each other and seated back to back. The examinee approached the first observer, whose reading was recorded by the clerk attending him. This was recorded in red on the record card and the card was then handed back to the examinee, who proceeded to the second observer.

The record card was taken by the clerk attending the second observer in a way which precluded him from inadvertently seeing what was already recorded on it by the first observer. The second observer then made his reading, and this was recorded in blue by the attending clerk. Any examinee whose test was recorded as negative or doubtful by either observer was retested with 0.1 ml. of 1/100 O.T.—that is, 100 T.U. The final tests were also read by the two observers. The results are summarized in Table III.

TABLE III.—Summary of Double-observer Readings

1st Test, 1/10,000 O.T.	No.	2nd Test, 1/100 O.T.			No Second Test
		Neg.-Neg.	Neg.-Pos.	Pos.-Pos.	
Neg.-neg.	990	912	1	77	
Neg.-doubtful	16			16	
Neg.-pos.	9			9	
Doubtful-doubtful	38			38	
Doubtful-pos.	23			23	
Pos.-pos.	152				
Total	1,228	912	1	163	152

Only qualitative differences in reading the tests are shown, though both qualitative and quantitative—that is, differences in millimetres of induration measured—differences were noted.

There are only two categories of double-observer readings: those of “negative-positive” and “doubtful-positive,” which include examinees who may not have been given a second test had there been only one observer. There are nine in the category “negative-positive” and 23 in the category “doubtful-positive.” All of these reacted positively to the second test. Thus had these 32 cases not been retested because a single observer had read them as positive on the first test this would have made no difference to the final figures of positive and negative reactors.

It was concluded from these results that no appreciable error was likely to arise through the qualitative reading of the tuberculin tests by one experienced person. One and the same reader only was therefore employed during the rest of the survey.

(2) Non-specific Reactions

Attention has been drawn (Palmer, Ferebee, and Petersen, 1950) to the possible occurrence of reactions of a non-specific character when using the larger doses of tuberculin. Positive reactors to a low dose of tuberculin among 10,000 white student nurses in the U.S.A., arranged according to lifetime residency in different States, occurred with a frequency which corresponded to known geographic variations in the prevalence of tuberculosis, whereas positive reactors to a higher dose showed a peculiar geographic distribution unrelated to known prevalence. This suggested “a local widespread non-specific sensitivity to tuberculin.”

This possible source of error is fully discussed in the M.R.C. tuberculin survey (Daniels, 1952). The conclusion is drawn that there is no evidence that with a dose of 100 T.U. the proportion of non-specific reactions is so high in this country as to warrant ignoring those positive only to doses greater than 10 T.U.—that is, 0.1 ml. of 1/1,000.

(3) Bovine Infection

Another possible source of error in using the results of a tuberculin survey as an index of total communal infection from human pulmonary sources is the existence in the community of the bovine type of infection. By comparing the percentage of positive reactors among children in an area in which tuberculosis in cattle was non-existent with that among children of similar age groups in an area where infection in cattle was frequent, it has been shown (Madsen, Holm, and Jensen, 1942) that infection with bovine bacilli may influence the results of tuberculin-testing surveys. That this may be a factor influencing the results is also borne out by the differences in percentages of positive reactors among children of school entry age from rural and urban areas in England and Wales (Daniels, 1952).

So far as the Rhondda Fach is concerned the proportion of notified cases of tuberculosis which are designated as non-pulmonary may give some indication of the prevalence of bovine tuberculous infection.

Table IV shows the number of respiratory and non-respiratory cases of tuberculosis notified during the years 1949, 1950, and 1951 in the Rhondda Fach area. The sharp

TABLE IV.—Notified Cases of Respiratory and Non-respiratory Tuberculosis in the Rhondda Fach

Year	Respiratory Tuberculosis	Non-respiratory Tuberculosis	Meningitis
1949	59	6	—
1950	87	9	2
1951	66	5	2
Total	212	20	4

increase in the notifications for 1950 reflects the discovery of an abnormally large number of early cases of pulmonary tuberculosis through the intensive mass radiographic survey carried out in connexion with the research scheme.

In the four cases of meningitis human-type bacilli were recovered from the cerebrospinal fluid. In 9 out of the 20 cases of non-respiratory tuberculosis, tissue fluid was available for examination; in five of these, cultures were positive for tubercle bacilli and all were of human type (J. Glyn Cox, 1952, personal communication).

Information supplied by the Central Tuberculosis Laboratory of the Welsh Regional Hospital Board (J. Marks, 1952, personal communication), shows (Table V) that since 1943

TABLE V.—Isolations of Human and Bovine Type of Tubercle Bacilli from Tuberculous Patients in Wales

Year	Total Positive Cultures	Human Type	Bovine Type
1943	554	499	55
1944	511	463	48
1945	484	453	31
1946	442	416	26
1947	536	519	17
1948	569	541	28
1949	1,041*	1,026	15
1950	1,539*	1,534	5

* The increase in positive cultures reflects wider use of the laboratory.

there has been a steady decrease in the number of isolations of the bovine type of bacillus, suggesting that infection with this type has been responsible for only a small and steadily decreasing proportion of the total number of cases of tuberculosis.

This laboratory receives specimens from all over Wales, though about three-quarters of them come from the South Wales area, which includes the more densely populated counties of Monmouth and Glamorgan.

In Glan Ely Hospital, Fairwater, there are 110 beds for non-pulmonary tuberculosis, and most of such cases occurring in the South Wales area, including the Rhondda Fach, are admitted to this hospital. Information was made available by the medical superintendent (V. Emrys Jones, 1952, personal communication) to the effect that during the past five years not one of the large number of cases yielding positive cultures was due to a bovine infection.

The likelihood of bovine infection affecting the percentage of positive reactors in different age groups amongst the schoolchildren of the Rhondda Fach can also be related to the sources of milk supply to the school and homes. From information supplied by the Rhondda Urban District Council Health Department (D. J. Thomas, 1952, personal communication) it has been ascertained that licensed retail distributors of milk in the Rhondda Fach area obtain their supplies from four main wholesale sources. All of the milk so supplied is sterilized, pasteurized, or from tuberculin-tested herds. Of the 25 distributors, 23 supply milk which is from tuberculin-tested herds and pasteurized as well, and

the remaining two supply milk which is pasteurized or sterilized. These conditions of milk supply have been in existence in the Rhondda Fach for at least ten years, with the exception of three small farms which supplied raw milk in small localized areas until five years ago. One distributor, however, who possesses a small farm, produces about 8 gallons (36.4 litres) of milk a day, and this he retails intermittently in a very small locality. The sale of 8 gallons (36.4 litres) of untreated milk represents about 0.8% of the total milk sold daily in the entire valley. The bulk of the milk has for decades been imported into the district and, on account of the method of milk marketing during the past 20 years, heat treatment has been a commercial necessity.

It is therefore reasonable to conclude that bovine infection is unlikely to contribute to the number of positive reactors amongst the Rhondda Fach schoolchildren to an extent which would invalidate tuberculin surveys as an index of human tuberculous infectivity in that community.

A contrast is provided by the survey carried out in the Calder Valley in the county of Yorkshire (Keidan *et al.*, 1952). Out of a total school population of 6,532 in the Calder Valley 85% completed the skin-testing programme. A high prevalence of positive tuberculin reactors was found amongst the schoolchildren in this rural area when compared with those from Hull and Leeds. The reactor rates from Hull and Leeds closely approximate to those from the Rhondda Fach and to those from the urban areas of England and Wales, whereas the rates from the Calder Valley are much higher at every age group and exceed also the rates for rural England and Wales (Fig. 4). Table VI

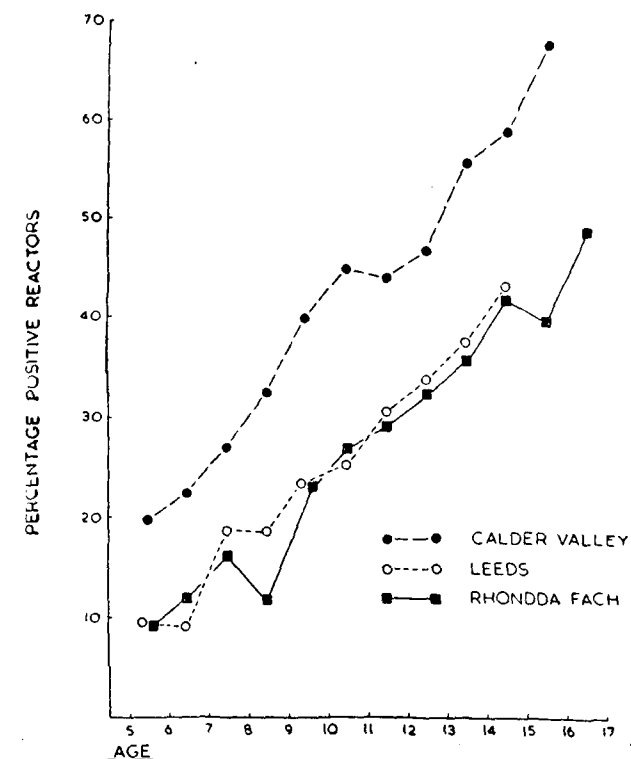


FIG. 4.—Results of tuberculin-testing in the Rhondda Fach compared with those of the Calder Valley and Leeds.

TABLE VI.—Tuberculosis Morbidity in the Calder Valley and in the Rhondda Fach

	Total Cases Notified, All Types, per 100,000	Non-respiratory Cases Notified per 100,000	Percentage of Cases Non-respiratory
Calder Valley, 1948	460	215	46.7
Rhondda Fach, 1949	244	24	9.8

shows that the greater total morbidity from tuberculosis in the Calder Valley compared with that in the Rhondda Fach is almost entirely accounted for by the much higher proportion of non-respiratory cases notified in the former valley. These figures suggest, moreover, that the higher incidence of positive reactors found in the Calder Valley might be attributed to an excessive amount of bovine infection, a supposition which is supported by other direct evidence. The conditions appertaining to the supply of milk in the Calder Valley are in marked contrast to those in the Rhondda Fach, Hull, and Leeds. As much as 80% of all milk consumed in the Calder Valley is untreated, and about 40% of the cows in the area are positive tuberculin reactors. These findings therefore amount to strong circumstantial evidence that the difference in prevalence of positive tuberculin reactors in the Calder Valley and in the Rhondda Fach is related to a high incidence of bovine infection in the former and a low incidence in the latter.

(4) The Negative Reaction

Attention has been drawn (Rich, 1951) to the fact that a negative tuberculin test is not necessarily proof that a person has not been infected. He quotes many workers who have demonstrated the phenomenon of "reversion" from a positive to a negative test and have shown that such reversion can occur in as short a time as two years. He suggests that, in the past, available evidence tended to support the view that only in exceptional cases will the test be negative in healthy persons who have been previously infected, but that in the face of greatly changed conditions "it becomes possible that the results of the tuberculin test in present-day surveys no longer mirror so well the actual incidence of infection." The average duration of tuberculin sensitivity following a slight well-resisted infection is not known.

It is believed that reversion tends to occur only where the incidence of active disease, and therefore the chance of reinfection or superinfection, is very low. It may therefore influence the figures in schoolchildren living in rural and semi-rural areas with a milk supply free from infection, but it is less likely to affect those resulting from a survey in an urban area such as the Rhondda Fach.

(5) Use of the Multiple-puncture Test

It was recognized during the early stages of the survey that a number of children were "lost" on account of absenteeism during the routine of first testing, reading, retesting, and again reading. Needle-puncture methods of tuberculin-testing have been described (Trambusti, 1928; Stewart, 1928) which presumably possess a number of advantages over Mantoux testing in mass surveys, chief of which are that it is a single procedure and that only 1% of complicated reactions occur, in contrast to 10% produced by Mantoux testing with 1/1,000 O.T. (Edwards and Savonen, 1951).

In order to ascertain whether a needle-puncture technique similar to the Trambusti test but employing multiple punctures and using undiluted adrenaized O.T. might prove to be a satisfactory single test, it was used in 1,109 cases as the initial test. The method and criteria adopted have already been described.

To ascertain whether the results in these cases could be included in the total figures, a comparability study between the multiple-puncture test and the accepted intradermal routine was undertaken in 692 cases.

Method of Comparability Study.—A multiple-puncture test was performed on the right arm and at the same time an intradermal test with 0.1 ml. of 1/10,000 O.T. was performed on the left arm. The tests were read 48 hours later in groups of 20 in the following way. The right arm of each examinee was exposed, the left arm being placed behind the back. The observer read the multiple-puncture test, keeping his attention deliberately and strictly only on the arm of the examinee. Whilst the observer left the room

the whole group was "shuffled." The right arm was now placed behind the back and the result of the intradermal test on the left arm was then read. Cases in which either test was read as negative were retested with 1/100 O.T.

Results of the Comparability Study.—It will be noted from Table VII that one false positive occurs in Category 2 multiple-puncture reactions and none in Category 3. Thus in 102 cases that would have been read as positive if multiple puncture alone had been used as the initial test, one would have been in error. Reference to Table I (a) shows that 231 cases were read as positive to the initial multiple-puncture test and were not retested. Two of these may have been "false positives"—an error which does not affect the validity of the total results.

It should be noted (Table VII) that, had the multiple-puncture test been used as a single test only, the Category 2 reaction would have been too high for reading a positive

TABLE VII.—Comparison Between Results of Multiple Puncture and Intradermal Tuberculin Testing in School Children

Reactions to Multiple-puncture Test			Reactions to Mantoux Tests		
Presumed Negative	Presumed Positive		1/10,000 O.T.	1/100 O.T.	Total
0	1		Pos.	Neg.	Pos.
561	29		—	561	22
			7	22	14
			43	17	16
			40	2	2
	60				
		42			
Total	692		90	602	54
					548
					144
					548

test, since out of 29 reactions designated as Category 1 as many as 21 were positive to Mantoux testing. If, however, Category 1 reactions had been accepted as positive then 8 out of the 29 would have been in error. This is preliminary work with this test, and further investigations on the reading of the lowest category of reaction that can be regarded as positive is necessary before the multiple-puncture test can be used as a satisfactory single test in survey work requiring scientific accuracy.

Criteria for Reading a Positive Reaction

Although qualitative results only are shown in Table I, any measurable induration was recorded. The results on retesting cases which were read as qualitatively negative but in which some measurable induration was present are shown in Table VIII. Since only 12 out of 124 of such

TABLE VIII.—Results of Retesting with 1/100 Intradermal O.T. a Sample of Cases Designated after the First Test as "Negative," but Showing Some Measurable Induration

Reaction to 1st Test with 1/10,000 O.T.	Reaction to 2nd Test with 1/100 O.T. Induration Measured in mm.					
	0-5 mm.	5-10 mm.	10-20 mm.	20-30 mm.	30-40 mm.	40+ mm.
Negative "with measurement" .. 51	12		6	23	7	3
Doubtful "with measurement" .. 73			8	41	21	3
Total .. 124	12		14	64	28	6

cases proved negative on second testing with 1/100 O.T. and the measured induration of those reacting positively was high, the results suggest that the criterion of 5 mm. of induration for a positive test with 0.01 mg. of O.T. is probably too high.

Summary and Conclusions

Of the children on the school registers in the Rhondda Fach area, 71.9% were tuberculin-tested. The stages at which lapses occurred are presented and three-quarters of the total lapses are analysed by age groups.

Evidence is presented which suggests that the sample is adequate for the results to be considered as an accurate reflection of the total tuberculous infection in the community.

The trend of conversion rates at different age groups in the Rhondda Fach and in another valley are presented. These form a satisfactory basis for later comparison applicable to the studies which are to be continued in the future to ascertain the effect of the control of tuberculous infectivity in the Rhondda Fach.

Possible sources of error have been considered, including that of error in the qualitative reading of tuberculin tests by experienced observers, and none of these are regarded as invalidating the results and purpose of the survey.

A comparability study was carried out in 692 cases between the multiple-puncture method of tuberculin-testing and the normal intradermal method. The inclusion of figures obtained by the use of the multiple-puncture method of testing does not invalidate the results or conclusions drawn from the study. As yet the multiple-puncture test cannot be regarded as a satisfactory single test for survey work requiring scientific accuracy.

Evidence is presented that the criterion of 5 mm. of induration for the reading of a positive test with 0.01 mg. of O.T. is probably too high.

I am grateful to Dr. V. W. J. Hetreed for his ready co-operation in the work on double-observer reading of the tests and to Mr. John H. Phillips, Administrative Officer of the Mass Radiography Service in Wales, for the organization of the survey and in the preparation of the statistical tables. I am indebted to the Medical Research Council, London, for the material and equipment used in this study and to the Cardiff Public Health Laboratory for its preparation and sterilization; to Professor F. Heaf, of the Department of Tuberculosis in the Welsh National School of Medicine, to Dr. Norman Tattersall, late Regional Tuberculosis Physician, Welsh Regional Hospital Board, to Mr. Peter Oldham and Dr. A. L. Cochrane, of the Pneumoconiosis Research Unit, and to Dr. J. B. Atkins, H.M. Inspector of Mines, for generous and helpful criticism.

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Dr. Max J. Miller, of the Institute of Parasitology, McGill University, has recently been appointed Research Director of the Liberian Institute of the American Foundation for Tropical Medicine. The Foundation was incorporated in 1934, and is associated with the American Society of Tropical Medicine and the American Academy of Tropical Medicine. The Foundation supports the teaching of tropical medicine in medical schools and promotes research into tropical disorders. The Liberian Institute was established in 1946 to carry on comprehensive research on the origins, treatment, and control of tropical diseases. The Institute's immediate objective is to provide an international laboratory centre where medical, governmental, educational, and industrial scientists of all nationalities can unite in a common attack on diseases of man and domestic animals, and on the production of balanced food crops for both man and animals.

CHLORAMPHENICOL TREATMENT OF THE NEWBORN

BY

R. M. CALMAN, M.B.
Bacteriologist

AND

JOHN MURRAY, M.D.
Director of Pathology

(Bernhard Baron Memorial Research Laboratories, Queen Charlotte's Maternity Hospital, London)

The synthesis and large-scale production of chloramphenicol has made available everywhere a valuable antibiotic, effective against a wide range of pathogenic organisms, including strains resistant to penicillin. As the drug can be taken by mouth, vast numbers of patients, old and young, have been treated somewhat empirically, and it is not surprising that some of the hundreds of papers describing successful therapy disclose serious toxic effects. Most of the reports of fatal aplasia of bone marrow are associated with relatively large doses, or prolonged or repeated treatment with the drug (Hawkins and Lederer, 1952; Sturgeon, 1952; Smiley *et al.*, 1952; Claudon and Holbrook, 1952; Wolman, 1952).

It has therefore become necessary that the clinician should know exactly what serum concentration to expect from a recommended dose. In the case of adults this was provided by Ley *et al.* (1948) and by Hewitt and Williams (1950). For children, Kelly *et al.* (1951) have reported blood-serum levels, and shown how long they persist. As their series contained only one baby less than 6 kg. in weight, an investigation was undertaken in order to establish serum levels obtained in babies during the first fortnight of life.

A group of babies suffering from staphylococcal infections was therefore selected for trial with chloramphenicol therapy.

Present Investigation

Methods.—Blood was obtained in sterile Wright's capillaries from heel puncture. With this method quite small quantities of blood yielded enough serum for assay.

Assay.—Numerous different organisms have been used for the biological assay of chloramphenicol levels in blood serum. The organism most commonly recommended is *Sh. sonnei*. We have tested various other bacteria and found that, using the capillary technique of Fleming (1944), one of our strains of Group A beta-haemolytic streptococci (9570) was conveniently inhibited by exactly 1 µg. of chloramphenicol per ml. The use of this strain clearly simplified the estimation of chloramphenicol levels when a result in µg. per ml. of serum was required.

Test.—The results were read after incubation at 37° C. overnight, the end-point being the tube in which the test organism just failed to grow. This was confirmed by Gram-staining where there was any doubt.

Dosage of Drug.—In order to ensure that all of the intended dose was taken by the babies, chloramphenicol was dispensed as a powder, each powder being made up separately in a waxed paper packet, according to the infant's weight. The powder was given by teaspoon, together with a small amount of syrup. By the dosage scheme, only a limited series of weighed powders need be held by the dispensary to meet the requirements of babies of different sizes, and powders of appropriate amount were available at all times of the day and night. As will be seen from the Table, even at the extremes of each weight range the

deviation from the intended dose is very slight. This dosage was calculated on the basis of 100 mg. per lb. (220 mg. per kg.) per day in three separate doses.

As babies do not appear to taste chloramphenicol it was not thought necessary to use the palmitate derivative, the absorption of which might be less certain in the newborn.

Chloramphenicol Dosage According to Weight

Weight of Baby	Individual Dose
1½ lb. (0.68 kg.) and below	50 mg.
2-3 lb. (0.91-1.36 kg.) inclusive	100 "
3½-4½ lb. (1.59-2.04 kg.) "	150 "
5-6 lb. (2.27-2.72 kg.) "	200 "
6½-7½ lb. (2.95-3.40 kg.) "	250 "
8-9 lb. (3.63-4.08 kg.) "	300 "

Where the weight lay between the points on the range, it was taken to the nearest ½ lb., and doubtful ones were placed in the higher group; thus a 7 lb. 10 oz. (3.46 kg.) baby received 250 mg., and a 7 lb. 12 oz. (3.51 kg.) baby received 300 mg. The chloramphenicol was dispensed as a powder.

Results

A preliminary series of tests was made in 17 babies (weight 6 to 9½ lb., 2.7 to 4.3 kg.) to determine the effect of a constant dose of chloramphenicol (100 mg. thrice daily) irrespective of weight. This method was tried, as

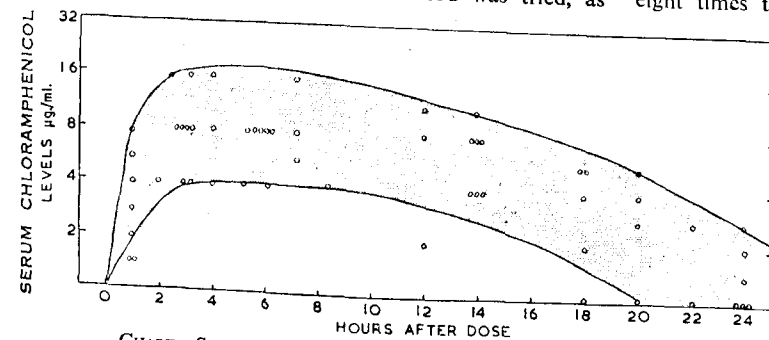


CHART: Serum chloramphenicol levels in 24 newborn babies.

Murray and Crawford (1951) had found that with oral penicillin in the newborn a constant dose of 100,000 units gave excellent serum levels for more than six hours. The results with a constant dose of chloramphenicol gave very inconsistent serum levels, and this method was abandoned in favour of dosage by weight.

The serum level of chloramphenicol was traced over a period of 24 hours in 30 babies who received a single dose according to the scheme shown in the Table. In order to exclude the possible presence of inhibitory substances in the serum, in the first half of the cases a control test was made before administration of the drug. In none of these was any inhibitory level found.

In 24 babies chloramphenicol was detected in the serum, whereas in six no serum level was found. In one of these six cases the baby vomited within 30 minutes of receiving the drug, but in the remaining five the causes of the failure to detect a serum level were never elucidated, and in the absence of vomiting must remain open to conjecture, since there is no evidence of failure to absorb the drug. In fact, in one of the five cases the baby received a repeat dose the following day, and levels of 3 µg. were found at one hour, and 6 µg. at seven and a quarter hours after the dose.

It is interesting to note that in Case 30 vomiting occurred one and a quarter hours after the drug was given, and a good serum level was still present at 18 and 24 hours.

The results of these estimations are shown as points in the Chart, and the limits within which they fall appear as a stippled area, which it can be seen forms a smooth curve.

On account of the times at which samples were collected, a calculated mean curve is not presented: it is felt that the band showing the general limits of chloramphenicol levels presents a more useful indication of the results that can be expected from treatment with this drug. Individual cases were followed through, and conformed to the general shape of the curve.

Of the results on the 24 babies shown in the Chart, the first 12 were tested two or three times during the first eight hours in order to establish how rapidly the serum level rose. The remaining cases were used to determine how well the serum level was maintained during the latter part of a 24-hour period. In this group, samples were taken three times—the first at one hour, and the others between 12 and 24 hours after the dose. In only one case in which the chloramphenicol was shown to have been absorbed did the level fall below 4 µg. per ml. serum in under 14 hours.

Discussion

The effect of an antibiotic upon an organism in the body compared with its effect in the test-tube is always a matter of experience and prolonged trial. As this investigation was designed to show the effect of a single dose, no attempt was made to correlate the serum levels with clinical results. However, treatment has proved uniformly satisfactory in cases subsequently treated according to this dosage scheme. The results, however, do show that it is possible to achieve a concentration of chloramphenicol in the serum four to eight times that which is effective in the test-tube. The

Chart shows that in the present series such a level was maintained in almost all cases for more than 12 hours. It would appear, therefore, that for the newborn it should be necessary to give chloramphenicol only in the doses here suggested, twice daily. With any drug given by mouth there is always some risk that it will not be absorbed; this is especially true of babies, for extra care must be taken to ensure that regurgitation does not occur. For this reason it is desirable to keep the babies under strict supervision.

Although the dosage scheme was calculated on the basis of 100 mg. per lb. (220 mg. per kg.) per day, given in three separate doses, the levels achieved have shown that it is unnecessary for the drug to be given so often, since the serum level is maintained so well. We have therefore employed doses of 33 to 50 mg. per lb. (73 to 110 mg. per kg.) per single dose. An odd feature of this investigation is that the levels obtained were nowhere near so high as those found in older children by Kelly *et al.* (1951) using almost half the dose. It is possible that this discrepancy may be accounted for by the difference in method of assay. That used by Kelly *et al.* was a modification of the Osgood turbidimetric method, whereas ours was a biological assay using a standard β -haemolytic streptococcus as a test organism. Whatever the absolute accuracy and relative merits of the two methods may be, the one used in this series has shown that the levels obtained in the serum were very much greater than those necessary to inhibit chloramphenicol-sensitive pathogens in the test-tube, and all the evidence goes to indicate that this drug is at least as active in the body as *in vitro*.

Our dosage, while rather greater than that recommended by the manufacturers, is very similar to that successfully used by Smellie (1950) in the treatment of infantile gastric enteritis. We feel, therefore, that a dosage of between 33 and 50 mg. per lb. (73 and 110 mg. per kg.), given twice in 24 hours, should be adequate in the treatment of suitable infections in the newborn.

Summary

A haemolytic streptococcus sensitive to 1 µg. of chloramphenicol per ml. was used to assay blood-serum concentrations in 47 newborn babies.

Dosage irrespective of weight proved unsatisfactory in 17 cases.

A scheme of dosage based on body weight was applied to 30 babies, 24 of whom showed satisfactory blood levels for at least 12 hours and detectable levels for 24 hours.

No chloramphenicol was detected in the blood serum in six babies, one of whom had vomited half an hour after its dose. No cause for the remaining five negative results was found. Failure of absorption was discounted, as one of these cases showed a reasonable serum level in a repeat test the following day.

We recommend a dosage as set out in the Table: this represents 33-50 mg. per lb. (73-110 mg. per kg.) per dose, given twice daily.

We would like to thank the paediatricians, paediatric registrars, and nursing staff for their co-operation in this investigation. We are also grateful to Messrs. Parke Davis for generous supplies of chloramphenicol.

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SUMMER HAY-FEVER AND ASTHMA TREATED WITH ANTIHISTAMINIC DRUGS

BY

A. W. FRANKLAND, M.A., B.M., B.Ch.

AND

R. H. GORRILL, M.D.

The Wright-Fleming Institute of Microbiology,
St. Mary's Hospital Medical School, London, W.2

In the early summer of 1948 a trial of a new antihistaminic drug was carried out in the hay-fever clinic. It has since been named chlorcyclizine hydrochloride ("histantrin"). Each tablet contains 25 mg. of N-methyl-N-(4-chlorobenzhydryl) piperazine dihydrochloride. After this trial it was suggested (Frankland, 1949) that, although antihistamines could help the mild case of hay-fever, they might precipitate the onset of asthma in the more severe cases. This was commented on in the review of hay-fever literature for 1949 (Kaplan and Ehrlich, 1951). It was, however, pointed out that a statistical survey of hay-fever patients treated with antihistamines must be carried out before it could be taken as proved that asthma was more apt to occur in such patients. It is interesting that in another trial (Gay *et al.*, 1948) the high incidence of asthma in hay-fever patients treated with antihistamines had been noted, but not commented upon. There is now fairly widespread belief that hay-fever patients who receive antihistaminic drugs as the only form of therapy are more liable to develop asthma than those who receive no treatment (*British Medical Journal*, 1952).

An experiment was designed to test not only the efficacy in hay-fever and hay-asthma of an untried antihistaminic drug, but also whether there was any statistical difference in the incidence of asthma in treated and untreated hay-fever patients. In the first enthusiasm

that greeted the preparation of many new antihistaminic drugs, the published reports suggested that antihistamines do benefit many cases of asthma. Southwell (1948) commented on the non-critical assessments in many of the published papers from France and America. He concluded as a result of a trial of mepyramine maleate ("anthisan," pyranisamine maleate, or "neo-antergan") in the treatment of asthma that it "conferred no apparent benefit upon 25 specially selected and carefully observed asthmatic patients." Hunter and Dunlop (1948) also concluded that mepyramine maleate was of no value in the prevention of asthma. Frankland (1952) and Watkins (1952) agree with these views.

Scheme of Trial and Methods of Assessment

The patients were treated with three different kinds of tablets: (1) mepyramine maleate, which has had extensive trials and clinical use; (2) a new antihistaminic preparation which has as yet no name and will be referred to as 405-c-49 (chemically it is 3-pyrrolidino-1-(4'-chlorophenyl)-1-(2'-pyridyl) prop-1-ene maleate); and (3) inert tablets. It was considered essential that the box of tablets given by the doctor to the patient should be numbered and not named. The consecutive-numbered boxes were given to the patients in the order they reported. Previously the three kinds of tablets had been allocated to the numbered boxes by use of a random-number table. Twin girls who both received the same tablets were the only exception to this random distribution. Anthisan (mepyramine maleate) is normally coloured green, but for the purposes of the trial Messrs. May & Baker kindly supplied white tablets. The inert tablets, which contained 5 gr. (0.32 g.) of lactose, looked similar to but differed in taste from the antihistamine under trial. Each tablet of 405-c-49 contained 10 mg. of the antihistaminic drug, which was thought to correspond clinically to a dose of the 100-mg. tablet of mepyramine maleate. The doctor did not know which type of tablet he gave to the patient (except for the few patients who asked for a change of tablet). It was not until all the results of treatment had been tabulated that the kind of preparation used was entered on the card. Each patient was given a chart and asked to keep a daily record, from the time the symptoms of hay-fever began, of the number of tablets taken each day, and whether the results were good, moderate, or poor so far as the hay-fever was concerned. The letters G, M, and P were used to designate the daily result of taking the tablets.

The patients were told that they were taking part in a trial of a new drug for hay-fever, and that it was believed that the side-effects, if any, would probably not be annoying, but that the dose was not known. It was suggested that up to four tablets a day was probably the correct dose for relief of symptoms, but more or fewer tablets might be necessary. As a third of all patients were to receive inert tablets when first seen, all of them were told that if they thought the tablets given to them were not effective they could either come back for a stronger tablet or use any other preparation that was considered from previous years' treatment to be more effective.

Normally a patient used the same tablet throughout the hay-fever season, though a few patients who were seen more frequently were given the chance of a change of tablet if they so desired. If a patient did ask for a change of tablet, in each case the new antihistaminic tablet 405-c-49 was given. This allowed a direct comparison with either the inert or the mepyramine maleate tablets. In practice only a few patients came back for what was euphemistically called the stronger tablet.

When the patients were first seen at the beginning of the trial they were accepted as suitable for it so long as their complaint was one of seasonal hay-fever. Before the dis-

nosis could be made, symptoms of irritation of the eyes with rhinorrhoea and sneezing during the month of June had to be present. In many the symptoms lasted longer than one month. In many cases the symptoms began in May and continued until the beginning of August or longer. Interestingly, the daily charts often indicated a season much shorter than had been given at the first interview. Many of the women and nearly all the children were very vague about the week and sometimes even the month of the onset and disappearance of symptoms. Every patient was also carefully questioned at the beginning and at the end of the trial regarding symptoms of asthma. If there was any suggestion of a non-seasonal allergic rhinitis or asthma the patient was excluded from the trial.

During the last week in August and the first week in September the patients were reviewed. They brought back their completed daily charts and any unused tablets. For reasons unconnected with this experiment they had their skin reactions retested. For various reasons, but generally because of distance from London, some of the patients undergoing the trial did not return for the final interview. Each one of these was written to and requested to return the daily chart and answer a questionnaire. The following information was obtained from all patients. They were asked whether the overall results of the treatment were good, moderate, or poor; whether they had noticed any side-effects from the tablets, and, if so, what these were; and whether they preferred the new tablets to any previous antihistamine used.

The daily record of the chart indicated the number of tablets taken and whether they produced good, moderate, or poor relief. If the total number of "good" days exceeded the total number of "moderate" and "poor" together the result was called "good." So, too, if the total number of "poor" days exceeded the "moderate" and "good" days the result was called "poor." Moderate relief as shown from the chart nearly always corresponded to the patient's overall impression of the treatment. The heading includes most of those who obtained good results at the start of the hay-fever season but at the height of the pollen cloud found that the tablets were not effective. When the side-effects from the tablets were such that normal everyday occupations could not be continued the results were designated "poor." In five cases the results according to the chart and to the patient's statement did not correspond. The patient, who in each case was a child, stated that the tablets had not helped, while the chart showed good results. The child's impressions were accepted rather than the wishful thinking of the mother that had caused her to fill in a faulty card. Even so, as is described later, some of the patients did obtain good results from the inert tablets.

The diagnosis of asthma in all the patients was based on subjective observations. Grading of asthma according to severity of symptoms was not carried out.

The clinical diagnosis of summer hay-fever was confirmed in every case by means of skin tests. The method used was to prick through a small amount of testing fluid with a sharp needle so that momentary pain was felt but no blood was produced. It has been shown that under standard conditions about 0.000003 ml. is introduced into the skin (Squire, 1950). For the diagnosis of a grass-pollen sensitivity a mixed pollen extract ("pollacine") of a strength of 20,000 Noon units was used.

Results

In all, 174 patients took part in the trial, and the preliminary analysis shows that the three groups are comparable regarding sex ratio, age, age of onset of hay-fever, and follow-up (Table I). The results of the use of the three different tablets in the treatment of hay-fever, together with the results of those who changed their tablets, are given in Table II. Few patients elected to change their type of

tablet during the trial: the figures show that no patient on 405-c-49 tablets changed, three patients on mepyramine maleate changed and were given 405-c-49, and four patients on control changed and were given 405-c-49 tablets. The results following change of tablet are interesting, but owing to the numbers being so small no statistical analysis can be made.

In each group records were made of the incidence of asthma and the history of previous antihistaminic treatment for hay-fever. The results are shown in Table III. All patients who had had asthma in previous summers developed asthma again in the summer of 1951 except one patient who previously had had a summer hay-fever and associated asthma but had noticed no asthma for the last five years. As will be seen, the results show no evidence for a correlation between drug-taking and asthma. The same number of patients developed asthma for the first time in the summer of 1951 whether they took antihistaminic or control tablets.

TABLE I.—Composition of Three Groups of Cases

		Mepyramine Maleate (55)	405-c-49 (59)	Control (60)
	Male	31	37	33
	Female	24	22	27
Age of patient	Years			
	0-9	2	4	3
	10-19	12	9	14
	20-29	22	22	21
	30-39	12	18	16
	40-49	7	5	2
	50+	0	1	4
Age at onset	Years			
	0-9	13	12	14
	10-19	17	24	22
	20-29	20	16	19
	30-39	4	6	2
	40+	1	1	3
Follow-up:	Attended interview	48	45	50
	Responded by letter	7	12	7
	Defaulted	0	2	3

TABLE II.—Results of Treatment of Hay-fever

Results	Mepyramine Maleate	405-c-49	Control
Good	28	25	11
Moderate	10	16	4
Poor	16	16	42
Total	54*	57	57

Statistical analysis:

- (1) Mepyramine maleate v. control: $\chi^2 = 21.18$, $P < 0.001$
 (2) 405-c-49 v. control: $\chi^2 = 24.18$, $P < 0.001$
 (3) Mepyramine maleate v. 405-c-49: $\chi^2 = 1.26$, $P \approx 0.5$

Changed Tablets

	Original Status	Results on 405-c-49
Mepyramine maleate	3 poor	2 good, 1 moderate
Control	4 "	4 good

* Although all the mepyramine maleate patients were successfully followed up one failed to take any tablets during the season.

TABLE III.—Incidence of Asthma

	Present Before this Year	First Time this Year	Absent
Mepyramine maleate	17	6	31
405-c-49	18	6	33
Control	18	7	32
Total	53	19	96

Overall % = 42.86

History of Previous Use of Antihistaminic Drugs

Mepyramine maleate	23 with asthma	13 had used drugs before (57%)
	31 without asthma	24 " " " (77%)
405-c-49	23 with asthma	17 " " " (74%)
	34 without asthma	22 " " " (65%)
Control	25 with asthma	20 " " " (80%)
	32 without asthma	25 " " " (78%)

TABLE IV.—Duration in Years of Hay-fever in Asthma and Non-asthma Cases

Duration of Hay-fever in Years	Mepyramine		405-c-49		Control		Pooled Data	
	Asthma Cases	No Asthma	Asthma Cases	No Asthma	Asthma Cases	No Asthma	Asthma Cases	No Asthma
0-...	7	14	8	14	3	14	18	42
5-...	5	7	4	7	8	10	17	24
10-...	6	2	3	7	6	6	15	15
15-...	3	4	6	4	4	1	13	9
20+...	2	4	3	1	4	1	9	6
Total	23	31	24	33	25	32	72	96

χ^2 on pooled data = 9.51, $P = 0.05$.

Also when the past history of the asthma cases is compared with the unaffected cases it will be seen that there is no difference in the incidence of asthma whether antihistaminic drugs had or had not been taken previously.

In view of these findings the importance of duration of hay-fever on the onset of asthma was examined. The results are set out in Table IV. It will be seen that in all three groups of patients asthma is more likely to occur with long durations of hay-fever. The figures have accordingly been pooled and analysed, and the results are just significantly different.

The value of treatment of hay-fever by antihistamines might depend upon the presence or absence of hay-asthma. With this in mind the figures in Table V were obtained, and, as each group shows the same trends, two groups of pooled data are also shown. The statistical analysis shows that the results are significantly better in non-asthma cases than in asthma cases. This observation is emphasized by including the control group, which makes the significance much bigger. The explanation is that inert tablets had very little effect in cases with hay-asthma but seemed to have some effect in mild cases not complicated by asthma.

The figures collected in this trial of the incidence of asthma in the three treatment groups allows an investigation into the number affected with asthma and the number with relief of symptoms. There seems to be no difference in results between the two potent antihistamines and lactose in the treatment of hay-asthma (Table VI).

The side-effects from taking the three different kinds of tablets are shown in Table VII. In 10 patients mepyramine maleate caused such a marked soporific effect that hay-fever was preferred. Other patients with less severe side-effects reported that these lessened after the first few days. If the patient complained of any other effect which was believed to be due to the tablets and not to the hay-fever, this was recorded. Some of the patients who developed asthma for the first time when taking tablets not unnaturally blamed the treatment. Two of the patients who attributed

TABLE V.—Results of Treatment of Hay-fever in Asthma and Non-asthma Cases

Results	Mepyramine Maleate		405-c-49		Mepyramine Maleate and 405-c-49 Pooled		Control		Pooled Data All 3 Groups	
	A.P.	N.A.	A.P.	N.A.	A.P.	N.A.	A.P.	N.A.	A.P.	N.A.
Good	8	20	11	14	19	34	3	8	22	42
Moderate	1	9	6	10	7	19	0	4	7	23
Poor	14	2	7	9	21	11	22	20	43	31

χ^2 pooled data of all 3 groups = 13.63, $P = 0.001$.
 * 2 active groups = 10.63, $P = 0.01$.
 A.P. = Asthma present. N.A. = No asthma.

TABLE VI.—Results of Treatment of Hay-asthma

Drug	No. of Patients with Asthma	No. Obtaining Relief
Mepyramine maleate	23	3
405-c-49	24	4
Control	25	3

TABLE VII.—Side-effects of Tablets

Side-effects	Control	Mepyramine Maleate	405-c-49
Soporific { Mild .. 4 } 5 { Severe .. 1 }		11 } 21 { 10 }	9 } 10 { 1 }
Any other effects* { Constipation (1) { Headache (1) { Diarrhoea (1)		Depression (1) Nausea (1) Headache (1) Diarrhoea (1)	Depression (1) Dizziness (1) Thirst (1)
Catarth	0	3	3
Asthma	2	1	2

* The number in parentheses refers to the frequency of complaints and not to the number of patients.

TABLE VIII.—Preference of Tablet for Hay-fever Treatment

Tablet	Preferred Tablet to Any Other	Preferred Others	The Same	No Opinion	Never Used Tablets	Total
405-c-49	24	5	7	3	18	57
Mepyramine	22	6	10	3	14	55
Control	15	27	1	4	10	57

their asthma to the treatment were on control tablets, one was on mepyramine maleate, and two were on the new antihistamine.

Table VIII shows the preference of patients for various kinds of tablets. Ten of the patients preferred control tablets to all other tablets tried because they produced no side-effects. Even so, the control tablets gave such poor results that 27 patients preferred any other tablets. There is little to choose between the preferences of the groups on the two antihistaminic drugs, though Table VII would indicate that because of fewer side-effects the new preparation is preferable.

Conclusions

The purpose of the trial in 1951 was twofold: (1) to carry out a clinical trial of a new antihistaminic drug in cases of hay-fever; and (2) to see whether the incidence of asthma in seasonal cases of hay-fever was altered when symptomatic treatment with antihistaminic drugs was used. This paper is concerned mainly with the latter problem.

The new antihistaminic drug 405-c-49 compared favourably with mepyramine maleate, though weight for weight it was ten times more potent.

The number of patients who had asthma with their seasonal hay-fever for the first time in their life was the same or similar in the three groups, as was the number who never had asthma but who had had previous antihistaminic drugs. In Table III it will be seen that the overall incidence of asthma for the whole group was 42.86%, which compares with a figure of 55% given by Williams (1950) for South Wales. Table VII shows that in each group a few patients thought that their asthmatic symptoms were due to the tablets.

The prognosis in hay-fever is difficult to gauge except to say that Table IV indicates that the longer hay-fever is present the more likely is it that the patient will develop asthma with it. The presence of asthma makes it less likely that antihistamines will help the hay-fever, as shown in Table V, though if specific hyposensitization is given, and this helps the pollen asthma, any remaining hay-fever is helped by antihistamines (Frankland, unpublished work). Finally, it will be seen (Table VI) that, contrary to the observations of the earlier literature on the subject, there is no evidence in a carefully controlled selected group of seasonal (pollen) asthmatic patients that the antihistaminic drugs are of any benefit to the asthma when used as the only form of treatment.

Summary

A clinical trial has been made with antihistaminic drugs in the treatment of seasonal cases of hay-fever and asthma.

Suitable antihistaminic drugs help many of the mild cases of seasonal hay-fever. These drugs do not increase the incidence of asthma, nor do they help the symptom of asthma when it occurs.

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PYLEPHLEBITIS AND SEPTICAEMIA TREATED WITH AUREOMYCIN

BY

F. GRAHAM MARSON, M.D., M.R.C.P.

Senior Medical Registrar

AND

M. J. MEYNELL, M.D., M.R.C.P.

Clinical Pathologist

with a Note on the Surgical Findings by

F. WELSH, F.R.C.S.

The General Hospital, Birmingham

Recovery from systemic infection with organisms of the *Bacteroides* group is worth recording in view of the high mortality. In well-established infections the case mortality is over 50% (Topley and Wilson, 1946). Brown *et al.* (1941) reported the recovery of one of fifteen patients with septicaemia due to bacteroides. Comparably poor results were recorded by Thompson and Beaver (1932), Reid *et al.* (1945), Ruys (1947), and McVay *et al.* (1949). The last-named, in their report of six cases, had four deaths despite chemotherapy. The last two cases recovered after large dosage of aureomycin and supportive treatment.

A case of pylephlebitis with septicaemia, from which both *Bacteroides fragilis* and *Streptococcus haemolyticus* were isolated, was recently admitted to this hospital. The patient was originally treated with penicillin, chloramphenicol, and streptomycin with no apparent benefit. The regimen of McVay *et al.* was adopted, with final recovery of the patient.

Topley and Wilson include the bacteroides in the genus *Fusiformis*. They define the latter as follows: "Obligate parasites. Anaerobic or microaerophilic. Cells frequently elongated and fusiform, staining somewhat unevenly. Filaments sometimes formed; non-branching; sometimes highly pleomorphic. Non-motile. No spores. Reaction to Gram variable, but mainly Gram-negative. Growth in laboratory media feeble." They term infections with the genus *Fusiformis* as necrobacillosis.

Bergey (1948) separated the bacteroides from the fusiform bacilli and defined them as motile or non-motile Gram-negative bacilli which are obligate anaerobes.

Beigelman and Rantz (1949) emphasize the ubiquitous character of the group. They state that these organisms have been isolated from gangrenous lesions of practically all the organs of the human body as well as from

normal mucous membranes. They are commonly present in the mouth, tonsils, large bowel, and female genital tract. The general opinion is that they are of low virulence in man and act as secondary invaders. Blood-stream infection is probably not uncommon, but spontaneously terminates as soon as the primary focus is treated. Rarely, a septicaemia arises which ends fatally. It is stated by Reid *et al.* that pylephlebitis of the regional veins draining the primary focus is a common occurrence; arthritis, jaundice, and pulmonary emboli are frequent accompaniments.

Case Report

A man aged 32 was admitted with an illness of one month's duration. Whilst at work he was seized with severe upper abdominal pain, which later radiated to the right iliac fossa. This continued for four days and was accompanied by some diarrhoea. On the fifth day the pain began to abate, but he suffered a rigor. For the three weeks before admission he had two or three rigors a day.

On examination he appeared extremely ill, and was pale, thin, and sallow. His pulse was 120; temperature 102.8° F. (39.3° C.). No abnormality of the cardio-respiratory system was detected apart from a haemic murmur. The upper abdomen was tender; no mass was palpable. The liver and spleen were not palpable. A rectal examination was negative.

The blood count showed: haemoglobin, 54%; red cells, 3,060,000 per c.mm.; white cells, 19,800 per c.mm., 82% being polymorphonuclears. There were many target red cells in the stained films. The other laboratory examinations were negative, apart from a serum alkaline phosphatase of 35 units, and the Van den Bergh was immediate positive. On admission blood cultures in various media, including Robertson's meat, were taken. These were repeated with each rigor for the first 24 hours. From all cultures two organisms were isolated—a β -haemolytic streptococcus belonging to Lancefield's Group A, and *Bacteroides fragilis*. The latter was agglutinated by the patient's serum to a titre of 1 in 250. The streptococcus was fully sensitive to penicillin.

Bact. fragilis, by the ditch-plate method, was insensitive to penicillin but fully sensitive to chloramphenicol and streptomycin. As a result the penicillin treatment which he had had since admission was stopped and chloramphenicol and streptomycin were given. Chloramphenicol was administered as follows: 4 g. the first day and 2 g. daily subsequently. In addition 2 g. of streptomycin in divided doses was given subcutaneously each day. His temperature continued to swing, at times reaching 105° F. (40.6° C.). A laparotomy was performed on the sixth day after admission and an appendicular abscess was found and drained; the necrotic remnant of the appendix was removed. Examination of the pus revealed, in addition to various organisms, a β -haemolytic streptococcus and *Bact. fragilis*. There was no appreciable change in his condition.

Six days after the first operation another laparotomy was performed in order to ligate the ileo-colic vein. The patient's condition was critical and no further procedure was attempted. On this day he was given aureomycin, 1 g. four-hourly by mouth, and all other antibiotic therapy was stopped. In three days, after 18 g. of aureomycin, his temperature fell to normal and remained so. He received a total of 80.5 g. in approximately 14 days. During this period he had 4 pints (2.3 litres) of blood and a high-protein diet with additional vitamins. His only complaints were a slight soreness of the mouth and some difficulty in swallowing.

After all treatment was stopped he became less cadaverous and began to put on weight. For a few days a pseudochylous fluid drained from his operation wound, but this rapidly cleared up. He was discharged to a convalescent home.

Note on Surgical Findings, by Mr. Welsh

The patient presented as a case of septicaemia, with probably a focus of pus in the abdomen which could not be located by clinical or x-ray examination. Laparotomy, by a transverse upper abdominal incision, led to the discovery of a small appendix abscess containing thick greenish-yellow pus in the right iliac fossa. There was a small amount of blood-stained free fluid in the general peritoneal cavity, and the spleen was found to be enlarged.

Appendicectomy, aspiration, and drainage of the abscess were performed. No definite search was made for thrombosed portal-vein tributaries. On the sixth post-operative day it was decided to reopen the abdomen and search for and ligate the ileo-colic vein. The tissues at the root of the mesentery were all matted and oedematous, but a portion of what was believed to be thrombosed vein was removed between ligatures. Subsequent histological examination did not confirm the presence of vein wall in this tissue.

Notes on the Laboratory Findings

The organism, *Bact. fragilis*, was first isolated from Robertson's meat medium. It was subsequently cultured on blood agar under micro-aerophilic conditions. It closely resembled the characters of the organism described by Schwabacher and Mitchison (1947).

The sensitivity results were as follows:—Penicillin: sensitive to 20 units per ml., insensitive to 10 units per ml. Sulphadimidine: sensitive to 5 and 50 mg. per 100 ml. (plate method). Chloramphenicol: sensitive to 5 units per ml., insensitive to 4 units per ml. Streptomycin: sensitive to 25 units per ml. (plate method). Aureomycin: sensitive to 0.1 unit per ml. Terramycin: sensitive to 0.4 unit per ml.

Comment

A case of pylephlebitis and septicaemia is described with recovery on large dosage of aureomycin. It was of great interest for the following reasons: (1) The failure to respond to penicillin, streptomycin, and chloramphenicol. (2) A Gram-negative bacillus of the *Bacteroides* group and *Sr. haemolyticus* were isolated from the blood and the appendix abscess. (3) The relative absence of toxic effects despite the large dosage of aureomycin used. (4) The development, on recovery, of ascites, which was possibly related to pylephlebitis. (5) The long duration of the illness, with complete recovery.

Thanks are due to Professor A. P. Thomson for permission to publish; to Miss V. M. Jones for technical assistance, and to Miss M. N. Ellis for secretarial assistance.

ADDENDUM.—Since this case was seen rules have been formulated for the combined use of antibiotics. A leading article in the *Lancet* (July 26, 1952, p. 173) divides these agents into two groups. Group 1: Bactericidal—for example, penicillin, streptomycin, and bacitracin. Group 2: Bacteriostatic—for example, aureomycin, chloramphenicol, terramycin, and possibly sulphonamides. Where the organism is sensitive to a drug of Group 1 the addition of a bacteriostatic agent may result in antagonism (this may have occurred in the above case when streptomycin and chloramphenicol were given in combination). If the organism is only partially sensitive to the bactericidal agent the combination with a bacteriostatic may result in synergism.

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CONGENITAL OBSTRUCTION OF THE SMALL INTESTINE IN TWO PREMATURE INFANTS

BY

W. P. SWEETNAM, M.D., M.R.C.P., D.P.H., D.C.H.
PaediatricianF. W. SHEPHERD, M.D., F.R.C.S.
Surgeon

AND

E. F. MURPHY, M.D., D.C.H.
Senior Paediatric Registrar

The Royal Infirmary, Huddersfield

The neonatal mortality rate has fallen by more than a half over the last 40 years. The rate in England and Wales in 1949 was 19.31 per 1,000 live births. Over half the deaths (10.2 per 1,000 live births) were due either to prematurity or to congenital malformations (Ministry of Health, 1949). This paper describes the successful treatment of two infants presenting both of these two main causes of neonatal death. One was a premature infant with an ileal atresia, the other a premature infant with exomphalos and congenital obstruction of the small intestine.

Wangensteen (1942) estimated the incidence of congenital atresia of the small intestine as 1 in 20,000 births. This estimate is based on necropsies and hospital births, and, although the condition must be considered rare, it is probable that the true incidence is higher. O'Neill *et al.* (1948), in a comprehensive review of the literature, could find only 36 cases of atresia of the small intestine which had been successfully treated by operation. A further case has been described by Stevens (1951). The 37 cases include three premature infants with birth weights of 4 lb. 11 oz. (2.12 kg.) (Stetten, 1940), 4 lb. 11 oz. (2.12 kg.) (Ward and Cooper, 1943), and 4 lb. 8 oz. (2.04 kg.) (Duncan *et al.*, 1943). The 52 babies operated upon by Ladd and Gross (1941) showed a mortality rate of 80% for duodenal, 50% for jejunal, and 91% for ileal atresia.

Exomphalos is commoner. Jarcho (1937) estimated its incidence as 1 in 5,000 deliveries; again this estimate is based solely on hospital births, and the true incidence is probably higher. The chances of survival depend largely on the size of the sac. Gross (1948), in a series of 60 cases, found that with a sac less than 7 cm. in diameter there was about a 75% chance of survival following surgery. When the sac was 7–9 cm. in diameter survivals were cut to about 30%. When the sac was larger than 9 cm. the survivals were reduced to about 15%.

Case 1

The baby, a boy, was born a month prematurely. The birth weight was 4 lb. 6 oz. (1.98 kg.). The mother's pregnancy had been uneventful. She had had one previous pregnancy in 1949, and a three-months miscarriage in 1945. Her blood was Rh-positive; the Kahn test was negative. Delivery was rapid, the mother suffering mild obstetrical shock. The baby was left undisturbed for 24 hours, when a small amount of glucose-water was given and retained. The following day $\frac{1}{2}$ -oz. (14-ml.) feeds of breast milk were given two-hourly, and taken readily. Early on the third day vomiting started, and soon became bile-stained. At about this time a normal meconium stool was passed, no food residue being noted.

The baby showed the usual signs of prematurity and dehydration. The abdomen was slightly and evenly distended and peristaltic waves could be clearly seen over the gastric area, and also up and down each side of the abdomen. The child's weight had fallen by this time to 3 lb. 8 oz. (1.59 kg.), and he had lost a fifth of his birth weight. Radiographs taken of the abdomen with the child in various positions showed several loops of gas-distended small intestine with fluid levels, confirming a small-intestine obstruction (Fig. 1).

Three hours were spent in pre-operative treatment: the stomach was washed out and aspirated half-hourly (an intranasal catheter being kept *in situ*), and 200 ml. of 5% glucose in N/5 saline was given intravenously by continuous drip.

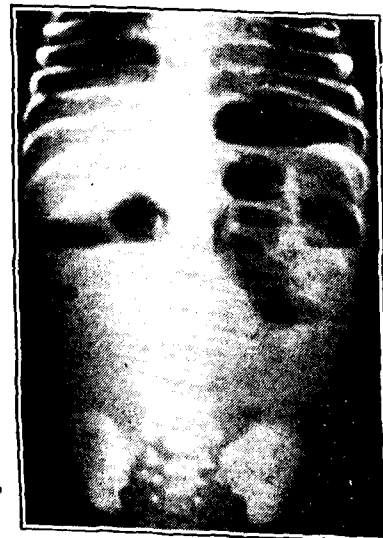


FIG. 1.—Case 1. Radiograph of abdomen showing fluid levels in stomach and small intestine. No air present in large intestine.

A laparotomy was performed 80 hours after birth, by which time the baby's weight must still have been under 4 lb. (1.81 kg.). Atropine, 1/200 gr. (0.32 mg.), was given pre-operatively, and the abdomen was opened through a right paramedian incision, under "vam" and oxygen anaesthesia → ether and oxygen on an open mask (Miss K. M. Watson). There was bile-stained free fluid. Part of the omentum was adherent to the ileum about 12 cm. from the ileo-caecal junction. At this point the lumen appeared to be obstructed by a short imperforate portion, or diaphragm, the ileum above being distended to a diameter of 2 cm., while distally it was collapsed, though probably canalized. No bowel contents could be milked along. The caecum, appendix, and ascending colon were normally developed, though empty.

It was decided that relief of the obstruction could most simply be obtained by making a stoma between the distended ileum and the caecum. The short length of collapsed ileum would then be left as a blind diverticulum draining into the caecum through the ileo-caecal valve. The anastomosis was sutured in two layers with catgut, antiperistaltically, without difficulty. No attempt was made to close the gap in the mesentery or to explore the rest of the abdomen. The abdominal wall was closed in layers. The baby stood the operation very well.

Post-operatively the baby was nursed in an oxygen container with a minimum of clothing; 5% of CO₂ was added for five minutes of each hour. Aspiration of the stomach was continued half-hourly. The intravenous drip of 5% glucose in N/5 saline was continued until the first signs of oedema appeared, by which time a total of 750 ml. of fluids had been given. The drip was then changed to whole fresh blood (from the father), 100 ml. being given in the following two hours. Twenty-four hours after the operation glucose was given by mouth. The next day this was changed to expressed breast milk ½ oz. (14 ml.) two-hourly, slowly increasing to 2 oz. (57 ml.) two-hourly. Streptomycin, 25 mg., and penicillin, 100,000 units, were given intramuscularly four-hourly for four days. The baby's temperature (per rectum) remained between 95 and 96° F. (35 and 35.6° C.) for three days. No attempt was made to raise this. On the fifth day the baby passed a normal stool. The stitches were removed on the tenth day and the baby was

discharged home three weeks after the operation, weighing 6 lb. 8 oz. (2.95 kg.). He was last seen at 3 months of age, by which time he weighed 10 lb. 2 oz. (4.59 kg.), and was having no trouble with breast-feeding or bowel action.

Case 2

This baby, a female, was born six weeks prematurely. The birth weight was 4 lb. 4 oz. (1.93 kg.). The mother's pregnancy had been uneventful. She had had one previous miscarriage, in 1951. Her blood was Rh-positive; the Kahn test was negative. The presentation was a breech with extended arms and legs. An episiotomy was performed under pudendal block and the after-

coming head delivered with forceps. The baby was badly shocked. A small defect was seen in the anterior abdominal wall, through which a translucent rounded mass about 8 cm. across protruded. This mass could be seen to contain intestine. The precarious condition of the child and the danger of rupturing the thin-walled sac precluded any immediate conservative or radical attempts at reduction. The infant was placed in an oxygen container and left undisturbed for 36 hours, when small amounts of glucose-water were given by mouth, followed by ½-oz. (14-ml.) feeds of expressed breast milk. By this time the mass had become opaque and friable. On the fourth day the baby began to vomit. It was apparent that a loop of intestine in the sac had become obstructed. This was confirmed by a plain x-ray film of the abdomen, which showed gaseous distension of the small intestine. The exomphalos was also seen to contain a small loop of intestine (Fig. 2).



FIG. 2.—Case 2. Radiograph of abdomen showing gaseous distension of the stomach and small intestine and a loop of small intestine in exomphalos.

The same pre-operative regime as in Case 1 was followed, 150 ml. of 5% glucose in N/5 saline being given intravenously over two hours. Ninety hours after birth the baby was operated upon. Atropine, 1/200 gr. (0.32 mg.), was given, followed by vam and oxygen → ether and oxygen on an open mask (Miss K. M. Watson). An incision was made over the upper and lower angles of the hernia and the sac opened. A loop of small intestine was seen to have herniated through a small hiatus in the transversalis fascia about 2 cm. in diameter. The sac was excised, the constricting neck divided, and the loop of intestine replaced in the abdomen, which was then closed in layers.

The post-operative regime was the same as in Case 1—a total of 500 ml. of 5% glucose in N/5 saline followed by 75 ml. of fresh blood being given by continuous intravenous drip over the next 36 hours. By the fourth post-operative day the baby was taking 1½ oz. (42 ml.) of expressed breast milk two-hourly. She was discharged home three weeks after the operation.

Discussion

The development of regional neonatal surgical centres for the treatment of congenital malformations has been

strongly advocated (Rickham, 1952). Most paediatricians will agree that certain congenital abnormalities such as oesophageal atresias and genito-urinary malformations require the specialized surgical techniques available only at regional centres. Abdominal malformations of the alimentary tract, particularly obstructions of the small intestine, are probably the most urgent of the remedial congenital malformations. Early diagnosis and immediate pre-operative treatment are required. Available statistics suggest that after 96 hours the operative mortality even in the most capable hands is practically 100%. The delay and disturbance necessarily involved in transferring such cases from outlying hospitals to regional centres is unjustified. Rickham (1952) points out that a surgeon working in one hospital group is unlikely to see more than one or two such cases a year, and therefore unlikely to gather enough experience to deal correctly with the complicated surgical problems. On the other hand, the general surgeon, owing to the development of other surgical specialties, is a specialist in abdominal surgery, and neonatal abdominal surgery should rightly remain within his province.

Summary

Two cases of congenital obstruction of the small intestine in premature infants, with recovery after operation, are reported. The question whether congenital surgical abnormalities in the newborn should be treated locally or at regional centres is discussed. It is suggested that certain congenital abnormalities requiring specialized surgical technique should be transferred to regional centres, and that others, such as obstructive malformations of the small intestines, should be treated locally.

Our thanks are due to Dr. W. S. Dickson, Dr. W. Niven, and Miss K. M. Watson; to the junior medical staff; and to the nursing staff of the Huddersfield Royal Infirmary and the Princess Royal Maternity Home for their invaluable assistance.

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In 1911 Dr. M. David Eder read a paper on "A Case of Obsession and Hysteria Treated by the Freud Psychoanalytic Method" to the neurological section at the Annual Meeting of the B.M.A. It was the "first public contribution to clinical psycho-analysis" in Britain to be described publicly, and was later published in this *Journal* (1911, 2, 750). Now, 42 years later, the case has been followed up—which in that respect probably makes it unique in the psychiatric literature, as Drs. Hunter and MacAlpine indicate in the *British Journal of Medical Psychology* (1953, 26, 64). The patient first consulted Dr. Eder in 1910 because he was worried by a dull aching pain in the back of the neck which caused considerable depression. He was treated twice weekly for three months—the technique being based mainly on free associations and dream analysis. At the last session he was hypnotized, and Dr. Eder suggested to him that he was cured. At the age of 68 he still has some symptoms, mainly of intense pain and tension in the head, which he relieves with barbiturates. But on the whole, says the report, he seems to have made a satisfactory adaptation to life, and learned to live with his symptoms. An interesting point mentioned by these authors is that the patient, who was found to have a "mother complex" displaced on to his sister Ada, probably chose Dr. Eder because of the homophony of the names. But this, involving the concept of transference then little appreciated, went unnoticed by Dr. Eder.

SUCCINYLMONOCHOLINE

BY

H. LEHMANN, M.D., Ph.D., F.R.I.C.

Senior Lecturer in Chemical Pathology, St. Bartholomew's Hospital, London

AND

E. SILK, B.Sc.

Research Assistant

Whittaker and Wijesundera (1951) reported that the product of succinylcholine (succinylcholine SDC) hydrolysis by horse serum was succinylmonocholine (SMC). We decided to study this process, using human serum. While this work was in progress another communication by Whittaker and Wijesundera (1952) described work done with a highly concentrated horse pseudo-cholinesterase (33,000 units per ml.) confirming that, in the enzymatic breakdown of SDC, first SMC was formed, but that this was an intermediate which was subsequently hydrolysed to succinic acid and choline: SDC → SMC + choline; SMC → succinic acid + choline. We found the same with human serum, and when using similar concentrations (SDC 1.1, SMC 0.7 mg. active cation per ml.) could show that SDC was at first hydrolysed four to six times as fast as SMC, but that between 40 and 60% hydrolysis point the speed slowed and became identical with that of hydrolysis of pure SMC. Thus, using a highly concentrated human cholinesterase, we found that it contained for one unit SMC hydrolysis six for SDC. One unit equals 1 μl. CO₂/ml./min./37° C. obtained by the bicarbonate method according to McArdle (1940). At higher substrate concentrations the difference falls, and when they reach 15 times the values with which Whittaker and Wijesundera worked the ratio becomes less than 2:1 (see Table I).

TABLE I.—μl. CO₂/min./ml. of Pseudo-cholinesterase (Human, 16,000 Units) Produced at 20% Hydrolysis Point of Succinylcholine and Succinylmonocholine. Total Volume, 3 ml.; Enzyme Dilution, 1:60

Substrate Concentration 10 ⁻³ M	Succinylcholine SDC	Succinylmonocholine SMC
55	580	350
5.5	514	134

Whereas SMC resembles SDC in its response to pseudo-cholinesterase, as a substrate of the true cholinesterase of the red cells it occupies a position midway between acetylcholine and SDC. Table II shows that SMC, like acetylcholine and unlike SDC, is hydrolysed by true cholinesterase at low substrate concentrations. It resembles SDC in inhibiting acetylcholine hydrolysis by the true cholinesterase, but whereas SDC is still effective at very low concentrations (Evans *et al.*, 1952) SMC inhibits only at the high levels at which the acetylcholine itself becomes an inhibitor.

TABLE II.—μl. CO₂/min./ml. of Packed, Washed, and Laked Human Red Cells, 37° C., Bicarbonate Buffer. Substances are Referred to as mg. Active Cation/ml. Total Volume, 3 ml.; Enzyme Dilution, 1:75

	0.7 mg. Acetylcholine	0.9 mg. SMC
—	149 μl.	24 μl.
+7 mg. acetylcholine ..	71 "	71 "
+9 mg. SMC ..	69 "	21 "

Effect on the Rabbit

SMC has been considered pharmacologically inactive by Bovet *et al.* (1951), but nevertheless they noted a "head-drop effect" with 10 mg. of SMC iodide per kg. of rabbit, compared with 0.2 mg. of SDC di-iodide per kg. As there was here a substance which had a pharmacological action and which could be destroyed by cholinesterases, we decided to investigate the effect on the rabbit in the first instance. The animals were females weighing between 2.5 and 3 kg. The dosages represent active cation of SMC injected intravenously in mg./kg. No effect could be seen below 0.8 mg.; 0.8 to 1.2 resulted in slight depolarizing twitches but no paralysis; 1.3 to 1.5 produced a transient head-drop; from 1.5 to 4.5 there was paralysis of increasing duration—150 seconds at 2.5 and 570 seconds at 3.5. At this latter range the breathing was shallow, but there was no apnoea. A dosage above 4.5 could, and above 5 did, regularly cause respiratory paralysis. When given in doses above 7 mg.—that is, twice that producing 10 minutes' relaxation without apnoea—SMC caused a fall in blood pressure followed by a fall in heart rate. There seemed to be a hexamethonium-like effect on the peripheral blood vessels accompanied by "pooling" of blood in dependent parts of the body. It was followed by a depressant effect on the heart, which persisted after severing the vagus. Thus there is a wide range from the head-drop dose of 1.5 to the toxic dose of 7.5. SMC is much longer acting than SDC at similar pharmacological levels—doubtless because it is so much more slowly destroyed by pseudo-cholinesterase than SDC. An injection of 1 ml. of human pseudo-cholinesterase (16,000 units) terminated the effect of SMC as effectively as that of SDC. In fact, such treatment will allow a rabbit (female 2.5–3 kg.) to survive with impunity a threefold lethal dose of both SDC and SMC.

To find whether these results are applicable to man further work will have to be carried out on other mammals. One certainly would not like to embark on the injection of unusually large amounts of a choline derivative into man without ample reassurance. There exist for man a number of long-time relaxants which are readily controlled by neostigmine; nevertheless a long-acting relaxant which could be counteracted by a harmless compound might be a useful addition to the equipment of the anaesthetist. Neostigmine tends to be given in emergencies and to patients who are already at hazard, and there is always a risk of a toxic effect. Be this as it may, at any rate so far as the rabbit is concerned there exists a cholinergic compound which resembles decamethonium in its prolonged curarizing action and succinylcholine in permitting this action to be terminated at will by the injection of pseudo-cholinesterase.

The Function of Pseudo-cholinesterase

It has hitherto not been possible to allot to the pseudo-cholinesterase a function in life, particularly as, unlike true cholinesterase, it can be removed by specific inhibitors in man and animals *in vivo* without notable ill effect. The most important study on the distribution of pseudo-cholinesterase was that carried out by Ord and Thompson (1952) on brain and nerves of man and animals; they demonstrated by the interplay of specific substrates and inhibitors that the pseudo-enzyme is largely in the white matter of the central and peripheral nervous system in close association with the true cholinesterase of the grey substance. There are now at least four compounds which "poison" the true cholinesterase and are destroyed by the pseudo-cholinesterase: acetylcholine and SMC in high concentrations, SDC and suxethonium at high and low concentrations. Except for acetylcholine, the compounds tested have been synthesized *in vitro*, but it is obvious that similar substances must arise in the intermediary metabolism of the body. It may therefore not be unreasonable to suggest that a function of pseudo-cholinesterase is that of protecting true cholinesterase from non-specific inhibitors.

Summary

Succinylmonocholine inhibits true cholinesterase of man and is broken down by the pseudo-cholinesterase. In rabbits at concentrations of 3.5 mg. of active cation per kg. of body weight it produces muscular relaxation of 10 minutes' duration without apnoea; its effect can be terminated at will by the injection of pseudo-cholinesterase. Prior injection of pseudo-cholinesterase will protect rabbits against toxic doses.

It is suggested that a function of pseudo-cholinesterase is that of protecting true cholinesterase against non-specific inhibitors.

We thank Professor D. Bovet and Messrs. May and Baker Ltd. for gifts of succinylmonocholine. We are indebted to Professor K. J. Franklin, who kindly gave us the hospitality of his laboratory for the kymographic recording of blood pressure changes; to Dr. G. Boissard, for assistance in this part of the work; and to Drs. F. T. Evans and P. W. S. Gray for helpful discussions. Dr. E. B. McLean kindly provided us with a concentrated pseudo-cholinesterase solution produced by a further fractionation of Cohn's fraction IV-6-1 with ammonium sulphate. We are grateful to the Medical Research Council for an expenses grant, and for a maintenance grant to one of us (E. S.).

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Medical Memorandum

Stevens-Johnson Syndrome

A further case of this rare disease is reported in the hope that the photographs will be of help to others who have not encountered it. Involvement of the nails is a feature that has not been mentioned in previous cases.

CASE REPORT

A boy aged 5 years 3 months had been in good health since the removal of his tonsils and adenoids two months previously on account of frequent attacks of tonsillitis. The only other illnesses were measles at 3, whooping-cough at 5, and several large epistaxes. The family history was not relevant. On September 7, 1949, a slight discharge from both eyes was noticed, and his appetite became poor. This discharge increased rapidly and the lids became oedematous. The next day his lips began to swell, a rash appeared, and he was febrile. He was admitted on September 9. The clinical picture is shown in the photographs taken the next day. The features of the case were:

Bilateral angular conjunctivitis, with a profuse purulent discharge and much irritation, which made him rub the oedematous lids. There was no corneal ulceration.

Haemorrhagic crusting of the lips, strikingly confined to the red margins, extending neither to the mucous membrane inside the lips nor to the relative normal surrounding skin producing by contrast the appearance of circumoral pallor (Fig. 1).

The Rash.—The distribution was general but more pronounced on the face, extensor surface of the forearms palms (but not the soles), and nail margins. On the face the cheeks were the most affected, with fewer lesions round the mouth, on the forehead, and (not shown) behind the pinnae. The penis was involved no more than the trunk and there was no urethritis. The configuration was pleomorphic, the discrete lesions varying from 2 to 5 cm. in diameter and tending to be circular or oval. The lesion

itched and some were in relation to scratch marks (see left forearm in Fig. 2). The early lesions were erythematopapular, later becoming vesiculo-bullous. Breaking of the bullae produced raw areas and haemorrhagic crusting. On the face the lesions were confluent. On the extensor surfaces of the forearms and on the palms, where the lesions

were becoming confluent, the intervening skin was erythematous. Elsewhere the intervening skin was normal. Oedema was confined to the cheeks, mouth, and eyelids. Except at the umbilicus, no lesion was pustular.

In the mouth there were raw areas from lesions on the mucous membranes of the cheeks; the soft palate, fauces, and tonsillar beds escaped. Surprisingly there was no enlargement of the cervical lymph nodes.

The nail beds and skin of the terminal phalanges of both fingers and toes were heavily involved (Fig. 3).

On examination his temperature was 102.6° F. (39.2° C.), pulse 128, and respirations 26. He was miserable and crying, but intelligent and co-operative. The lymph nodes were not enlarged. The cardiovascular and central nervous systems were normal. The respiratory system showed no evidence of infection. The liver and spleen were not palpable.

Swabs from the conjunctival, skin, and mouth lesions were taken before any treatment was given. Cultures in broth and on blood-agar and chocolate-agar (+CO₂) plates were sterile. The blood count and urine were normal.

Treatment.—(1) Aqueous penicillin, 100,000 units six-hourly for six days, then procaine penicillin, 300,000 units (1 ml.) daily for a further six days. (2) Tab. sulphadimidine, 1 g. six-hourly for six days (total 24 g.). (3) Penicillin cream to the broken bullae. (4) The eyes were irrigated every six hours with 1% boric eye lotion, after which penicillin eye drops (1,000 units per ml.) were instilled. (5) Tab. phenobarbiton, ½ gr. (32 mg.) twice daily, during the first ten days.

The patient was afebrile and the pulse rate became normal within 24 hours. There was no further rise in temperature. Also, by the next day, in spite of the alarming appearance, he was feeling well and faced the camera with co-operation and composure. In a week the conjunc-

tivitis had cleared up completely. After a fortnight all the skin lesions had cleared except for a little dry crusting where the larger bullae had been. He was discharged home in good health on October 10 after 31 days in hospital. When seen in January, 1950, he had remained in good health. He had shed all the nails of his fingers and toes twice since discharge from hospital. In November, 1950, he was well and there has been no recurrence of any skin lesions.

COMMENT

This disease was reviewed by Thomas (1950), who regarded it as a severe form of erythema exudativum multiforme (Hebra). Thomas stated: "It occurs to me that simpler appellations would be 'erythema multiforme exudativum major' and 'erythema multiforme exudativum minor.'" Although possibly attractive to the purist, most doctors will prefer to leave this esoteric sesquipedalianism to their dermatological colleagues and continue to call the disease the Stevens-Johnson syndrome.

The clinical picture is pathognomonic and must rank with diseases such as cretinism, mongolism, pink disease, etc., which, once seen, can thereafter be recognized at a glance.



FIG. 1.



FIG. 2.



FIG. 3.

This case satisfied the criteria of the Stevens-Johnson syndrome—namely, a generalized eruption, continued fever (cut short by treatment), inflamed buccal mucosa, and severe purulent conjunctivitis. The marked involvement of the nail beds, with subsequent shedding of the nails twice, is not mentioned in other cases. This boy was never very ill, and within 24 hours of admission became afebrile, improving steadily thereafter. The dangerous complications of corneal ulceration and pneumonia never looked likely to occur, and gave no anxiety. This prompt improvement must be attributed to the energetic treatment, which prevented any secondary infection. It seems to me that, in these days when sulphonamides are more of a food than a medicine, it is difficult to be sure that toxicity to sulphonamides can be a cause of the Stevens-Johnson syndrome. Certainly, except in persons known to be sulphonamide-sensitive, such a consideration should not prevent sulphonamides being given in full doses to prevent secondary infection.

For permission to publish this case I am grateful to Dr. Duncan Brierley, the family doctor, and to Dr. W. H. Macmillan, under whose care the boy was while in hospital. I am indebted to Mr. J. Parkes Foy for the photographs.

C. ROMER, M.B., B.S.

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The first party of British children to go to Denmark this year under the Anglo-Danish Sanatorium Scheme for British Children (see *Journal*, 1952, **1**, 634) left Northolt Airport recently. The party included a number of Scottish children and also some from Liverpool. About 20 children who have been at Vordingborg Sanatorium through this scheme for several months returned to England on the same day.

Reviews

HANDBOOK OF RADIOTHERAPY

4 *Handbook of Radiotherapy for Senior and Postgraduate Students*. By Walter M. Levitt, M.D., F.R.C.P., F.F.R., D.M.R.E.(Camb.). (Pp. 232; 53 figures. £1 10s.) London: Harvey and Blythe. 1952.

Dr. Levitt has written a book which is admirably composed, giving ideal proportions to its various technical and clinical parts, and filling it with the wisdom that stems from wide experience, acute observation, intellectual synthesis, and profound insight: he has produced a work of art. To refer to such a prosaic-sounding book as this in these terms may seem to be an exaggeration, but, just as in looking at a picture one continually appreciates more and more the artist's thoughts, and, just as the expert in art can see more in the work, so in this book both the students for whom it is written and radiotherapists of whatever experience will find sound information and wise counsel on the application of radiotherapy to disease. There are a few minor errors which will no doubt be corrected in the next edition, and a slight illustration of the case of pituitary basophilism (p. 195) might well have been of the type recovering without any treatment. The work is adorned with apt illustrations and useful and accurate index.

The book follows a natural sequence in its arrangement of chapters, starting with two on physics clearly and evenly written, followed by one on the application of radiation in treatment and another on the effects of radiation on cells, tissues, and organs. Fourteen chapters on clinical radiotherapy follow. Two of these—on principles of treatment and the management of the patient—are admirably written. In the succeeding chapters, which are devoted to systems and organs, the handbook nature of the work becomes more apparent towards the end of each chapter, but the balance of the book is never at fault. Readers wishing to know something of radiotherapy will find it useful, and readers who know something of radiotherapy may find it even more useful.

FRANK ELLIS.

CHALLENGE TO PSYCHIATRISTS

The Philosophy of Psychiatry. By Harold Palmer, M.D. (Pp. 70. \$2.75 or £1 2s.) New York: Philosophical Library. London: H. K. Lewis and Co. 1953.

The development of psychiatry has necessarily been dependent on verbal communication. In the effort to record and discuss the products of mental and cerebral activity, psychiatrists have built up a terminology of their own, often hastily adapted from other disciplines, often based on analogies and theoretical constructs and finally becoming so specialized as to discourage contact with their scientific neighbours. Within this terminology it is possible to discuss the same concepts in different terms—such as those of analytic psychology and cybernetics, for instance—so that the reason for the restriction of communication between schools is mere lack of common language. Further, the means of communication may leave its imprint on the ideas transmitted. There is thus reason for a careful logical scrutiny of the basic terms and assumptions of psychiatric discourse, and such a scrutiny, in Dr. Palmer's view, is essential if any synthesis is to be achieved which will reconcile the different approaches.

It is as the prolegomena to such a unifying system that he has written this book, and with the purpose of encouraging psychiatrists to question the terms and working hypotheses which they use in clinical practice. Assuming that the legitimate subject-matter of psychiatry is mental ill-health as it affects the self, he proceeds to define a group of primary entities—awareness, consciousness, self, thought, and mind—and a secondary group nearer to the clinical

field—personality, character, morale, group, and society. The way is now clear for definition of some of the descriptive categories into which clinical material may fall, but the author does not carry this very far and reminds readers that he claims no more than to clear the way. Readers are now left free to work out the next stage, including the definition of symptoms, for themselves.

The statement of the problem, which occupies most of the book, appeared originally in two articles in *Philosophy* (October, 1951, and January, 1952) and provoked surprisingly little reaction. The author now presents it as a challenge to psychiatrists. The essentially abstract material is discussed with great clarity, although the application of the methods of logic is a little self-conscious. The compass of the book is not as ambitious as the title, and discussion of the relation of brain to mind, for instance, is confined to the field of psychosomatic manifestations. This book deserves serious consideration. It can hardly fail to sow the seeds of healthy scientific doubt in a branch of medicine where the clinician can too easily escape from the philosophical implications of his subject by taking refuge in belief and in mere words.

ALEXANDER KENNEDY.

TRICHLORETHYLENE ANAESTHESIA

Trichlorethylene Anaesthesia. By Gordon Ostlere, M.B., B.Chir., D.A. (Pp. 83; 5 figures. 7s. 6d.) Edinburgh and London: E. and S. Livingstone. 1953.

This little book provides a complete review of all that has been said and written about trichlorethylene. History, pharmacology, and clinical use are all described, each short chapter having a very full list of references at its end. The book will be useful to supplement the chapters on this subject in the standard textbooks and as a reference source for the literature on trichlorethylene.

W. W. MUSHIN.

NO SURRENDER

Disabilities and How to Live with Them. By 55 Patients. (Pp. 243. 10s. 6d.) London: The Lancet Ltd.

Help Yourself to Get Well: A Guide for T.B. Patients and their Families. By Marjorie McDonald Pyle, M.D. With foreword by H. Corwin Hinshaw, M.D. (Pp. 143. 12s. 6d.) London: William Heinemann. 1952.

The well-remembered articles from the *Lancet*, in which patients related their case histories, have now been collected in this remarkable little book. The degree of disability varies, but the authors display a uniformity of courage and an absence of self-pity which is very impressive. Although these sufferers, like Samuel Johnson, might be conquered but would not capitulate, yet the dominating impression on rereading these essays is not one of courage but of the extraordinary adaptability and resource of the human body and mind. Consider, for example, the doctor who, after 20 years of Parkinsonism with increasing difficulty in walking, talking, eating, and writing, found that his left index finger, which he used so laboriously to type the articles which too frequently were returned to him, was at last refusing its essential function. He looks forward to the purchase of an electric American typewriter which will continue to make his work possible. And the woman who, although completely paralysed below the waist, can manage the life of a housewife by the use of four different types of propelling chair.

If the biological lesson to be derived from these essays is that of adaptation, the philosophical conclusion is that, although these patients demonstrate the supreme value of the human will, their reactions to disaster are predetermined. The thinking surgeon with an acute anxiety state found his cure in the probing and painful operations of psychoanalysis as certainly as the turbulent and asthmatic physician rejected the "unscientific" approaches of three psychiatrists.

"Gentleman," as Wilfred Trotter declaimed on a famous occasion, "let us remember the patient," and it is because these essays remind us so vividly of suffering men that the book has an especial value for all doctors. These histories are told with a different emphasis from those we hear in our consulting-rooms. There we see the "stills," but here, as in a film, we are shown the initial rejection, the acceptance, the struggle, and the final triumph.

The family doctor, who already has a sufficiently intimate acquaintance with sick persons, will nevertheless find this book of value. Some of these patients set out the management of their disabilities in considerable detail, and their personal experience of drugs, apparatus, and clothing is worth studying. It is not easy always to draw apposite conclusions from their experience, as in the case of the lady with myasthenia gravis who gives herself an injection of neostigmine every two hours and yet finds it unnecessary either to anoint her skin with ether or to sterilize her syringe more than once a week. It is a good book for the layman, too, but it should not be given to patients indiscriminately. There are as many patterns of disease as there are patients. Not every man with coronary thrombosis should again work as hard as he did 20 years before his attack, and not every diabetic should regard hypoglycaemia so lightly as does one doctor-driver. The book should become a classic.

Help Yourself Get Well is not of the same quality. It is, however, a sensible and encouraging book addressed to the tuberculous patient. It must be a great comfort to the dwellers in sanatoria to know that the auto-therapies of Samuel Smiles are now efficiently supplemented by the hetero-therapies of biochemists and surgeons.

D. V. HUBBLE.

SUICIDE

Der Selbstmord. By Dr. Erwin Ringel. Wiener Beiträge zur Neurologie und Psychiatrie 3. (Pp. 235. M.20.) Vienna: Wilhelm Maudrich. 1952.

Suicide is considered as the outcome of a pathological mental development. 745 patients admitted to the psychiatric clinic at Vienna after attempted suicide in the year 1949 were investigated; 454 were female and 291 male patients. In about half of them unfavourable home conditions in childhood were found. In later life mental trauma figured highly: the traumatic factors were mainly an unhappy married life, childlessness, unfaithfulness of the partner, disappointments, and professional setbacks. The trauma caused a lowering of moral values and produced a devaluation of life itself. One-fifth of the patients were either asocial or delinquent. These were the conditions in the patients' past which prepared the ground for what the author calls the "presuicidal syndrome," consisting in the triad of constriction, aggression, and flight into unreality. Constriction leads to loss of expansive power, stagnation, and regression; aggression creates destructive tendencies culminating in self-destruction; the flight into unreality promotes fantasies which replace reality. No distinction is made between attempted suicide and successful suicide, and the author attaches no significance to the setting and circumstances of the suicidal attempt. The non-psychotic patients form a separate neurotic group, and the therapeutic approach advocated is a short analysis on psycho-analytical lines. In cases of depression the same presuicidal syndrome can be traced, while in schizophrenics the psychotic picture as a whole is held responsible for the tendency to self-destruction. In a chapter on prophylaxis the collaboration of the psychiatrist with lay organizations is stressed.

The book contains some interesting material on the cultural and social background of the suicidal patients. But the general psycho-pathological formula at which the author arrives is sweeping, as can be expected from his simplification of the complex problem.

R. KLEIN.

WATER METABOLISM

Physiologie Normale et Pathologique du Métabolisme de l'Eau. By Professor Jean Hamburger and Dr. Georges Mathé. (Pp. 512; illustrated. 2,850 francs.) Paris: Editions Médicales Flammarion. 1952.

This is a nicely produced book by authors who have themselves made contributions to the subject of water metabolism, and provides a general review of normal and disturbed body-fluid balance. It is in three main parts, dealing respectively with normal physiology, methods of investigation, and pathological states. The presentation is balanced and the expression clear.

As might be expected from the title, the physiological aspects are most fully considered. At the same time, clinical manifestations are clearly described. Advice on treatment is relatively brief, and greater detail would be more helpful to clinicians. The illustrations are well chosen and simple to understand. A feature particularly useful to students of the subject is the very full bibliography of 2,500 references. These include a large number of English and American publications as well as Continental papers. The authors are to be congratulated on producing an excellent book.

H. L. MARRIOTT.

POISONS

Poisoning: A Guide to Clinical Diagnosis and Treatment. By W. F. von Oettingen, M.D., Ph.D. (Pp. 524. £3 10s.) London: William Heinemann. 1952.

The incidence of poisoning, both acute and chronic, is constantly increasing as new chemicals for industrial, domestic, and medicinal use are introduced. In addition there are many plant poisons of concern particularly in rural districts. The purpose of this book is to summarize knowledge of poisoning in a way which will be easily available to the physician in emergencies. The volume is divided into four parts: in the first the author classifies poisons and discusses medico-legal implications; in the second he deals with the clinical diagnosis of poisoning and the diagnostic laboratory tests available; in the third he discusses the principles of treatment; and in the fourth and largest section he lists alphabetically 461 poisons, with, in each case, a short synopsis of the clinical syndrome produced and the treatment advised.

The work gives the impression of having been compiled by a State official from case reports, documents, and literature rather than from personal knowledge acquired by clinical experience. Many of the laboratory tests for poisoning are old-fashioned. Poisoning by aureomycin is described, but poisoning by chloramphenicol is omitted, which in the light of modern experience seems odd. It is surprising to learn that 34% of cases of agranulocytosis due to thiouracil prove fatal, but the surprise becomes less when it is discovered in the next paragraph that the treatment recommended is the administration of sodium pentnucleotide, with no mention of penicillin or blood transfusions.

The descriptions of treatment throughout are insufficiently detailed. For example, the harassed doctor confronted by a case of acute poisoning may not find the laconic statement that "analeptics should be given" very helpful. He might want guidance on dosage and route of administration and might even want to know, if he had not studied the humanities, what an analeptic is.

The considerable expense of American books in this country is often well worth incurring because of the almost invariable excellence of their production and the admirable and up-to-date information which they frequently contain. But it is doubtful if this volume of 524 pages justifies the expenditure of 70s. even by an ardent toxicologist.

D. M. DUNLOP.

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QUEEN MARY

Queen Mary, as Queen Consort and Queen Mother, held the affection and respect of the British people in an unusual degree during over forty years of eventful history. This was not because of any superficial glamour or cultivation of the arts and graces of a princess. The head of society for a quarter of a century, she was more like the matron of an ordinary household than a society woman in the usual sense of the term. The public thought of her as a woman of good sense and practical mind, really interested in people and their affairs, and animated by a principle of duty—of duty as the strict mid-Victorians understood it—which, as her son the Duke of Windsor has said, she put before everything else in life.

Those who saw or accompanied Queen Mary on numerous public occasions, on her visits to hospitals, exhibitions, and the like—visits which she continued with great energy into old age—were impressed, sometimes embarrassed, by the thoroughness with which she undertook her task. She made it plain that she was there not to be seen but to see, and she insisted on seeing everything. Her questions, the result of her habit of serious reading, especially of social history, showed that she understood the background. She could certainly be forbidding, and, on occasion, a stickler for etiquette. But that was all part of her rigid schooling and her Hanoverian ancestry. At public ceremonies she had a disconcerting way of departing from schedule. In 1925, on the occasion of the opening of the British Medical Association House in Tavistock Square by George V, the Queen went on by herself ahead of the official procession which was about to leave the Great Hall and found her way into the Hastings Hall, which was untenanted save for one rather frightened junior member of the staff who on her entrance effaced himself behind a pillar. By the time the King and the chief officers of the Association had descended the stairs she had already made a solitary round of the exhibits. It was on her initiative, too, that the royal party on that occasion paid an unexpected visit to the children gathered in the grounds of the Mary Ward Settlement next door. In her visits to hospitals her practical sympathy was shown, not in a few conventional words and a passing smile, but in grave and under-

standing inquiries, followed later in some cases by an appropriate gift or other act of kindness. The great preoccupation of royalty is said to be to avoid the appearance of being bored. Queen Mary had no need to fear lest her countenance betrayed boredom, for her interest was real and sustained.

The first world war gave her the opportunity to demonstrate her practical ability in many directions as the leader of British women in their various endeavours to mitigate suffering. In the seventeen years of reign which followed the Armistice and culminated in the Silver Jubilee—when the public gave a spontaneous manifestation of their feelings towards the King and Queen—her interest in hospitals and nursing was shown on many occasions, notably when she opened the Royal College of Nursing in London, the gift of Lord and Lady Cowdray, in 1926.

During the illnesses of George V the King's doctors and others in court circles remarked on her fortitude and courage and disciplined emotion. She had a never-failing confidence in the medical men who had care of the King—as indeed she had to the end in the doctors of her own household—calmly assuring them that she felt they knew best and protecting them from well-intentioned and fussy interference. She was the ideal “patient's relative.” In the biography of Viscount Dawson of Penn, with whom she was on the friendly terms to which the family doctor is accustomed in any well-conducted household, it is related that Dawson said to his wife on returning from the palace on one occasion, “If only they were all like Queen Mary how much easier it would be.” A story is told of Dawson that during the King's illness in 1928 he wanted more air in the sick-room and suggested that an upper window be lowered and the opening covered with fine moistened muslin. Queen Mary knew at once what was wanted, and took Dawson along corridors and up stairs to a store-room where she asked him to clamber up on a stool and hand down to her a bundle from a high shelf. It proved to be exactly the material needed.

From her own steadfastness and courage in successive bereavements people in all classes of society drew inspiration to sustain them in their own like troubles, and it is a particular grief to the whole nation that she has not lived to see the coronation of her granddaughter, whose reign holds such high promise. Archbishop Lang once told how at the beginning of their reign he accompanied King George V and Queen Mary through an industrial district of South Yorkshire and they overheard one working-man say to another, “He ain't seech a fine man as Teddy” (Edward VII), to which the other replied, “Well, anyway, he's gotten him a fine oop-

standing wife.” It is as a “fine oopstanding” wife, mother, and queen that Queen Mary will be remembered. From the time of her emergence in the public eye as “Princess May,” the bride of 1893, she has strengthened that high standard of family life which in modern times has given the British monarchy, shorn of much of the power and state which it had in the past, an even surer hold on the imagination of the people.

COOLING THE BODY

The physiological changes induced in animals by cooling of the body have interested physiologists for some years, and the importance of these investigations to surgery is referred to by Sir James Learmonth in our opening pages this week. The results of acute hypothermia in dogs were studied by Prec and his colleagues,¹ who caused cooling by means of chipped ice packed round the body. They found that, in the early phases of cooling, thermogenic reflexes produced shivering, which was accompanied by a rise in cardiac output, blood pressure, heart rate, respiration rate, and oxygen consumption. After these reflexes had been inhibited by deep anaesthesia, the effects were reversed if cooling was continued, and there was reduction of the cardiac output, blood pressure, heart rate, respiration rate, and oxygen consumption. Haemoconcentration also occurred, and the electrocardiogram showed an increase in the duration of systole, auriculo-ventricular and intraventricular block, depression of the ST segment, and flattening and inversion of T waves; sometimes ventricular fibrillation occurred. Death appeared to be due to failure of the respiratory and vasomotor centres.

Oxygen transport and consumption were found to be greatly reduced in dogs cooled down to 64.4° F. (18° C.) in a cold room, but no tissue deficit of oxygen resulted, even when they were cooled for as long as four hours, provided full arterial oxygen saturation was maintained by artificial respiration.² Temple Fay³ reported that the rectal temperature in human beings could be lowered to 80° F. (26.7° C.) for many hours without untoward incident, while Talbott,⁴ reviewing the use of hypothermia for the treatment of patients with intractable pain, noted the same cardiovascular changes as those found in animals. It was found possible to lower the general

body temperature to 75° F. (23.9° C.) with subsequent recovery. Auricular fibrillation developed in all cases when the temperature reached 80° F. (26.7° C.), but could be reversed with quinidine, digitalis, and warming up again. The electrocardiogram also showed changes similar to those seen in animals.

Reduced oxygen requirements and lowered metabolism are great advantages when patients with cyanotic congenital heart disease are being operated upon. Especially is this so when they are children, since they can be readily cooled and re-warmed, and tolerate a low temperature far better than a high one. According to Bigler and his colleagues⁵ cooling may be achieved either by packing ice bags round the body or by means of a rubber mattress with water at the desired temperature. The internal temperature of their patients was measured by a rectal thermometer and kept between 94° and 97° F. (34.4° and 36.1° C.). They found that less anaesthetic was required at low temperatures during operations on children with cyanotic congenital heart disease, and that the heart action seemed to be slower and more forceful; the respiration rate was also reduced and fluid loss diminished. In exploratory thoracotomies on such children, in which no procedure to increase the pulmonary blood flow was possible, the mortality was 54% in uncooled cases and 14% in cooled cases. Apart from the fact that cooling reduced the mortality in cases of cyanotic congenital heart disease, Bigler and his associates emphasized its importance in preventing and treating the hyperpyrexia which they observed during operation in 62% of their patients between the ages of 6 months and 13 years, two of whom died as a result of it.

But of even greater interest and importance are the possibilities of intracardiac reconstructive surgery in a relatively bloodless field. At present the cardiac surgeon must confine himself to rapid and “blind” intracardiac manipulation, which limits his scope considerably. To exclude the heart from the circulation for sufficiently long to permit intracardiac procedures under direct vision would be a major advance. It could be accomplished in one of two ways: either some form of artificial circulation could be provided, or the oxygen requirements and metabolism of the tissues could be reduced to a point at which the heart could be excluded from the circulation for the requisite length of time. Bigelow and his colleagues⁶ with this object in view studied the effects of cooling in forty dogs. At 82.4° F. (28° C.) respiration ceased and anaesthesia was no longer required. They noted the same physiological effects as did previous workers, oxygen consumption being reduced to about

¹ *J. clin. Invest.*, 1949, **28**, 293.² Bigelow, W. G., et al., *Amer. J. Physiol.*, 1950, **160**, 125.³ *N.Y. St. J. Med.*, 1940, **40**, 1351.⁴ *New Engl. J. Med.*, 1941, **224**, 281.⁵ *J. Amer. med. Ass.*, 1951, **148**, 551.⁶ *Ann. Surg.*, 1950, **132**, 849.⁷ *Arch. Chirurg. neerl.*, 1951, **3**, 25.⁸ *Dis. Chest*, 1952, **22**, 245.⁹ *Lancet*, 1952, **2**, 914.¹⁰ *Surgery*, 1953, **33**, 52.

15% of normal, and they found that ventricular fibrillation commonly occurred and caused death at temperatures between 60.8° and 71.6° F. (16° and 22° C.). The central venous pressure showed an initial fall, and then a rise, which was often followed by ventricular fibrillation when the pressure exceeded 6 cm. water. Of great interest was the fact that venesection often caused reversion to sinus rhythm, and was the only measure among many (including mechanical stimulation, massage, and a variety of drugs) which had any effect on the arrhythmia. Other effects of venesection included an increase in heart rate and shortening of the lengthened ST segment of the electrocardiogram.

Boerema and co-workers⁷ maintained dogs at 66.2°–77° F. (19°–25° C.) for periods varying from 20 to 150 minutes. In nineteen dogs the venae cavae and vena azygos were clamped for 10 to 15 minutes and the heart was opened. It was found to be almost bloodless and beating slowly and feebly. An intracardiac operation was performed in eight cases, and in four cases resection of the septum was carried out: two of these animals were alive and well nine months later. In some dogs complete asystole occurred during the period of clamping, but the heart usually began to beat after warmth had been applied. In some cases (the exact number is not given) ventricular fibrillation occurred, and was always fatal. The dogs were slowly warmed again after operation, and many of them developed shock, possibly as a result of peripheral vasodilatation. But shock could be prevented by the intravenous infusion of 5% glucose and of blood. Cookson and others,⁸ conducting similar experiments, noted that after the removal of caval clamps the heart began to beat forcibly and more rapidly, and that in some animals ventricular fibrillation quickly followed. They attributed this to flooding of the heart with a high concentration of adrenaline released from the suprarenal glands as a result of anoxia and dammed back in the caval blood. They were subsequently able to prevent the onset of ventricular fibrillation by means of an adrenolytic drug. Thirty-two dogs were subjected to cardiomy, twenty-seven with caval occlusion for twelve minutes at 78.8° F. (26° C.), of which 80% survived, and five with occlusion for thirty minutes at 62.6° F. (17° C.), of which 40% survived. They attached great importance to the use of digitalis, intravenous glucose, A.C.T.H., adequate ventilation with 100% oxygen, and injection of atropine if marked tachycardia occurred, in addition to measures to maintain blood pressure and to prevent ventricular fibrillation. Delorme⁹ reported survival in dogs after twenty minutes' caval occlusion at 71.6°–78.8° F. (22°–

26° C.) and after other procedures which would have been fatal at normal temperatures.

The work on animals carried out by many investigators indicates that cardiomy under direct vision during hypothermia should be a practical technique applicable to man. Lewis and Taufic,¹⁰ after reporting their ability to make and then close atrial septal defects in dogs under hypothermia, successfully closed an atrioseptal defect in a 5-year-old girl. The patient was anaesthetized and wrapped in refrigerated blankets until, after 130 minutes, her rectal temperature had fallen to 82.4° F. (28° C.). The cardiac inflow was arrested for five and a half minutes, and at the end of the operation, which lasted fifty-eight minutes, the rectal temperature was 78.8° F. (26° C.). Re-warming, and subsequent convalescence, were uneventful.

This technique may pave the way for important new advances in the surgical treatment of congenital heart disease. Of greater significance, however, is the possibility of improving the techniques available for operations on the mitral and aortic valves. For example, the surgical treatment of mitral incompetence is generally conceded to be unsatisfactory, but it might be possible to reconstruct the mitral valve under direct vision, to say nothing of greatly increasing knowledge of the detailed function of the abnormal valve. Clearly there are many problems yet to be solved, the greatest perhaps being the prevention of ventricular fibrillation at low temperatures and on restoration of the venous inflow to the heart, and the comparatively short period available to the surgeon for working inside the heart. The technique should be carried out only in fully equipped centres; accurate estimation of internal temperature must be possible, while continuous electrocardiographic records and measurements of central venous pressure are of great importance. Controlled respiration and administration of 100% oxygen are essential, since spontaneous respiration ceases early in the refrigeration process. Facilities, probably including the use of the electrical defibrillator, must be available for treating ventricular fibrillation if it occurs; venesection and the use of an adrenolytic drug may also be necessary for this. The equipment for producing cooling must not be too cumbersome, must not obstruct the surgeon, and must permit of rapid re-warming. Refrigerated blankets or a rubber mattress filled with cooled water are probably satisfactory. Further reports of the refrigeration technique will be eagerly awaited by cardiologists and cardiac surgeons, many of whom may consider hypothermia to be a valuable alternative to the artificial heart.

THE FATE OF PREMATURE CHILDREN

By international convention an infant is regarded as premature if it weighs 5½ lb. (2.5 kg.) or less at birth. Each year about 40,000 of the infants born in England and Wales fall into this category,¹ and approximately one-quarter of them die before they are a month old. Indeed, nearly half the deaths occurring in this period are associated with prematurity,² and we are only likely to make substantial improvements in neonatal survival if we can reduce the incidence of prematurity and lower the high death rate among those that are prematurely born.

While there are no two opinions about the importance of prematurity as a cause of death, there is no agreement about the fate of those premature children who survive. Some find in prematurity a major source of stunted growth and mental backwardness, whereas others find that premature children are retarded only to the extent that they are born before term. Few would fully agree with Capper's opinion that the premature infant will become "the backward school child, is the potential future psychopathic or neuropathic patient, and even the potential inmate of the home for imbeciles or idiots,"³ or with Sir Robert Hutchison's comment: "I confess I cannot get up much enthusiasm for trying to save these premature arrivals: I have a strong suspicion that, of those who survive, a large proportion turn out defective either physically or mentally or both,"⁴ but the feeling that premature children are likely to remain handicapped is strong. It has been encouraged recently by the discovery that a proportion, perhaps 12%, of the infants weighing 3 lb. (1.4 kg.) or less develop after birth retrolental fibroplasia.^{5,6} This condition is now said to account for more than one-third of blindness in young children in the U.S.A. There is, however, some evidence that its development is related to treatment rather than to prematurity *per se*,⁷ and until more is known about this we should hesitate to include it among the handicaps of prematurity.

As Dr. J. W. B. Douglas and Mr. C. Mogford write in a paper published elsewhere in this issue (p. 748),

- 1 *On the State of Public Health*, 1952, H.M.S.O., London.
- 2 *Maternity in Great Britain*, 1948, London.
- 3 *Amer. J. Dis. Child.*, 1928, **35**, 443.
- 4 *Lancet*, 1940, **2**, 799.
- 5 Terry, T. L., *J. Amer. med. Ass.*, 1945, **128**, 582.
- 6 ———, *Arch. Ophthalmol.* (Chicago), 1945, **33**, 203.
- 7 Crosse, V. M., *Ulster med. J.*, 1952, **21**, 32. See also leading article in the *British Medical Journal*, 1952, **2**, 1193.
- 8 Capper, A., *Amer. J. Dis. Child.*, 1928, **35**, 443.
- 9 Asher, C., *British Medical Journal*, 1946, **1**, 793.
- 10 Hess, J. H., Mohr, G. J., and Bartelme, P. F., *The Physical and Mental Growth of Prematurely Born Children*, University of Chicago Press, 1934.
- 11 Capper, A., *Amer. J. Dis. Child.*, 1928, **35**, 443.
- 12 Glaser, K., Parmelee, A. H., and Plattner, E. B., *Pediatrics*, 1950, **5**, 130.
- 13 Drilling, C. M., *Arch. Dis. Childh.*, 1948, **23**, 69.
- 14 Ferguson, A. E., Brown, A. C., and Ferguson, T., *Glasg. med. J.*, 1952, **33**, 143.
- 15 Hess, J. H., Mohr, G. J., and Bartelme, P. F., *The Physical and Mental Growth of Prematurely Born Children*, University of Chicago Press, 1934.
- 16 Looft, C., *Acta paediat. (Uppsala)*, 1927, **7**, 15.
- 17 Asher, C., and Fraser Roberts, J. A., *Brit. J. soc. Med.*, 1949, **3**, 56.

it is clearly of importance to know how large a proportion of prematurely born children are mentally or physically retarded in later life and what institutional or other care they need. And the growing interest in this country in the fate of these children makes this a convenient moment to consider why so many careful studies have yielded such inconclusive results. At first sight it would appear simple to take a sample of premature children and trace their health and development in later life; and this is in fact what many have tried to do. There are, however, two major problems to solve before even the most careful study of this type can give meaningful results. First, the children followed up must be either a complete series of prematurely born children or a random sample of such a series of births. Secondly, they must be compared with a suitable group of children born at term. The task of tracing children is no easy one, and few workers have found more than half of those they were looking for.^{8,9,10} Unfortunately it seems that, depending on the channels through which they have had to work, some have traced mainly the abnormal children and others mainly the normal ones. And for this reason alone it is difficult to know what weight to attach to their findings.

Even a perfect sample of prematurely born children would be of little value unless their growth and development could be compared with a similar group of children born at term. This has not always been recognized, and many have been content to compare their figures with national averages often obtained many years earlier from highly selected groups and by methods differing widely from those used in their own inquiries.^{11,12} But even a control sample drawn from a contemporary population^{13,14} fails to meet the needs of the case. Douglas and Mogford remark that premature children tend to be firstborn, to come from poorer families, and to have mothers above the average age for child-bearing; therefore they should be compared with controls chosen to conform to this pattern, otherwise comparison will be difficult. For example, it is often stated that premature infants are particularly likely to suffer from lower respiratory infections, but it has not been established whether this is owing to their prematurity or to their being drawn from the poorest homes. Some, realizing this difficulty, have hoped to eliminate the effects of environment by comparing premature children with their sibs.¹⁵ But this method also is unsatisfactory, for, except with twins, the sibs will have been exposed to very different risks of infection; for example, the history of infection of a firstborn child is likely to be very different from that of his later-born brothers and sisters. Moreover, comparisons of growth and health

are valid only if they are made between children of the same age. Accordingly, when sibs are used as controls the real comparisons will be between children of like age drawn from different families and not between premature children and their own brothers and sisters.

Another approach to the problem is to find out what proportion of children in special schools and institutions of one kind or another were prematurely born.^{16 17} But here again there are difficulties of interpretation. It is still necessary to make allowances for the selective factors in prematurity which have already been mentioned. For example, the generally poorer social level of children of low birth weight might explain part at least of the excess of these children found by Asher and Fraser Roberts¹⁷ among the feeble-minded and borderline defectives.

There is no reason why the handicaps of prematurely born children should not be accurately known, though it is unlikely that the answer will come from studies based on the highly selected child populations of maternity hospitals or special premature baby units. A new approach to the problem has been made by the Joint Committee of the Institute of Child Health (University of London), the Society of Medical Officers of Health, and the Population Investigation Committee, which, with the help of health departments throughout the country, has been following for the last six years all premature children born during a single week in 1946 in England, Wales, and Scotland. Douglas and Mogford's paper presents the results of part of this research. They have been able to compare 676 premature children during the first four and a half years of their lives with the same number of children born at term, matched for sex, social class, and order of birth. Many questions which have been in doubt can now be answered with greater certainty. For instance, the higher mortality among premature children extends beyond the first month of life: up to the age of 4½ years these children appear to run a greater risk of dying from lower respiratory infections, congenital defects, and nephritis. In this series 91 premature children and 64 controls were admitted to hospital at least once during the first four and a half years of their lives. On an average premature children spent three and a half times as many days in hospital during the first two years of their lives as did the controls: in the third and fourth years, however, there was no difference in the time spent in hospital by premature and full-term children. It is clear that the greater morbidity (mainly upper and lower respiratory infections) among premature children is not confined only to those from poor homes.

Owing to the complexity of the causes that may lead to the birth of under-weight children a much larger investigation than this excellent preliminary study of the joint committee is still needed. The Ministry of Health during recent years has shown an increasing interest in the survival of premature children, and it is to be hoped that in the future this interest will be extended to the fate of those who survive.

PRESCRIBING HABITS

The cost of the general pharmaceutical services in Great Britain is approximately £50m. a year, and it is clearly the duty of the medical profession carefully to examine how this large sum is spent. In a paper published in this *Journal* about a year ago Dunlop, Henderson, and Inch¹ analysed 17,307 prescriptions on E.C.10 forms completed during the month of September, 1949, and coming from three different areas in England. Several unexpected facts emerged from their investigation. It appeared that about one-third of all preparations used were sedatives, stomachics, and tonics, and that 21% of all prescriptions were for proprietary drugs. Some drugs which are widely used in hospital practice, such as mersalyl and thiouracil, were very seldom prescribed in general practice. This paper was widely discussed in our correspondence columns, and general practitioners were able to explain some of the curious facts brought out by the survey.

Professor Dunlop and his collaborators have now carried out a more extensive investigation of prescribing, having planned it so as to meet some of the criticisms of the first paper, and their report was published in last week's *Journal* (p. 694). The month of October, 1951, was selected for intensive study, and it seems unlikely that the pattern of prescribing has altered much during the last eighteen months, for the introduction of the shilling charge has not reduced the total cost of the pharmaceutical service as much as was expected.² The month of October was chosen fortuitously, but for some unexplained reason it so happened that more scripts were issued during October than during any other month in the last half of 1951: this fact was taken into account by Professor Dunlop when making general deductions.

The new survey was limited to Scotland: this had the advantage of providing evidence about methods of prescribing in one large section of Great Britain representative of all types of general practice. The results of the investigation, however, are not strictly comparable with those of the earlier one, for differences in prescribing habits might have arisen in the two-year interval between them or there might be differences between Scottish and English prescribing. Thus the proportion of proprietary preparations (30%) is higher than the corresponding figure (21%) for the previous

¹ *British Medical Journal*, 1952, 1, 292.

² See leading article in *British Medical Journal*, 1953, 1, 716.

³ *British Medical Journal*, 1952, 1, 149.

⁴ *British Medical Journal Supplement*, 1952, 1, 50.

survey, and this probably reflects a universal trend in Great Britain. In general, however, the relative frequency with which drugs are ordered is remarkably similar. As Dunlop and his colleagues found in the previous investigation, most drugs are given as mixtures or tablets; powders and injections are little used. About 10% of all prescriptions are for barbiturates, and mild analgesics were prescribed almost as often. Bromides were much less used than in England—which reflects credit on the teaching of pharmacology in the Scottish schools. More than half of all prescriptions are for symptomatic remedies unlikely to affect underlying disease processes. At a conservative estimate the United Kingdom spends through the National Health Service alone £2m. on vitamin preparations. It can hardly be doubted that large quantities of drugs are being prescribed as placebos, which of course may often be justified. But, as we have already pointed out,³ quite apart from the expense, placebos may do actual harm to the patient whose symptoms are associated with anxiety or fear.

Surprising differences exist in prescribing between different parts of England. For example, in each of the last three months of 1950 the average cost of prescriptions per person in Chester was consistently more than twice what it was in Huntingdonshire.⁴ Professor Dunlop and his colleagues have been able to shed some light on these differences. Thus there is a close relationship between three factors—the number of scripts issued per unit of population, the population density, and the average size of the doctor's list. Many more prescriptions are issued in densely populated areas, perhaps because of the greater incidence of disease or the easier availability of the doctor. But another possible explanation might be a greater tendency for workers in an industrial area to report sick and the likelihood that an overworked practitioner will give medicine rather than advice. Further studies of prescribing in different areas should provide answers to some of these questions.

LIVER INJURY BY ANTIBIOTICS

The antibiotics in common use have become popular because they combine a high degree of activity against infecting organisms with low toxicity to the host tissues. But the occasional fatality attributed to their use emphasizes that their low toxicity is relative, and excessive dosage or unusual susceptibility may have unpleasant consequences. Aplastic anaemia resulting from chloramphenicol, although rare, has received wide publicity. Less widely known are some of the hazards of therapy with aureomycin and terramycin.

In their early trials with aureomycin Lepper and his associates¹ were impressed by the evidence of liver damage caused by the combination of oral with intravenous administration. Of eighty-nine cases treated exclusively by the oral route, none showed clinical evidence of hepatic dysfunction, but seven of the fourteen cases in which oral therapy was supplemented by intravenous injections six-hourly of 8 mg. per kg. body

weight or more showed definite clinical signs of liver damage. It was confirmed in one case by biopsy and in five by necropsy. The clinical features were usually hepatomegaly and jaundice, and the morphological change in each case was severe cytoplasmic vacuolation and fragmentation. Since all the cases in this series which showed liver damage were seriously ill before receiving aureomycin, it may reasonably be objected that the hepatic damage resulted from the primary illness and occurred despite the antibiotic therapy. To eliminate this possibility, Lepper and his colleagues² studied the effect of heavy doses of aureomycin in experimental animals. In a large series of mice, changes virtually identical with those in the human cases were caused by parenteral administration of large doses of either aureomycin or terramycin. Only insignificant changes occurred with comparable doses of chloramphenicol, or when the other antibiotics were administered orally.

Further evidence of damage to the liver by intravenous aureomycin in man has recently been presented by Rutenburg and Pinkes.³ They too were impressed by the frequency of hepatomegaly and jaundice, but as in most of their eighty-nine cases, none of whom showed any evidence of disease that might have caused impaired liver function, the drug was given post-operatively for prophylactic purposes, the correlation between the development of liver damage and the exhibition of aureomycin is more convincing than in the series of Lepper and his colleagues.¹ Thirty developed hyperbilirubinaemia three to seven days after operation: in fourteen the serum bilirubin exceeded 2 mg. per 100 ml., and in fifteen clinical jaundice was present. In all cases the values returned to normal within a few days of discontinuing the drug. It has been shown, however, that moderate hepatic injury and dysfunction is common after operations of many kinds, quite independently of antibiotic therapy.⁴ To exclude this possible complication, Rutenburg and Pinkes studied twenty selected patients with no evidence of cardiovascular, renal, or hepatic disease, each of whom received 500 mg. of aureomycin intravenously twice daily for three consecutive days. Serial estimations of serum bilirubin, cephalin flocculation, and bromsulphthalein retention were made in several of these cases before, during, and after the three days of therapy. Nine of these selected patients developed transient hyperbilirubinaemia, and four of the seven tested showed abnormal retention of bromsulphthalein.

This evidence from human and animal studies shows that aureomycin, and probably terramycin, are mildly injurious to the liver when given in large doses, especially parenterally. Even more remarkable perhaps is the absence of such toxicity when these substances are given orally in the usual dosage. In very severe cases of infection the greater antibacterial effect of large doses and intravenous administration must be weighed against the small but real risk of damaging the liver.

¹ *Arch. Intern. Med.*, 1951, 88, 271.

² *Ibid.*, 1951, 88, 284.

³ *New Engl. J. Med.*, 1952, 247, 797.

⁴ Zamcheck, N., et al., *Amer. J. Med.*, 1949, 7, 409.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

PROLAPSE

BY

A. J. WRIGLEY, M.D., F.R.C.S., F.R.C.O.G.

Obstetric Physician and Lecturer in Midwifery and Diseases of Women, St. Thomas's Hospital, London

Prolapse signifies the descent through the vaginal orifice of any structure lying immediately above the pelvic floor. Thus the term may imply descent, singly or in combination, of the uterus, bladder and urethra, anterior wall of the rectum, or pouch of Douglas. Prolapse is usually found in parous women, and therefore it is assumed that weakening of the pelvic floor muscles and fascia and damage to the transverse cervical ligaments are produced by the birth of a baby. Prolapse is rarely seen in nulliparous women; when this does occur it may be associated with a general weakness on the part of the patient as the result of overenthusiastic fasting, or with some lesion in the central nervous system, usually in the lower part of the spinal cord. Prolapse to the laity means descent of the womb, and this may explain the general expectation, which is present even with a few doctors, that its logical treatment is the removal of this offending organ.

Symptoms and Signs

Nearly all women who suffer from prolapse notice the same symptom and phrase their complaint in the words that they "feel something coming down." It is as rare to find prolapse without this symptom as it is to hear of the symptom and discover no prolapse. Concurrently the patient may state that she easily tires and that she has acquired a low backache that becomes progressively more pronounced as the day wears on and is relieved immediately she lies down. Difficulties with micturition may or may not be present. Quite often a patient in whom there exists a large cystocele states that micturition is normal, whereas another with relatively slight descent of the bladder and urethra may be greatly troubled with stress incontinence of urine or frequency of micturition. Occasionally the patient discovers that emptying of the bladder can be completed only by the digital reduction of a large cystocele. A similar trouble with defaecation is dealt with in a like manner in the case of a large rectocele. When a severe degree of prolapse occurs, the patient's discomfort is great, and it is rare for complete procidentia to be tolerated for any length of time.

Although prolapse may occur directly after childbirth, in the majority of patients it develops at about the time of the menopause. This may be due to a general diminution in muscle tone at about this time in a woman's life or to a considerable increase in weight. Rarely, prolapse is suddenly produced following some severe and perhaps unexpected muscular effort such as the lifting of a heavy weight or an attempt to recover from a slip or fall. Prolapse always becomes worse if the patient becomes pregnant.

The diagnosis of prolapse is easy. The patient should be examined lying on her back with the knees drawn up and well separated. She is then asked to give a violent cough or to bear down hard. Prolapse will then be visible, and it will be possible to discover its exact nature and extent. A faulty diagnosis is rarely made either by the patient or by her doctor. Very occasionally a cyst beneath the anterior vaginal wall suggests a cystocele, or a fibroid polyp may simulate uterine descent.

Prevention

Theoretically it should be possible to do much to prevent prolapse, and, indeed, over the last two or three decades

much has been tried. It must be noted, however, that in spite of conscientious painstaking work on the part of the doctor and midwife, and the enthusiastic co-operation of the patient, the condition seems to be as commonly seen as ever it was. Prenatal physiotherapy by education in muscular relaxation and contraction, the prevention of any expulsive efforts during the first stage of labour, the use of the forceps only during the second stage of labour, and renewed physiotherapy after delivery directed toward re-education of the pelvic floor muscles might with reason have been expected to produce good results. There is no evidence that this is so. Those who advocate that early rising after childbirth will lessen the likelihood of prolapse argue with others who believe that the uterine supports will function better if they are allowed a few days' rest and peace and quiet in which to recover. Of all these various methods, the art of midwifery in the conduct of the actual labour is undoubtedly by far the most important.

Treatment of Prolapse

Unless contraindicated, the treatment of prolapse is by operation. Operation is contraindicated if the condition of the patient is such as to make its performance dangerous. It is not advised if the patient is advanced in years, though recent advances in methods of anaesthesia and improved surgical technique have greatly extended the age of safety. Each patient will be judged individually. Operation is not advised if the patient suffers from some chronic illness, and especially if, following a pelvic floor repair, she is likely to be affected by a persistent or troublesome cough. Operation would not be advised if the prolapse was noticed directly after childbirth, for a considerable degree of improvement should be expected in the course of normal involution aided by symptomatic treatment. Operation would not be advised if the patient was young and intended to become pregnant, and never, of course, during pregnancy. A severe degree of prolapse, however, in a woman in the child-bearing period of her life merits operative repair: such an operation is no contraindication to further pregnancy or to the expectation subsequently of a normal delivery. A recurrence of the prolapse in such a patient is very far from inevitable, and the small risk of such a recurrence is justified because the operative safety of a further pelvic floor repair is very much greater than that of caesarean section, which is the only method of avoiding the risk.

Palliative Treatment

This treatment is now reserved for those patients in whom any operative procedure is inadvisable or who refuse operation. A quarter of a century ago many more patients suffering from prolapse were treated palliatively, and operation was often reserved for those few in whom palliative treatment for some reason was ineffective. The change of outlook that has occurred is probably due to the appreciation by doctors and by their patients of the great benefits that follow a correctly performed pelvic floor repair.

Palliative treatment consists in the insertion into the vagina of a ring pessary of such a size that it is larger than the hernial orifice through which the prolapse occurs. The pessary is usually circular and may be made of rubber or of vulcanite. The rubber pessary is usually employed because it is more easily inserted and removed. Rubber is

much more irritant to the tissues of the vaginal wall than vulcanite, and is therefore more likely to produce an offensive purulent discharge. The correct size of pessary to be used in any particular patient can be determined only by trial and error. It is usually advised that the smallest pessary should be inserted which appears to control the prolapse. Such advice inevitably leads to many errors and many trials, and it is much better in the first instance to insert the largest pessary of whose presence the patient is not aware. The patient who for the first time has been so treated for prolapse must be instructed upon the necessity of regular douching to try to prevent infection, and of regular visits to her doctor or nurse for the removal and cleaning, or changing, of her pessary. Most women hate a pessary life, and with good reason.

Operative Treatment

Many and varied have been the operative procedures suggested for the cure of prolapse. Only one has stood the test of time, and that is the operation first evolved at the beginning of the century by the surgeons in Manchester, notable among whom were Donald and Fothergill. The various parts of this operation are designated anterior colporrhaphy, amputation of the cervix, posterior colporrhaphy, and perineorrhaphy. The use of the word colporrhaphy is unfortunate because it implies the use of the vaginal wall in the cure of the condition. The part played by the vaginal wall is exactly analogous to that of the skin overlying the umbilical hernia. It becomes stretched by the hernial protrusion and redundant skin has to be removed. The essential procedure consists in an exposure of the separated inner margins of the two levatores ani muscles with their adjacent fibromuscular fascia. This necessitates dissection beneath the anterior and posterior vaginal walls and exposure of the transverse cervical ligaments by amputation of the cervix. Thus the reconstruction of the pelvic floor and of the perineum is performed. There is no necessity to open the abdomen. Vaginal hysterectomy can be combined with pelvic floor repair and is especially indicated in the presence of some pathological condition of the uterus. It is undoubtedly a more severe proceeding, but the results are excellent.

Aftercare

The care of a patient on whom the Manchester operation has been performed may be divided into the initial period of her stay in hospital and the following two months when she is at home. In the latter period she will certainly be in the hands of her family doctor, and very often, especially in the smaller hospitals, he is also responsible during the first three weeks. For this reason a brief account will be given of the management of these patients until they are well enough to go home. The operation is followed by a definite, and sometimes considerable, amount of pain and discomfort, and morphine should not be withheld during the first 24-36 hours. Thereafter tab. codein. co. or its equivalent should be sufficient. The patient may be returned to the ward with a self-retaining catheter inserted into the bladder. This should be released by the nursing staff at regular intervals and is usually removed on the third or fourth day. By this time much of the initial and local discomfort will have abated and the patient in consequence is far less likely to have difficulty in micturition. If she is able to pass her water naturally the nursing staff must be instructed to pass a catheter regularly on at least two occasions in each 24 hours after the patient has passed water, in order to discover the presence of, and to remove, any residual urine. When by this means less than 2 oz. (60 ml.) is found to remain in the bladder, catheterization may be discontinued. Cystitis is a frequent and troublesome complication of any pelvic operation. The belief that it is most likely to result from repeated catheterization is probably incorrect. A far more probable explanation is that it is due to temporary imperfect emptying of the bladder and

the infection of a considerable quantity of unsuspected residual and stagnant urine. The routine administration of urinary antiseptics should be left to the discretion of the doctor in charge of the case. Aperients should be ordered as soon as the patient has recovered from the immediate ill-effects of the operation. There is no need to purge the patient, nor is it necessary to order an enema. The Manchester operation is not a dangerous proceeding, but one of the few alarming complications is due to occasional phlebo-thrombosis or even thrombophlebitis. Instruction in post-operative deep breathing exercises and early movements on the part of the patient is of great and proved importance in its prevention. Indeed, no harm seems to result from early ambulation, though this must not prejudice the patient's stay in hospital, which should be from two to three weeks, depending upon the severity and extent of the operative repair. Reactionary bleeding is rare, but secondary haemorrhage following amputation of the cervix does occasionally occur at about the end of the first week. It may be severe and even dangerous. An initial injection of morphine $\frac{1}{2}$ gr. (16 mg.) should be given. The patient should be turned on to her left side into the Sims position and a Sims speculum gently inserted into the vagina. A good light is essential. With dry gauze and a pair of dissecting forceps all blood and clot is removed, and the vagina should be carefully, systematically, and firmly packed with dry sterile gauze. In nearly every case this will deal with the condition and no further bleeding occurs after the removal of the gauze plug at the end of 24 hours. Very occasionally, and if the blood soaks past the gauze, it is necessary to take the patient back to the operating theatre and to deal with the bleeding point or area by the insertion of a catgut stitch. The wounds in the anterior and posterior walls of the vagina and in the vaginal vault rarely heal entirely by first intention, and in consequence many patients following a Manchester repair operation acquire for a few days a noticeable and offensive vaginal discharge. When, and if, this occurs the patient should be ordered a twice daily vaginal irrigation with a dilute solution of some non-irritant antiseptic given at body temperature. A solid douche nozzle must not be used, but the fluid should be run into the vagina through the largest size of rubber catheter. Before the patient leaves hospital a digital examination of the vagina must be made. Occasionally the wound on the anterior wall becomes adherent to the wound on the posterior wall. Two or three weeks after the operation the adhesions will be slight and easily separated by the examining finger.

On return home the patient should be told to use her common sense. Prolonged periods of standing, lifting of heavy weights, straining at stool, and similar exertions will all tend to stretch an insecure wound and to undo the repair. Her return to normal activities should be gradual and she should be able to lead a full and normal life once more about three months from the time of her operation. A final examination made about this time is most advisable in every case, and not until then should a return to married life be contemplated.

Conclusion

Prolapse nearly always occurs in women who have borne children, and often first becomes troublesome about the time of the menopause.

The treatment of prolapse is by operative repair unless contraindications exist. The contraindications to the operation are obvious.

The success of the repair operation depends not only on the surgeon but also on all those who take part in the aftercare of the patient up to the end of the third month.

Next Refresher Course Article.—"The Management of Late and Latent Syphilis," by Dr. G. L. M. McElligott.

QUEEN MARY WITH KING GEORGE V AT THE OPENING OF B.M.A. HOUSE, JULY 13, 1925



Escorting the King and Queen are (right) Mr. Basil Hall, President, and Dr. (later Sir) Robert Bolam, Chairman of Council.

Correspondence

Treatment of Ringworm of the Scalp

SIR,—Dr. Bernard A. Thomas (*Journal*, March 7, p. 536) propounds the interesting thesis that cases of tinea tonsurans caused by *Microsporum canis* need neither be treated by x-ray epilation nor be kept from school. Our experience at Goldie Leigh Hospital does not support the former in its entirety. Some cases of infection with *M. canis* are sufficiently persistent to warrant epilation.

I am, however, greatly concerned at two statements in his paper. He states that "in common with others treating ringworm of the scalp" he has had "an occasional case of incomplete regrowth of hair." I had hoped that this unhappy sequela did not occur in these days of precision apparatus. At Goldie Leigh Hospital, in a series of more than 4,300 cases treated during the last thirty years, the last case of incomplete regrowth happened in 1927. This occurred in the bad old days of coil sets, mercury interupters, and Sabouraud pastilles, and since that date in 2,700 epilations I have not had a single case. With modern apparatus and technique properly calibrated by a hospital physicist, overdoses sufficient to cause impaired regrowth should not occur. Indeed, the child's scalp is remarkably

tolerant in this respect. I have seen a child receive two full epilation doses at one week's interval without any permanent damage resulting.

Dr. Thomas also states that "occasionally an anaesthetic had been necessary in toddlers." An anaesthetic is never necessary in toddlers or in other patients. In 1924, and again in 1931¹ and 1944, I described a simple restraining-couch (made by the hospital carpenter for £5) with which it is possible to keep children still during irradiation. It has been used at Goldie Leigh Hospital in over 2,000 cases, including imbeciles up to 15 years of age, and has not yet been found wanting.—I am, etc.,

London, W.1.

S. COCHRANE SHANKS.

REFERENCE

¹ Shanks, S. Cochrane, *Brit. J. Derm.*, 1931, 43, 477.

SIR,—I refer to Dr. B. A. Thomas's article on *M. canis* ringworm and loss of schooling (*Journal*, March 7, p. 536). Dr. Thomas states that *M. canis* ringworm of the scalp need never be treated by x-ray therapy because local applications are effective in all cases, and that there is no valid reason for excluding such cases from school. I would disagree with both conclusions. Most authorities agree that topical treatment may prove inadequate in some cases of *M. canis* ringworm. Accordingly, if the lesion is of a non-inflammatory type (and many cases of *M. canis* infec-

tion are non-inflammatory) x-ray epilation is clearly indicated regardless of the particular species of fungus isolated, since in skilled hands it provides the most certain cure within the shortest time.

So far as appears from Dr. Thomas's article, no Wood light examinations of the school groups at risk were carried out, and therefore the possibility of child-to-child transmission cannot be entirely eliminated. The time lapses between the diagnosis of infection in Cases 15, 19, and 25 (attending the same school) in particular are insufficient in themselves as evidence that child-to-child propagation did not in fact occur; in this connexion it should be born in mind that fallen infected hairs may remain contagious for long periods. "Boys will be boys," and the instruction to apply a fungicidal ointment daily and to wear a linen cap constantly would seem to be a fragile therapeutic barrier to place between the infected and the healthy child.

It is to be hoped that education authorities in general will continue to exclude all types of scalp ringworm from school.—I am, etc.,

Glasgow, W.2.

W. A. DEWAR.

Treatment of Perforated Peptic Ulcer

SIR,—Dr. Avery Jones and his colleagues (*Journal*, January 17, p. 122) are to be congratulated on their continued follow-up and research on the surgical treatment of perforated peptic ulcer. It is of great interest to me to find that the overall mortality in all their cases is 7.9%, while the mortality in the "operable cases" is 3.3%. These figures are the best results achieved by a method that has been established for 50 years. They are identical with the first results of treatment of the same groups of cases by the regime of continuous gastric aspiration, collected from different hospitals in England, France, and America and published in the *Lancet* (1951, 1, 7). Clearly the method of gastric aspiration can achieve all that can be obtained by the method of surgical closure, but with the not inconsiderable advantages of avoiding an operation. Recurrence of symptoms seems to be about the same with both methods.

There is no doubt, however, that in the patient with a long-standing history of ulcer immediate partial gastrectomy is the treatment of choice if conditions permit. At King George Hospital, however, we are continuing to use the aspiration method wherever possible in order to achieve results beyond statistical criticism. I feel sure that the future regime for the management of perforated ulcer will be the immediate emptying of the stomach when the patient arrives at hospital and the institution of continuous gastric aspiration. In suitable cases where a chronic ulcer has finally perforated, immediate partial gastrectomy is indicated. In all other cases treatment by gastric aspiration should be continued except in air-swallowers, in whom surgical closure of the perforation may be called for. The routine practice of simple closure has an honoured place in surgical history, but modern developments have rendered it obsolete.—I am, etc.,

London, E.1.

HERMON TAYLOR.

Dogs and Disease

SIR,—In "Medical Notes in Parliament" (February 14, p. 409) you state that, in answer to a question by Sir William Darling on February 5, Miss Pat Hornsby-Smith replied that "the Minister of Health was advised that there was little evidence that domestic dogs were commonly responsible for any human disease in this country." Has not the Minister been incorrectly advised? Surely dogs are almost invariably responsible for at least one disease in this country.

Cases of hydatid disease are not infrequent in South Wales, and dogs are definitive hosts in the life-cycle of *Taenia echinococcus*. They have also been shown to be one of the sources of infection of the relatively common *Taenia mediocanellata* (Paterson).¹ One hundred and forty-four cases of hydatid disease were admitted to hospitals in Wales during the years 1927–36. The minority came from agrarian

areas, 62% being from the industrial counties of Glamorgan and Monmouth, and it is probable that in these cases infection in the main occurred directly from dogs (Howell).² A series reviewed recently consisted of 71 patients suffering from pulmonary hydatid disease and treated between 1938 and 1952: in 90% the disease had been contracted in the British Isles (Barrett and Thomas),³ and it is probable that pulmonary infection forms only 10–16% of cases of hydatid disease (Dew).⁴ For a demonstration last year, my friend Mr. I. F. Barwell-Clarke had little difficulty in collecting a dozen specimen organs recently affected by hydatid disease. Deaths from hydatid disease from 1931–5 (inclusive) were England 103, Scotland 2, Wales 35 (Wolfe).⁵ The Registrar-General's statistical reports for England and Wales show an average of 17 deaths a year for the last 10 years reviewed.

In Iceland, under the Health Act of 1924, district councils are allowed to forbid the keeping of dogs in large towns. There are now no pet dogs in Reykjavik (Jonsson).⁶ An infestation which in the middle of the last century affected between one-fifth and one-sixth of the population has probably been completely eliminated (Gerault, Hjalalin).⁷

Our city parks are playgrounds for infants. They also serve as excretory areas for many dogs. Though regulations have been made regarding the disposal of offal in abattoirs, little effort seems to have been made to inform the public of the disease, the dangers of contact between children and pet dogs, the need for protective fencing of vegetable gardens and allotments, and the necessity for prompt detection and treatment of cestode disease in dogs. The appalling complacency amongst dog-owners regarding worm infestation is not surprising. As a father not long ago said in this hospital regarding his daughter of 8 years, "She loves dogs and spends much of the day with them." Her cerebral symptoms were found to be due to an intracranial hydatid cyst the size of a golf-ball.—I am, etc.,

Cardiff.

CECIL LEWIS.

REFERENCES

- ¹ *Sick Children*, 1947, 6th ed. London.
- ² *Annual Report of the Chief Medical Officer of Health of the Ministry of Health*, 1938, Appendix D. London.
- ³ *Brit. J. Surg.*, 1952, 40, 222.
- ⁴ *British Surgical Practice*, 1948, 5, 48. London.
- ⁵ *Lancet*, 1943, 1, 795.
- ⁶ *Report on Public Health in Iceland*, 1938. Reykjavik.
- ⁷ Quoted by Thomas, J. D., 1894, *Hydatid Disease*.
- ⁸ *Reports on the Progress of Practical and Scientific Medicine in Different Parts of the World*, 1869. London.

Counting High Pulse Rates

SIR,—Professor Crichton Bramwell's valuable article on tachycardia (February 28, p. 500) prompts me to mention a technique for counting very high pulse and heart rates, for which, of course, I claim no originality. It does not, however, appear to be sufficiently widely known to practitioners, house-officers, and nursing staff. The method is very simple. The watch is disengaged from the wrist or pocket and placed on the bed in a position of good visibility. One hand holds the pulse or the stethoscope, the rate is counted in tens, and the fingers of the free hand are used to add up the series of tens. There is no question that this greatly facilitates counting accurately at high rates.—I am, etc.,

London, N.21.

E. MONTUSCHI.

Mental Hospital Service

SIR,—Drs. R. A. Sandison and A. M. Spencer (March 7, p. 560) rightly plead for a reorganization of the mental hospital service to meet the problem of overcrowding, but the suggestions they offer for improving the present state of affairs are such as to invite challenge. Particularly unacceptable is their statement that "occupational therapy should be developed towards providing active rehabilitation for acute and recent cases rather than for providing occupation for chronic patients." The implied suggestion is that occupation for chronic patients is hardly to be regarded as a

treatment, and that all skilled staff should concentrate their energies on acute, and presumably recoverable, cases.

Again, by the use of the phrase "interesting and recoverable" the writers seem to suggest a lack of interest in the incurable patient. Such an outlook appears to be increasing among present-day mental hospital psychiatrists, and as a consequence juniors regard the acute case as one surrounded by therapeutic glamour and the chronic case as a chore. The result of this attitude is that the poor chronic patient tends to be more and more deprived of the occupational facilities which constitute his only defence against total social rejection. More and more paid staff replace him in the utility departments of the hospital. More and more lay administrators point with pride to the economic efficiency of departments now as compared to the "bad" old days when they were operated with patient labour.

I therefore submit that both patients and the public would be grateful to the psychiatrist if he were to revive his traditional, but now almost moribund, interest in the chronic patient. Instead of appealing to the Minister to dip heavily into the public purse, we mental hospital psychiatrists should set about organizing our vast armies of idle chronic patients to build their own workshops, and to put to collective use their many already acquired trades and skills.—I am, etc.,

Shenley, Herts

OTHO FITZGERALD.

The Metric System

SIR,—The advantages of the metric system are international usage and suitability for scientific work. These are good things to our profession. But the main body of medical men are tied to one locality and are engaged in practical work with patients. They are dependent for the administration and supply of medicines on nurses and dispensers, or their assistants, all of whom, even the doctors, are much more familiar with the old British system than with the metric. The confusion of a change might so easily prove fatal. In the meantime any journal which caters for both scientific and practical aspects, and has some international circulation, does well to foster both systems.

There are some who would abolish one system. In spite of some anomalies and queer terms which are falling out of use, the Imperial and apothecary systems are adapted to everyday requirements and not basically to scientific niceties. It is only to be expected that pharmacologists and scientific committees should advocate the metric system, but it has some serious practical drawbacks and medicine cannot be altogether a pure science. Apart from the risk of error by a mere shift of a point, the only factors of 10 are 2 and 5. Most practical systems cater conveniently for common fractions. It is a pity that the mathematicians who introduced the metric system did not have polydactyly and thus base their system on 12 instead of 10. Such a duodecimal system might then have grown up scientifically and yet have been accepted for everyday use. It has 2, 3, 4, and 6 as factors, is used already in our measure of distance and money, and comes into the universal measurement of time and angles. Hitler attempted to decimalize the last of these, but he failed. However, the time for such an innovation has passed. Mathematicians now go in for a binary system to suit the electronic calculating machines, and it is probable that the brain works on a similar basis as a yes-no problem in several steps.

Both a scientific and a practical system are desirable. It is rather similar to Latin surviving as an international language until comparatively recently, while Italian came to be used in its country of origin. However the controversy goes, I shall continue to use the metric system for my scientific work and to prescribe opiates in vulgar fractions of a grain.—I am, etc.,

London, N.W.2.

JOHN PRIMROSE.

SIR,—My few remarks on this subject (February 21, p. 450) seem to have aroused a good deal of criticism, mainly of an adverse nature. While fully realizing the theoretical advantages of changing over to the metric system,

I was only trying to point out the difficulties that would arise in practice, and even in medicine the old adage still holds good: "14.18 grammes (grams, gm., g., or G.) of practice are worth 0.454 kg. of theory."

Before embarking on a revolution of this magnitude, it seems prudent to consider the history of any similar project which has been actually launched within living memory. and I think that the closest analogy occurs in the attempt to introduce the new terminology into anatomy. It was said at the time by the promoters of this scheme that the new system was scientific and that all errors would be avoided, as the impeccable Latin used was an international language. There is no need to discourse on the confusion which actually resulted, and which indeed still exists after some 20 years. The chief good which accrued was to unexpected people, such as scientific publishers and examination candidates. For instance, in a surgical anatomy viva, a student when asked about a structure of which he is totally ignorant can always say in a rather patronizing voice: "I am sorry, Sir, but it is not called that now." There is always a chance that the eminent surgeon then becomes so confused that he may turn to another subject altogether. Is it improbable that worse muddles would occur on and after the "appointed day" for the metric system?

I am sorry that Mr. A. L. Bacharach (March 14, p. 619) should think that my letter was not meant to be taken seriously. This so affected me that I have been running a temperature of over 36.5° C. ever since, and my feelings can only be expressed by the dire threat of the Victorian father: "Beware lest I thrash you to within 2.54 cm. (approx.) of your life."—I am, etc.,

London, E.C.1.

C. LANGTON HEWER.

Export of Antibiotics to China

SIR,—The letter of Drs. Richard Doll, D. G. Leys, and Douglas McClean, and Professor L. S. Penrose (March 7, p. 563) on the export of antibiotics to China is interesting. It is difficult to imagine on what grounds the sending of British streptomycin to China should be prohibited and other important drugs restricted, especially when we apparently have freely available stocks in this country.

Looked at politically or economically, this action seems foolish; medically it is unethical. I would urge second thoughts. In this country we treat laughingly the epithets applied to us from some countries in the East. It would be a pity if we ever came to deserve them.—I am, etc.,

London, W.5.

N. F. COGHILL.

General Peritonitis and Appendicectomy

SIR,—Mr. N. N. Iovetz-Tereschenko (February 21, p. 454), under the heading "Abuse of Antibiotics" and referring to a letter by Mr. Norman C. Lake (December 13, 1952, p. 1307), states: "Drainage alone in a case of perforation of the appendix is permissible only when a localized abscess is present. In a case in which generalized peritonitis is diagnosed at or before operation the appendix must be removed . . . the actual removal of the offending appendix is absolutely essential to prevent the continuation of infection of the peritoneum."

This is a sweeping statement and, we believe, dangerous teaching, especially when directed to inexperienced operators. About 300 cases of acute appendicitis in children come under our care each year; 25% of these cases have spreading or generalized peritonitis. There has been no mortality during the last two years. When an appendix can be removed without much difficulty this is done, but no determined effort is made to remove an adherent appendix when generalized peritonitis is present. Pre-operatively, rigidity and distension make determination of the position of the appendix difficult or impossible, and these patients are poor subjects for second incisions, widely enlarged incisions, packing off of inflamed small intestine, and retraction. The removal of an adherent appendix, however skillfully performed, may involve opening up tissue planes and

may well leave an oozing surface, an ideal culture medium and area for absorption of toxins. Some of our worst cases of generalized peritonitis result from rupture of an appendix abscess; appendicectomy in these cases would surely be the height of folly.

In the pre-sulphonamide and pre-antibiotic era, when open ether was almost routine for emergency surgery in children, one of us saw many cases of appendix peritonitis with distended and drumlike abdomens. A small incision made with local anaesthesia released pints of pus; apart from inserting a small tube, nothing further was done. Some of these children died, but many recovered. We believe that more extensive surgery would have resulted in a mortality approaching 100%. By the time generalized peritonitis has occurred the appendix distal to the obstruction is often empty, or at least no longer under tension—that is, in many cases a perforated appendix will do so much and no more harm; this is confirmed by the appearance of appendices removed at a later date.

The correct treatment of appendicitis in all its aspects is the most important subject in general surgery, because appendicitis is the commonest condition calling for emergency operation and because, by and large, it affects the young and able-bodied. In deciding to leave an appendix in or to go on and take it out the general condition of the patient and the quality of the anaesthetic, as well as the ease or difficulty of the operation, require consideration. Good judgment is acquired only with experience, and, on the whole, cases of appendicitis are treated by comparatively inexperienced operators.

While all surgeons will probably agree that a perforated, and more especially a gangrenous, appendix is better removed in a case of generalized peritonitis, no firm dictum should be made. Advice, if it may be offered, should be: "When in doubt or difficulty, leave the appendix in.—We are, etc.,

ISABELLA FORSHALL.

P. P. RICKHAM.

Liverpool.

A Continuous-feed Aneurysm Needle

SIR,—Since my brief description of the continuous-feed aneurysm needle (*Journal*, November 29, 1952, p. 1201) a number of inquiries have been received from surgeons wishing to know from whom this instrument might be obtained. I should be most grateful if you could publish this letter to let it be known that Messrs. Thackray, of Leeds, have undertaken manufacture of the instrument and are now able to supply it on order.—I am, etc.,

Newcastle-upon-Tyne.

D. J. TIBBS.

Research in General Practice

SIR,—In your leading article on research in general practice (March 14, p. 605) you state that "the first obstacle is the attitude of mind that the sick man expects in his medical attendant—assurance in diagnosis and confidence in prescribing." This statement might stand alone. When linked with the subsequent statement that the practitioner finds it essential "to be dogmatic and assured even when dogmatism is not altogether warranted by the state of current medical knowledge," it becomes a matter for debate. It should be made clear, if only for the sake of self-protection from the publicity columns of the lay press, that "assurance in diagnosis and confidence in prescribing" comprehends the right to withhold diagnosis and treatment at the physician's discretion, if uncertainty exists.

There was a time when dogmatic assurance and confidence were the only useful weapons in the possession of the practitioner. Nowadays the sick man and his relatives tend to expect a degree of intellectual honesty from their doctor because of the widespread medical education of the general public, the increased likelihood of a cross-check of the diagnosis by x-ray examination or laboratory tests (to say nothing of necropsies), and the demand for ethical indications before potent and potentially dangerous drugs are used. I submit that among good doctors there are many who find it unnecessary to be dogmatic and assured. A doctor may safely and with dignity decide to avoid a diagnosis and treat a case expectantly. He may thus keep his mind open for further evidence, and reassure the patient that the root of the disease is still being sought. I do not

deny the right of a doctor on occasion to use the unwarranted dogmatic approach, but I do object to the giving of an impression that the G.P. must spend all his day using such methods. The average patient does not expect superhuman wisdom from his general practitioner, and the great teachers of the "classical" school of clinical medicine were apt to leave a back door open for use should time prove first impressions or treatments to be wrong.

With regard to the scientific approach in general practice, Professor Robert Platt (p. 577) quotes Professor Pickering as having remarked that "doctors are really experimenting every day." The pity is that many do not realize the fact, and it is towards this realization that we must strive if research in general practice is to be advanced.

In conclusion it seems of importance that those practitioners who manage to retain the loyalty of their patients without constant recourse to diagnostic and therapeutic dogmatism should make their numbers known. For this matter leads to consideration of the G.P.'s attitude to over-prescribing and the prescribing of tonics and placebos, in which the pros and cons are subtly balanced, and the pivotal factor is what the sick man expects from his medical attendant.—I am, etc.,

Hornchurch, Essex.

I. H. J. BOURNE.

SIR,—The address by Professor Robert Platt (*Journal*, March 14, p. 577) should be most stimulating to those general practitioners who believe they can contribute something to investigation and research into varied diseases and disorders in the course of their general practice. I hope that, instead of merely applauding the idea, general practitioners themselves will do something about it.

Some years ago a colleague and I wrote a letter to the *British Medical Journal* advocating the formation on a volunteer basis of groups of enthusiastic general practitioners who would, in co-operation with the appropriate consultant and with the assistance of laboratory facilities, undertake investigation into the incidence or special features of some disorder in which they are particularly interested. The teaching hospitals might sponsor several groups of practitioners working in this way, and some central body, perhaps the College of General Practitioners, could co-ordinate these investigations and see that there was no necessary overlapping. I believe that this method would commend itself to the general practitioners far more than merely working at a subject chosen by some central body, and I believe that in the course of a few years really useful information would be made available in this way.—I am, etc.,

Calne.

A. K. JAMES.

SIR,—Professor Robert Platt's interesting remarks on research in general practice (*Journal*, March 14, p. 577) prompt mention of two points which might be suitable subjects for such research.

Some years ago I began treating vomiting in whooping-cough with sodium bicarbonate, on the assumption that vomiting, once started, would be made worse by acidosis. My impression has been that relief of the vomiting has been almost invariable with occasional complete cure. However, I have kept no records, and my impression may well be wrong. Also I have invariably kept such cases in bed, and improvement may have been due to that. Furthermore, there may have been mothers who did not give the bicarbonate regularly or did not keep their children strictly in bed. If so, such cases would form two control series; but in my practice the total number of cases in any one epidemic is too small for statistical analysis.

The other suggested subject is the early diagnosis of lobar pneumonia. The experience of other doctors with whom I have discussed this seems to have been the same as mine—that if an ill child, with no other signs or symptoms than a rise of temperature and grunting respiration, is treated with sulphonamides it is quite well in 24 hours. This happened so regularly that I began to suspect that my diagnosis was a fantasy, until one child, after apparent com-

plete recovery, produced rusty sputum. The difficulty here is that, with this experience, I should not feel justified in withholding the drug and waiting to see if the classical signs would develop, and so, even if I saw enough cases, I would not be able to produce a control series. Such a series would eliminate the snag (there may be others) that grunting respiration and a rise of temperature are a slender foundation for a diagnosis, and that some of the cases might recover as rapidly on expectant treatment only. I do not believe this to be so. I seldom see a case of pneumonia with classical symptoms, and it seems improbable that pneumonia has almost died out in my practice, as would be the position if any considerable proportion of these rapid recoveries were not pneumonias. Obviously, however, belief is not enough for statistical purposes.—I am, etc.,

Bracknell, Berks.

L. G. JACOB.

Agranulocytosis

SIR,—The annotation on agranulocytosis (March 7, p. 553) prompts us to record some observations on this condition made over the last three years. During this time we have seen six cases; of these, four have been due to thiouracil, one to amidopyrine, and in one the offending drug was not discovered. Experience of these cases has confirmed the findings of other authors^{1,2} that marrow function will usually return spontaneously within a week, provided the infective processes can be controlled. Further, serial marrow studies suggest that the presence of myelocytes or later cells of the granular series indicates that recovery is already under way.³ It is evident that, in view of the likelihood of spontaneous recovery, only those cases in which the agranulocytosis has lasted longer than one week and which still show no evidence of granulopoiesis in the marrow are of value for assessing a new therapy such as A.C.T.H. or cortisone. One of our cases showed these features.

A woman, aged 21, developed complete agranulocytosis five days after a surgical induction for toxæmia of pregnancy. The patient had received numerous drugs during and after parturition, and the offending drug was not discovered. Aureomycin and, later, chloramphenicol were given to combat the infection, but despite this and other routine measures there was no improvement. Marrow punctures on the first and fourth days showed a complete absence of granulopoiesis, and a further puncture on the eighth day showed a similar picture, though an occasional atypical promyelocyte was seen on prolonged search of the film. On the eleventh day 25 mg. A.C.T.H. was given intramuscularly, six-hourly, for 48 hours, and subsequently 50 mg. per day was given with 25 mg. intravenously in slow drip on alternate days. A marrow puncture on the fourteenth day showed marked granulocytic hyperplasia with abundant myelocytes and an occasional mature polymorph. Granulocytes appeared in the peripheral blood on the fifteenth day and the count rapidly returned to normal.

Because spontaneous recovery cannot be excluded in this case or even in that reported by Hart and his colleagues,⁴ where there was complete agranulocytosis for 13 days before A.C.T.H. was started, these cases suggest that further trials of A.C.T.H. should be conducted in those patients whose marrow punctures still show complete failure of granulopoiesis after several days' observation. Indiscriminate use of A.C.T.H. or other drugs in the early stages of the disease gives no information as to their therapeutic value.

Our thanks are due to Dr. F. T. G. Prunty for permission to record this case.—We are, etc.,

M. S. R. HUTT.
G. DE J. LEE.

London, S.E.1.

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- 1 Dameshek, W., and Wolfson, L. E., *Amer. J. med. Sci.*, 1942, 203, 819.
- 2 Tyson, M. C., *et al.*, *Blood*, 1946, 1, 53.
- 3 Hutt, M. S. R., *St. Thom. Hosp. Rep.* (Second Series), 1951, 7, 98.
- 4 *British Medical Journal*, 1952, 1, 1273.

SIR,—In your annotation on agranulocytosis (March 7, p. 553) you state: "The most beneficial single therapeutic measure is to give penicillin as soon as the condition is diagnosed." A recent case in which this was done suggests that this may not be the wisest course. A man of 29, with

agranulocytosis and high fever and sore throat, was treated with penicillin (250,000 units three-hourly) for three days, during which he became increasingly ill and developed metastatic abscesses. Blood culture and throat swab taken on the first day grew *Staphylococcus aureus* resistant to penicillin 10 units per ml., but fully sensitive to aureomycin. When aureomycin was given the temperature began to fall and the patient started to improve.

Barber¹ and others have shown that nearly 60% of strains of staphylococci grown from hospital patients may be resistant to penicillin, and it is clear that when agranulocytosis occurs there is need for an antibiotic of the widest possible range. It is probably unwise to give chloramphenicol in the presence of a damaged bone marrow, but there is no contraindication to aureomycin, and I would suggest that this drug rather than penicillin is the antibiotic of choice in agranulocytosis at the stage before the bacteriology of any intercurrent infection is known.

I am grateful to Dr. C. N. Armstrong, under whose care the patient was admitted, for permission to refer to this case, and to Dr. C. A. Green, who has carried out the bacteriological studies.—I am, etc.,

Newcastle-upon-Tyne.

R. E. IRVINE.

REFERENCE

- 1 *British Medical Journal*, 1947, 2, 863.

Intraperitoneal Rupture of the Intestine

SIR,—Having had two recent cases of intraperitoneal rupture of the intestine without an external wound under our care, both due to crushing injuries, we were interested to read your report (January 17, p. 166) of the case of *Payne v. St. Helier Group Hospital Management Committee and Another*. Few will have a wide personal experience of this condition, and a short report of these two cases may be of interest.

Case 1.—A child aged 2 years 6 months was seen two hours after he had pulled the top of a bird-bath weighing 1½ cwt. (50.4 kg.) on to him. He was shocked, pale, and cold, with a pulse of 140. There was no abrasion or contusion of the skin of the abdomen, but there was slight tenderness all over, with some resistance, but no rigidity, in the left flank. The latter was no more than might have been explained by bruising of the abdominal wall. There were no red blood cells in the urine. The patient was admitted and half an hour later his pulse was recorded as 170. In view of this a laparotomy was performed. A ragged hole 1 in. (2.5 cm.) in diameter was found in the jejunum 2 ft. (0.61 m.) from the duodeno-jejunal flexure. The tear was on the antimesenteric border, and mucous membrane was pouting through. Peritoneal soiling was slight, and apart from bruising in a small area and enlarged mesenteric glands there was no other abnormality. The hole was sutured and recovery was uneventful.

Case 2.—A man aged 17 was admitted six and a half hours after being struck in the abdomen by the starting-handle of a tractor which had backfired. He felt bruised at first, but continued for a while to work. Later he had to cease work, but the degree of pain did not start to increase until two hours after the accident, when it started steadily to increase. He vomited once and passed urine which did not contain obvious blood. On admission his general condition was very good and he was not shocked. His pulse was 80 per minute and his blood pressure 145/80. The site of the blow had been in the umbilical region and he was tender there and in the hypogastrium. There was some resistance to palpation in the lower abdomen, but there was no rigidity. Bowel sounds were absent. It was felt that the clinical signs might well be accounted for by bruising from injury to the abdominal wall, but the history of the case raised doubt and so laparotomy was performed. At operation there was a small quantity of serous fluid in the right iliac fossa. About 3 ft. (0.91 m.) of the lower ileum was bruised and oedematous, and there were petechial haemorrhages in the bowel wall and adjacent mesentery. In the lower part of this bowel, and about 2 ft. (0.61 m.) from the ileo-caecal valve, there was a perforation in the antimesenteric border, ½ in. (1.25 cm.) in diameter. It appeared already sealed by the omentum, but it was sutured. Recovery was uninterrupted.

The only features common to these two cases were the absence of obvious bruising of the abdominal wall and the absence of rigidity on examination. In neither case was

laparotomy performed on account of unequivocal abdominal signs, and Case 2 was not shocked. Early diagnosis of rupture of the intestine is always difficult, and it is quite possible for it to occur without producing shock or rigidity of the abdomen.—We are, etc.,

D. G. LAMBLEY.
T. H. CULLEN.

Northampton.

A Journal and its Readers

SIR,—Having, as a member of the Journal Committee, acquired some knowledge of the difficulties with which you are faced, may I mention some points which I think are relevant?

It may surprise your readers to learn that 50 years ago the *Journal*, like the *Lancet*, had about twice as much reading matter as it has to-day. Each issue had 64 pages compared with the present 52–56 (excluding the *Supplement*). Editorials were 1,240 words to the page compared with the present 900. Minor articles and many paragraphs in major articles were printed in a type which, if used now, would cause howls of protest, despite National Health Service spectacles. Soon we shall refuse to read any type smaller than that used for "The Owl and the Pussy-cat" or "The Tiny Toddler's First Story-book," and we shall demand pictures illustrating every object named.

The articles submitted can be divided into three groups: those accepted without question, those which would have been accepted if there were more space, and those which are below standard. The contents would be more varied and the appeal would be wider, without materially lowering the standard, if more of the second group could be published. This could be done if contributors were less prolix.

In scientific or philosophic arguments writers cannot expend too much trouble on composition. Most writers, even those of great experience, have to rewrite and rewrite in order to get the correct words and the correct order of words. The specimen proof-page of Mr. Churchill's *The Second World War* displayed by Messrs. Cassell & Co. Ltd. at the South Bank Exhibition shows how much travail is undergone by a Master, though to the casual reader the result seems effortless. In descriptions of clinical cases, however, rounded sentences (not to say turgid periods) are unnecessary. Technical facts need only to be brief and accurate, an aim which is best achieved by the telegraphic, or, as Professor D. M. Dunlop (*Journal*, February 21, p. 441) calls it, the Jingle style. If this were adopted the inordinate space now occupied by such descriptions could be cut to one-third.

Here are some examples. I hope the authors, if they recognize the passages as theirs, will not take offence.

"Examination revealed that the pulse was of poor volume but regular at 120 beats per minute." Only through examination could this revelation have come; 120 could only be beats per minute. *Pulse 120, regular; volume poor*—5 words instead of 16.

"Laparotomy was carried out through a lower right paramedian incision. There was no free fluid in the peritoneal cavity." Laparotomy cannot be carried out without an incision: it is, in fact, an incision. Where on earth was free fluid expected except in the peritoneal cavity? *Lower right paramedian laparotomy. No free fluid*—7 words instead of 19.

"There was slight distension of the upper jejunum." Here the noun is used instead of the verb. *Upper jejunum slightly distended*—4 words instead of 8.

"The spleen was enlarged three fingerbreadths below the left costal margin." Where else could it have been enlarged? *Spleen enlarged 3 fingers*—4 words instead of 11.

"Pathological Report. Microscopical examination of the tissue was performed by Dr. X, who reported: . . ." *Pathological Report (Dr. X): . . .*—4 words instead of 14.

It may be objected that literature is debased by such condensation. But, with all due respect to Professor Dunlop, I maintain that the Jingle style, when properly used, can be very effective: ". . . On the fifth [day], in the morning, deafness; all the symptoms exacerbated; spleen swollen; distension of the hypochondrium; alvine discharges scanty and black; he became delirious. On the sixth, delirious;

at night, sweating, coldness; the delirium continued. On the seventh, he became cold, thirsty, was disordered in mind; at night recovered his senses; slept. . . ." Thus Hippocrates, in Adams's translation. The case stands out with dramatic vividness.

As Dr. Stephen Taylor says (March 21, p. 673), readership varies inversely with verbosity. But his remedy, a ruthless subeditor, however appropriate for a daily newspaper, hardly meets the case of the *Journal*, where a subeditor has quite enough work in touching articles up. Anything more drastic should be done by writers themselves; they should not expect the editorial staff to revise their contributions.

Finally, with Sir Adolphe Abrahams (March 21, p. 673) I venture to question the need to publish the lengthy "Isotiazid in Treatment of Pulmonary Tuberculosis" (March 7, p. 521). This work, having been sponsored by the Medical Research Council, should surely have been published by Her Majesty's Stationery Office? Why should the Association bear the heavy cost? For readers of the *Journal* your admirable leading article was sufficient.—I am, etc.,

Histon, Cambridge.

FFRANGCON ROBERTS.

POINTS FROM LETTERS

Emphysema

Dr. J. TODD (Littlemore, Oxon) writes: I note with regret that Dr. W. N. Leak (February 21, p. 450) continues to argue in favour of using morphine in certain cases of status asthmaticus. To be sure, a few of the older textbooks continue to recommend this practice, but modern opinion is firmly set against it. The latest edition of Martindale's *Extra Pharmacopoeia* (1952, 1, 23rd ed., London) contains the following statement: "It (morphine) should never be given in the presence of bronchial asthma or of heart failure secondary to chronic lung disease." Dr. Leak does not give first importance to the cough reflex in "a man gasping for his life," but I respectfully suggest that areas of atelectatic lung (due to retained mucus) may *per se* contribute to this melancholy situation. Furthermore, he seems to ignore the habit-forming propensities of morphine. In those cases where the differential diagnosis between bronchial and cardiac asthma causes difficulty an intravenous injection of aminophylline has much to commend it.

Research into Relief of Pain

Dr. H. BROSTOFF (London, N.W.10) writes: I recently have had two cases of inoperable carcinoma with intractable pain in which attempts at relief were woefully inadequate. . . . All the drugs used, either in series or in combination (including, finally, morphine), failed to produce a satisfactory relief of pain for more than very short periods. Surely there is ample scope here for intensive investigation to relieve the large numbers of these unfortunates.

"Efocaine" and the Relief of Pain

Dr. T. H. HOWELL (London, S.W.11) writes: I have recently been seeking for a local anaesthetic with a long duration which could be used in the treatment of chronic rheumatic disease. I used "efocaine" (*Journal*, December 13, 1952, p. 1243) on a series of 15 patients suffering from fibrositis. In five of these there was a local reaction with pain and tenderness at the site of injection lasting two or three days; one patient also showed a rigor and a rash; five patients had relief for a period of three days, two for a period of a week, one for a period of two weeks, and two more for three weeks. Although this series is only a small one I feel it should be put on record so that others using the drug may have a chance to compare their results with those I have obtained.

Danger of Blood Injections

Dr. E. ROBERT REES (London, W.1) writes: It appears that the serious consequences that may follow the injection of even small quantities of whole blood into rhesus-negative female infants are still not universally realized. My attention was drawn last month to a case where a girl of 3 years was given a syringe of her mother's blood because her other sister had contracted measles. The mother was an Rh-positive, group O, and I can only conclude that the doctor thought that the daughter must also be Rh-positive. This, of course, is by no means necessarily the case, as is readily understood if we consider its mode of inheritance.

Obituary

S. S. WHILLIS, M.D.

Mr. S. S. Whillis, honorary consulting surgeon to the ear and throat department of the Newcastle-upon-Tyne Victoria Infirmary, died at his home in Gosforth on February 28. By his death Newcastle loses a personality and one of its colourful medical pioneers—a man known only as Sam to his contemporaries and as Sammy to generations of students and house-surgeons.

Born in the west end of the city in 1870, Samuel Short Whillis received his medical training at the old College of Medicine and the old Infirmary on the Forth Banks. He graduated M.B., B.S. in 1892, proceeding M.D. in 1896. While he was holding an appointment at the Ingham Infirmary, South Shields, in 1894, his work was noticed by Mr. Frederick Page, who invited him to become house-surgeon at the Newcastle Infirmary. At that early stage the gruff manner, which never changed throughout his life, had already developed: it was a characteristic which inspired the utmost devotion in many patients and something like terror in a few. About 1895 Whillis entered general practice and also became visiting surgeon to the Wingrove Hospital, where he supervised all the patients and did a good deal of general surgery. He held this post until 1911, and over the years he exercised a considerable influence with the board of guardians. Between the ages of 30 and 40 Whillis led a very busy life, for at the beginning of this century he took up ear and throat work in addition to general practice, beginning as a kind of unauthorized assistant to the late Mr. Walter Ridley, a general surgeon to the infirmary who held an out-patient clinic for ear, nose, and throat diseases. Before the new Royal Victoria Infirmary was established on the Leazes site the house committee decided to appoint official assistants in special departments, and in 1905 Whillis became the first honorary assistant ear, nose, and throat surgeon. On Mr. Ridley's death in 1911 Whillis was appointed honorary surgeon to the now separate department, of which, for almost 20 years, he was chief.

Despite a busy consulting practice Whillis served his hospital well, being a strict timekeeper in out-patients, in the theatre, and in the wards. His out-patients clinic began at 9 a.m., and he was very late if not there by 9.3 a.m. The operating list was timed for 10 a.m., and at 10 o'clock exactly he would turn the corner of the corridor to enter the theatre and ask always the same question, "Where's Mr. So and So?"—the anaesthetist was always "Mister" to Sam Whillis. Other appointments which Mr. Whillis held were those of honorary surgeon to the Fleming Memorial Hospital for Children and honorary otorhinologist to the Sanderson Orthopaedic Hospital for Children, and he was one-time lecturer in otorhinology in the University of Durham. He was a past-president of the Newcastle-upon-Tyne and Northern Counties Medical Society.

In many ways Whillis was a shrewd clinician. For example, he had made observations about the general picture of lateral sinus septicaemia which had escaped his contemporaries and which were not to be found in textbooks; and many years ago, long before there was any safety under drug "umbrellas," he had noted that there was a stage in cerebral abscess when the surgeon might interfere with hope of success, but woe betide the patient if the surgeon did not wait for that stage. Despite

a well-merited reputation, established more than 40 years ago, for a method of tonsil enucleation in children, he was strangely lacking in confidence when it came to tonsillectomy in adults. Seen against the background of his own time Whillis was an excellent temporal bone surgeon, for he performed a very pretty and efficient radical operation. Even in those days most of his radicals were done by hand-gouging, the mallet being used very little. His house-surgeons loved him, soon finding that once his confidence was established his gruffness was no more than a cloak. A little unbending, a little lowering of the barrier, was the equivalent of high praise from Sammy.

He retired from his hospital in September, 1930, and was elected honorary consulting surgeon in the same month. Within a very short time he had abandoned practice altogether and retired to the north of the city. Whillis was always an introspective type, at times tending to be almost morbid, and hence the bereavements of his later life fell very heavily upon him. His last few years of active work at the infirmary were clouded by the sudden loss of an only daughter, and in November, 1943, he was shattered by the untimely death of his only son, Robert, who had but recently succeeded as chief in the department which his father had virtually founded. Mrs. Whillis died some years ago, and so the last days of the old pioneer were lonely indeed.—F. MCG.

JOHAN M. HOLST, M.D., Hon.L.L.D., Hon.F.R.C.S.
Hon.F.R.C.S.Ed.

Professor LAMBERT ROGERS writes:

Professor Johan Holst, whose death and professional career were referred to in the *British Medical Journal* of March 21 (p. 680), was a charming host whom visitors to his clinic in Oslo will remember for his courtesy, enthusiasm, and the high standards which he himself practised and so obviously induced in his staff. Those who have been to his island home and seen him in his family surroundings will have happy memories of the lovely island in the fiord where they were so lavishly entertained and where he spent such leisure moments as his busy practice and many activities allowed him. His frequent visits to this country, and the pleasure which he appeared to find both in visiting us and being visited by friends from here, have done much to make a happy bond of association between members of our profession in our two countries. His death is not only a loss to surgery, but it also takes from us a most charming and very courteous colleague whom we shall sadly miss but remember with admiration and affection. Our sincere sympathy must be with Madame Holst and the members of his family.

Dr. F. ARNOT BEARN writes: The news of Professor Holst's death will cause grief to many R.A.M.C. officers who served with him during the last war. I saw a great deal of him during my service in Iceland and later with the 52nd Division, to which the Norwegian medical services were attached, and like many others was most impressed by his very brilliant and charming personality. He came out regularly on our winter exercises under rather grim conditions in Scotland, and was most helpful to me with his wide knowledge of winter warfare and the evacuation of casualties under these conditions. During purely medical "exercises" he most readily acceded to my request to lecture to us on some of the aspects of military surgery, and I well remember the applause that greeted my thanks for "a masterly address by a master." Apart from surgery, he was widely read in the literature of many countries and many subjects, but even so I was startled one evening when, sitting with him in my "two-man" tent discussing Kitchener's Nile campaign, he remarked that the railway from Wady Halfa to Abu Hamed was very vulnerable. My

wife and I were his guests in Norway three years ago, and again realized what an able and charming person he was.

Dr. V. F. USHER, who had a large practice in Auckland, died on October 26, 1952, as a result of a boating accident on Lake Rotoiti. He had many friends in Britain. Victor Field Usher was born at Nelson, New Zealand, in 1880, the son of Mr. Thomas Usher, and was educated at Nelson College, where he excelled at football and swimming. Having decided on the medical profession as a career, he enrolled as a student in 1902 at the University of Edinburgh, where he became a close friend of Dr. Douglas Guthrie and the late Sir John Fraser, and where he graduated M.B., Ch.B. in 1907. He obtained the F.R.C.S.Ed. in 1910, and proceeded to the M.D. two years later. After graduation he held a clinical assistantship at Edinburgh Royal Infirmary, and later was house-surgeon at the Seamen's Hospital, Greenwich, before returning to New Zealand in 1913 to settle in practice at Auckland. He served with the New Zealand Forces throughout the war of 1914-18 and returned to Auckland in 1920, and later was appointed honorary surgeon to the Auckland Hospital. Dr. Usher took an exceptional interest in the welfare of his patients and built up a large practice. He was a keen sportsman, and for many years nothing pleased him more than to entertain friends at his cottage at Rotoiti, where he would arrange fishing, shooting, riding, and boating expeditions for their pleasure. He married Miss Doris Salter, daughter of the Reverend Walter Salter, and had two daughters, one of whom is a member of the medical profession and the other a nurse.

Dr. J. E. H. SAWYER, who died at his home at Burwash, Sussex, on February 22 at the age of 78, was the elder son of the late Sir James Sawyer, formerly professor of medicine and a consulting physician at the Queen's Hospital in Birmingham. Born at Birmingham on September 8, 1874, James Edward Hill Sawyer was educated at Shrewsbury and at Christ Church, Oxford, going on from there to do his clinical work at St. Thomas's Hospital, where he gained the Solly and Bristowe medals and the Hadden prize. He graduated B.M., B.Ch. in 1900, and in 1903 he proceeded to the D.M. and obtained the M.R.C.P. After holding resident posts at St. Thomas's Hospital, Dr. Sawyer returned to his native city, and in 1906 he was appointed assistant casualty physician and in 1914 assistant physician to the General Hospital, Birmingham. He was also physician to out-patients at the Children's Hospital, and assistant to the professor of medicine in the University. For some years Dr. Sawyer was editor of the *Birmingham Medical Review*, and papers by him, notably one on the physical signs of disease in the thorax and abdomen, appeared in medical journals and in French's *Index of Differential Diagnosis*. When the British Medical Association held its Annual Meeting at Birmingham in 1911 he served as one of the secretaries of the Section of Diseases of Children. His career as a consulting physician ended with the onset of the 1914-18 war. He had been much interested in the Territorial Army since its inception, and he received the Coronation medal of 1911. When war broke out the First Southern General Hospital (T.A.) was mobilized, and the unit converted part of the Edgbaston buildings of Birmingham University into a military hospital. Dr. Sawyer, who had been registrar since 1908, was mobilized in that capacity and served with the unit throughout the war, becoming the administrator in 1917 and receiving the brevet of lieutenant-colonel. He was released from the Army in 1919, and he retired also from his civilian hospital appointments and from active practice. Dr. Sawyer then settled at Burwash, where he lived for the remainder of his life. From 1939 to 1943 he served as a captain in the 19th Battalion of the East Sussex Regiment, retiring from those duties in his 70th year. Although in younger days Dr. Sawyer was a physician of some promise, he ceased to practise as a consultant nearly 40 years ago, and his Birmingham colleagues remember

him chiefly as the conscientious administrator of the Birmingham military hospital at Bournbrook. In 1906 he married Miss Margaret Longstaff, who, with three sons and a daughter, survives him.

A shadow was cast over the village of Chipping Campden and the neighbouring countryside in Gloucestershire by the sudden death on March 1 of Dr. C. E. MOORHEAD at the early age of 46. Charles Edward Moorhead was born at Birmingham on August 15, 1906, the son of the late Dr. J. H. Moorhead and nephew of Professor T. Gillman Moorhead, Regius Professor of Physic at Trinity College, Dublin. He received his medical education at the University of Birmingham and graduated M.B., Ch.B. in 1930. After holding resident appointments at the Queen's Hospital he settled at Edgbaston, where he was in practice for six years until the outbreak of war in 1939. Immediately mobilized as a member of the Territorial Army, he went to France with the 268th Regiment of Artillery, and came through the evacuation of Dunkirk. Later he took part in the Burma campaign, being mentioned in dispatches for gallant and distinguished services and attaining the rank of lieutenant-colonel. He was appointed O.B.E. in 1946.

G. H. D. writes: Blessed with great charm, Charles Moorhead was nevertheless a forceful character who did not suffer fools gladly. He combined in his person the old type of country doctor with the more modern physician. A lover of the countryside and country ways, he truly enjoyed a day's shooting and was a keen fisherman, but work in the last few years had put a stop to hunting and golf. First and foremost, however, he was a doctor, and a very good one. Able and extremely conscientious, he lived up to his high standards. He was not one to be content with the second best, and the strain under which he must have worked without doubt contributed to his death. Campden Church was filled at his funeral service, and his epitaph might well be written in the words of one of his patients who wrote to me after his death: "A truly great gentleman and a friend to all." To his widow, formerly Miss Pandora Pollen, of Norton Hall, Mickleton, and to his two young children, will be given the sympathy of all who knew him.

Mr. FRANCIS BARTHOLOMEW, who died on March 2, received his medical education at St. Thomas's Hospital and qualified M.R.C.S., L.R.C.P. in 1930. After holding the appointment of house-surgeon at the Royal Victoria and West Hants Hospital, Bournemouth, where his rapidly growing surgical skill greatly impressed his seniors, he took the Fellowship of the Royal College of Surgeons of Edinburgh, and entered the Sudan Medical Service, in which he eventually became senior surgeon to the Sudan Government. He served in the R.A.M.C. from 1940 to 1944, attaining the rank of major and acting as surgeon-specialist to the Sudan Defence Force. He married Miss Joyce D. Hodgins, daughter of Mr. J. F. Hodgins, of Crowborough, in 1942, and she survives him, together with two daughters and a son. Bartholomew had an unobtrusive personality, but also a sturdy independence, a practical outlook, and a most kindly disposition. This last quality was invaluable to him as a doctor and made him many friends.

We are indebted to Dr. H. ABDALLA for the following appreciation: I was in close contact with Francis Bartholomew in 1935, when he was a medical inspector in the Northern province of the Sudan. It was while there that he began to make his great contribution to surgery. He toured in a river motor launch with a handful of instruments and would operate in village dispensaries or in a small cabin in the launch. Before his time major surgery was not attempted in outlying districts: he operated anywhere. The essence of his contribution was in the fact that he evolved a new routine in the theatre. This consisted essentially in limiting his surgical armamentarium to a few instruments and appliances, and in reducing the number of assistants and the time of operation. With his handful of instruments he was prepared to operate on any part of the

body with only one helper. He had no lotion bowls or saline packs or multitudinous swabs of different sizes. He employed a no-touch technique and made full use of spinal anaesthesia, hexobarbitone, and chloroform, and his results were an inspiration to all. He proved that with an intelligent variation of the theatre routine surgery could be undertaken anywhere with the minimum of instruments and assistance, yet without any deviation from the fundamentals of modern surgical practice. Apart from his own achievements and the benefits he gave to his patients, his example stimulated his contemporaries to carry the gospel of serious surgery to all parts of the Sudan. He was equally an exemplary character in other ways. His devotion to his patients, his quiet conduct of his duties, and his love and respect of all human beings won for him the friendship and esteem of all sections of the community. He has made his mark. His loss is a sad one.

Dr. A. C. WATKIN, who died at Shrewsbury on March 11 at the age of 70, after a short illness, was born at Llanfair-Caereinion, Montgomeryshire, in 1882, the second son of the late Alderman Thomas Watkin, J.P. Arthur Christopher Watkin studied medicine at University College Hospital, London, and qualified M.R.C.S., L.R.C.P. in 1906. He then held house appointments at the Brompton Hospital and elsewhere before going to Shrewsbury as a tuberculosis officer in 1914. He had taken the D.P.H. two years earlier. During the 1914-18 war he served with a field ambulance corps in France and was mentioned in dispatches in 1918. Released from the R.A.M.C. with the rank of major, he returned to Shrewsbury and eventually became senior tuberculosis officer for the county of Shropshire, holding the post until he retired in September, 1951. Dr. Watkin was a most conscientious worker and gave devoted service to his patients, by whom he was greatly liked. Always keenly interested in the administration of Shirlett Sanatorium, Broseley, he became a member of its committee of management. The presidency of the Shropshire and Mid-Wales Branch of the British Medical Association was an honour which came to him in 1936-7. Outside his professional work Dr. Watkin was particularly interested in Welsh literature and music, and he was a past-president of the Shrewsbury Cymrodorion Society. He was also an enthusiastic angler and bridge player. He is survived by his widow and one son and one daughter, to whom our sympathy is extended.—A. G. W.

The death of Dr. H. STEDMAN on March 9 at the age of 86 recalls the days when the countryside of Middlesex and Hertfordshire was much nearer to London than it is to-day. Herman Stedman was born at Islington, where his father, Dr. James Stedman, was in practice, on July 21, 1866, and was educated at Silverstone—now famous for its car-racing circuit—in Northamptonshire, and at Winterthur, in Switzerland. At the age of 16 he went to the United States with his father, and continued his education at the University of Cincinnati, where he studied medicine, graduating M.D. in 1887. In the following year, after a period of study in Glasgow, he took the Scottish triple qualification, and took over his father's practice at Towcester, in Northamptonshire. Later he went into practice in Poplar, and while there he took the F.R.C.S.Ed. His first wife, formerly matron of Halstead Hospital, where Dr. Stedman had been a house-surgeon, travelled on the first train on the Hampstead Tube—now part of the Northern Line—in search of a new home in more congenial surroundings, and so in 1906 they moved to Temple Fortune, and Dr. Stedman became the first medical practitioner at Golders Green. There he quickly built up a large practice and did a good deal of work as a gynaecological surgeon, both privately and at the Hendon Cottage Hospital, which he helped to found. Dr. Stedman had a long association with the old Volunteers and the Territorial Army, but on the outbreak of war in 1914 he was considered to be medically unfit for military service overseas, and in response to a request from the

British Red Cross Society he took charge of a special Belgian hospital at Calais, where he helped to combat an outbreak of typhoid fever among the civilian population. For his services he was awarded the Belgian Croix de Guerre, and he was also made a Chevalier de l'Ordre de Léopold. Later he joined the Royal Air Force and was appointed principal medical officer at York. After the war he returned to his practice at Golders Green, and on April 23, 1925, he presided at the inaugural meeting of the Hendon Division of the British Medical Association, and was its chairman until 1927. In the following year he retired from practice, though still continuing to treat a number of his old patients, and in 1934 he moved to Iwer Heath, joining the staff of the local hospital for service in the last war. From 1940 to 1952 he lived at Bushey Heath and elsewhere, until he finally settled at Farnham Common in January of this year. His second wife, formerly Mrs. L. J. Dipple, of Watford, died in hospital on March 7, only two days before the death of her husband. Dr. Stedman is survived by a son, his daughter having died a few years ago.

Dr. R. GALWAY MURRAY, who had been a general practitioner in Bayswater for nearly 50 years, died on March 9 at his home in London, at the age of 79. He was the eldest son of Dr. Thomas Murray and grandson of Dr. Thomas Murray, both of whom practised in Trinidad, British West Indies. His great-grandfather, Henry Murray, had fought against Napoleon in the Walcheren expedition of 1809, and later went with his regiment to the West Indies. At the termination of the war with France he married Mademoiselle de Rochard, daughter of the Marquis de Rochard and formerly lady-in-waiting to the Empress Josephine, and then settled in Trinidad, becoming Marshal of the island. Henry Murray's great-grandson, Richard Galway Murray, was born in Trinidad on September 15, 1873, and was educated in England at Epsom College and St. George's Hospital, where his father and grandfather had studied medicine before him. He was one of the first to join the Epsom College volunteer cadet corps on its inception. He won the Macfarlane challenge cup for athletics, and was one of the invincible Rugby team of 1891-2. He represented the United Hospitals against Cambridge University in the 100 yards in 1896. On coming to London, he joined the London Scottish and was one of the guard-of-honour at the celebration of Queen Victoria's diamond jubilee. He qualified M.R.C.S., L.R.C.P. in 1898, and when the South African war broke out enlisted in the 62nd Company of the Middlesex Imperial Yeomanry (The Duke of Cambridge's Own). He was promptly promoted sergeant, and after three months' training saw active service in South Africa. His battalion lost its medical officer, and Sergeant Murray was called upon to shoulder his duties as well as those of a combatant. This he did until after the battle of Wittebergen, when he was promoted surgeon-captain by the "forced orders" of Lieutenant-General Sir Hector Macdonald, which were later confirmed by Lord Kitchener. On his return to England, having taken the Cambridge D.P.H., he went into general practice in London near the Marble Arch. In the war of 1914-18 he first went to France on the staff of the Allied Forces Base Hospital, but later returned to England, joined the R.A.M.C. as a captain, and was put in charge of a hospital at Lydd. He returned to France in 1916 as medical officer to the 55th Heavy Artillery Group and was present at the Battle of the Somme. In 1917 he was invalided out of the R.A.M.C. and returned to his practice, taking the degree of M.D. at Durham three years later. Developing an interest in radiology, he took the D.M.R.E. of Cambridge in 1928 and was appointed radiologist to St. Charles's Hospital, North Kensington, and to the St. Mary's Hospital for Women and Children, Plaistow. In the last war he was medical officer in charge of mobile first-aid units in Paddington. Dr. Galway Murray married Florence Edith, eighth daughter of Paymaster T. B. M. Richards, of Mutley, Plymouth, and she survives him with two married daughters.

Medical Notes in Parliament

Pneumoconiosis in Miners

Mr. JOYNSON-HICKS, Parliamentary Secretary to the Ministry of Fuel and Power, stated in reply to Miss Jennie Lee on March 26 that about 80 coal-miners in 1950, and 101 and 112 in the two following years, were advised to leave the industry or were suspended on account of having pneumoconiosis with tuberculosis.

Home Equipment or Hospital Bed

Sir GUY LLOYD, on March 26, asked the Minister of Health whether a local authority or a hospital board was expected to pay for equipment which, if provided to a disabled person, could permit him to be discharged from hospital, thus freeing a bed for another patient.

Mr. IAIN MACLEOD replied that local health authorities had power under Section 28 of the National Health Service Act, 1946, to provide home-nursing equipment and to make such charges, if any, as they considered reasonable having regard to the person's means. Individually fitted surgical and medical appliances for permanent or semi-permanent use were provided through the hospital and specialist service, and hospitals might lend certain other equipment for domiciliary treatment under specialist direction.

Control of Cortisone

Mr. C. R. BENICE, on March 26, asked the President of the Board of Trade what limitations were placed on the importation of cortisone.

Mr. PETER THORNECROFT replied that licences permitting private commercial imports of finished cortisone were not at present being issued. Supplies were purchased by the Ministry of Health for continuing clinical research and for use in selected hospitals where treatment could be strictly supervised.

Mr. BENICE asked what was the use of using cortisone in hospital if it was to be denied to the patient after leaving hospital.

Mr. THORNECROFT said he understood that the Ministry of Health still considered it necessary to control the use of the drug very carefully, and it could be adequately supervised only if done in this way.

Pricing Prescriptions

Miss PAT HORNSBY-SMITH, Parliamentary Secretary, Ministry of Health, informed Mr. Hugh Linstead on March 26 that the total number of staff employed in prescription-pricing offices in January, 1952, was 1,089, and in January this year 1,302. The number of National Health Service prescriptions dispensed during the year 1952 and priced to date was approximately 139 million.

Registration Service Bill.—A Bill entitled the Registration Service Bill was introduced on March 24 in the House of Lords. It is a consolidating measure dealing with the central and local organization of the service which, under the Registrar-General, administers the law on registration of births, marriages, and deaths and many aspects of solemnization of marriages in England and Wales. This body of law has been contained in a large number of scattered enactments, some of them old and not easy to read together.

The Services

Colonel W. R. Ward, T.D., R.A.M.C., T.A., has been appointed Honorary Surgeon to the Queen, in succession to the late Major-General P. H. Mitchiner, C.B., C.B.E., T.D.

AUXILIARY R.A.M.C. FUNDS

The annual general meeting of the members of the Auxiliary Royal Army Medical Corps Funds will be held at 11, Chandos Street, London, W.1, on Monday, April 13, at 5 p.m., to receive the annual report and accounts for the year 1952 and to appoint officers and elect auditors for the year 1953.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 14 (No. 10) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	31	3	7	0		38	4	14	1	
Dysentery ..	362	28	111	1		639	62	71	4	4
Encephalitis, acute..	5	0	0	0		6	1	0	0	
Enteric fever:										
Typhoid ..	1	0	0	1	2	0	0	1	0	
Paratyphoid ..	6	0	1(B)	0		6	0	2(B)	0	
Food-poisoning ..	94	3		0		94	14		2	
Infective enteritis or diarrhoea under 2 years ..				14	15				11	22
Measles*	26,924	1371	381	119	248	6,883	218	561	239	222
Meningococcal infection ..	45	2	11	0	4	57	7	25	0	6
Ophthalmia neonatorum ..	35	7	6	0		46	5	17	0	
Pneumonia†	1,099	52	372	37	9	1,143	60	579	16	5
Poliomyelitis, acute:										
Paralytic ..	15	2		3	0	13	0		2	4
Non-paralytic ..	2	0				6	0			
Puerperal fever§	220	24	12	1	1	232	37	10	0	3
Scarlet fever ..	1,675	89	233	54	50	1,581	149	221	29	80
Tuberculosis:										
Respiratory ..			150	28				148	42	
Non-respiratory..			27	3				44	15	
Whooping-cough ..	3,072	178	298	27	159	2,918	114	341	112	45

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	1	0	0	0	0	9	0		0	0
Dysentery ..	0	0*		0		0	0		0	
Encephalitis, acute..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0			0
Infective enteritis or diarrhoea under 2 years ..	13	0	1	1	3	11		1	1	0
Influenza ..	139	9	10	0	2	45	5	29	0	0
Measles ..		0	0	0	1		0	1	0	1
Meningococcal infection ..		0	0				3	1		
Pneumonia ..	389	50	31	8	13	349	55		8	10
Poliomyelitis, acute	0	0			0	2	0			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis:										
Respiratory ..	124	19	15	4	11	160	19	17	3	12
Non-respiratory..		1	3	1	1		1	4	2	4
Whooping-cough ..	1	1	0	0	3	3	0		2	1
Deaths 0-1 year ..	311	29	34	9	20	275	28	37	10	19
Deaths (excluding stillbirths) ..	6,605	928	687	144	224	6,399	907	776	140	217
LIVE BIRTHS ..	8,149	1126	891	237	428	7,954	1208	884	223	427
STILLBIRTHS ..	217	25	27			204	17	30		

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

Vital Statistics

Smallpox in the North Country

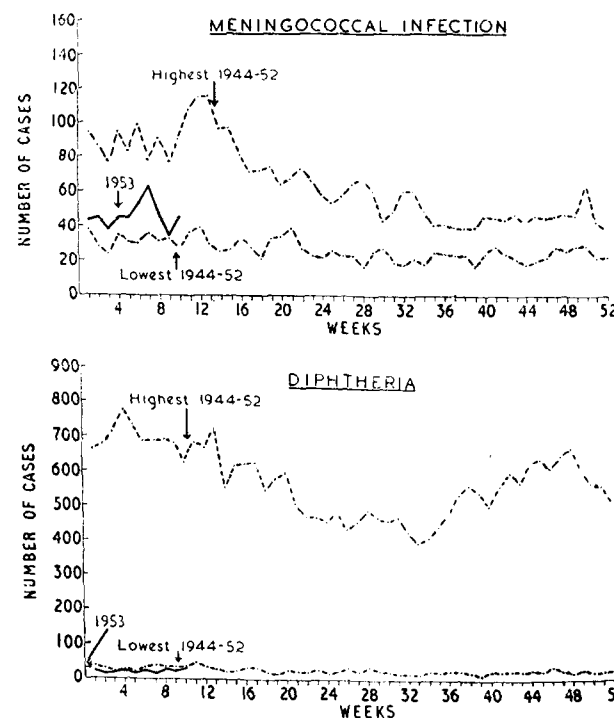
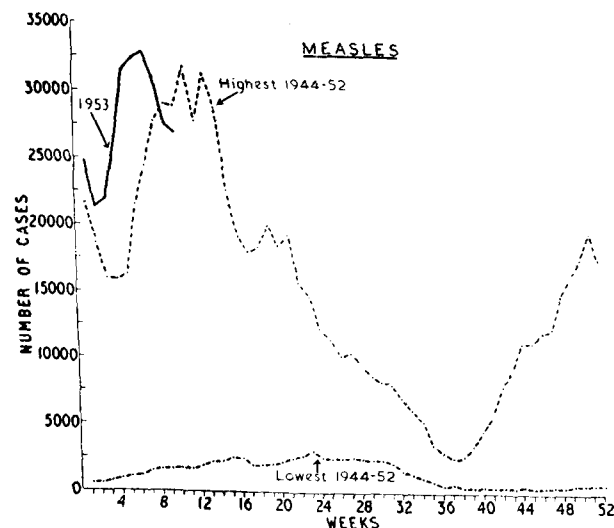
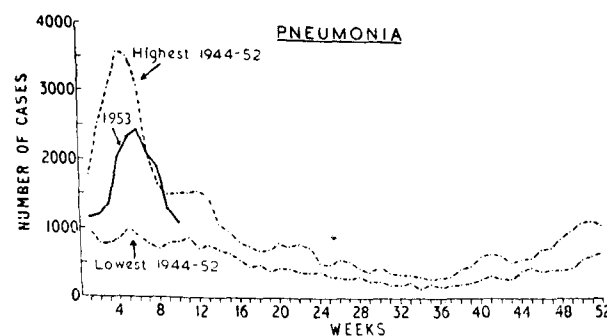
Up to noon of March 27 the following cases (with deaths in parentheses) had been reported: Todmorden M.B. 11 (1), Bacup M.B. 2 (1), Oldham C.B. 1 (0), Bury C.B. 2 (0); total 16 (2). 9 cases are in hospital at Oakwell, Yorkshire West Riding, and 5 in hospital at Ainsworth, Lanes.

Since last week's report (*Journal*, March 24, p. 738) further cases had occurred up to March 27 as follows:—Bacup M.B.: 1 case, wife of a Bacup patient with smallpox. Todmorden M.B.: 2 cases, both contacts of the new Bacup case. Bury C.B.: 2 cases in children at the Florence Nightingale Hospital, Bury, who are contacts of a previously reported case in the hospital. All recent cases have been direct contacts with previous cases.

The Minister of Health announced in Parliament on March 26 that he had asked the Medical Research Council to investigate the possibility of smallpox transmission by raw cotton, imported bales of which are suspected of being the source of infection in this outbreak. He was advised there was no danger of infection being spread by cotton yarn or finished materials made from it. All possible steps had been taken to isolate the suspected bales.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Rises in the number of notifications of infectious diseases in England and Wales during the week ending March 14 included 314 for whooping-cough, from 2,758 to 3,072; 141 for scarlet fever, from 1,534 to 1,675; and 73 for dysentery, from 289 to 362. The largest falls were 714 for measles, from 27,638 to 26,924; and 202 for acute pneumonia, from 1,301 to 1,099.

The largest decreases in the number of notifications of measles were 332 in Hertfordshire, from 1,190 to 858; 250 in London, from 1,621 to 1,371; 182 in Middlesex, from 1,613 to 1,431; and 178 in Buckinghamshire, from 494 to 316. The largest rises were 263 in Lancashire, from 1,455 to 1,718; 192 in Surrey, from 1,769 to 1,961; 169 in Staffordshire, from 1,119 to 1,288. Only small variations were recorded in the local trends of scarlet fever and whooping-cough. 31 cases of diphtheria were notified, 9 more than in the preceding week. The chief features of the returns for diphtheria were rises from 6 to 10 in Lancashire and from 1 to 4 in Warwickshire; all these cases were notified in three cities—Liverpool C.B. 7, Manchester C.B. 3, and Birmingham C.B. 4.

17 cases of acute poliomyelitis were notified during the week. They were 3 more for paralytic and 3 fewer for non-paralytic cases than in the preceding week. Sussex with 3 notifications (Chancetonbury R.D. 2) was the only county with more than one case.

The largest returns of dysentery were Lancashire 82 (Liverpool C.B. 43, Rainford U.D. 20; Manchester C.B. 11); Yorkshire West Riding 59 (Todmorden M.B. 19, Bradford C.B. 13, Barnsley C.B. 10); Leicestershire 36 (Leicester C.B. 35); London 28; Middlesex 21; Worcestershire 21 (Oldbury M.B. 20).

139 deaths were attributed to influenza, 54 fewer than in the previous week.

Quarterly Report for Scotland

The birth rate during the fourth quarter of 1952 was 17.0 per 1,000, being 0.9 above the rate for the December quarter of 1951 but 0.7 below the average of the five preceding fourth quarters. The infant mortality rate was 39 per 1,000 registered live births and was 3 above the rate for the preceding fourth quarter. The general death rate was 12.5

per 1,000 and was 1.0 above the rate for the corresponding quarter of 1951 and 0.3 above the five years' average. The death rate from all forms of tuberculosis was 28 per 100,000, and that from respiratory tuberculosis was 24. Both these rates were 9 below the rate for the fourth quarter of 1951, and they were respectively 33 and 30 below the average of the five preceding fourth quarters.

Deaths from the principal epidemic diseases numbered 422, or 710 fewer than in 1951. This decrease was mainly due to the fall in the number of influenza deaths, from 958 in 1951 to 316. 26 deaths were attributed to whooping-cough, 22 to measles, 8 to diphtheria, 12 to acute poliomyelitis and polioencephalitis. Other figures for 1952 were given in the *Journal* of March 14, (p. 628).

Week Ending March 21

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,625, whooping-cough 3,104, diphtheria 20, measles 27,226, acute poliomyelitis 26, dysentery 433, paratyphoid fever 2, typhoid fever 3.

Medical News

Human Factors in Industry.—The Department for Scientific and Industrial Research and the Medical Research Council announce that they have appointed two committees to work on human problems in industry. The object is to improve production. The first, under the chairmanship of Sir Frederic Bartlett, F.R.S., lately professor of experimental psychology at Cambridge, will deal with "human factors in individual efficiency." The work of this committee will fall under three main heads: fitting the job to the man, selection and training, and job assessment. This committee includes among its members Professor J. Drever (Department of Psychology, Edinburgh), Dr. C. B. Frisby (Director, National Institute of Industrial Psychology, London), Professor Esther Killick (Department of Physiology, Royal Free Hospital School of Medicine), Professor W. E. Le Gros Clark, F.R.S. (Department of Human Anatomy, Oxford), and Professor R. W. Russell (Department of Psychology, University College, London). The second committee, under the chairmanship of Mr. A. B. Waring, managing director of Joseph Lucas Industries, Ltd., will be concerned with human behaviour and human relations in industry. It will review joint consultation procedures, attitudes to work, and the structure of informal groups in the factory. Members of this committee include Professor T. Ferguson (Department of Public Health, Glasgow), Professor Aubrey Lewis (Institute of Psychiatry, London), Professor R. W. Russell, and Dr. A. T. M. Wilson (Director, Tavistock Institute of Human Relations). The committees will advise the D.S.I.R. and M.R.C. on research policy in their respective fields.

Society of Anaesthetists of South Wales.—The following officers have been elected: president, Dr. F. Pearson; vice-president, Dr. W. W. Mushin; honorary secretary, Dr. K. S. Thom, 41, Caerau Road, Newport, Mon.; honorary treasurer, Dr. D. S. Jones.

Princess Tsahai Memorial Hospital.—The hospital is still in need of further equipment and funds, and about £700 is required to complete payment for goods already installed. Help in meeting these expenses will be gratefully acknowledged by the honorary treasurer, Lord Horder. Cheques should be made payable to the Princess Tsahai Memorial Hospital, and sent to him, c/o Messrs. Gould and Prideaux, 88, Bishopsgate, London, E.C.2.

Scientific Films.—A supplement is planned to the catalogue of medical films published last May by the Scientific Film Association, and owners of films not listed in it are

invited to send details to Dr. M. Essex-Lopresti, at 164, Shaftesbury Avenue, London, W.C.2. They should state title, running time, summary of contents, date of production, gauge, sound or silent, colour or black-and-white, free loan or hire, and the name and address from which the film may be obtained.

Medical Photography.—The centenary programme of the Royal Photographic Society includes an item of special interest to the medical profession. It is an exhibition arranged by the Medical Group of the Society on "100 Years of Medical Photography" for display at 16, Princes Gate, London, S.W.7, on April 7-30.

Professor P. A. Buxton, F.R.S., professor of entomology at the London School of Hygiene and Tropical Medicine, is to receive the Linnean Medal for 1953. The award will be made at the anniversary meeting of the Linnean Society of London on May 28.

Sir Harold Himsworth, secretary of the Medical Research Council, is among those who are to receive the honorary degree of LL.D. at Glasgow University's Commemoration Day on June 17.

Dr. Albert Sharman, gynaecologist to the Royal Samaritan Hospital for Women, Glasgow, has been elected a vice-president of the International Fertility Association, representing the United Kingdom.

Sir Henry Dale, O.M., F.R.S., who toured Austria last month, had the honorary degree of M.D. conferred upon him by the University of Graz on March 23.

COMING EVENTS

Annual Dinner of Guild of St. Luke.—The annual dinner and ball sponsored by the Guild of St. Luke, SS. Cosmas and Damian (Westminster Branch) is to be held at the Dorchester Hotel on April 9 at 7 p.m. Tickets may be obtained, price 2 gns., from the Hon. Secretary of the Westminster Branch of the Guild, 5, Wimpole Street, W.1. (Tickets for the ball only are available price 25s. each.) Among those who have accepted invitations to be present at the dinner are Cardinal Griffin and the Spanish, Irish, and Portuguese Ambassadors.

World Health Day.—April 7 is World Health Day, and the World Health Organization has selected "Health is Wealth" as an appropriate theme for its observance this year. In London there is to be a meeting at the Caxton Hall at 5 p.m. on Tuesday, April 7, at which the speakers will be the Minister of Health and Dr. H. S. Gear, Assistant Director-General of the World Health Organization.

International College of Surgeons.—The International College of Surgeons will hold meetings as follows: University of Amsterdam, April 8 to 10; University of Rome, June 5 to 7; University of Vienna, June 11 to 13. The Bank of England has consented to grant a travelling allowance to delegates. Further information may be obtained from the secretary (British Chapter), International College of Surgeons, 20, Highfield Road, Edgbaston, Birmingham, 15.

Scottish Society of Anaesthetists.—The annual meeting of the Scottish Society of Anaesthetists will be held at Dunblane Hotel Hydro from April 24 to 26. The 1953-4 president of the Society is Dr. W. M. Shearer. Further details may be obtained from the hon. secretary of the Society, 7, Kinellan Road, Bearsden, Glasgow.

British Association of Plastic Surgeons.—The 1953 programme of meetings of the British Association of Plastic Surgeons is now available. There will be a meeting at the Royal College of Surgeons on April 24, at Salisbury from September 10 to 12, and at the Royal College of Surgeons (annual general meeting) on December 4. Those wishing for further information are asked to get in touch with the secretary, British Association of Plastic Surgeons, 45, Lincoln's Inn Fields, London, W.C.2.

Meeting on Vitamins.—The National Research Council of Italy is holding a meeting on vitamins at the National Museum for Science and Technology, Milan, from April 12 to 16. Applications to attend the meeting should be made to: Consiglio Nazionale delle Ricerche, Segreteria della Giornata della Scienza, Piazzale delle Scienze, 7, Rome, Italy.

British Medical Students' Association.—The annual conference of the British Medical Students' Association (Midland Region) will be held in Oxford from April 15 to 17, at the invitation of the Oxford University Medical Society. The inclusive fee for the conference is £5, and those wishing to attend are asked to communicate with the Conference Secretary, Oxford University Medical Society, c/o Medical School Office, University Museum, Oxford.

The Family.—The Second British National Conference on Social Work is to be held at Bedford College for Women, Regent's Park, London, N.W.1, from April 15 to 18. The subject of the Conference, which is under the chairmanship of Sir Wilson Jameson, will be "The Family." The fee for the Conference is two guineas. Further information and registration forms may be obtained from the Secretary, British National Conference on Social Work, 26, Bedford Square, London, W.C.1.

Congress of Oto-neuro-ophthalmology.—The Eighteenth International Congress of Oto-neuro-ophthalmology will be held in Bologna, Italy, from May 3 to 7. The chairman will be Professor Q. Di Marzio, and the two main subjects for discussion are "Dysgraphia in Oto-neuro-ophthalmology" and "Ménière's Disease." Those wishing to submit a paper or take part in the discussions are asked to apply to the Congress Secretary, Dr. Giuseppe Cristini, Clinica Oculistica-Polichinico, Bologna.

European Society of Haematology.—The Fourth Congress of the European Society of Haematology will be held in Amsterdam in September. Full particulars will be available later on, but those interested are asked to communicate with Dr. A. Piney, 152, Harley Street, London, W.C.1.

World Federation for Mental Health.—The Sixth Annual Meeting of the World Federation for Mental Health will take place at the University, Vienna, from August 16 to 22. The theme of the meeting will be "Social Provisions for Mental Health." Further information may be obtained from the secretary, National Association for Mental Health, 39, Queen Anne Street, London, W.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Wednesday, April 8

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, W.C., 4.30 for 5 p.m., Dr. J. J. Stevenson: X-rays.
MIDLAND MEDICAL SOCIETY.—At Dudley Road Hospital, Birmingham, 8.15 p.m., clinical meeting.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnold Demonstration by Professor Lambert Rogers: Tumours of the Central Nervous System.
ROYAL EYE HOSPITAL.—5.30 p.m., Dr. A. A. Guild: Mechanism and Appearances of Puffiness.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. Guy W. J. Bousfield: The Case for Combined Diphtheria-Pertussis Prophylaxis in Young Infants (Illustrated).

Thursday, April 9

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. Walter Schindler: Group Psychology.
FACULTY OF HOMOEOPATHY.—5 p.m., Dr. Pierre Vannier: Humans and Homoeopathy.
ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Brigadier J. S. K. Boyd, F.R.S.: Some Aspects of Chemotherapy in Tropical Medicine.

Friday, April 10

ROYAL EYE HOSPITAL.—4.30 p.m., Mr. A. J. Cameron: Ophthalmic Aspects of Hypertension and its Treatment.
WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Professor S. P. Bedson, F.R.S.: Recent Trends in Virus Research.

Saturday, April 11

SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Benenden Sanatorium, 10.30 for 11 a.m., clinical meeting.
SOUTH WEST LARYNGOLOGICAL ASSOCIATION.—At Portsmouth and Southern Counties Eye and Ear Hospital, Southsea, 2.30 p.m., meeting.

APPOINTMENTS

AIRD, PATRICK JOSEPH, M.B., B.Ch., D.P.H., D.P.M., Resident Medical Superintendent, District Mental Hospital, Ennis, Co. Clare.
BACKHOUSE, KENNETH MORLEY, M.B., B.S., Lecturer in Anatomy, St. Bartholomew's Hospital Medical College, London, E.C.
BARCLAY, R. F., M.B., B.S., D.P.H., Medical Officer of Health for Borough of Newbury and Rural Districts of Newbury, Hungerford, and Bradfield; Assistant Medical Officer, Berkshire County Council.
CASSELLS, NULCE, M.B., Ch.B., C.P.H., Assistant County Medical Officer and Schools Medical Officer in the County of the Isle of Ely.
COTTON, JOHN L., M.B., Ch.B., D.P.H., Deputy Medical Officer of Health and Deputy School Medical Officer, County Borough of Bury.
GRAHAM, ANDREW, N., M.B., B.S., D.P.M., Physician-Superintendent (Consultant), St. Crispin Hospital, Northampton, Oxford Regional Hospital Board.
HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.— Daphne S. A. Anderson, M.D., D.C.H., Part-time Clinical Assistant (Radiotherapy); Pauline I. M. Winn, M.B., Ch.B., House-physician to Neurological and Neurosurgical Unit; Dorothy F. M. Burnett, M.B., Ch.B., and S. G. F. Wilson, M.B., Ch.B., House-physicians; G. G. Wyllie, F.R.C.S., House-surgeon.
MCFARLAN, ALLAN M., M.B., Ch.B., Epidemiologist for Tuberculosis, Department of Public Health, City and County of Bristol.
MURPHY, PHILIP KEVIN, L.R.C.P.S.I., D.P.H., T.D.D., Assistant Medical Officer of Health in Guernsey, Channel Islands.
RUSSELL, ALAN PETER, M.B., Ch.B., D.P.M., Physician-Superintendent and Consultant Psychiatrist, Bellisdyke Mental Hospital, Larbert, Scotland.
SHEARER, CHARLES WILLIAM, M.B., Ch.B., D.P.H., Deputy Medical Officer of Health, Swindon.
SKONE, J. F., M.D., D.P.H., D.C.H., D.I.H., Deputy Medical Officer of Health and Deputy School Medical Officer, City of Oxford.
WELSH REGIONAL HOSPITAL BOARD.—J. M. Marchant, M.B., B.Chir., D.A., Consultant Anaesthetist, Wrexham, Powys and Mawddach H.M.C.; A. W. Fowler, M.B., F.R.C.S., Assistant Traumatic Surgeon (S.H.M.O.), Mid-Glamorgan H.M.C.; J. M. Lewis, M.B., B.Ch., D.A., Consultant Anaesthetist, Gwent H.M.C.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Matthews.—On March 16, 1953, at St. Helier Hospital, Carshalton, Surrey, to Diana, wife of Dr. Harold W. Matthews, a sister for Rohan—Fiona Elizabeth Marguerite.
Rafferty.—On March 7, 1953, at the Trevalyn Manor Nursing Home, Wrexham, Denbighshire, to Julia (formerly MacHale), wife of John Pearce Rafferty, M.B., B.Ch., a son—John Roger.
Summers.—On March 22, 1953, at Brixworth, Northants, to Mary, wife of Dr. H. A. Hamilton Summers, a son and a daughter.

DEATHS

Bartlett.—On March 13, 1953, Frank Whinfield Bartlett, M.R.C.S., L.R.C.P., of The Haven, Brixham, Devon, formerly of Romsey, Hants, aged 83.
Bennett.—On March 11, 1953, at his home, Chakrata, Werneth Road, Woodley, Cheshire, John George Bennett, M.C., M.D., aged 63.
Brennan.—On March 2, 1953, at his home, Anacloone, Oughterard, Galway, Eire, Joseph Roland Brennan, M.B., B.Ch., Surgeon Captain, R.N., retired.
Briscoe.—On March 13, 1953, at Axminster, Devon, Ralph Cay Briscoe, M.R.C.S., L.R.C.P.
Burt.—On March 18, 1953, at 5, Springfield Place, Bath, Joseph Barnes Burt, M.D., aged 72.
Crossley.—On March 13, 1953, at 12, Passmonds Crescent, Rochdale, Lancs., Harry Newbold Crossley, M.B., Ch.B., D.P.H.
Cunningham.—On March 8, 1953, at 41, Lyndhurst Road, Barnehurst, Kent, David Muir Cunningham, M.B., Ch.B., aged 50.
Eves.—On March 13, 1953, at 10, Stanford Avenue, Brighton, Sussex, Percy Stanhope Eves, M.D.
Johnson.—On March 8, 1953, in a London nursing-home, Marcus Beauchamp Johnson, M.R.C.S., L.R.C.P.
MacDougall.—On March 13, 1953, at his home, Dunollie House, Oban, Argyll, Alexander James MacDougall, C.M.G., M.B., C.M., J.P., Colonel, R.A.M.C., retired, aged 81.
McMillan.—On March 16, 1953, at St. John's, Melrose, Roxburgh, John James McMillan, M.D.
Mason.—On March 12, 1953, at his home, 79, Willes Road, Leamington Spa, Warwickshire, Harold Mason, M.B., J.P., aged 87.
Murray.—On March 9, 1953, at 225, Sussex Gardens, London, W., Richard Galway Murray, M.D., D.P.H., D.M.R.E.
Roberts.—On March 17, 1953, in the National Hospital, London, W.C., David Reid Eccles Roberts, Ch.M., of 107, Stanhope Road, Darlington, Co. Durham.
Roxburgh.—On March 17, 1953, at "Oaksleigh," Locks Heath, Hants, Alexander Bruce Roxburgh, M.B., F.R.C.S.
Ryrie.—On March 9, 1953, at Berford, Milton Terrace, Kirkcaldy, Fife, Gordon Alexander Ryrie, M.B., Ch.B., late of Sungai Buloh, Malaya.
Shields.—On March 17, 1953, at The Rectory, Lound, near Lowestoft, Charlotte Annie Shields, M.B., B.S., formerly of Westcliff-on-Sea, Essex, aged 81.
Spon.—On March 11, 1953, in St. George's Hospital, London, S.W., the result of an accident, Harry James Spon, M.R.C.S., L.R.C.P., D.P.H., of West Lodge, Leigh, Kent.
Stedman.—On March 9, 1953, at the West Hertfordshire Hospital, Hemel Hempstead, Herman Stedman, M.D., F.R.C.S.Ed., formerly of Temple Avenue, Bushy Heath, Herts.
Sutton.—On March 3, 1953, at 24, Northcourt Avenue, Reading, Berks, Henry Martyn Sutton, M.R.C.S., L.R.C.P., formerly of Bagdad and Truro, aged 93.
Vincent.—On March 15, 1953, at 37, Westbourne Road, Sheffield, William James Nathaniel Vincent, C.B.E., M.D.
Watkin.—On March 11, 1953, at Grassendale, Shrewsbury, Salop, Arthur Christopher Watkin, M.R.C.S., L.R.C.P., D.P.H.
Wheelodon.—On March 3, 1953, at Woodlands Cottage, Ashford, Ludlow, Salop, Frederick John Wheelodon, M.R.C.S., F.S.A., aged 60.

Any Questions?

Correspondents should give their names and addresses (not or publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

A Quick Eye

Q.—What is the physiological basis of a "quick eye"? How may it be acquired or improved?

A.—There does not appear to be any precise or definite knowledge directly bearing on this problem. Knowledge of the eye is based more on static than on dynamic tests, and is difficult to obtain direct information on the interrelationship of the eye and the brain. It is practically certain that the possession of a "quick eye" has very little to do with the retina or refraction, and a person who wears spectacles can have a quick eye, provided that the vision is well corrected. The ability to keep in sight a rapidly moving object like a tennis or cricket ball is undoubtedly closely associated with the control and rapid adjustment of the musculature of the head and neck, and particularly of the intrinsic ocular muscles.

People who wear glasses usually have some restriction of the peripheral field of vision, due to obstruction by the rim of the spectacles. Flat lenses also restrict vision in the periphery of the field and are less satisfactory than toric lenses in this respect. Thus people who wear glasses might be expected to use the head and neck muscles more than a person without glasses, who might use mainly the intrinsic ocular muscles. Contact lenses are an advantage in this respect, since they give a full unobstructed field of vision and permit the more "normal" movement patterns of the head, neck, and eyes for the visual processes. There is also a "central" factor concerned with co-ordination of and action upon visual information. The distance receptors are used with a certain measure of anticipation of action, as was pointed out by Sherrington in his *Integrative Action of the Nervous System*. Little known about this.

Poisonous Snakes

Q.—What treatment is advised for snake bites? I live in Australia, and a veterinary surgeon tells me that the mortality of cattle from snake bites has been vastly reduced since the use of antihistamine drugs. Is this true, and would these substances be useful in humans?

A.—Most bites occur on the limbs. The limb should be immobilized and a tourniquet applied where possible about 1 in. (5 cm.) proximal to the bite. Tourniquets may be tight enough to stop all circulation if rapid neurotoxic effects are expected; usually it is sufficient to stop venous and lymphatic flow. They should be loosened for half a minute after the first 20 to 30 minutes, and subsequently at intervals of 10 minutes; they should be moved proximally as oedema spreads.

Vash the wound before incising, as many snakes dribble venom when they bite. Incisions should be about half an inch (1 to 2 cm.) long and through the fang puncture. Avoid large vessels, and in the case of viperine bites keep the wound on subsequent bleeding, which may be very severe. Tension may be applied to the wound; if the mouth is closed it must be protected with thin rubber such as that used in condoms.

Specific antivenin should be given intravenously as soon as possible, provided there is no serum sensitivity. Identification of the offending snakes is very important, since antivenins are highly specific. Local knowledge and the snake's history are helpful if the snake is not available.

Polyvalent serum should be given only in cases where there is doubt about the identity of the snake. Antivenin may also be injected into the tissues proximal to the bite. After the intravenous dose has been given and local treatment has been instituted for an hour or more remove the tourniquet if the local reaction has become stationary; if the latter is increasing, the tourniquet should be retained, with frequent release and reapplication.

When the bite is in a suitable place on the leg or arm, a double tourniquet may be applied to wash out the venom from the region of the bite. A proximal tourniquet is placed above the knee or elbow tight enough to obstruct all circulation. A second tourniquet tight enough to obstruct only venous flow is placed above it, and a vein in the limb is cut. The lower tourniquet is loosened for a minute or two, during which bleeding takes place from the incised vessel. The tourniquet is then tightened and the procedure repeated at intervals.

Haemotoxic venoms may lead to severe shock and bleeding so that intravenous infusion of plasma or blood transfusion may be necessary. Artificial respiration may be necessary where the venom is neurotoxic.

Bites from non-poisonous snakes should be treated with respect because of the danger of infection. Severe bites—for example, from pythons—present the risk of anaerobic infections, and injection of tetanus antitoxin may be an intelligent precaution.

There is no reputable evidence that antihistamine drugs reduce the mortality of cattle bitten by snakes, in Australia or elsewhere. The action of these drugs in snake bite in man has also not yet been established.

Pregnancy after Subarachnoid Haemorrhage

Q.—A woman of 27 had a baby six years ago, and nine months later had a subarachnoid haemorrhage. She then had recurrent subarachnoid haemorrhages one and two years later. She is now six months pregnant, and apart from an anxiety state—due to her being warned that she should not become pregnant again—is perfectly well. (a) Is there any indication for caesarean section at term? (b) What should be done if she shows signs of toxæmia? (c) If she had been seen earlier, would there have been any indication for therapeutic abortion?

A.—Cases of pregnancy occurring in women who have previously suffered from subarachnoid haemorrhage are not common; most obstetricians come across only one or two in a lifetime, and each case has to be treated on its merits. Within the writer's experience previous subarachnoid haemorrhage with residual paralysis has been regarded by physician, neurosurgeon, and obstetrician as an indication for therapeutic abortion. If the pregnancy is allowed to continue many believe that caesarean section involves less risk of a recurrence of the haemorrhage than does vaginal delivery. This view, however, is based on theoretical considerations and expectations rather than controlled observations. If it is decided to deliver vaginally, no straining in the second stage should be allowed, and forceps delivery should be carried out as soon as the cervix is fully dilated.

Whatever method of delivery is effected, one important consideration is anaesthesia, because the straining associated with post-anaesthetic vomiting might in itself carry a risk of recurrence of haemorrhage.

Since the patient in question had a normal first pregnancy she is unlikely to develop toxæmia this time. If she does become hypertensive, however, termination of pregnancy, possibly by caesarean section, should not be long delayed.

Spontaneous Combustion of Alcoholics

Q.—Is there any foundation for the belief in the spontaneous combustion of chronic alcoholics?

A.—There is no scientific foundation for the theory that hell-fire is anticipated by spontaneous combustion of the living body in chronic alcoholics. The body contains

approximately 72% water, which renders it highly combustible: a temperature of 1,500° C. is required for the destruction of the body at cremation.

It is probable that the greatest publicity to the theory of spontaneous combustion was given by Charles Dickens in *Bleak House*, but in the preface to that volume, dated August, 1853, he admits that "the possibility of what is called spontaneous combustion has been denied since the death of Mr. Krook." Dickens stated at that time that there were about thirty cases on record, and cited several instances occurring in the eighteenth century. There is some support for the theory that bodies which have undergone extreme fatty degeneration are possibly unusually combustible and may act as the tallow of a candle, the wick being provided by clothing.

Death as a result of a conflagration is undoubtedly commoner in chronic alcoholics than in the general public, but this is owing to the fact that the alcoholic does not take ordinary precautions against fire, such as extinguishing cigarette ends, guarding the fire, etc., and he is of course more liable than ordinary persons to fall into a fire. But the detailed investigations carried out by fire brigades into the cause of individual fires have not confirmed the belief that the chronic alcoholic has, of himself, been the site of origin. Spontaneous combustion has been put forward as a defence in murder cases, and on one occasion at least in the eighteenth century it succeeded, but the theory is now quite contrary to all scientific knowledge.

Gases may be formed within the intestinal tract which can be ignited on the application of a flame, but there is no evidence that such gases are spontaneously combustible.

Mepacrine for Rheumatoid Arthritis

Q.—Is mepacrine of value in the treatment of rheumatoid arthritis?

A.—Mepacrine has been reported to be of value in rheumatoid arthritis in several papers which have appeared in the United States. No controlled series has yet been reported, but preliminary observations which have been carried out in this country have not proved to be encouraging. Such improvement as has sometimes been reported by patients has, on examination, seemed to be subjective rather than objective.

Percussion for a Painful Stump

Q.—What treatment is advised for constant pain and pins-and-needles in a forearm amputation stump? On inspection the stump appears healthy. Local injection of the cervical sympathetic (with the production of a Horner's syndrome) has failed to benefit the patient, and he is now weary of hospital treatment. Would tapping the stump with a rubber hammer do any good, and, if so, could you please give details?

A.—Many of the paraesthesiae and pains experienced in amputation stumps or phantom limbs undoubtedly originate in neuromata in the stump. This is demonstrated by the temporary disappearance of such sensations when the nerves to the stump are blocked by local analgesia. Percussion treatment to the end of the stump is often effective in relieving these pains (see *British Medical Journal*, 1950, 2, 68). It seems to render the neuromata insensitive and gradually converts them into painless scars. The patient must at first treat himself several times a day. For the lower limb a short length of broom handle (15 cm.) is fitted with a metal applicator at one end which is then pressed firmly against the tender neuromata and hammered with a heavy wooden mallet, gently at first, for 10 to 15 minutes. The relief experienced is often quite startling to both patient and doctor. For the upper limb the patient may slap the end of the stump repeatedly on a smooth wooden table, but the better way is to use an electric vibrator, and these have become so popular that the Ministry of Pensions now issues them on loan to certain patients.

This causes the neuromata to become insensitive—a traumatic local analgesia—and the effects of such repeated percussion or vibration seem to be very effective in most cases. Incidentally the local analgesic effect of a vibrator used in this way makes it useful for a variety of other conditions in which local tenderness or even pruritus are prominent.

NOTES AND COMMENTS

Spinach.—OUR EXPERT writes: Your correspondents Dr. J. E. and Mr. N. S. Bamji (March 21, p. 674) must be thanked for their useful review. Spinach is certainly rich in oxalic acid, and it is clear that it may adversely affect the absorption of calcium in rats when it is given in large amounts after concentration into the dry form. Indications that it is harmful to humans when consumed in reasonable quantities after cooking, however, are much less definite. The oxalic acid is largely soluble, and some may be discarded in the cooking water or exuded juice. Bonner *et al.*¹ have reported that a daily intake of 700 mg. of the acid has no ill effects on children receiving adequate amounts of calcium in their food, and less than this amount should be contained in a normal helping of the vegetable. From experiments with rats, Gortner *et al.*² have even suggested that oxalic acid may protect the teeth from etching caused by other acids, such as citric and phosphoric, which may be included in soft drinks. The teeth of Hawaiian natives are said to have deteriorated since they stopped eating taro, which is rich in oxalic acid. Iron is less well absorbed from spinach than from wheat, but the same finding appears to apply to kale and other green vegetables.

The progress of nutritional research has revealed objectionable features in many common foodstuffs. Wholemeal flour depresses calcium absorption on account of its high content of phytic acid. Cod-liver oil opposes vitamin E and can cause serious lesions of the muscles and brain in experimental animals. Cabbage contains a factor which opposes the action of thyroxine. Maize is associated with the incidence of pellagra. When eating a good mixed diet, however, we may include all these foods without ill effects, and the same immunity probably applies with spinach.

Perhaps the most alarming point raised by your correspondents is the tendency in some children for spinach to cause soreness round the mouth and anal region. It should certainly neither be given to young children in unreasonable quantities nor be forced upon them at all if not wanted. A watch should be kept for signs suggesting that it is poorly tolerated.

REFERENCES

- ¹ J. Pediatr., 1938, 12, 188.
- ² J. Nutr., 1946, 32, 121.

Allergic Rhinitis.—Mr. C. HAMBLIN-THOMAS (London, W.1) writes: I am sorry to see the proposal ("Notes and Comments," March 7, p. 576) to revive the use of the long-discarded method of electric ionization in the treatment of hay fever. Apart from the suggestive effect with an electric method in this age of "electrotonics" I consider the treatment disappointing as well as harmful to the mucous membrane of the nose and likely to destroy the delicate hair cells which are so important; there is also often considerable pain. If an empirical treatment is to be used, simple cauterization with the electric point applied to a minimal area is preferable and considerably more effective. The area touched is not more than 1-1 mm. in diameter and rapidly heals with normal tissue. But in all cases of hay fever a careful investigation of all factors is necessary and a correspondingly well-planned treatment carried out if the patient is to receive lasting benefit.

Correction.—Dr. S. D. MITCHELL has written to point out that he made no claims for the "curative" value of music at the recent conference on "Pictures, Books, and Music in Hospitals" (March 21, p. 683), but only gave examples of its value as an "ancillary in treatment."

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THE NATURE AND PLACE OF THINKING IN MEDICINE*

BY

Sir FREDERIC BARTLETT, C.B.E., F.R.S.

1. The Nature of Thinking

At a first encounter there may seem to be something peculiar about the title of this lecture. Surely it could be said the nature of thinking is the same under all circumstances, and in no way dependent upon its subject matter. This view has, indeed, been held by a great many people, and among them are some excellent psychologists. But it is not to be taken for granted. Even a swift survey, whether of contemporary medical activities or of the history of medicine, is enough to suggest strongly that the fact of the very great diversity of the persons to whom medical discovery and practice offer an overwhelming attraction cannot possibly be accounted for simply in terms of difference of interest in particular medical topics. It would seem that there must be some radical differences between strongly preferred methods of investigation, and that these, in their turn, may be traced to equally radical differences in the process of thinking. Doubtless the differences which I am going to try to discuss can be illustrated in other branches of knowledge as well. But their wide range, as well as the rapidity of change of fashion, of method, and of emphasis to which they have been subjected throughout the whole of their history, makes medical science and practice an outstandingly interesting and fruitful field within which to study the nature and the place of thinking.

Both in ordinary conversation and in technical definition "thinking" is a term which is almost always given an inconveniently wide application. When a man says "I didn't think of that," all that he means is that he failed to give attention to something which was not, in fact, there for him to see or hear, or otherwise to perceive. And most formal definitions which have been framed amount also precisely to this: that there is thinking whenever sensory or perceptual signs or stimuli are supplemented in the course of their observation or discussion in any way whatsoever. Now, there is no known human observation or discussion in which supplementation of this kind does not take place. And so the common view means not only that thinking is present in perceiving—which nobody need doubt—but also that remembering is thinking, and the whole sweep of imagination and fancy is thinking, and believing is thinking. Thinking, in fact, becomes so multiform that it is quite impossible to say anything definite about it at all,

except the one formal statement that it is the use of information not immediately sensorially or perceptually present.

If we are to get anywhere effectively we must have more definite starting-points than this, although in a single lecture these will have to be stated in a rather dogmatic manner, and without that experimental justification which is available.

Everybody agrees that thinking is one of the ways that animals have developed for dealing with evidence. Broadly, all human evidence is of two sources—either it comes from direct observation or else it is in some form of record, sometimes descriptive, but more often in the mode of an achieved generalization presented for acceptance or criticism. The first is the only original source, and it requires sensorial perception. When evidence of this sort is fairly examined the striking thing about it is its partial and fragmentary character. At no stage is animal observation a literal and complete reduplication of the external environment upon which it works. The character of the sensory and perceptual mechanisms through which it is made renders such reduplication impossible. Moreover, every great step in advance of animal observation has been less in the service of the accurate and complete reduplication of the external signs and stimuli and more in the service of extending the range and increasing the amount of available evidence, and especially of the building up of information on evidence. It is exceedingly likely, for example, that human observation is less accurate and less complete, relative to its possible range, than that of more primitive and restricted forms, where the sensory mechanisms are fewer and much less specialized. However this may be, all the evidence that is directly accessible comes to us fragmentary and scrappy to a degree. It is full of gaps, and we must try to fill up the gaps. Sometimes—there are innumerable cases in clinical diagnosis and in all kinds of experiments—we have evidence, and then a gap, and then more evidence. We must interpolate. Sometimes, as in clinical prognosis, there is evidence and the evidence stops short and we must extrapolate. We can interpolate or extrapolate, if we like, in the interests of what is often called aesthetic satisfaction, or we can do either or both under the dominance of objectivity—that is, in such a way that the issue we reach can be identified by observation, or proved in accordance with the nature of the system within which we are working. Thinking chooses the second, the objectivity-dominated way.

*A lecture given to the British Postgraduate Medical Federation at the London School of Hygiene and Tropical Medicine on January 27.

Thinking also usually, though not invariably, requires a number of steps or links, and when it does each step must be such that it reduces the number of possible next steps, until eventually, sometimes quickly, sometimes after a protracted process, a stage is reached beyond which all thinking persons will proceed uniformly.

That the kind of process which I have just described briefly does take place when people are given fragmentary evidence and required to bring it to an objective issue can be experimentally demonstrated. That it is the kind of process which all people who have used the term "thinking" rigorously have intended to indicate seems at least to be extremely likely.

This, however, is a lecture on thinking in medical science, and so without any more discussion I propose to try to see what direction this somewhat general lead can give to a study of *the Nature and Place of Thinking in Medicine*.

2. Everyday Thinking in Medicine

First I want to consider the psychological processes involved in certain relatively simple cases of thinking, very common and necessary as I understand them, in medical practice. I shall call this "everyday thinking."

When a "man in the street" is confronted with fragmentary evidence, say about current events, and is required to bring it to an issue, more often than not he will do it by accepting or adopting some generalization, because somebody that he trusts has said so or because it has prestige within his social group, and immediately identifying the evidence as an instance. The issue is then little or nothing more than a restatement of the generalization in terms of the particular evidence.

There seems no good reason to refuse to call this "thinking." At any rate, it certainly is what passes for thinking in most of us most of the time. It does consist in filling a gap between the generalization which is accepted and some concrete evidence which has to be directly examined. It is, basically, the process of at least some of those doctrines of "physical signs" which have received much support in medical practice from time to time.

Or perhaps an instance is the recorded statement of Ambroise Paré when he was asked if the wound of the King of Navarre was mortal. "Yes," he said, "because all wounds of great joints, and especially contused wounds, are mortal according to all those who have written about them."

From our present point of view we need not be much concerned with the generalization or formulated principle which is involved. It is sufficient to notice that this is simply accepted and may be believed. The critical part of the process lies in the treatment of the concrete evidence. For in a great many instances this evidence will lack some of the characters that are required to put it into a general class, and in practically all instances it will possess other or, in many cases, assuming points of similarity and ignoring differences. The interesting thing is that for anybody who relies solely on direct observation differences stick out much more prominently than similarities, and are much easier to observe. But once we have accepted a principle the situation is radically changed, and it becomes increasingly easy to slur over differences. Consequently the integrity of thinking in this simple kind of case depends almost entirely upon a determined, and usually conscious, effort to observe and weigh differences, and it is this quality in observation, to give due weight to differences, which needs above all else to be stressed in relatively routine diagnosis. No doubt extreme instances of what can happen when it is ignored are the eighteenth-century theories of "large and small" doses associated with the names of John Brown and Samuel Hahnemann.

Or, again, though maybe it is unfair to treat this as an instance of medical diagnosis, there was the driver of an ambulance wagon in the American Civil War. He was asked if he knew how to treat wounded men. "Oh, yes," he said; "if they are hit here"—pointing to his abdomen—"knock 'em on the head; they can't get well." Any pre-occupied medical practitioner who is forced to make rapid routine diagnosis is always up against this difficulty, the psychological source of which is the power of principle to obscure differences, and there seems to be only one real remedy, the development of an experimental approach. We must therefore go on to consider and attempt some analysis of

3. Experimental Thinking in Medicine

Experiment is still often regarded as a kind of abrogation of thinking. Every medical student must have been told of John Hunter's advice to Jenner, "Don't think, but try; be patient, be accurate," or, in an alternative version: "Why think? Why not try the experiment?" But Hunter's own practice, and Jenner's, too, show clearly that the warning was simply against the pitfalls of the kind of thinking that we have just been considering. I believe it can be shown that experimental thinking is different in important respects from the kind which I have called "everyday."

Perhaps there are two sorts of scientific experiment. One, usually the earliest kind to occur, is when some large topic or field of knowledge is well known to be inadequately mapped out, and somebody decides to try to improve ordinary unassisted processes of observation by special methods of recording which will make the detection and interpretation of likenesses and differences in arranged cases that come within this topic more exact and certain. The other, more limited and directed, usually begins when somebody decides to take seriously certain differences revealed by direct observation between specific instances and accepted principle. The kind of thinking required is pretty well the same in both, but the first tends to grow into the second, which becomes both more common and more fruitful as specialization advances. I propose, therefore, to take a fairly simple case of the second kind—probably simplifying it more than is right for the purposes of rapid discussion—and to try to bring out its leading characters as an illustration of experimental thinking.

When Sir James Mackenzie was a young medical practitioner he wrote, "I set myself the task of finding out the nature of the symptoms and signs I met with in the course of my practice. This placed before me two definite objects at which to aim—(1) the understanding of the mechanism of symptoms, and (2) the understanding of their prognostic significance." In this general statement there are two points of importance: the first a resolve to take direct observation seriously, and the second that observations of medical significance must inevitably fall into time-related sequences with gaps that must be filled in. The general resolve, however, had to become more specific. A few years later the death of a patient from heart failure directed Mackenzie's attention to the disorders of circulation, and especially to irregularities of the pulse. At that time any form of pulse irregularity tended to be regarded as serious.

The story of Mackenzie's investigations is already well known. First came the improvement of direct observation by the systematic use of instrument tracings. Then came the first critical step: the comparison of two sources of direct information, sphygmographic and jugular tracings which so far had not been combined for practical purposes, leading to the separation into a special group of those forms of irregularity alleged to be due to a premature beat of the ventricle. There followed the recognition that these also must not be lightly placed all into one class, leading eventually, after about ten years of observation and thinking, to the separation of that form of arrhythmia in which the absence of the auricular wave in jugular tracings was associated with the disappearance of the presystolic murmur, to the reinstatement of a sensible form of digitalis therapy,

and finally to a radical revision of the significance of heart murmurs which had already been studied and described over and over again, and to the view that in the end the only thing that matters is the reserve power of the heart muscle.

It is already an old story, and of course much of it has been rewritten since, but the course of Mackenzie's investigations does bring out very well some of the leading characteristics of experimental thinking in medicine.

First comes the firm resolve not to be swept away by the slumping power of established generalizations, but to give the direct evidence a fair chance. This means almost always that unaided observation must be supplemented by instrumental records. As soon as this is done differences between cases will at once, and, so to speak, by their own inherent capacity to attract attention, spring into prominence. This is only a first step. Differences of themselves lead nowhere, but hidden within them may be some significant similarities which have to be searched for, for they are inherently as difficult to identify as differences are easy. Almost always, perhaps always, they are found only when two or more sources of evidence or of information which so far have never been effectively combined are brought together. This identification of significant likeness or agreement, coupled with an appreciation of differences but a determination not to be controlled by them, is really the crux of the whole thinking activity in the case of the experimental investigation. There is, however, a third characteristic, important in all biological experimentation, but probably more vital in medicine than anywhere else, and this is that the direct sources of information which are used must all be treated as related in a sequence in time and proceeding towards some point which can be treated as terminal. This consideration leads us at once to the third kind of thinking, different in its nature from the other two, far more difficult to understand, and more fascinating to study; namely, to

4. Prognostic Thinking

Perhaps it is not too much to say that all really characteristic or specific medical thinking started in a recognition of the importance of prognosis. "I hold," said Hippocrates, "that it is an excellent thing for the physician to practise forecasting." All the great clinicians have said much the same, though it is less fully recognized that prognosis is equally a part of medical experiment, and that when general biological experiments turn out to have a medical significance it is because their conclusions are viewed in the light of some prognostic approach.

On the whole there seems to have been very little direct and sustained attempt to discover and understand the processes which are internal to medical prognosis. They are perhaps most frequently supposed to depend upon continuous faithful observation and accumulated experience. "No doctor," said James Mackenzie, "lives long enough to write a reliable book on prognosis." He was himself no doubt a fine clinician, but the idea behind this assertion seems wrong. Prognosis is often, at the least, a swift process, though its confirmation may be slow enough. On the whole I think that the great prognostic physicians have shown their special facility early, just as they have also been far more successful with the particular case than with their generalizations from many cases.

There seems to be something about medical prognosis not unlike expertness in games. At some stage the games expert seems pretty well sure to attempt an analysis of his expertness, and then he will write things like the tortuous books on golf, or cricket, or lawn tennis. The elaborate post-mortem examination gets cluttered up with detail which has minor importance, if any at all, at the living moment of performance. And this may be more than an analogy, for there is something about prognosis identical with the technique of the surgeon. Sir James Paget, speaking of William Fergusson, referred to his hands, "which were so strong and yet so sensitive, so swift and light," so apt to "clear and prompt invention." There is something execu-

tive about prognosis that seizes, so to speak, the chance of the moment. It is observation of direction, and what that is still remains a psychological puzzle as yet unravelled.

There are great differences between extrapolative thinking in mathematics and the physical sciences and extrapolative thinking, of which prognosis is obviously an example, in biology and medicine. In the former the elements which have to be used are known; their properties are known, too, and the relations of those properties can be defined at the beginning and do not change. But in the latter the elements which are to be used must be picked out of a lot of others, all of which may at first seem to have an equal status. We cannot enumerate the properties of the elements completely, and especially we do not know at the beginning what are their relations. We have to inspect instances, and, basing ourselves always upon agreements and differences, reach an issue through an appropriate use of these.

However, prolonged extrapolative thinking does, of course, take place in mathematics, the main difference perhaps being that in the mathematical case the issue is more or less defined to begin with, whereas in medical prognosis it has to be extracted from the direct evidence just as much as the items of evidence which are going to lead up to it. As is well known, Poincaré and Jacques Hadamard, in particular, have made penetrating studies of mathematical extrapolation. There is one suggestion of Hadamard's which seems to me to be particularly interesting. He is discussing Barnard's statement that "those who have an excessive faith in their own ideas are not well fitted to make discoveries." He says that this is not very important in mathematics, because good mathematicians when they make errors soon perceive and correct them. "As for me, I make many more of them than my students do; only I always correct them so that no trace remains in the final result. The reason for this is that, whenever an error has been made, insight—that scientific sensibility . . . —warns me that my calculations do not look as they ought to."

Can this suggestion be taken over directly into the biological field of medical prognosis? If we do this we have to suppose that the directional character which is always present in vital evidence can be known, or perceived, only, or mainly, through a greatly enhanced sensitivity to wrongly assigned directions. I see no reason to doubt that this does happen, but that it is the whole story, or even a main part of it, seems exceedingly unlikely. I know of no outstanding recorded instance of medical prognosis in which the final verdict was reached through the progressive rejection of all possible, or even of a large number of possible, errors. What, then? Are we reduced to the view that the directional character of evidence gathered from the examination of a patient is immediately perceived, or known, by some process of immediate insight or intuition about which nothing more can be said?

I believe that the whole of this matter could be brought to the test of reasonably controlled psychological experiment. But the experiments have not been carried out, and all that I can do now is to make certain suggestions in an extremely tentative manner.

No medical prognosis is achieved on the basis of a single examination. When this appears to be done it is only because the physician has already a fund of information, based upon other examinations, about the signs and symptoms which his direct observation has identified. Moreover, the symptoms and signs are never seen in isolation, never merely enumerated; they are seen as carrying trails which run off into the contemporary life setting, and in most cases also into the course of individual history. This being so, it seems to me very likely that prognostic thinking has fundamentally the same character as the thinking involved in scientific discovery. This is a refusal to accept apparent differences at their face value, and a capacity to probe beneath them in order to find out whether there are significant likenesses. In the case of the prognosis, the observation and information made or used are sections of

an individual life stream; in the case of scientific discovery they are more commonly fields of fact or of knowledge that are to a more superficial examination separate. In the first the resemblances are essentially of changing phenomena in temporal process. In the second this is less often the case. The essence of both is a persistent search for uniformities and likenesses where differences abound. Success in both is difficult and somewhat rare, principally because our human apparatus for building up factual observation and knowledge makes the appreciation of differences among similarities relatively easy, but of similarities among differences relatively hard.

If this is even broadly along the right lines the main reason for one thing which will impress itself upon everybody who studies the history of medicine will become more clear. All the great doctors, especially the clinical physicians, have been men of wide and varied interests and have used them all. They have put their need for this in different ways according to the different times in which they have lived, but it is a theme that crops up again and again. "The doctor," said Paracelsus, "must be a traveller because he must inquire of the world." Osler was for the peripatetic professorship, the quinquennial rejuvenation by return to hospital and laboratory, the bedside library by no means to be restricted to medical writing. Only the man of many and related interests is likely to find those uniformities in nature and in human life which he must use to fill up the gaps of observed and recorded evidence, in ways that pass unnoticed by the mass. This process of bringing together fields or items of knowledge and observation which hitherto have been unrelated is almost always the first step of discovery, especially in biology. Since in a sense every exercise in medical practice is a voyage of discovery, the vital value of varied interests is never to be overlooked.

5. The Conclusion

I have said that thinking is the expansion of evidence in accord with the evidence, to fill up the inevitable gaps in evidence. The gaps are so filled that either at once, or through a series of steps, a stage is reached beyond which all persons who accept and remain loyal to the evidence must reach the same objective issue. Since all medical science and all medical practice claim a direct evidential basis, and since our human mechanisms for dealing with evidence cannot avoid fragmentariness, thinking has its essential place in absolutely every medical exercise, whatever its level, and whatever its generality or individuality. There are some activities required in everyday life, especially probably in much current industrial practice, where all that is required is simply to treat each particular case as it comes along as nothing but a fresh instance of an already defined class of cases. Then the decision, and the resulting action, if there is any, can fairly be called automatic or mechanical. If there is any genuinely routine diagnosis it has this same character, but it is doubtful whether there ever can be, and so the physician can never get away from the challenge to think.

But the nature of medical thinking does differ in different instances. In so far as routine diagnosis is approached the success of the whole thing depends upon the identification of similarities combined with a resolute refusal to neglect differences. And it is the latter that is apt to be difficult.

Once the function of the observed differences becomes clear, either for the purpose of individual diagnosis or for the general development of medical science, the first step is usually to supplement the deficiencies of direct unaided observation by the invention and use of instrumental recording. Experiment comes upon the scene, and must play a greater and greater part as time goes on. But in first-hand observation the difficult thing is the identification of likenesses. So inherently difficult is this that once experiment starts it inevitably develops in the direction of limited range and specializations which separate one branch of knowledge

or topic of exploration from another. Practically all biological discovery, however, whether it concerns the individual instance or the establishment of general principles of treatment and explanation, rests upon the combination of different specialized fields of evidence. Thinking then is apt to be effective only when the thinker has many interests and is able to combine them. Always the watchword or slogan is "Search for likenesses, especially in unexpected places."

All medical phenomena have a future as well as a past, and their significance at any stage is as much determined by what lies ahead as by what has already happened. When this becomes dominant we have prognostic thinking, the mechanism of which is still hardly at all understood. Perhaps it depends upon some unusual sensitivity to those lines of exploration which are not likely to be very fruitful, or perhaps there is something more positive about it: the direct identification of lines of interpretation which will reach an issue. We call this insight. But it may be a capacity to use memory and stored experience, and at the same time to stay loyal to direct observation; so that likenesses which are embedded in a mass of differences and very likely to escape attention are given fair weight. If so, insight, intuition, wisdom, good judgment, are as analytical in their nature as any other thinking processes.

The doctor, like any other thinker, is all the time using "signs." The items, and the established principles, of evidence are used to carry him into the gaps in evidence. If we could know what these signs are we should be in a better position to understand the internal mechanism of thinking. And if it turned out that there are signs which the doctor must use, and which are not used much or at all anywhere else, we could perhaps say whether his thinking is peculiar in its internal mechanism. This seems very unlikely. It is certain that the signs need not be words at any level of medical thinking. It seems likely that the medical scientist and the physician can use effectively any, or all, of the signs open to any other person: words, or images, or perhaps immediately apprehended "directions." Until we know a lot more about this the attempt, not uncommon nowadays, to be dogmatic about the internal, particularly the central nervous, mechanisms of thinking, whether for medicine or for any other field, seems to be premature.

A recent account published by the National Joint Industrial Council for the Rubber Manufacturing Industry summarizes the accident experience of a considerable part of the British rubber industry from January, 1950, to June, 1952. In this period more than 26,000 reports of accidents were received; they varied from those causing trivial injuries to those with disastrous results. The authors of this enterprising study have not only shown how accidents arise in the rubber industry but indicate how wide and useful may be the application of similar methods of investigation elsewhere. They emphasize need for accuracy in classification: far too many accidents, many of them severe, come under the general heading "Other Cause." A high proportion of the accidents were found to be not specific to the conditions of the industry and its machinery but to be in two groups—"Persons Falling" and "Falling Material"; these account for 40% of the serious accidents. Some of the figures, however, are of questionable value. For instance, the fact that more men than women were injured in certain types of accident is of no interest unless the numbers of each at risk are known. One practical result of the survey has been a substantial drop in the frequency of accidents in the industry. The important role of the foreman in keeping workers alert and careful is emphasized. The authors state that "goggles can give positive protection, and the men who need their protection really must accept them." Unfortunately, they do not. Perhaps only legal sanctions and fear of dismissal can make rules observed, though much can be achieved by education, competition, and good morale.

A RELATIONSHIP BETWEEN CANCER OF STOMACH AND THE ABO BLOOD GROUPS

BY

IAN AIRD, Ch.M., F.R.C.S.*

Professor of Surgery, University of London

AND

H. H. BENTALL, M.B., F.R.C.S.

Senior Surgical Registrar, Postgraduate Medical School of London

With statistical analysis by J. A. FRASER ROBERTS, M.D., D.Sc., F.R.C.P.†

Lecturer in Medical Genetics, London School of Hygiene and Tropical Medicine

It was shown by Stocks (1950) that the standardized mortality of cancer of the stomach tended to be greater in northern than in southern towns in England. Stocks considered this to be consistent with the hypothesis that gastric cancer depends on an irritant. The only environmental factor which appeared to correlate in any way with the varying incidence of cancer of the stomach was hardness of water, towns with a water supply of moderate hardness tending to have lower rates than towns with soft or very hard water. This correlation was not a very close one. He showed also that the standardized mortality of cancer of the stomach was greater in towns with a low proportion of people of advanced age and in towns with a high proportion of men in unskilled and partly skilled occupations. Stocks did not explore, and apparently did not take into account, any possible genetic difference in the populations which he examined, nor was this possibility mentioned by Legon (1951, 1952) in attempts to correlate the geographical variations in the mortality from gastric cancer with variations in the organic content of the soil.

It occurred to one of us that there might be a correlation between the high northern incidence of cancer of the stomach and the genetic differences which are reflected in the ABO blood groups, the frequency of blood group O being greater, that of A less, in northern than in southern populations, B and AB being similar in all geographical areas in England and Scotland.

Previous published work on the association of the ABO blood groups with cancer has been on very small series of cases without adequate controls. The results have been diverse and without statistical significance (Alexander, 1921; Johannsen, 1925; Goldfeder and Fershing, 1937).

Method

A collection was made of cases of cancer of the stomach from a number of hospitals in England and Scotland, and the distribution of the ABO blood groups in patients with stomach cancer from each hospital was compared with the distribution of ABO blood groups in an equal number of patients chosen at random from the same hospital. The criterion of diagnosis has in most cases been a histological

*From the Department of Surgery, Postgraduate Medical School of London.

†From the Burden Mental Research Department, Stoke Park Colony, Bristol, and the London School of Hygiene and Tropical Medicine.

report on material obtained at operation or post-mortem examination, but in a few cases we have been dependent upon "a cast-iron clinical diagnosis based on radiological findings, operative findings, and clinical follow-up." Our survey concerns only cases treated in the past five years, for in most hospitals blood grouping has been dependable and accurately recorded only during this period. In most cases the blood groups have been determined by hospital laboratories, though in a very few cases the determinations have been made in the laboratory facilities of a clinical unit. Wherever possible, cross-checks against the case records were obtained from the hospital transfusion service.

For controls we have selected, where possible, a cross-section of the patients of the hospital concerned rather than data from the regional transfusion organization, since the hinterland of a hospital has not necessarily the same population as that served by the transfusion service. This type of control has been used in all the provincial and Scottish hospitals which we have approached, with two exceptions. In these two exceptions controls were not easily obtainable from the hospital population, and in the case of these, affecting 566 of our controls, the blood groups of an equal control number were estimated from their frequencies in very large numbers of the local population obtained from the local transfusion centre. In the London area we have used as controls the blood-group frequencies in a series of 10,000 from North-west London collected and published by Discombe and Meyer (1952). These frequencies are very close to those given by Fisher and Taylor (1940) for Southern England.

Results

Our results are presented in simple form in Table I, and are analysed statistically by Dr. Fraser Roberts in Table II. It is clear that throughout England the distribution of blood groups in cancer of the stomach is different from their

TABLE I.—Percentage Distribution of Blood Groups in Cases of Stomach Cancer Compared with that in Equal Numbers of Controls

	Cancer Cases				Controls			
	O	A	B	AB	O	A	B	AB
Newcastle (101 cases)	43.6	43.6	11.9	1.0	52.5	37.4	7.6	2.5
Leeds (217 cases)	42.4	47.9	7.4	2.3	46.5	40.3	7.1	6.2
Manchester (771 cases)	44.7	44.5	6.4	3.8	52.1	38.4	7.0	2.5
Liverpool (217 cases)	39.2	44.7	12.4	3.7	49.7	39.6	7.8	2.7
Birmingham (100 cases)	37.0	57.0	3.0	3.0	49.6	44.4	3.0	3.0
Total of Northern England (1,406 cases)	42.9	46.4	7.6	3.1	50.7	39.3	6.8	3.2
London (1,340 cases)	43.1	46.0	7.9	2.9	45.8	42.2	8.9	3.1
Scotland (478 cases)	51.2	36.4	9.6	2.7	52.6	32.5	11.7	3.1
Overall* figures (3,632 cases)	44.5	44.8	7.8	2.9	48.6	39.8	8.3	3.2

Gene Frequencies†

London		Northern England		Overall English + Scottish*	
Cancer	Control	Cancer	Control	Cancer	Control
p=0.287	0.261	0.290	0.236	0.278	0.243
q=0.058	0.064	0.056	0.047	0.056	0.058
r=0.657	0.678	0.655	0.713	0.668	0.698
1.002	1.003	1.001	0.996	1.002	0.999

*The overall figures are the sum of Northern England, London, Scotland, and four other scattered hospitals in the south of England (the latter individually too small for deductions but included for completeness).

†Calculated from nomograms published by Boyd (1937-8).

distribution in the general population in England, and this difference is highly significant. Blood group A is more frequent, blood group O less frequent in patients suffering from cancer of the stomach than in the general population of the same locality. In every hospital from which data were obtained this same difference was observed. There thus seems to be a direct or indirect correlation between the A and O groups and susceptibility to cancer of the stomach in this country.

Discussion

Since cancer of the stomach is commoner in the North of England than in the South, while group A is less common in the North of England than in the South, it follows that this correlation with the blood groups is not responsible for the geographical differences in the incidence of cancer of the stomach demonstrated by Stocks. We must postulate that there are at least two influences operating in the cause of cancer of the stomach in England. One is an inherited influence with a relation to the A and O blood groups. The other, presumably environmental, must be assumed to be responsible for the high northern frequency of carcinoma of the stomach which Stocks showed. Since group A is commoner in the South of England than in the North and is more frequent in the cancer of stomach patients, it follows that the inherited factor operates in a direction opposite to the environmental factor of Stocks with regard to the geographical distribution of cancer of the stomach in England. Because of the low frequency of group A in the North of England, cancer of the stomach should be less common there than it is in the South, while Stocks has shown that it is in fact more common. Our figures thus add weight to the importance of the environmental factor which Stocks has postulated.

Any explanation of the apparent susceptibility to cancer of the stomach with which blood group A is invested, or protection against cancer of the stomach which is afforded by the possession of blood group O, is exceedingly difficult. It is clear that the susceptibility to cancer of the stomach or the protection against cancer of the stomach which our figures suggest must be inherited, since blood groups A and O are inherited. Our preliminary interpretation of the data was that they revealed high-incidence and low-incidence strains in the population of England with respect to cancer of the stomach. Such a hypothesis, however, would be difficult to substantiate in the light of the known facts of Britain's genetic history. The essential difference between patients with cancer of the stomach and controls affects blood groups O and A in a reciprocal fashion, B and AB retaining an equal level in both groups throughout. This reciprocity between O and A, and the constancy of B and AB, which are characteristic of the ethnological pattern of the population in this country, do perhaps strengthen an anthropological (i.e., ethnological) hypothesis. It would still be difficult, however, to devise a genetic explanation for the correlation of the blood groups with cancer of the stomach based on the known ethnological origins of the population of this country.

The alternative explanation would in its turn offer difficulty to the pathologist. It is hard to conceive any mechanism whereby the antigen A could offer a slight but definite susceptibility to, or the antigen O offer a slight but definite protection against, such a disease as cancer of the stomach. Further speculation would appear to be unprofitable at this stage. Extension of the data to cover other forms of malignant disease and other populations ethnologically alien to ours might make it clear whether an ethnological or a serological hypothesis is more tenable.

Some other conclusions may be drawn from our figures. It is generally assumed that the ABO blood groups have no selective value, at least in adults, the possession of any one of the groups conferring neither advantage nor disadvantage on its possessor with respect of survival. Our figures would seem to show that blood group A has in England at least a negative selective value, blood group O a positive selective value because of the greater and lesser

risk of cancer of the stomach which they respectively offer. Admittedly cancer of the stomach most often affects individuals after their most active reproductive period, and the transmission of the gene for group A is in most cases not prevented. Nevertheless, cancer of the stomach does affect younger people on occasion, and blood group A must therefore be regarded as having some negative, and blood group O some positive, selective value, however slight.

It is possible that there is some intermediate influence affording an indirect rather than a direct correlation between these blood groups and cancer of the stomach. Achlorhydria and pernicious anaemia, for example, come to mind as possible links.

Cancer of the stomach is commoner among the unskilled and semi-skilled than among the professional and clerical orders. We have attempted, but failed, to find a method to correlate blood groups with social class. It seems unlikely that in this country there should be differences of blood-group distribution in the various social orders, and Fraser Roberts (1953) has informed us that no such class difference appears to exist in at least one English locality.

The inheritance of cancer of the stomach has been previously suspected. One need only mention the Bonaparte family in this connexion.

Further evidence could be obtained from studies on the incidence of cancer of the stomach in twins. Gorer (1937-8) reviewed the literature on cases of cancer of all sites occurring in twins. He recorded four pairs of monozygotic twins and one pair of dizygotic twins of which each pair developed cancers of the stomach either simultaneously or within a year of each other. He concluded: (1) that heredity and environment should not be regarded as alternative causes of cancer, and that genetic factors must be regarded as influencing the sensitivity of individuals to stimuli capable of giving rise to malignancy; (2) that evidence obtained from studies with pure lines of mice shows that such genetic factors can be of great importance but do not fix the time at which the tumour will appear; (3) the likelihood of obtaining simultaneous development of identical tumours in man is probably much lower; and (4) that tumours of the alimentary canal, and especially the stomach, appear to be influenced by genetic factors.

Our findings would seem to substantiate that inheritance plays some part in the susceptibility to or protection against cancer of the stomach. The data respecting twins suggest that susceptibility is more important in this connexion than resistance.

We have explored a little the geographical and ethnological aspects of the correlation between blood groups and cancer of the stomach beyond the British Isles, but the collection of data is difficult. We have, however, obtained with the help of Dr. Holländer and his Swiss colleagues the most striking figures from Basle, where the incidence of blood groups in 704 cases of cancer of the stomach is O 36.22%, A 53.12%, B 7.53%, AB 3.13%, while in 4,518 controls from the general population the frequencies are O 41.65%, A 45.06%, B 9.03%, AB 4.26%. These differences are highly significant.

Certain North American Indian tribes have a very high incidence of group A indeed. If it could have been shown that they had also a high incidence of cancer of the stomach the hypothesis that predisposition to or protection against cancer of the stomach depended directly on an antigenic or a serological factor would be greatly strengthened. The American Bureau of Indian Affairs has assisted us in this matter, but the Indian tribes with high incidence of group A are so small, and their expectation of life is so low, that figures about cancer of the stomach are not available.

This technique of examining the distribution of blood groups in a disease is capable of further extension. It could be applied most conveniently to those diseases which require blood grouping for their treatment by transfusion, or which are commonly submitted to an operation which requires transfusion. We propose to examine cancer of the rectum, cancer of the colon, cancer of the lung, brain

tumours, and the blood dyscrasias with particular reference to pernicious anaemia, and peptic ulceration for other possible relationships with the blood groups. In view of the virus work of Bittner it would be desirable to apply the method also to cancer of the breast, though transfusion is seldom required for a patient submitted to radical amputation of the breast, and a large enough series might be difficult to collect.

Statistical Analysis

It is clear that there is practically no difference in the proportions of those with gene B for England and Scotland: $\frac{(B + AB)}{(O + A + B + AB)} = 11.08\%$ and 11.57% respectively.

The Swiss data do show a difference—10.65% and 13.28%—but this is not significant: χ^2 (with Yates's correction) = 3.504. What the British data do show is a reciprocal difference in the relative proportions of O and A. Hence the simplest and most straightforward analysis is to examine the ratio $\frac{A}{(A + O)}$. This is done in Table II. The conclusions are clear. The total χ^2 for the difference in $A/(A + O)$ between cancer patients and controls is enormously significant, $P < 1/10,000$, and the seven separate areas are perfectly homogeneous in this respect.

TABLE II.—Analysis of Differences in Relative Proportions of Groups O and A in Cancer Patients and Controls

Groups														
1	2	3	4	5	6	7	8	9						
	Cancer Cases		Controls		A/(A+O)%			χ^2						
	O	A	O	A	Cancer	Control	Diff. Cancer-Control							
Manchester ..	343	349	402	295	50.43	42.32	+8.11	9.183						
Liverpool ..	85	97	108	86	53.30	44.33	+8.97	3.022						
Leeds ..	92	104	102	87	53.06	46.03	+7.03	1.902						
Birmingham ..	37	57	50	44	60.64	46.81	+13.83	3.616						
Newcastle ..	44	44	53	37	50.00	41.11	+8.89	1.418						
London ..	578	617	614	565	51.63	47.92	+3.71	3.267						
Scotland ..	245	174	252	155	41.53	38.08	+3.45	1.022						
Total ..	1,424	1,442	1,581	1,269	50.31	44.53	+5.78	19.198						

Col. 9: χ^2 separately from the eight 2×2 tables.

Analysts		D. of F.		χ^2	
Sums of χ^2 for seven areas separately	7	7	23.430		
Total for England and Scotland	1	1	19.198		
Difference attributable to heterogeneity	6	6	4.232		

As might be expected, weighting makes practically no difference. The mean difference becomes +5.80 instead of +5.78, and the χ^2 for heterogeneity 4.121 instead of 4.232.

The frequencies in the controls correspond reasonably with what would be expected in the regions concerned.

Fisher and Taylor's (1940) figure for $\frac{A}{(A + O)}$ for the South-east of England is 48.8, against that given for London in the present paper of 47.9. A figure of 45.5 would very fairly represent England east of the Pennines over an area stretching from Leeds, Bradford, and Hull to Newcastle-upon-Tyne. The northern area controls give 43.4. Thus the ratios for controls are lower than expectation, though only slightly so; in any event the ratios for the cancer series are far higher than those for the corresponding general populations.

Conclusions

The frequency of blood group A is greater and the frequency of blood group O less in patients suffering from cancer of the stomach than in the general population of the locality in which they live.

From this correlation of blood groups and cancer of the stomach it follows that there is an inherited element in the susceptibility to or protection against cancer of the stomach.

This inherited element is not responsible for the known geographical differences in the incidence of cancer of the stomach in England.

The environmental element which Stocks has postulated in the aetiology of cancer of the stomach is more potent than would appear from the geographical incidence of the disease in England.

It is not possible from our present data to deduce whether the relationship between blood groups A and O and cancer of the stomach is dependent upon high- and low-incidence strains of cancer of the stomach in the general population of Great Britain or upon some specific effect of the antigens A and O.

In view of the relationship with cancer of the stomach in Great Britain it is no longer possible to regard blood groups A and O (in adults) as being devoid of selective value.

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Ciba Laboratories have recently presented a film on senile obliterative arteritis of the legs to the B.M.A. Film Library. The course, diagnosis, and management of the condition are demonstrated by members of the university surgical unit, Manchester Royal Infirmary. The film is a 16-mm. colour film with commentary, and it runs for about 55 minutes. It is divided into three parts: the first deals with the pathological anatomy, the second with clinical examination, and the last with the general and local management of intermittent claudication and severe ischaemia. The producer was Dr. Brian Stanford.

SYMPTOMATIC DISTURBANCE AFTER SINGLE THERAPEUTIC DOSE OF X RAYS

ITS RELATIONSHIP TO THE GENERAL RADIATION SYNDROME

BY

W. M. COURT BROWN, M.B., Ch.B., B.Sc., F.F.R.*

Department of Medicine, Postgraduate Medical School of
London, W.12

The development of atomic power and the consequent dangers, both in war and in peace, of exposure to the radiations produced by nuclear fission have instigated extensive research into the effects of whole-body irradiation on many animal species. This research, together with the observations made on the populations of Hiroshima and Nagasaki following their exposure to the radiations of the atomic bombs, has shown that such irradiation produces a fairly well defined pattern of signs and symptoms, collectively known as the general radiation syndrome (Fig. 1). This syndrome has been reproduced following whole-body irradiation given to a wide range of mammals such as rats, mice, monkeys, dogs, swine, etc., and, although there are certain species differences, particularly concerning the critical dose of x rays required to produce the full syndrome in each instance, the overall picture of the syndrome is sur-

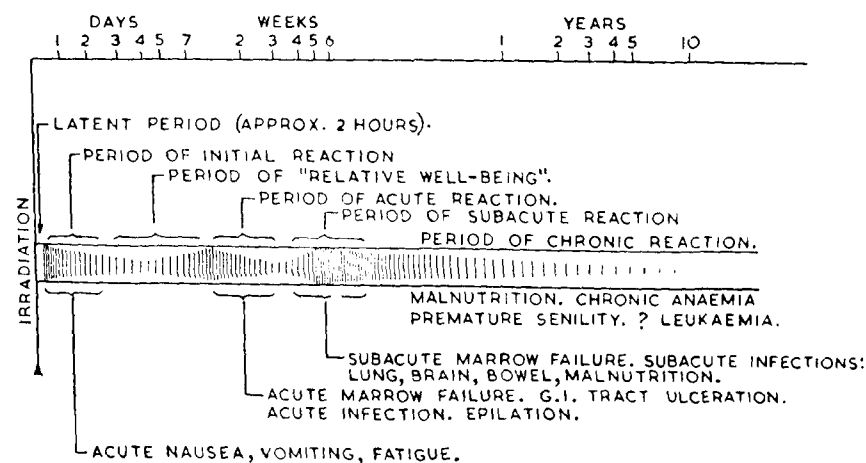


FIG. 1.—Diagrammatic representation of the general radiation syndrome in man. (Adapted from Liebow, Warren, and De Coursey, 1949.)

prisingly comparable throughout the range of mammals investigated. The fact that such a reproducible syndrome exists is of great value and importance in furthering basic research work into physiological disturbances produced by x rays.

Walsh (1897) first described acute constitutional symptoms in an x-ray worker, and since that time many reports have appeared concerning the production of such symptoms as nausea and vomiting in patients undergoing radium and x-ray therapy. Early workers held several factors to be responsible for these symptoms, among which may be mentioned poor ventilation of the treatment rooms, electrical charging of the patient's body, psychological disturbances, and the release into the circulation of the toxic products of protein breakdown.

*Working for the Medical Research Council

The position to-day regarding the aetiology of these symptoms is only a little less confused. Progress has been hampered by the lack of any clear-cut definition in the medical literature of what has come to be known to radiotherapists as radiation sickness, and the apparent absence of any correlation with the disturbances found after the experimental whole-body irradiation of animals.

It is the object of this communication to describe the pattern of symptoms which occurs in human beings shortly after a single exposure to a dose of x rays within therapeutic limits, and to demonstrate the place of this pattern within the general radiation syndrome.

Clinical Material

Concurrently with the supervision of the x-ray therapy of certain patients referred to the Radiotherapy Department of Hammersmith Hospital, detailed clinical observations were made before and after a single dose of x rays. Fifty such patients have now been observed, and they were selected for these studies because their general health was good and the nature of their disease necessitated the irradiation of a large volume of tissue. The primary diseases of these patients are as follows:

Ankylosing spondylitis	20
Reticulosis	20
Carcinoma of ovary (post-operative)	5
" " testis "	2
" " thyroid "	1
Malignant melanoma (recurrent)	2

It will be seen that the majority suffered either from ankylosing spondylitis or from various forms of reticulosis. In the latter group all patients except one have been early or moderately early cases of Hodgkin's disease, follicular reticulosis, and reticulum-cell sarcoma, the single exception being a case of multiple myeloma. The patients suffering from carcinoma of the ovary, testis, and thyroid had been referred for radiotherapy following surgical excision of the primary tumour. Both cases of melanoma demonstrated metastases after surgical treatment of the primary tumour at an earlier date, the recurrences being widespread.

To provide a control series of observations, sham irradiations were also given to 34 of the 50 patients. The conditions of the sham irradiation exactly resembled those of the actual irradiation in respect of the positioning of the patient under the x-ray tube, the number of fields apparently irradiated, and the delineation of the fields of irradiation on the skin. The patient believed that irradiation was being carried out, and was in position under the tube for the correct period of time. The x-ray tube, however, was not energized.

Irradiation

Sites.—The main sites of irradiation are shown in the Table. The sacro-iliac joints and whole length of the spine were irradiated in patients suffering from ankylosing spondylitis and also in the one patient with multiple myeloma. In the patients with reticulosis, irradiation was given either to the upper half of the trunk or to the abdomen, depending upon the main sites of distribution of the lesions, the only exceptions being one individual with reticulum-cell sarcoma in whom radiation was directed to the lower part of the left half of the pelvis and upper half of the left thigh, and three

Incidence of Symptoms After a Single Dose of X Rays to Various Sites

Radiation Given	Mean Integral Dose	No. of Patients		
		Irradiated	Developing Symptoms of Any Type	Developing Vomiting
Whole spine and sacro-iliac joints	4.0	21	20 (97%)	12 (57%)
Whole abdomen ..	3.4	10	9 (90%)	6 (60%)
Upper half of trunk	3.9	13	11 (84.5%)	4 (31%)
Whole body ..	2.9	4	2 (50%)	1 (25%)
Lower abdomen and thigh ..	4.2	1	0	—
Both thighs ..	3.8	1	0	—

patients to whom whole-body irradiation was given. Whole-abdominal irradiation was employed in those patients who had had testicular and ovarian tumours excised. One patient with an undifferentiated carcinoma of the thyroid was given wide-field irradiation of the upper half of the trunk; and of the two patients with melanoma metastases one was given whole-body irradiation and the other had both thighs irradiated.

Dosimetry.—All patients were irradiated with x-ray tubes operating at 250 kV, the tube current being 18 mA. In each instance dosage has not been expressed in terms of the number of conventional r units received on the skin or at some defined point deep to the skin, but in terms of the total amount of energy absorbed within the body, calculated in megagram-roentgens. The estimate of total energy absorption is known as the "integral" dose, and from the biological standpoint it carries greater significance than an estimate of dose in r units, allowing, with certain reservations, comparisons to be made between results obtained following irradiation in differing sites of the body. In the calculation of integral doses, valuable help has been given by Mr. J. W. Boag, of the M.R.C. Radiotherapeutic Research Unit, and the figures for whole-body irradiation have been derived from the observations of Mayneord and Clarkson (1944). The Table demonstrates the mean integral dose given in the various sites irradiated.

Results

The General Symptom Pattern

Symptoms developed in 42 out of 50 patients irradiated (84%), and the chief symptoms were found to be fatigue, anorexia, nausea, and vomiting. The pattern of symptoms in each instance was found to be very similar (Fig. 2), and

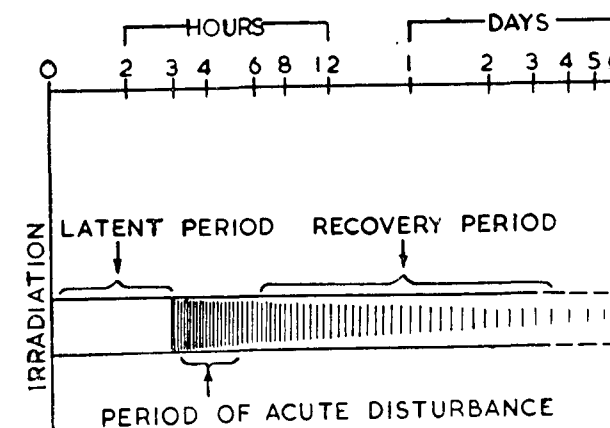


FIG. 2.—Diagrammatic representation of symptom pattern after a single therapeutic dose of x rays.

differed in degree only from one patient to another. The time interval which elapses from the beginning of irradiation until the disappearance of all symptoms can be divided into three main periods: the latent period, the period of acute disturbance, and the period of recovery.

Control Sham Irradiation

Information was obtained from the control sham irradiations concerning the part played by psychological and emotional disturbances in determining the incidence of symptoms. Eight out of the 34 patients developed symptoms from their sham irradiations (23.5%), but in no instance did the pattern of symptoms resemble that following the actual irradiation. It was characteristic that in these circumstances the patient complained of symptoms, chiefly headache and fatigue, either during the period of apparent irradiation or immediately after leaving the treatment room. The emotionally or psychologically disturbed patient failed to demonstrate any latent period—in complete contrast to the symptom pattern following actual irradiation. In the great majority of instances the sham irradiation was given some days before the actual irradiation, and it was noticeable that those who developed symptoms after their sham exposures did not develop any symptoms at comparable times after their actual irradiation.

Detailed Analysis of Symptom Pattern:

1. Latent Period

The mean time lapse from the beginning of irradiation to the development of symptoms was 2.7 hours. It appeared that the latent period was shorter in those patients who were generally more severely upset and who developed vomiting. A comparison made between these two groups showed that there was a difference of nearly three-quarters of an hour between the mean values of the latent periods, a difference which was found to be statistically significant (see appendix). The lengths of these two latent periods have been examined for possible influences upon them of sex distribution, dosage, disease, and site of irradiation, but no evidence has been found that these factors were responsible for the significant difference observed. It seems fair to conclude that, following a given dose of x rays, the more sensitive an individual is to the effects of irradiation the earlier are the symptoms likely to appear.

It will be realized that the latent period as calculated includes the period of time occupied by the positioning of the patient under the x-ray tube and in most instances by the irradiation of several fields. On an average this period is approximately half an hour, so that the absolute value of the latent period, assuming irradiation to have been given in an instantaneous period of time, is approximately 2.25 hours for all the patients in the series.

2. Period of Acute Disturbance

The usual complaints are of a sudden bout of nausea or of a sudden feeling of severe fatigue. Less frequent initial symptoms are headache of no particularly characteristic distribution, a feeling of dizziness or "muzziness" in the head, and an emotional disturbance taking the form of acute mental depression, in a few instances accompanied by actual weeping. Whatever the initial symptoms may be, the predominant symptoms which establish themselves in the early part of this period are fatigue, anorexia, and nausea. Objective assessment of these symptoms is practically impossible, but it appears that, after being present for a time interval varying approximately from half an hour to an hour and a half, three developments may occur, depending on the severity of the patient's upset. In the mild case the symptoms gradually subside; in the moderately severe case either the fatigue element or the feeling of nausea, or both, become accentuated for a further period of about one hour before subsiding; and in the severe case vomiting and retching supervene. Only one bout of vomiting may occur, but in the more severe cases there may be vomiting at intervals for a period of two to three hours. After the cessation of vomiting the recovery period ensues.

In studying the incidence of the various symptoms in this period of acute disturbance it is clear, both from

impressions of the observer and from the descriptions given by the patients, that fatigue appears to be dissociated from nausea and vomiting. Thus in some individuals the outstanding complaint is one of fatigue, nausea being a mild transitory symptom and vomiting not occurring at all. In rare instances the patient has never complained of nausea but solely of fatigue. On the other hand, at least four patients were encountered whose presenting symptom was nausea, which was rapidly followed by vomiting, but in whom fatigue, apart from slight tiredness apparently consequent upon the act of vomiting, did not occur at all. It was a striking observation that these latter patients remained perfectly well between their bouts of vomiting, and as soon as their vomiting ceased had no further symptoms. This suggests that two aetiological disorders may underlie the development of these symptoms—one associated with fatigue and the other with nausea and vomiting.

A detailed analysis of the incidence of symptoms for each site irradiated, and in particular for the incidence of vomiting, is shown in the Table. The incidence of vomiting when irradiation was confined to the upper half of the trunk was 31%, as opposed to an incidence of 60% when the abdomen alone was irradiated. However, the total numbers in each group are small, and, by considering all instances in which radiation was not directed to the abdomen in contrast to all those in which the abdomen was irradiated, irrespective of whether radiation was directed to other sites as well, the relevant figures are 29% and 53%. Statistically these two sets of figures are not significant, but in the larger group the difference approaches much nearer to a significant level than in the smaller group. It is possible that with an even larger series of patients a significant difference may be found in the incidence of vomiting, depending on whether the abdomen is irradiated or not.

During this period of acute disturbance no consistent changes have been noted in the pulse rate, blood pressure, body temperature, and respiration rate up to the act of vomiting.

3. Recovery Period

An accurate estimation of the recovery period is difficult, but it is possible to make an approximate estimate to the nearest day. With the subsidence of the period of acute disturbance the patient is left with a feeling of mild fatigue, nausea, and anorexia. Depending on the degree of acute disturbance, these symptoms either persist for one day or less, or extend in the most severe instances over a period of up to five days. In the most severely upset patients nausea may persist for two to three days, but of the three outstanding symptoms it is the first to disappear. Its disappearance is followed by the gradual subsidence of fatigue and anorexia, in that order.

The General Radiation Syndrome

The pattern of symptoms following a single dose of x rays within therapeutic limits having been demonstrated, the basic pattern of the general radiation syndrome, observed after the exposure of both animals and man to high levels of radiation, must now be considered.

The main features of the general radiation syndrome are depicted in Fig. 1. This diagram was derived from the observations made upon Japanese necropsy material and from the histories and clinical features of the survivors (Liebow, Warren, and De Coursey, 1949). It will be seen that there are four main periods in which clinical disturbances and death may or do occur, which may be designated: the period of initial reaction, the period of acute reaction, the period of subacute reaction, and the period of chronic reaction.

Period of Initial Reaction.—This supervenes after a brief latent period following exposure, and is characterized by nausea, vomiting, and fatigue. It is probable that the mean length of this latent period is approximately two hours, although species differences and the level of dosage received

may well determine its actual length. In the Japanese cases the latent period is said to have been in some instances as short as half an hour. On the other hand, Painter and Brues (1949) state that the initial signs and symptoms occur within the first six hours in man, the dog, rat, mouse, guinea-pig, and goat. Theoretically it is possible for a human being to die during this stage, as it has been shown that animals subjected to radiation of very high intensity may die either during the period of irradiation or within a few hours of its cessation (Henshaw, 1944). It is generally stated that in most instances the duration of the initial reaction is approximately two to three days and that following its disappearance a period of comparative well-being ensues before the next stage of the general radiation syndrome supervenes. It appears likely, however, that in some of the Japanese casualties and also in some rats and dogs (Painter and Brues, 1949) this period of initial reaction is prolonged towards the end of the first week after exposure and terminates in death. The human beings showing this developed high fever, thirst, diarrhoea, and delirium before they died. At the time of death clinical evidence of bone-marrow damage was not prominent, and it seems likely that death at this stage is the outcome of an extremely severe form of damage inflicted during the original irradiation.

Period of Acute Reaction.—This stage becomes apparent towards the end of the second week, and is characterized by the clinical features of acute marrow failure, of ulceration of the mucous membrane of the gastro-intestinal tract of acute secondary infections, and also by epilation.

Period of Subacute Reaction.—This stage occurs at about the end of the sixth week, at which time the marrow damage clinically obvious in the preceding phase, is becoming less marked. At this stage death may result from lung or brain abscess, persistent ulceration of the large bowel, an exacerbation of a pre-existing focus of infection, and malnutrition.

Period of Chronic Reaction.—The preceding period of subacute reaction probably merges insensibly into the period of chronic reaction, where the presenting features and causes of death are malnutrition, chronic anaemia, chronic infections, premature senility, and possibly leukaemia.

It will be realized that in the majority of patients the complete syndrome will not be shown. In these patients depending on the amount of radiation received during the original exposure and the inherent radiosensitivity of the individual, one or more of the acute manifestations may develop, resulting in some instances in death. On the other hand, there may only be evidence of mild upset, probably in the form of a minor degree of suppression of marrow function and some epilation. Finally, a proportion of individuals will show no clinical features of the syndrome, but haematological investigation will demonstrate an abnormally low total white-cell count.

Conclusion

It has been shown that, following a single dose of x rays within therapeutic limits and of the order of 3-4 megagram roentgens, there is a well-defined latent period which terminates in the sudden onset of symptoms, and that the period of acute disturbance, after lasting for a variable number of hours, passes into a recovery phase. The total duration of the symptomatic disturbances has been shown to vary from one to five days, depending on the radiosensitivity of the individual and the actual dose given. The similarity of the symptom pattern following the therapeutic dose of x rays to the period of initial reaction, the first manifestation of the general radiation syndrome, is evident. The close agreement in the length of the latent periods and the similarity of the symptoms justifies the conclusion that after therapeutic x-ray doses the symptom pattern is a milder version of the symptom pattern of the period of initial reaction seen in animals after mid-lethal doses. This conclusion indicates that it is justifiable to utilize observations made

after a single therapeutic dose of x rays in the interpretation of the consequences of exposure to irradiation of greater and possibly lethal proportions.

Summary

The pattern of symptoms following a single therapeutic dose of x rays has been described, based on the findings in a group of 50 patients. The pattern was found to consist of three well-defined phases: a latent period extending from the administration of the x rays to the onset of symptoms; a period of acute disturbance which persisted for approximately between one and a half and four hours after the onset of symptoms, depending on the degree of upset; and a recovery period which in the most acutely disturbed patients extended over four to five days. In those patients in whom the period of acute disturbance was not associated with vomiting the latent period was found to be significantly longer than in those who vomited.

A brief description has been given of the general radiation syndrome produced in man and in many types of mammals following a single mid-lethal dose of x rays, in which four general periods of reaction can be discerned: the periods of initial reaction, acute reaction, subacute reaction, and chronic reaction.

The similarity between the pattern of symptoms following therapeutic doses of x rays and the symptoms of the period of initial reaction of the general radiation syndrome has been stressed, and attention has been drawn to the possible value of using clinical studies based on single therapeutic doses of x rays to interpret what may occur when, either accidentally or under conditions of war, much higher doses are received.

No account has been given of the physiological disturbances produced by therapeutic doses of x rays, which will form the subject of a later communication.

I wish to thank Professor J. McMichael and Dr. Russell Fraser, of the Department of Medicine, Dr. J. F. Loutit, of the M.R.C. Radiobiological Research Unit, A.E.R.E., and Dr. C. A. P. Wood, Director of the M.R.C. Radiotherapeutic Research Unit, for their advice and criticism.

APPENDIX

The mean length of the latent period in the less severely upset group of patients (Group A) has been compared with that in the more severely upset group (Group B). The distribution of the different lengths of the latent periods within each group, the value of the mean and t and P values of the difference of the means are shown below.

	Length of Latent Period (Hours)							
	1-1.49	1.50-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-3.99	4.0-4.49	4.5-4.99
Group A (19 patients)	0	1	2	7	0	7	2	0
Group B (23 patients)	5	4	4	4	1	2	1	2

Mean length of Group A = 3.06 hours } Difference of mean
Mean length of Group B = 2.44 hours } lengths = 0.62 hr.
The t value of the difference is 2.10, indicating that P<0.05 and that the difference is significant.

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ORAL N,N'-DIBENZYLETHYLENE-DIAMINE PENICILLIN IN CHILDREN

BY

I. A. B. CATHIE, M.D., M.R.C.P.

AND

J. C. W. MacFARLANE, M.D., B.Sc.

(From the Department of Clinical Pathology, The Hospital for Sick Children, Great Ormond Street, London)

The greatest drawback to the use of oral penicillin has been, in our experience, the variability with which it is absorbed into the blood stream. Several penicillin derivatives have been tried in different dosages, with and without antacids, before and after meals, and scaling the dosage according to body weight. While in a good proportion of cases therapeutic blood levels have been obtained by the oral route, with no preparation have consistent levels been observed; this has meant that, when any case has been treated with oral penicillin, blood-level estimations have been essential to confirm that the antibiotic was being absorbed.

Recently a new salt N,N'-dibenzylethylenediamine penicillin has been available (Szabo, Edwards, and Bruce, 1951); this is referred to here as "penidural." It has been the subject of a recent report by Fletcher and Knappett (1953) as a long-acting repository penicillin following intramuscular injection; we have investigated it from the point of view of reliability of absorption following oral administration.

Side-effects.—Several adults have complained of borborygmi and urgency at stool during the first 24 hours of treatment but not subsequently. No children of any age have been disturbed, and the palatability of the product has made its administration easy.

Material and Methods

Penicillin blood levels were estimated, using a dilution technique with a strain of *Staphylococcus aureus* of sensitivity to 0.03 µg. of penicillin per ml. A total of 101 children of all ages were given 300,000 units of penidural and their blood levels were estimated three to four hours after administration for reliability of absorption. In addition a small series of 17 adult volunteers were investigated with the same preparation.

The penidural was given irrespective of the times of meals and whether the stomach might be full or not.

Results

Fig. 1 shows that the antibiotic was reliably absorbed in all of the 118 cases in which it was administered, and Table I shows the levels obtained in the 101 children. In several

TABLE I.—Serum Penicillin Levels in 101 Children Three Hours After 300,000 Units of Penidural

Weight in lb.	0.06 unit per ml.	0.125 unit per ml.	0.25 unit per ml.	0.5 unit per ml.	Total Cases
0-10	—	1	4	—	5
11-20	—	5	2	1	8
21-30	7	4	6	1	18
31-40	10	13	—	2	25
41-50	8	8	1	—	17
51-60	5	7	—	—	12
61-70	5	5	1	—	11
71 and over	1	4	—	—	5
TOTALS	36	47	14	4	101

TABLE II.—Serum Penicillin Levels in Units per ml. at 3 p.m. on Consecutive Days. 300,000 Units of Penicillin Given Six-hourly Throughout

Case No.	3 hours	27 hours	51 hours	75 hours
1	0.06	0.25	0.25	0.25
2	0.125	0.25	0.25	0.25
3	0.25	0.5	1.0	1.0
4	0.125	0.5	0.5	0.5

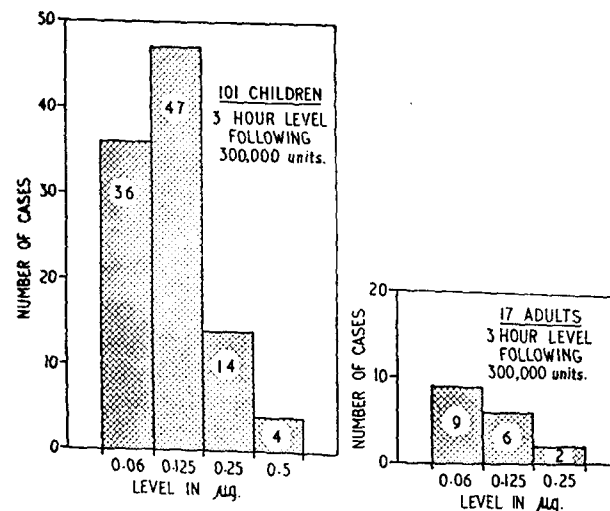


FIG. 1

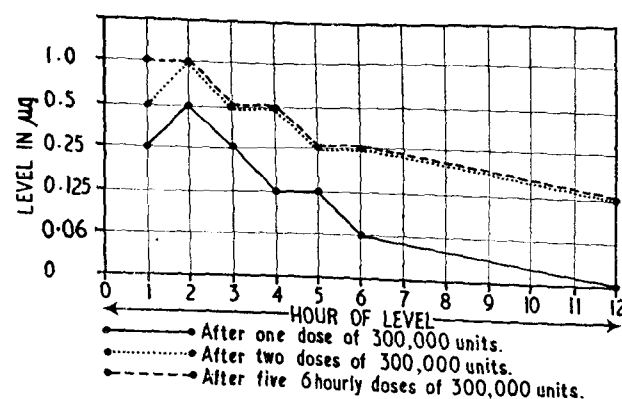


FIG. 2

cases hourly penicillin levels were estimated and a cumulative effect was seen following a second oral dose. Fig. 2 shows one such typical example, in which there were satisfactory blood levels for six hours, but no residual level at 12 hours after a single dose. When a second dose was given at six hours, not only were the levels for the succeeding six hours higher than in the first period but there was also a residual level at 12 hours.

In Table II are shown the blood levels at 24-hour intervals in four consecutive patients of differing weights and ages to whom six-hourly penicillin was being given. Blood samples were taken at the same time each afternoon, three hours after the last dose of the drug. Each shows the same increase in blood levels as is depicted in Fig. 2. There was some indication in the figures shown in Table I that better blood levels were obtained when penicillin was given before meals.

Discussion

Penicillin is the first oral preparation of penicillin which has in our experience been reliably absorbed in 100% of patients, irrespective of size and weight and using a standard dosage of 300,000 units. No attempt has been made to work out a graded system of dosage according to body weight, but it is possible that in the smaller children ther-

apeutic blood levels might be obtained with lesser amounts of penicillin. The emergence of a reliable oral penicillin seems to bring this drug into line with the newer antibiotics where penicillin-sensitive organisms are being dealt with.

In the treatment of acute infections blood levels during the first six hours with this oral penicillin alone cannot be regarded as adequate, and in five cases of acute illness in which penicillin has been used therapeutically a single intramuscular injection of a large amount of crystalline penicillin has been used to augment the blood level during this period. In these cases—two of osteomyelitis and three of pneumonia—the results obtained have been as good as those which would have been anticipated had intramuscular penicillin been chosen for treatment.

A rational scheme of treatment of acute infection appears to be an initial intramuscular injection of 600,000 units of penicillin (Fletcher and Knappett, 1953) and 100,000 units of crystalline penicillin, with 300,000 units of penicillin orally, the treatment continuing thereafter only with oral penicillin. Such a scheme will produce reliable therapeutic penicillin levels and should be adequate to treat infection by penicillin-susceptible organisms. Abuse of this new penicillin preparation is likely to enhance the growing number of strains of penicillin-resistant bacteria, and it is hoped that the growing menace of penicillin-resistant staphylococci will not be unnecessarily increased by improper dosage or dose-spacing.

We are indebted to Messrs. John Wyeth, Ltd., London, for a plentiful supply of penicillin.

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COMBINED ORAL PENICILLIN AND SULPHADIMIDINE IN ACUTE MIDDLE-EAR INFECTIONS

BY

DAVID WHEATLEY, M.D.

Modern antibacterial drugs have revolutionized the treatment of acute otitis media, and the role of surgery in this condition is of rapidly diminishing importance. Before the discovery of antibiotics, sulphonamide administration was an established part of the therapy of this condition (Hall, 1948). Owing to the limitations imposed by toxicity upon the attainable blood sulphonamide level, and the diversity of the invading organisms, it is not surprising that sulphonamides alone are often unable to quell the infection.

The Literature

The commonest causal agents are *Staph. aureus* and *Str. haemolyticus*; consequently much better results follow the use of penicillin as the antibacterial agent (György *et al.*, 1946; Lierle and Paul, 1946; Robinson *et al.*, 1948; Jersild and Kiørboe, 1950). However, this still leaves the dangerous residue of insensitive Gram-negative bacilli, notably *Bact. coli* and *Proteus* strains, which are often present in varying numbers in a mixed infection. Elimination of the main infecting bacteria allows, and even stimulates, these fellow-travellers to multiply rapidly and restore the severity of the original disease condition.

Of the newer antibiotics, streptomycin carries with it a danger of vestibular damage and is unlikely to commend itself for the treatment of infections in the aural cavities. Chloramphenicol and aureomycin, with a wider antibacterial range, approach more closely to the ideal.

treatment of this condition. The cost of these antibiotics, however, is prohibitive; and, if used with penicillin, the superior bactericidal power of the latter might be prejudiced by their antagonistic action (Armstrong and Lerner, 1951). My personal impression of a very limited trial of chloramphenicol is that it is not quite so effective in a mixed infection as penicillin and a sulphonamide combined.

That such a combination results in a pronounced synergism between the two drugs has been repeatedly demonstrated in the laboratory (Bigger, 1944; Chain and Duthie, 1945; Kolmer, 1948). Further, this synergistic action extends to Gram-negative organisms such as *Bact. coli* and *Bact. typhosum* (Stewart, 1947; Thomas and Hayes, 1947; Bigger, 1950; El Borolossy and Buttle, 1950). The action of the sulphonamides in preventing destruction of penicillin by penicillinase (Cronheim and King, 1951) may be of importance when dealing with these latter organisms. On the clinical side there are very few reports of combined therapy with the two drugs, although Johnson *et al.* (1951) have described a synergistic action between oral penicillin, sulphadiazine, and sulphamerazine in the treatment of gonorrhoea. On the other hand, Nielsen and Sørtrup (1951) found no difference between combined therapy and therapy with either drug alone in the treatment of pneumonia. I can trace no records of similar treatment in acute otitis media, although Moffett and Dalton (1949) have successfully treated acute mastoiditis with penicillin and sulphadiazine. It is the purpose of this paper to describe a number of cases treated with sulphadimidine and penicillin, with particular emphasis on the oral route for the latter drug.

There can be no doubt that, when administered on an empty stomach, penicillin is well absorbed from the first part of the duodenum in a dosage some five times in excess of that by injection (Little and Lumb, 1945; Buchanan, 1946; Husson, 1947; Markowitz and Kuttner, 1947; Reisman *et al.*, 1947; Stewart and May, 1947; Cohlan *et al.*, 1948). Hypochlorhydria, occurring as a result of severe illness, contributes to this (Buchanan, 1946; Anderson and Landsman, 1947; Bicknell, 1951). The adequate clinical effect of oral therapy in serious illnesses such as pneumonia has been amply demonstrated (Bunn *et al.*, 1945; Finland *et al.*, 1945; Suchett-Kaye and Latter, 1947; Anderson and Landsman, 1947; Eadie *et al.*, 1951). Good results have also been claimed in ear, nose, and throat infections (Robinson *et al.*, 1948; Wheatley, 1951). Oral administration is of greater convenience in general practice, where most cases of acute otitis media are likely to be seen. As this infection most commonly occurs in children, the oral route is again particularly desirable. For combination with sulphonamides, too, it is convenient to administer both drugs together by mouth, at the same dosage intervals. After some trial I adopted an eight-hourly interval for the treatment of these cases. This is a schedule which others have found to be highly effective with oral penicillin in pneumonia and scarlet fever (Bunn *et al.*, 1950; Weinstein and Perrin, 1950). Bunn and his co-workers also treated some of their cases with 12-hourly dosage, as did Austrian *et al.* (1951). Results were comparable with those following parenteral therapy.

In treating the acute middle-ear infection, the ideal procedure is to institute chemotherapy before perforation of the tympanic membrane can occur; thereby spontaneous perforation or the need for paracentesis may be avoided. The latter procedure is a difficult one to perform in general practice, and I am not convinced of its absolute necessity. Simpson (Fleming, 1950), considering this question in relation to penicillin therapy, advises paracentesis after 24 hours if there is no improvement. He rightly stresses that the object of treatment is the preservation of the function of hearing, and points out that even a sterile collection of fluid in the middle-ear may lead to resultant adhesions, and a possible recurrence later. I personally feel that such a collection of fluid will naturally drain away via the Eustachian tube, without the need for paracentesis. However, in order to prevent the possibility of serious permanent disability chemotherapy must be prompt and adequate.

Results

The cases have been divided into two groups, classified as mild and severe. Mild cases were those in which there was little constitutional disturbance but inflammation and bulging of the tympanic membrane were present. Severe cases were those in which there was much pyrexia and pain, or in which perforation of the ear-drum had already occurred before they were seen. Most of the mild cases were treated with penicillin alone, sulphadimidine being held in reserve in case there was not a prompt response to treatment. The severe cases were treated mainly with combined penicillin and sulphadimidine from the onset. Chloramphenicol was substituted in three cases when the results of bacteriological examination showed an organism highly sensitive to this antibiotic. In these cases the response to combined therapy had not been as immediate as in the other cases in the series. The results are tabulated and compared with some earlier results obtained with sulphonamides alone and with parenteral penicillin. These cases do not include acute exacerbations occurring in chronic otitis media. The standard dose for adults was 0.375 g. (600,000 units) of penicillin plus 1 g. of sulphadimidine, eight-hourly by mouth; there was a proportionate reduction in amounts for children.

Comparison of Results

Treatment	Cases			Perforated Before Treatment	Perforated After Treatment	Recurrence in 3 Months	Chloramphenicol Substituted
	Mild	Severe	Total				
S.	3	4	7	3	Nil	3	Nil
Inj. P. . . .	8	9	17	8	2	1	"
Inj. P. and S. .	3	5	8	3	Nil	1	"
Oral P. . . .	23	6	29	6	Nil	Nil	1
Oral P. and S. .	4	28	32	13	"	1	2
Total	41	52	93*	33	2	6	3

S.=Sulphonamide. P.=Penicillin. * There were 2 separate attacks in 4 cases.

Bacteriology.—Swabs were taken from one-third of the 33 cases in which perforation had occurred before treatment was begun. The cultures gave the following results:

<i>Staph. aureus</i>	3 cases
" " and diphtheroids	1 case
" " " <i>Proteus</i>	"
" " " <i>Bact. coli</i>	"
<i>Bact. coli</i> , pneumococci, and <i>Staph. albus</i>	1 "
<i>Staph. albus</i> (48 hours after treatment)	1 "
<i>β Str. haemolyticus</i>	1 "
" " <i>Staph. albus</i> , and diphtheroids	1 "
Sterile	1 "

Late Results.—General practice offers some unique opportunities for follow-up of these cases, with particular reference to late effect on hearing. This is so because over the course of years many of these patients are seen from time to time for other ailments. About three-quarters of the cases described here have been thus observed for periods of one to three years. In none of these was there any residual hearing defect, as measured by their ability to hear the whispered voice at 15 feet (4.6 metres) with the affected ear alone. Where perforation had occurred healing took place in every instance. Sometimes a minute scar could be seen at the site of the perforation; but in many it was impossible to detect any evidence of the previous rupture of the membrane or of the original infection. The six cases in which there was a recurrence in three months resolved with further treatment. In four cases there were repeated but separate infections (often in the opposite ear). These also resolved with repeated treatment, and further attacks were prevented when infected tonsils and adenoids were removed.

Conclusions

The small numbers of cases treated with sulphonamides alone and with parenteral penicillin offer no basis for accurate comparison. However, they are useful in that they indicate that oral penicillin is no less effective than penicillin by injection. Of the seven cases treated with sulphonamides

alone there was a recurrence within three months in three. This was regarded as an unsatisfactory result. Although one case out of 32 treated with oral penicillin and sulphadimidine suffered a recurrence in three months, it must be borne in mind that this group included by far the greatest number of severe cases. The satisfactory end-results in 93 cases of acute otitis media treated with chemotherapy alone are held to obviate the necessity for surgical intervention. The results of bacteriological examination in 11 cases indicate that the majority of cases are probably due to infection with penicillin-sensitive organisms, but that non-sensitive bacteria, particularly *Bact. coli*, form an important minority. It is held that the co-administration of sulphonamides with penicillin will effectively deal with most of these infections. This is particularly important in those cases (the majority) in which perforation of the ear-drum has not occurred and, as a result, the nature of the invading micro-organism cannot be ascertained. In the occasional instance in which a more specific antibiotic is required, combined therapy will stay the infection until the result of bacteriological examination is known.

Summary

The role of chemotherapy in acute otitis media is discussed and the advantages of combining penicillin and a sulphonamide are outlined. The synergistic action of these two drugs and the desirability of co-administration in mixed infections is stressed. The literature on oral penicillin administration is surveyed, and it is concluded that this is an effective and convenient method of administering the antibiotic.

The results in 93 cases of acute middle-ear infection are described. Of these, 61 were treated with either oral penicillin alone or oral penicillin and sulphadimidine, according to severity. Out of 34 severe cases treated in this manner, perforation of the tympanic membrane had already occurred in 19 before treatment was begun. The results were uniformly good, with no permanent sequelae or after-impairment of hearing. Healing of the ear-drum occurred in all cases in which perforation had occurred. The bacteriology in 11 cases showed a preponderance of infection with *Staph. aureus* and *Str. haemolyticus*. However, the infection was usually a mixed one, with *Bact. coli* and *Proteus* as the usual co-invaders.

I wish to express my thanks to Dr. L. W. Cann, of Ashford County Hospital, for undertaking the bacteriological examinations.

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THE Q-T INTERVAL IN MYOCARDIAL INFARCTION

BY

ROEINTON B. KHAMBATTA, M.B., M.R.C.P.
M.R.C.P.Ed.

(From the Department of Cardiology, University of Manchester, and the Cardiac Department, Royal Infirmary, Manchester)

The Q-T interval of the electrocardiogram is measured from the beginning of the Q wave to the point where the T wave ends at the isoelectric line. It is an indication of the total time occupied by ventricular excitation and recovery. Recently, great interest has been evinced in this hitherto neglected feature of the electrocardiogram, and its variations have been reported in a variety of conditions.

A statement in a leading textbook of electrocardiology (Wolff, 1950) that "abnormal Q-T occurs regularly as a result of myocardial injury. If QRS is normal, the prolonged Q-T must signify a profound disturbance in the recovery process" aroused interest in this question, and, as a search of the literature of the subject was barren in its results, this particular study was embarked on.

Clinical Material and Methods

As this study was undertaken to evaluate the significance of the Q-T interval in myocardial infarction particularly, it was decided to rule out all possible variables. For this purpose all the normals which serve as controls were selected from the ages of 40 and above. It was also made absolutely certain that all the normals had no electrocardiographic abnormality. The group of cases of myocardial infarction selected was also carefully scrutinized to exclude any which showed any changes of rhythm, of ventricular hypertrophy, of bundle-branch block, or of hypertensive heart disease, or which demonstrated either erect or inverted U waves. Also, any patient who had had digitalis (Berliner, 1931) or who had been on a regime of mercurial diuretics was discarded.

A total of 600 normal tracings (400 males and 200 females) and 800 tracings of myocardial infarction were studied. All the tracings had been taken on the standard Cambridge string-galvanometer electrocardiogram, by the same individual, with the same standardization (1 mV=1 cm.). In the examination of each tracing a strict routine was adhered to, the tracings being examined under a powerful magnifying-glass. Any tracing which showed any abnormality in the shape or the duration of the QRS complex was discarded, as were also all tracings in which the end of the T wave was not clearly definable. Each Q-T interval was measured from the point at which the Q wave (in the absence of the Q wave, the R wave) left the isoelectric line to the point where the T wave after its excursion returned to the isoelectric line. Each R-R interval was measured from the peak of the R wave of one complex to the peak of the R wave of the next complex.

To calculate the Q-T and R-R intervals the following procedures were followed: (1) Any two Q-T and R-R intervals were measured in each of Leads II, aVF, V₂, and V₄, giving a total of eight separate values for both the Q-T and the R-R intervals. (2) The Q-T₀—Q-T interval corrected to the rate (Taran and Szilagyi, 1947) of each corresponding Q-T and R-R interval—was worked out as explained below. (3) The average of these eight Q-T₀'s was taken as the final Q-T₀ figure. This procedure was followed in each tracing throughout the 1,400 tracings studied.

Methods of Calculation of Q-T₀

Various formulae have been recommended from time to time for the correlation of the Q-T interval to the cardiac cycle. The one that is simplest and has stood the test in most studies on the Q-T interval is that formulated by Bazett (1920):

$$S = K \sqrt{C}, \text{ where } S = \text{systole} = (Q-T) \\ C = \text{cycle-length} = (R-R) \\ K = 0.37 \text{ second for males and } 0.40 \text{ second for females}$$

Taran and Szilagyi (1947) introduced a very important new conception—the Q-T₀—namely, the duration of the Q-T interval corrected for the cycle-length. By the use of this modification, Bazett's formula standardizes the Q-T interval to a heart rate of 60 a minute, or, in other words, to a cycle-length (R-R interval) of 1 second. Now, the formula can be expressed as:

$$Q-T_0 = \frac{Q-T}{\sqrt{R-R}}$$

To obviate tedious calculations involved by this formula, use was made of the slide-rule method (Fox *et al.*, 1950), based on Taran and Szilagyi's modification of Bazett's formula. After the first few calculations on the slide-rule, Kissin's nomogram (Kissin *et al.*, 1948) was used in conjunction with the slide-rule. This nomogram is based on Taran and Szilagyi's modification of Bazett's formula, and employs exactly the same principle as the slide-rule method. Since no differences were recorded in the use of either of these methods, after the first 200 readings, Kissin's nomogram was employed in all cases.

All figures obtained were statistically analysed by the formula $\sigma = \sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ and found to be admissible.

Results

The results of the normal electrocardiographic tracings of the 400 males and 200 females, divided into age groups, are shown in Table I. In both the normal males and females

TABLE I.—Q-T₀ Plotted Against Age for Normal Males and Females (Aged 40 and Over)

Age Group	No. of Cases		Mean Q-T ₀ in Seconds		Q-T ₀ Range in Seconds	
	Male	Female	Male	Female	Male	Female
40-49 ..	124	97	0.398	0.415	0.392-0.404	0.409-0.421
50-59 ..	163	54	0.397	0.404	0.392-0.402	0.399-0.409
60+ ..	113	49	0.388	0.400	0.379-0.397	0.391-0.409
Total ..	400	200	0.394	0.406	0.387-0.401	0.399-0.413

there seems to be an inverse relationship between age and the duration of Q-T₀, but when the χ^2 test was applied no significant difference was found. Sex, however, definitely

TABLE II.—Comparison of Q-T₀ in Seconds in Normal Subjects Obtained by Various Authors

Author	Males	Females	Average Q-T ₀
(1) Bazett (1920) ..	0.370	0.400	0.385
(2) Dock (1931) ..	0.3841	0.3890	0.3885
(3) Cheer (1930) ..	0.3743	0.3877	0.3810
(4) Taran and Szilagyi (1947)			0.3924
(5) Alimurung <i>et al.</i> (1950)	0.403	0.400	0.4015
(6) Krasnoff (1950) ..	0.392	0.406	0.399
(7) Present study ..	0.394	0.406	0.400

In studies (1), (2), (3), and (5) "K" is used instead of "Q-T₀."

seems to play a part, the average Q-T₀ for normal males being 0.394 second, with a range of 0.387 to 0.401 second; and the average for females 0.406 second, with a range of 0.399 to 0.413 second.

These "control" readings are compared with those obtained by other authors (Table II). It will be noticed that almost all the figures approximate one another closely. Moreover, if it is appreciated that the studies of Taran and Szilagyi and of Alimurung *et al.* contained only children, further proof is added to the statistical contention already stated that Q-T₀ has no correlation with age.

Q-T₀ in Cases of Myocardial Infarction

Eight hundred electrocardiographic tracings following myocardial infarction were studied (496 of males, 304 of females). The procedure used in measuring the Q-T₀ was exactly as already outlined. The Q-T₀'s in males and females were plotted against the localization of the infarct, and this is shown at various stages of the infarct—on the first day, at the end of the first week, at the end of the first month, at the end of the sixth month, at the end of a year, and at varying periods after a year. Tables III and IV demonstrate the changes taking place in males and females respectively.

TABLE III.—Average Q-T₀ at Various Periods After Myocardial Infarction in Males, Plotted Against Localization of Infarct

Localization of Infarct	No.	Average Q-T ₀ in Seconds					
		1st Day	1st Week	1st Month	6th Month	1st Year	1 Year+
Antero-lateral	238	0.425 (39)	0.485 (35)	0.475 (60)	0.460 (64)	0.443 (13)	0.413 (27)
Posterior	192	0.430 (32)	0.430 (36)	0.417 (52)	0.416 (33)	0.443 (20)	0.413 (19)
Antero-septal	66	0.431 (19)	0.427 (16)	0.415 (20)	0.411 (11)	—	—

The figures in parentheses show the total number of tracings in each group.

TABLE IV.—Average Q-T₀ at Various Periods After Myocardial Infarction in Females, Plotted Against Localization of Infarct

Localization of Infarct	No.	Average Q-T ₀ in Seconds					
		1st Day	1st Week	1st Month	6th Month	1st Year	1 Year+
Antero-lateral	112	0.414 (30)	0.460 (34)	0.434 (35)	0.430 (6)	0.421 (7)	—
Posterior	108	0.470 (32)	0.465 (24)	0.450 (24)	0.435 (9)	0.418 (11)	—
Antero-septal	84	0.474 (17)	0.466 (21)	0.431 (25)	0.424 (8)	0.414 (13)	—

The figures in parentheses show the total number of tracings in each group.

It will be noticed that exactly the same pattern is followed in both the sexes. In antero-lateral infarctions, after a preliminary rise of the Q-T₀ interval on the first day, there is a further maximal rise at the end of the first week, after which it gradually regresses, but fails to reach normal levels. In the posterior and antero-septal infarctions the maximal rise is seen on the first day, and then the Q-T₀ interval regresses, until after a year it is nearing normal limits. Hence it is evident that the localization of the infarct has no direct bearing on the Q-T₀, this particular interval being always prolonged in the acute stages and gradually tending to return to normality with the healing of the infarct.

TABLE V.—Average Q-T₀ in Males and Females at Various Periods After Infarction

Period of Time Elapsed After Infarction	Average Q-T ₀ in Seconds			
	Males		Females	
	No.	Q-T ₀	No.	Q-T ₀
1 day ..	90	0.425	79	0.423
1 week ..	87	0.438	87	0.482
1 month ..	132	0.450	84	0.470
6 months ..	108	0.440	23	0.454
1 year ..	33	0.424	31	0.423
1 year+ ..	46	0.474	—	—

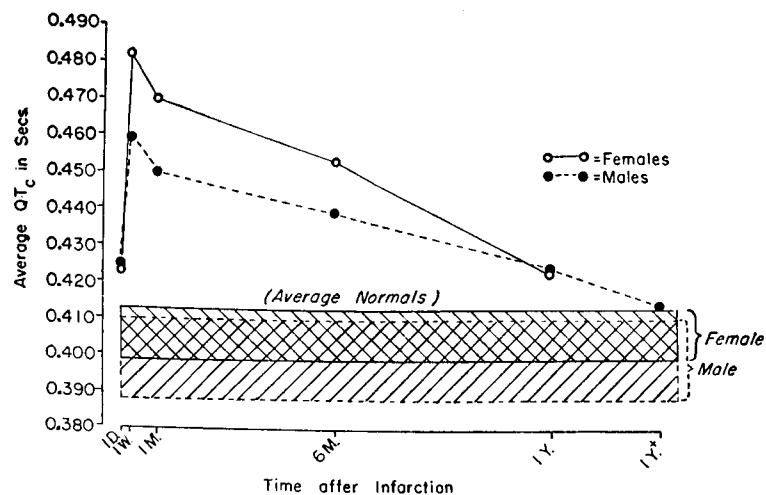


Chart showing average Q-T_c in males and females at various periods after infarction.

Since the localization of the infarct does not play a significant part, but the stage of the infarct does, it was decided to tabulate the Q-T_c's against the period of time elapsed after infarction, irrespective of the localization. This is shown in Table V and the Chart.

Discussion

The Q-T interval of the electrocardiogram represents the period of electrical systole of the heart. Katz (1921) suggested that measuring the duration of systole in diseased hearts compared with normal hearts would give a method of determining the functional integrity of the myocardium. White and Mudd (1929) pointed out that the Q-T interval is prolonged in paroxysmal tachycardia or disorders causing a marked widening of the QRS complex, but not in conditions associated with structural defects. Dock (1931) did not regard the Q-T interval as a satisfactory index of cardiac function, since only one-third of patients with failing hearts have electrical systoles longer than the maximum in normal subjects of the same sex and age. Moreover, he found that the duration of the Q-T interval in hypertensives with left ventricular enlargement without failure is the same as in those who are badly decompensated.

In 1939 Ashman disagreed with the above authors, and showed that measurement of the electrical systole gives valuable information regarding the degree to which the myocardium is affected in cases of diphtheria or acute rheumatic carditis. Taran and Szilagyi (1947) confirmed this in cases of acute rheumatic carditis, though their results are vigorously contested (Alimurung *et al.*, 1950). Similar prolongation of the Q-T interval has been noted in cases of hypotassaemia (Bellet and Dyer, 1937; Stewart *et al.*, 1940; Brown *et al.*, 1944; Currens and Crawford, 1950); and in cases of hypocalcaemia (Carter and Andrus, 1922; Kellogg and Kerr, 1936; Barker *et al.*, 1937).

Katz (1921), Robb and Turman (1947), and Horwitz and Graybiel (1948) have shown that many physiological factors such as cellular metabolism, sex, and position may influence the Q-T interval. Berliner (1931), Bayley (1942),

Savilahti (1945), and Krasnoff (1950) have shown that prolongation of the Q-T interval occurs in hypertension, bundle-branch block, ventricular hypertrophy, etc. (pathological cardiac states). Hence it may be taken as fairly certain that ischaemia and injury of the myocardium have a bearing on the duration of the Q-T interval.

As all these various factors may be playing a part, it is difficult to estimate the effects of one or many of these possible factors on the prolongation of the Q-T interval. However, this study definitely supports previous work of Krasnoff (1950) that the Q-T interval is prolonged in the early stages of myocardial infarction, and gradually diminishes until, after about one year, average normal levels are approached. There are good grounds for believing that the prolongation of the Q-T interval is directly related to the myocardial damage, though the immediate mechanism remains unknown.

A good correlation exists between these results and the findings of Mallory *et al.* (1939), which demonstrated the changes in the cardiac musculature following acute myocardial infarction. These results are summarized in Table VI. It will be seen that necrosis of the musculature starts on the first day, and reaches a maximum at one week, when there is maximum dead and dying muscle. At the end of a month granulation tissue is present, and clearance of the dead muscle is being effected, and collagen has started to be laid down—the earliest signs of repair. At the end of six months repair is fairly well advanced, and at the end of a year there is maximum deposition of collagen.

The Chart shows that the changes in the Q-T_c interval closely follow this pattern. Thus the Q-T_c interval increases on the first day, reaches its maximum at the end of a week, when cardiac damage is at a maximum, and then gradually recedes as the process of repair sets in.

Hence the Q-T_c interval may prove to be of use in estimating the duration of rest in bed, so that activity is indulged in only when a firm process of repair has set in.

Summary

The Q-T interval is dependent on the cardiac rate. The average normal Q-T_c was found to be 0.394 second, with a range of 0.387–0.401 second for males, and 0.406 second, with a range of 0.399–0.413 second for females. The Q-T interval has no relation to age. It was found to be prolonged in cases of acute myocardial infarction reaching a maximum at the end of the week, gradually approaching normal limits again after about one year. A definite correlation is shown between the length of the Q-T_c and pathological changes in cardiac musculature of cases of acute myocardial infarction. The Q-T_c bears no relation to the localization of the infarct.

The methods of selection of cases, the choice of the formula used, and the methods of measurement are described in detail.

TABLE VI.—Pathological Changes in Cardiac Muscle Following Myocardial Infarction in Relation to Time-interval (Modified from Mallory *et al.*, 1939)

Time Interval	Necrotic Muscle	Polymorphs	Blood Vessels and Connective Tissue	Removal of Fibres	Pigmented Macrophages	Eosinophils	Plasma Cells and Lymph	Collagen
1 day	++	+	0	0	0	0	0	0
1 week	++++	+++	++	+	+	+	+	+
1 month	+	0	++++	++	+++	+	++	+
6 months	0	0	++++	?	+	0	++	++
1 year+	0	0	++++	0	+	0	+	+++

The relation of the Q-T interval to various physical, chemical, and pathological states is discussed.

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CHLOROQUINE IN THE TREATMENT OF AMOEBIC LIVER ABSCESS

BY

J. C. PATEL, M.D., Ph.D., M.R.C.P.

Honorary Assistant Physician, King Edward Memorial Hospital, Bombay, and P.G. Singhanee Hindu Hospital, Bombay, India

The antimalarial action of the derivatives of the 4-aminoquinoline series was thoroughly established during the last war, and from among the series chloroquine (7-chloro-4-(4-diethylamino-1-methylbutylamino)-quinoline diphosphate) was found to be one of the most effective compounds, and to be of low toxicity. Observations revealed that the drug had a peculiar depot action, being stored in the liver in concentrations as high as 500 to 600 times the plasma level (Conan, 1948). This property of the drug, as well as its pronounced anti-plasmodial activity, led to the testing of its possible efficacy in protozoan infections other than those caused by malaria plasmodia. Tests carried out in England and America immediately after the war showed that it had a pronounced action in *Entamoeba histolytica* infections of the liver that were responsible for hepatic amoebiasis and liver abscesses. These experimental findings now seem to be generally confirmed by clinical trials.

Conan (1949) used chloroquine successfully in seven cases of amoebic hepatitis and found that it was an effective chemotherapeutic agent for the treatment of amoebic infections of the liver, being at least as effective as emetine but apparently without the latter's toxicity. In the same year Manson-Bahr (1949) reported his experience with chloroquine in a case of *E. histolytica* liver abscess in a very advanced stage, which could not

be influenced either by emetine or by streptomycin and penicillin. Fever and other symptoms persisted in spite of the latter. He then resorted to treatment with chloroquine and observed a prompt recession of the symptoms. The temperature was soon brought down to normal, and healing of the abscess was claimed after a fortnight's treatment. Similar results were reported by Murgatroyd and Kent (1948) in their case of liver abscess, which had proved very resistant to emetine, di-iodohydroxy quinoline, streptomycin, penicillin, and local emetine lavages. More comprehensive work on the subject has been reported by Harinasuta (1950, 1951), working in Siam, where hepatic amoebiasis is of frequent occurrence. In his first paper he reported nine cases of amoebic liver abscess (two with pulmonary complications) successfully treated with chloroquine. Later he made a comparative study of the action of chloroquine and emetine in amoebic liver abscesses, putting 45 cases on chloroquine treatment exclusively and an equal number of cases on emetine. In conclusion, Harinasuta remarked: "In comparison with emetine, chloroquine appeared to possess as much curative value in the treatment of amoebic liver abscess. It might be somewhat inferior on the point of relapse rate; but in other respects it had its own advantages—e.g., peroral administration, tolerability, and low toxicity in general—so that it might be employed even in cases in which emetine was contra-indicated." Among the side-effects of chloroquine Harinasuta listed nausea, vomiting, mild diarrhoea, transient pruritus, disturbance of ocular accommodation, and also a slight fall in the blood pressure. He noted, however, that these side-effects were usually mild and insignificant and only transitory in nature.

Among the publications by Indian research workers reference may be made to those of Sharma *et al.* (1951) and of Subramaniam (1951). The former reported on two cases of amoebic liver abscess from Bangalore which proved resistant to treatment with emetine, vitamin B-complex preparations, sulphonamides, and penicillin. At the time of chloroquine therapy the patients appeared to be so gravely ill that their chances of recovery seemed to be extremely small. The authors concluded: "Our impression was that the administration of chloroquine marked a turning-point in an otherwise downward course. Our cases are in line with the striking results by chloroquine reported by others, and the drug marks a definite advance in the treatment of amoebic hepatitis, especially cases with abscess formation." Subramaniam used chloroquine diphosphate only in four cases of amoebic hepatitis, but claimed good results with this exclusive treatment. He stated that in all cases the temperature subsided within 24 to 48 hours, there was a marked lessening of the pain, and the patient felt better.

Present Series

I have used chloroquine diphosphate ("resochin") in a series of 11 cases of amoebic liver abscess, and the results obtained seem to confirm the observations of others that this drug has advantages in the treatment of extra-intestinal infections with *E. histolytica*.

The patients were admitted to the King Edward Memorial Hospital or to the P.G. Singhanee Hindu Hospital, and were kept there throughout the course of treatment. They were asked to return if there were any symptoms suggesting relapse, and each was given a postcard to be filled in by a doctor treating him for the complaint. Each patient also received another card with particulars of the previous history and treatment given.

The diagnosis of amoebic liver abscess was based upon the history of the clinical signs and characters of the pus aspirated by liver puncture. One patient with enlarged tender liver, raised temperature, and leucocytosis was negative on aspiration; he was treated with chloroquine without success. Fluoroscopy was carried out to show the movement and elevation of the dome of the diaphragm and the condition of the lungs and pleura. In every case the blood was examined for evidence of leucocytosis and was repeated in some cases during the course of treatment. It was only after the diagnosis was established by aspiration of pus that treatment with chloroquine was instituted. Emetine was not given in any case. The dosage of chloroquine was one tablet (0.25-0.15 g. of base) twice a day, preferably after food, for a period of 10 to 12 days in the first six cases. After two of these cases had relapsed the length of treatment was increased to 30 days. The initial higher dosage advocated by Conan (1949) and used by most workers was not adopted because of the untoward reaction noticed in a case of amoebic hepatitis not included in the series. As Indians are of small size, the lower dosage was more likely to be tolerated, with fewer untoward reactions. The drug was given for a period of 30 days in a case of relapse. It was not administered by the parenteral route.

Eleven cases (nine male, two female) of amoebic liver abscess were treated during a period of two years. As there were rigid criteria for diagnosis, not all the cases of liver abscess were taken for study, particularly if there was any doubt about whether emetine had been given before or during hospital treatment. In some cases sulphadiazine and antibiotics were given for the lung and abdominal conditions. Details of the cases are shown in the Table.

Details of 11 Cases of Amoebic Liver Abscess

Case No.	Age	Sex	Result of Liver Aspiration	Stool Exam. for <i>E. histolytica</i>	Treatment Schedule		Day of Normal Temp.
					Daily Dose	Length of Treatment	
1	32	M	400 ml.	Neg.	0.5 g.	10 days	5th
2	45	M	200 "	"	0.5 "	12 "	2nd
3	29	M	50 "	"	0.5 "	12 "	3rd
4	46	F	50 "	Pos.	0.5 "	10 "	Died 3rd day
			50 "		0.5 "	2 "	
5	40	M	600 "	"	0.5 "	11 "	2nd
6	30	M	100 "	"	0.5 "	30 "	3rd
7	32	M	250 "	"	0.5 "	10 "	4th
8	37	M	200 "	Pos.	0.5 "	30 "	3rd
9	29	M	400 "	Neg.	0.5 "	30 "	2nd
10	36	F	50 "	"	0.5 "	30 "	3rd
11	44	M	300 "	"	0.5 "	30 "	3rd
			200 "	"	0.5 "	21 "	2nd

E. histolytica was found in the stools in two cases. The temperature subsided within 72 hours in most cases, and within 48 hours in five. In some cases in which the temperature was normal after aspiration of the abscess it did not rise after the drug was given. The patient felt better by the fourth day, and had an improved appetite. All patients gained weight—as much as 20 lb. (9 kg.) in a month in one case. A lessening of liver tenderness was the first sign of improvement, and the lower margin of the liver soon disappeared from below the costal margin. The leucocytosis subsided in about a week in those cases in which examinations were made. No attempt was made to measure any changes in blood pressure, as observed by Harinasuta (1950, 1951), but no overt effects of a lowered blood pressure were noticed. Apart from mild nausea in two cases and dimness of vision in one, toxic symptoms of the drug were not recorded. Nausea, gastro-intestinal irritation, itching, and changes in accommodation in the eyes were noted in one case (not included here) when the initial dose was double that used in this series.

Relapses

Two patients were readmitted with recrudescence of the disease, one of them three months and the other four

months after treatment with chloroquine for 10 days. In both cases pus was again aspirated. One of them (Case 4) died two days after the second admission, before chloroquine had any chance of action. This patient had a pulmonary complication. Case 5 was again treated with chloroquine, 0.5 g. a day for four weeks, with complete success.

Harinasuta (1951) had 10 relapses in a series of 45 cases which responded to further chloroquine treatment—a relapse rate of 22.2%. They occurred after a two-weeks or a three-weeks course of treatment. In the present small series the relapse rate was two in six (33.3%) after 10 to 12 days' treatment at a lower initial dosage. Harinasuta observed a definite refractoriness to a single course of chloroquine in two patients, both of whom died. Similar drug-resistance has been recorded with emetine.

Discussion

Conan (1949) advocated a three-weeks course of treatment, and subsequent workers have more or less followed the same course with satisfactory results. More than one-fifth of Harinasuta's (1951) cases required a second course of treatment, as did two of the first six cases in the present series. Relapses occur also with emetine and require further treatment. In order to avoid relapse the period of treatment in the remaining cases was increased to 30 days—longer than that advocated by Conan. From published work it seems obvious that the drug has a definite curative action on amoebic liver abscess, and it is the impression of most workers, including myself, that it acts more quickly than emetine and without the latter's harmful effects. It can be given when the general condition of the patient is poor and when emetine would be contraindicated and even harmful. Unlike emetine, it has no general toxic action and can be given orally. The dosage and the length of treatment so far used by most workers, even though satisfactory in most cases, needs evaluation by further clinical trials.

Relapses occur more often with smaller doses of shorter duration. They occurred even with the dosage advocated by Conan. Harinasuta (1951) had to use as many as five three-weeks courses in one case. From this it is obvious that the dosage advocated by Conan should be increased in length to four or even six weeks, as the drug can be taken by mouth and has no major untoward effects on the body. Conan's three-weeks course may be adequate for amoebic hepatitis, but not in all cases of abscess. In the present series cases of abscess and not of hepatitis were treated, as the value of the drug in the treatment of undoubted cases of liver complication of amoebiasis had to be established.

Extended clinical trials with a good follow-up should be undertaken in order to evaluate the length of treatment with chloroquine in cases of abscess. At present the drug is not readily obtainable, but when it is freely available and cheaper such a trial would be possible. Harinasuta (1951) advocated a combined treatment with emetine. I consider, in the light of present available knowledge, that a prolonged course of treatment is all that is necessary. A therapeutic trial with chloroquine can safely be carried out in cases of liver enlargement in which diagnosis is doubtful, and liver abscess can be easily excluded by such a trial, without any of the harmful toxic actions which accompany emetine therapy.

Summary

Eleven cases of amoebic liver abscess, three with pulmonary complications, were treated with chloroquine diphosphate with very good results. The dosage was 0.5 g. a day. It was found that treatment for 10 to 12 days was adequate in four out of six cases: two relapsed, but responded to further treatment. In the remaining cases the drug was given for 30 days. One patient died during a relapse. It is suggested that further work

should be carried out in order to determine the dosage of the drug required and the length of its administration in the treatment of the abscess. Minor toxic symptoms were observed. The drug can be safely used as a therapeutic test if diagnosis is doubtful.

My grateful thanks are due to the Dean of the King Edward Memorial Hospital and to the Honorary Director of the P.G. Singhanee Hindu Hospital for facilities, and to Dr. A. G. Brooke, of Chowgule and Co. (Hind) Ltd., for a free supply of the drug.

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“DANGEROUS RECIPIENTS” OF TRANSFUSION INCOMPATIBLE REACTIONS AFTER TRANSFUSION OF GROUP O Rh-NEGATIVE BLOOD

BY

GEOFFREY H. TOVEY, M.D.

Director South-west Regional Blood Transfusion Service

C. P. WARREN, M.B., B.S., D.C.P.

Consultant Pathologist and Area Transfusion Officer,
Torquay Sub-Area

AND

EILEEN E. WOOD, M.R.C.S.

Haematologist and Area Transfusion Officer, West Cornwall
Clinical Area

The following case reports are placed on record to re-emphasize that Group O Rh-negative blood is not free of potentially dangerous blood-group factors, and that inexperienced medical staff are not suitable persons to undertake the matching of blood for transfusion.

Case 1

A multiparous woman aged 26, known to be Group O Rh-positive, was delivered of her third baby by elective caesarean section. Because of haemorrhage during the operation a transfusion of 2 pints (1,140 ml.) of blood became necessary, and the house-surgeon “matched” two bottles of Group O Rh-positive blood against the patient's serum by a saline slide technique. No incompatibility was detected, but on the day after the transfusion the patient was noticed to be “slightly jaundiced.” The baby also had developed a definite jaundice within a few hours of birth, but since the mother was Rh-positive and the baby's haemoglobin was 140% (20.7 g. per 100 ml.) the possibility that the mother's serum contained irregular blood-group antibodies was not considered.

Seven days later the mother's general condition was unsatisfactory and her haemoglobin 35% (5.2 g. per 100 ml.). Transfusion of a further 2 pints (1,140 ml.) of blood was therefore prescribed, and on this occasion the house-surgeon selected and matched 2 pints (1,140 ml.) of Group O Rh-negative blood, presumably as a safeguard against a haemolytic transfusion reaction. No incompatibility was detected, but the transfusion was discontinued after 1½ pints (850 ml.)

had been transfused because the patient had developed a severe rigor. During the next 48 hours she had jaundice and oliguria. Although her haemoglobin remained at 35% (5.2 g. per 100 ml.) she refused any further transfusion and made a gradual recovery to normal health during the next six to eight weeks.

Laboratory investigations showed the patient's blood to be Group O Rh-positive, Rh genotype cDe/cDe, and that the transfused Rh-negative cells had undergone haemolysis. Immune antibodies, type anti-e + anti-C, were demonstrable in the patient's serum to a titre of 256 with homozygous e-positive red cells (Rh-negative cells, cde/cde) suspended in saline and in albumin. The titre against heterozygous cells (R₁R₂cDe/cDe) was 64.

Inquiry into the patient's previous history revealed that she had been transfused with 4 pints (2,270 ml.) of blood (Rh group unknown) at her first pregnancy seven years before, because of a severe accidental haemorrhage, and was subsequently delivered of a stillborn macerated foetus. Her second pregnancy, three years later, had resulted in the delivery of a healthy female child who had shown “a slight jaundice” shortly after birth, but whose subsequent progress was uneventful. The third baby, the outcome of the pregnancy under discussion, was subsequently found to be Group A, R₁R₂ (cDe/cDe); a direct antiglobulin (Coombs) test on its red cells was positive, and by the twenty-ninth day of life its haemoglobin had dropped to 42% (6.2 g. per 100 ml.). After a transfusion of Group O blood of genotype cDe/cDe it made a satisfactory recovery.

Case 2

A woman who had had two normal children received an emergency blood transfusion (group unknown) during an air raid in 1941. Later she had one normal full-term child and then two miscarriages, each being a six-months foetus. At the age of 42 she was admitted to hospital because of menorrhagia. After a few days in hospital she had a sudden haemorrhage at night, and a resident house-surgeon transfused a pint (570 ml.) of Group O Rh-negative blood in emergency and without previous direct matching. At the same time another member of the resident medical staff “matched” a further bottle of Group O Rh-negative blood for her by a slide technique, but transfusion of this blood was found not to be necessary. Nine days later it was decided to transfuse this “matched” blood so that the patient might be made fit for curettage. She developed a rigor at the conclusion of this transfusion, followed by jaundice, haemoglobinuria, and oliguria for the next seven days.

Serological investigations demonstrated the patient to be Group O Rh-positive, Rh genotype cDe/cDe. Immune antibodies of the type anti-c + anti-E were demonstrable in the post-transfusion sample of her blood to a titre of 32 in saline and 256 in albumin against homozygous c-positive cells (Rh-negative cells, cde/cde), and 2-4 in saline and 16-32 in albumin against heterozygous c-positive cells (R₁R₂cDe/cDe). The patient's post-transfusion sample contained no Rh-negative cells, thus confirming that the blood transfused was incompatible.

Comments

Both these patients nearly lost their lives, and both suffered severe renal damage, because of the transfusion of Group O Rh-negative blood. Fortunately, although Rh-negative corpuscles contain the Rh antigens c, d, and e, and may contain other antigens such as Kell, Fya, and S, which are known to have been the cause of similar haemolytic transfusion reactions, few patients requiring transfusion possess the corresponding antibodies, anti-c, anti-e, anti-Kell, etc., in their plasma. In consequence incompatible transfusions from this cause remain a rarity. The fact, however, that immune antibodies of this type may be present in the circulation of certain patients, even on rare occasions, constitutes a challenge, and, by a more thorough applica-

tion of knowledge already well established regarding the hazards of transfusion therapy, accidents from this cause need not arise.

In neither of these instances was the transfusion of whole blood so pressing that advantage could not have been taken of existing laboratory facilities for blood-matching by trained laboratory staff. These cases serve as a reminder that this must be done whenever circumstances permit if the best service is to be given to the patient. As soon as plasma prepared during the war years was found to carry a risk approaching 10% of inducing hepatitis in the recipient, preliminary plasma transfusion whilst the matching of blood was being undertaken, or as the sole emergency transfusion for cases of moderate haemorrhage, wisely fell into disrepute. Now that the transfusion of "small-pool" plasma carries little greater risk of transferring the hepatitis virus than does a transfusion of whole blood, and, alternatively, satisfactory plasma substitutes, dextran and polyvinylpyrrolidone, are available, we believe with Discombe (1952) that greater use should be made of such fluids for the avoidance of incompatible transfusions.

Immune antibodies active against transfused corpuscles of the patient's own ABO group are particularly likely to be present in the circulation of recipients who have had jaundiced or stillborn babies, or who have reacted adversely with a rigor, jaundice, or haemoglobinuria to a previous blood transfusion. Even in a dire emergency, where the transfusion of unmatched whole blood may seem entirely warranted, strenuous efforts should be made to have blood specially matched against the patient's serum when there is a history suggesting the presence of immune antibodies. It is such patients that one of us (Tovey, 1950) has proposed should be termed "dangerous recipients," and in each of the above cases the patient's history would have placed her in this category.

Dangerous recipients run a particular risk in that if they are Rh-positive the immune antibodies they have developed may well be of the type anti-c or anti-e, and thus active against Rh-negative corpuscles (cde/cde). Or, should the recipient be Rh-negative with Rh antibodies (anti-D) in her serum, an Rh D-positive bottle of blood which has been misgrouped or mislabelled "Rh-negative" may give rise to a serious haemolytic transfusion reaction. Moreover, in some instances incompatibility from immune antibodies can be detected *in vitro* only by methods of direct matching which are too complicated to employ as a routine, such as an indirect antiglobulin technique or a titration procedure using bovine albumin. It is important, therefore, that clinicians obtain a history of the outcome of previous pregnancies or transfusions from any patient about to be transfused. Should the history indicate the patient to be a dangerous recipient, blood should not be transfused until it has been matched by the special procedures mentioned. Whenever possible, the danger in the event of an emergency transfusion should be anticipated, and as soon as it is known that a patient has given birth to a jaundiced or stillborn baby or has suffered a serious reaction to transfusion a full serological examination should be carried out to determine whether immune antibodies are present, and, if so, their exact type.

In neither of the above patients, although their histories indicated the need, had such serological investigations been made before the transfusion accidents. Although Gunz (1946) drew attention to the need for a standard history sheet to accompany every request for transfusion, and such a sheet has been employed by regional transfusion centres for the past six years, many hospitals are still not taking this precaution as a routine for their cases for transfusion.

Case 2 further illustrates that, although a patient may be transfused without serious reaction with blood of a certain ABO and Rh group, this does not mean that a later transfusion of blood of the same ABO and Rh group will be similarly unaccompanied by reaction. It is important to bear in mind that the transfusion of blood can result in

the stimulation of dangerous antibodies, and any further blood for transfusion should invariably be matched on a freshly taken sample of the recipient's serum if more than 48 hours have elapsed since a previous transfusion.

We are grateful to Dr. M. Gillespie and Dr. J. S. Campbell, of the South-west Regional Transfusion Service, and to Dr. A. E. Mourant and Dr. D. Parkin, of the M.R.C. Blood Group Reference Laboratory, for help with the serological investigations.

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SENSITIVITY OF AUTONOMIC GANGLIA TO HEXAMETHONIUM IN HYPERTENSION

BY

JAMES CONWAY, M.B.

Senior Lecturer in Physiology, Charing Cross Hospital
Medical School

The introduction of hexamethonium bromide (H.M.B.) by Paton and Zaimis (1949, 1951) as a substance which blocks the transmission of nervous impulses across the synapses of autonomic ganglia presented a potentially valuable therapeutic means of controlling hypertension. The specificity of its action on autonomic ganglia makes it also a most valuable tool in the study of the autonomic nervous system, and this property is used here to study the underlying mechanisms producing hypertension. Repeated doses of hexamethonium bromide or bitartrate* are given intravenously, and the following points are observed:

- (1) the sensitivity of the blood pressure to depression by autonomic blockade;
- (2) the level to which the diastolic blood pressure may be depressed; and
- (3) the dose required to affect the pupillary light reflex.

The first indicates the state of activity of the autonomic ganglia controlling blood vessels, and incidentally the suitability of patients for treatment. The second gives the minimal diastolic pressure which is used to differentiate various types of hypertension. This term is used in the sense defined by Frew and Rosenheim (1949), as the pressure maintained by the inherent tone of the blood vessels and circulating pressor substances, and corresponds to the term blood pressure "floor" of Ferris *et al.* (1948). Both of these authors used tetraethylammonium bromide (T.E.A.B.) to block autonomic ganglia.

Material

Tests were performed on patients who had been in hospital for at least seven days, and in one-third of the cases repeated tests were performed to establish the reliability of the method. The admission of patients to hospital was made for the investigation and treatment of hypertension or renal disease, and was quite independent of the present study. Cases with heart failure, extreme renal failure, or a history of recent thromboses were excluded.

The clinical diagnosis of essential hypertension was made after exclusion of other causes. Renal hypertension was assumed to be present if evidence could be obtained of

*All doses are expressed as those of the dibromide salt. Messrs. May and Baker kindly gave supplies of the bitartrate used in this investigation.

previous renal disease or associated toxæmia of pregnancy. In all cases a standard amylobarbitone sedation test (White, 1944) was performed, and in a quarter of the cases a test using T.E.A.B. was performed.

Methods

After a single injection of H.M.B. the effect on the blood pressure is found to be maximal within five minutes; repeated injections give a progressively diminishing effect. To minimize the effect of the biological variation in sensitivity to drugs a number of repeated doses were given in preference to a single standard dose. After a single injection it is also found that there is a transient overswing in the fall of pressure which exaggerates the fall in blood pressure particularly when larger doses are used. All blood-pressure readings are taken by the same person, using the auscultatory method and the diastolic pressure taken at the fifth phase—that is, as all sound disappears. This is necessary because the fourth phase often disappears when the blood pressure falls. Attention is paid to the diastolic pressure, as this gives more constant responses and the end-point can easily be defined, whereas the systolic pressure is more variable and sometimes shows a progressive fall in pressure.

The Test.—The procedure outlined gives reliable results and is free from complications. The patients, after being told precisely what is going to be done, are placed in quiet surroundings lying *absolutely flat* except for one pillow under the head for comfort. Blood pressures are taken every ten minutes until a resting level is established, when the first injection of 10 mg. of H.M.B. is given intravenously and pressures are read at three-minute intervals for 15 minutes. Thereafter injections of 25 mg. are made at 15-minute intervals until the maintained reduction in diastolic pressure does not exceed that of the previous dose by more than 8 mm. Hg. This is usually achieved by doses of 35–60 mg.—that is, second or third injections. The dose producing 75% of the fall in diastolic pressure is recorded as the *effective hypotensive dose*. If the blood pressure does not respond to a dose of 35 mg. it will not do so to larger doses. This was demonstrated by the additional doses it was necessary to give in order to block the ciliary ganglion. The dose at which the response of the pupils to light is slight and unsustained is recorded as the *effective pupillary dose*. When large doses (exceeding 85 mg.) are given there is sometimes a secondary slight fall in blood pressure. This is not closely related to the injections, and is partly accounted for by the onset of somnolence and the prolonged immobilization of the patient. For this reason, blood-pressure readings are taken at half-hourly intervals after the completion of the test until an upward trend of pressure is established. The results of some earlier tests in which there were minor variations in procedure have been used.

Precautions.—Mild fainting sometimes occurs when the first, and rarely the second, dose produces a profound and

rapid fall in pressure. This is readily overcome by raising the foot of the bed. No patient has lost consciousness, and it has not been necessary to give pressor drugs. On three occasions when the blood pressure fell considerably after both the first and the second injection it was thought prudent to stop the test, although the patients did not complain of ill effects. Postural hypotension persists for a variable time after the test, and patients are not allowed out of bed or to sit upright in bed until the following morning.

In spite of a considerable reduction in blood pressure in some patients there has been no evidence of thrombosis occurring during the period of hypotension or afterwards. No symptoms due to the paralysis of other organs under the control of the autonomic nervous system were encountered.

Results

A total of 69 tests have been performed on 46 patients with hypertension, and in addition tests were carried out on a control series of 12 patients suffering from minor surgical disorders. According to the responses of the diastolic pressure to the test, the hypertensives can be divided into three groups (see Table).

Group A.—Eighteen patients in whom there was an appreciable fall of diastolic pressure (exceeding 14 mm. Hg.) to 90 mm. Hg or below. The mean fall in diastolic pressure was 28 mm. Hg (range 16–58) and the mean minimal diastolic pressure was 82 mm. Hg with a mean effective hypotensive dose of 25.8 mg. of H.M.B.

Group B.—Nine patients in whom the fall in diastolic pressure was at least 14 mm. Hg but remained above 90 mm. Hg. The mean fall was 28 mm. Hg (range 16–48) and the mean minimal diastolic pressure 104 mm. Hg with a mean effective dose of 37.7 mg. of H.M.B.

Group C.—Nineteen patients in whom the pressure remained within 14 mm. Hg of the initial level. To exclude the possibility that variations in sensitivity might account for the absence of response, repeated doses were continued in this group until an average dose of 110 mg. had been given. At these doses there was sometimes the slight fall in pressure already described, and this has been disregarded.

Throughout the entire series the reduction in the blood pressure was not related to the initial systolic, diastolic, or pulse pressures (Fig. 1). The initial resting blood pressures recorded show that the pulse pressure is related to the diastolic pressure and not to the age of the patient. The degree of response to the test was not determined by the clinical severity, as is illustrated by Fig. 2, in which the results of two similar cases are recorded. Group A contained the greatest proportion of cases of uncomplicated essential hypertension, while the nine cases of Group B appear to be more severe.

The average age in Group A was 53.1 years (only four being below 50 years) and in Group C it was 35.6 years.

Data of Controls and of Hypertensive Patients Divided into Three Groups According to Responses to Tests with Hexamethonium Bromide

	No. of Cases	Mean Age	Sex	Clinical Type of Hypertension	Mean Initial Blood Pressure	Mean Minimal Diastolic Pressure	Mean Fall in Diastolic Pressure	Mean Effective Dose	
								B.P.	Pupils
Controls	12	46.1 yrs. (s.d. 14.0)	M 4 F 8	None	118/64 mm. Hg	60 mm. Hg	4 mm. Hg		77 mg.
Group A	18	53.1 yrs. (s.d. 7.2)	M 5 F 13	Essential 13 Malignant essential 1 Renal 3 Malignant renal 1	186/110 " "	82 " "	28 " " (s.d. 11.1)	25.8 mg	76.7 "
Group B	9	43.6 yrs. (s.d. 10.3)	M 6 F 3	Essential 2 Malignant essential 5 Renal 1 Malignant renal 1	206/132 " "	104 " "	28 " " (s.d. 8.2)	37.7 "	83 " "
Group C	19	35.6 yrs. (s.d. 11.6)	M 9 F 10	Essential 10 Malignant essential 3 Renal 2 Malignant renal 3 Coarct. aorta 1	188/112 " "	107 " "	5 " "		82.6 "

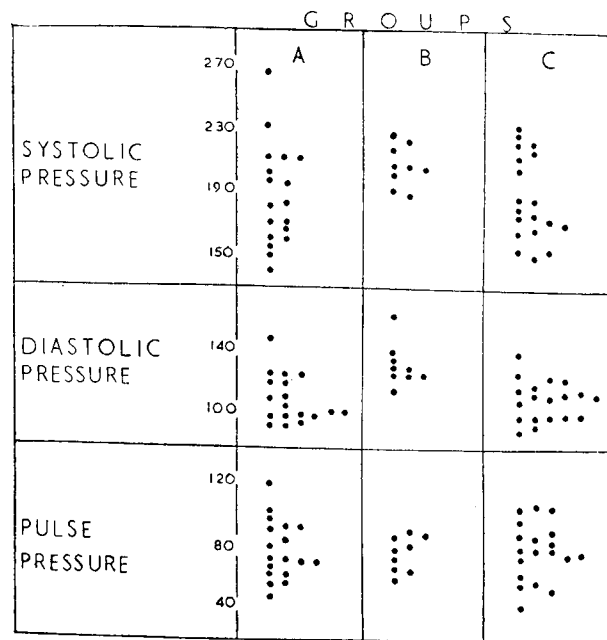


Fig. 1.—Initial status of 46 patients with hypertension, divided according to their responses to tests with hexamethonium. Group A—fall in diastolic pressure exceeds 14 mm. Hg and reduces it to 90 mm. Hg or below. Group B—fall in diastolic pressure at least 14 mm. Hg but remains above 90 mm. Hg. Group C—fall in diastolic pressure is less than 14 mm. Hg.

This difference was highly significant ($P < 0.001$), and was still valid when all cases of renal hypertension were excluded and essential hypertension was considered alone. The sensitivity of the blood pressure was not associated with that of the pupils. The effective pupillary dose in all groups was approximately the same (76.7–83 mg.).

Controls.—The control series of 12 patients showed an insignificant fall in diastolic pressure. There were no differences in the response of older and younger subjects. The average age of the group was 46.1 years. The effective pupillary dose was approximately the same as that of the hypertensive patients.

Repeatability.—To establish the value of the test 15 patients were given two or more tests, and in these the minimal diastolic pressure remained within 10 mm. Hg. Five patients had repeated tests over a period exceeding 12 months, the minimal diastolic pressure remaining at the same level in all except one, in whom it rose as the clinical state deteriorated. The effect of treatment with H.M.B. is found in general to follow that of the tests, a response being obtained in the blood pressure of patients in Groups A and B, but not in Group C. Prolonged treatment, however, with hexamethonium, or by sympathectomy, has not been found to affect the minimal diastolic pressure. In one patient, however, a strict rice diet which had been maintained for

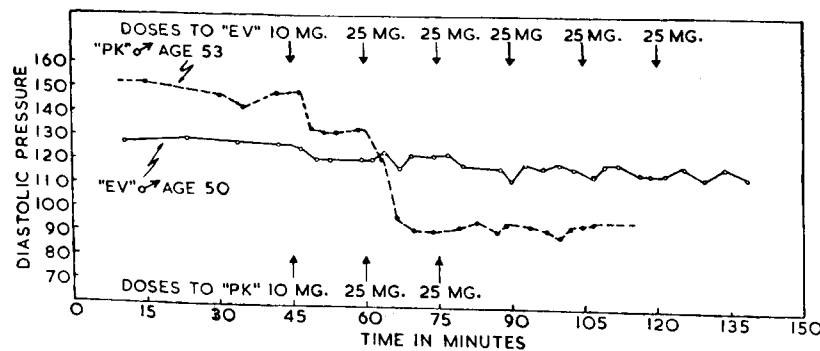


Fig. 2.—Response to hexamethonium test of two clinically similar patients, EV and PK, with malignant hypertension.

two months had a considerable effect on the minimal diastolic pressure, reducing it from 88 to 64 mm. Hg. A similar effect has been reported by Stead *et al.* (1948) using T.E.A.B.

Discussion

Hypertension is a single physical sign of what is known to be a large group of diseases. The separation of these from one another is sometimes difficult because the raised blood pressure itself in time produces changes, particularly in the arteries, and treatment is usually required for these effects of the raised pressure and not for the cause. The test described offers a method of identification of those cases of hypertension in which the nervous system plays an important part. It is only by the separation of types that order can be introduced into this bewildering subject.

The appreciation of the part played by nervous factors in elevation of the blood pressure has been maintained in spite of evidence to the contrary (Pickering, 1936; Prinzmetal and Wilson, 1936), from the study of the variability of the blood pressure (Ayman, 1931; Alam and Smirk, 1943) and its response to rest in bed (Watkin *et al.*, 1950) and sedatives (Cady *et al.*, 1936). More recently this has been reinforced by the markedly depressor response sometimes obtained to drugs which block the activity of the autonomic nervous system—T.E.A.B. (Lyons *et al.*, 1948; Frisk *et al.*, 1948) and more recently hexamethonium. This drug, like T.E.A.B., reduces the blood pressure by causing arteriolar dilatation and has little effect on the cardiac output in the recumbent subject (Gilmore *et al.*, 1952). Evidence of the overactivity of sympathetic ganglia controlling the blood vessels is demonstrated by their marked sensitivity to blockade in contrast with the ciliary ganglion. The main effect on the blood pressure is achieved by a small dose (10–35 mg.) before transmission through the sympathetic ganglia is completely blocked, and at approximately one-third of the dose required to paralyse the pupils. Response to hexamethonium is therefore similar to experimental neurogenic hypertension, which is the only type of experimental hypertension responding to autonomic blockade by T.E.A.B. (Page, 1949; Page and McCubbin, 1951).

As the degree of vasoconstriction is represented by the fall in blood pressure it is inevitably somewhat exaggerated in these tests, since the neurogenic component is always removed at the highest initial pressure. The same degree of vasodilatation at a lower initial pressure would give a smaller reduction in pressure. Nevertheless a great fall in pressure, particularly if it then comes within the normal range, must indicate that the nervous system is the dominant though not necessarily the only aetiological factor.

The responses in clinically similar cases were found to be quite unpredictable, as there was no correlation with the signs by which the severity is assessed, and each group contained both mild and severe cases. The depression of blood pressure was compared with that of amylobarbitone sedation, and in 12 patients it was also compared with the response to T.E.A.B. Although the trend of the three tests was often the same, there were considerable quantitative differences between them, and each test would have resulted in a somewhat different classification in this series. There is likewise a broad correlation between results of the H.M.B. test and those of Frew and Rosenheim (1949) using T.E.A.B., and also of Frisk *et al.* (1948) and Lyons *et al.* (1948), with the difference that Frisk *et al.* and Lyons *et al.* both report a correlation between the response and the initial level of diastolic blood pressure.

The variability of the minimal pressure in a particular patient reported by Levinson *et al.* (1948) and Ferris *et al.*

(1948) using T.E.A.B. was not found. Stability of the minimal diastolic pressure suggests the relative independence of the nervous and humoral factors in hypertension. The striking difference in the ages of Groups A and C is the only factor with which the response to H.M.B. could be correlated, and it suggests the separation of elderly hypertensives into a distinct aetiological group.

Collateral evidence for this is found in the well-known differences in mortality of hypertension below and above 50 years (Bechgaard, 1946; Burgess, 1948), particularly as the incidence of hypertension increases so strikingly with age, rising from 5% in young adults to 30–40% after the age of 40, and thereafter increasing progressively with age (Master *et al.*, 1943). In contrast to the severity and frequency of changes in the renal arteries of young hypertensives, in elderly hypertensives the lesions have been shown to be mild, and only a little more severe than those seen in subjects of the same age without hypertension (Perera and Krane, 1951).

In the group which failed to respond to hexamethonium it is clear that the autonomic nervous system can play little part in the elevation of the blood pressure at rest, and in this they behave in the same way as experimental renal hypertension. It is concluded that the absence of a response in the case of coarctation of the aorta is evidence that a humoral mechanism is present in this condition.

The evolution of early labile hypertension into a sustained humoral one is not supported by the present findings, but the reverse seems possible. Subjects in the intermediate Group B and those with renal hypertension in Group A may tentatively be said to have had a nervous mechanism superimposed upon a humoral one.

Summary

Hexamethonium was used to investigate a group of 46 cases of hypertension. It was given in repeated doses to produce the maximal fall in diastolic pressure. The results show that the neurogenic component is present in elderly hypertensives and is very uncommon below the age of 50 years.

I acknowledge the co-operation of the staff of Charing Cross Hospital, Drs. R. A. Hickling, K. Shirley Smith, and E. C. Warner, who allowed me access to their cases of hypertension, and to Mr. E. A. Crook and Mr. L. A. Broster for allowing certain of their cases to act as controls. I also thank Dr. A. A. Osman for facilities to investigate cases of hypertension at the Renal Unit, Pembury Hospital, Kent, and Mr. K. Browne for checking the statistical material.

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TERRAMYCIN IN THE TREATMENT OF ACUTE OTITIS MEDIA IN CHILDREN

BY

STUART MAWSON, F.R.C.S.

Surgeon to the Ear, Nose, and Throat Department, King's College Hospital and the Belgrave Hospital for Children

J. D. GRAY, M.D.

Pathologist, the Belgrave Hospital for Children

AND

A. B. HEWLETT, M.R.C.S., L.R.C.P.

Clinical Assistant, the Ear, Nose, and Throat Department, King's College Hospital and the Belgrave Hospital for Children

It is generally agreed that procaine penicillin, in single daily injections of not less than 300,000 units, is the most reliable means of controlling acute otitis media in children with a minimum degree of supervision. Larger doses of crystalline penicillin at more frequent intervals increase the margin of certainty. Oral penicillin and sulphonamides are less reliable, but they offer advantages of administration which favour their use in certain cases. Lewis *et al.* (1952) assessed the value of chloramphenicol and aureomycin in this disease, but concluded that they were unsuitable for domiciliary treatment because, although as effective as penicillin against the organisms commonly found in acute otitis media, some children took such a strong aversion to them that it was impossible to maintain an adequate dosage.

With the advent of terramycin it was decided to review the position, as this compound appeared to offer certain advantages that might answer the need for an oral antibiotic effective in this disease. Terramycin has a wide range of antibacterial activity, and so far has been reported free from toxicity. It is reasonably stable in flavoured solutions, not unduly bitter to the taste, and can also be given in the form of sugar-coated tablets or capsules. In the absence of any published studies of the action of terramycin in otitis media and of an exact precedent for dosage, a clinical trial was made using 50 mg. of terramycin per kg. of body weight per twenty-four hours, against a control series of cases receiving penicillin.

Method

A two-page form was prepared, the first page containing the history, results of examination, type of treatment, and notes on the bacteriological investigation. The second page showed the patient's name only and a summary of daily progress. When a case of acute otitis media was accepted the necessary parts of the form were completed and the pages separated; the first was retained in the laboratory and the second in the out-patient folder. This was to ensure that the clinical observers (S. M. and A. B. H.), who saw each case from the second day onwards, had no knowledge of which antibiotic was being used for treatment and could therefore rely on the impartiality of their judgment.

All cases were first seen by the same casualty officer, well experienced in the recognition of the disease, who allocated the cases to their respective antibiotic in strict alternation. Myringotomy was performed, regardless of

antibiotic, if it was considered necessary to relieve tension. Penicillin was given in the form of "distaquaine," 1.2 ml. daily for five days; this contains 100,000 units of crystalline penicillin and 300,000 units of procaine penicillin. Terramycin was administered orally for five days in the form of a flavoured elixir, tablet, or capsule—the mode depending on the age of the patient. The daily dose was 50 mg. per kg. body weight split into three portions, one being given after each main meal. Five days was regarded as the minimum safe period of administration, for each antibiotic, to be reasonably certain of avoiding an unextinguished disease due to bacterial "persisters."

Results

Clinical.—The Table shows the effect of the terramycin treatment of acute otitis media in children in comparison with treatment with procaine penicillin. It will be seen

The Effect of Terramycin Compared with that of Procaine Penicillin in the Treatment of Acute Otitis Media in Children

Treatment Groups	Distaquaine (F)	Terramycin
No. of cases	33	35
" ears affected	42	44
" unilateral cases	24	26
" bilateral cases	9	9
Average days' duration before seen	2.6	4.0
Drums intact	34	30
" perforated	8	14
Myringotomy required	16	9
Average days for:		
Relief of—		
Pain	1.4	1.4
Discharge	2.2	3.5
Ear to return to normal—		
Ear discharge, surgical or spontaneous	8.6	8.6
Ear never discharged	7.0	5.7
Failures	4	4
Mastoidectomies	0	0

that the results are comparable, the apparent failure rate—four cases in each series—being the same. On analysing the incidence of acute otitis media in childhood in relation to age in the 68 cases it was found that it was highest in the 6-year-old group. The Chart demonstrates the age/incidence relationship. It suggests that during the first school

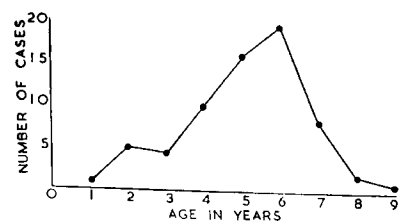


Chart showing incidence of acute otitis media in relation to age.

year exposure of the child to an alteration in its usual bacterial environment plays a part in the causation of this disease. The cases were equally divided between the sexes.

Bacteriological.

Two media were used, blood-agar and blood-crystal-violet agar plates, the second to suppress *Staphylococcus aureus* in order that any underlying haemolytic streptococci could be isolated. Meatal swabs taken as close as possible to the drum were inoculated on each medium.

No. of sterile swabs in presence of an intact inflamed drum	21
No. of swabs giving growth in presence of an intact inflamed drum	9
Coagulase-negative <i>Staph. albus</i>	4
Diphtheroids	1
Coagulase-positive <i>Staph. aureus</i> (1 penicillin-resistant)	4
No. of swabs giving growth in presence of a perforated drum or after myringotomy	29
Haem. strep. in pure culture	14
Coagulase-positive <i>Staph. aureus</i>	7
Haem. strep. and <i>Staph. aureus</i> mixed	5
<i>H. influenzae</i>	2
<i>Str. pneumoniae</i>	1
(1 strain of <i>H. influenzae</i> isolated was insensitive to penicillin)	

All organisms isolated were tested for sensitivity to both antibiotics using the A.C.P. (1952) disk method. With the exceptions given above, all pathogens were sensitive to terramycin and penicillin.

Penicillin Failures

Case 1.—On the third day of treatment for otitis media of the left ear, acute disease set in on the other, healthy, side, and bilateral myringotomy became necessary. The course of penicillin therapy had to be extended to 10 days before the infection was brought under control.

Case 2.—This case was one of unilateral otitis, for which myringotomy was required. Haemolytic streptococci in pure culture were isolated from the exudate. Two days after the completion of treatment there was a recurrence in both ears, followed by perforation of the drums. A five-day course of terramycin was given, with return of the middle ear to normal.

Case 3.—This was a case of right otitis media with an intact drum. Five days after apparent satisfactory response to penicillin, otitis media recurred; this responded well to a course of terramycin.

Case 4.—Bilateral otitis media with perforated drums and a discharge from which haemolytic streptococci were isolated in pure culture. After five days' treatment there was still a copious discharge from the left ear (no growth obtained on culture). Terramycin therapy was then started, and led to a dry left middle ear with a small healing perforation.

Terramycin Failures

Failure in Cases A and B was due to refusal of the patient to take the antibiotic in any form, the refusals being apparently based on childish antipathy to "medicine."

Case C.—A case of unilateral otitis media requiring myringotomy. Three days after completing the terramycin course bilateral relapse occurred. *Staph. aureus* was recovered from the primary and relapse exudates. This organism was only moderately sensitive to terramycin, but was highly sensitive to penicillin. Substitution of the latter antibiotic gave satisfactory clinical response.

Case D.—A case of unilateral otitis media with a perforated drum and copious discharge from which haemolytic streptococci in pure culture were isolated, equally sensitive to terramycin and penicillin. After two days' terramycin treatment the discharge was sterile and showed signs of abatement. Fourteen days after completion of the antibiotic course there was a recurrence of exudate through the unhealed perforation. A course of penicillin then resulted in cessation of discharge in six days.

Discussion

Of the four failures in the penicillin-treated cases, three responded to terramycin. In the terramycin series, if the two which refused medicine are discounted, the balance of favour indicated by an assessment of the failures rests with terramycin. In all other respects there is little to choose between the antibiotics. We have experienced no real difficulty in administration, nor have we encountered unwelcome side-effects. Terramycin should thus prove a satisfactory antibiotic for domiciliary use, particularly in treating nervous, frightened children whose reaction to a hypodermic needle leaves one exhausted and dismayed at the future prospects, and in those cases in which daily attendance by a doctor or nurse is difficult or impracticable.

Summary

A clinical trial of terramycin in the treatment of acute otitis media in children is reported.

The results indicate that this antibiotic, at a dose of 50 mg. per kg. daily for five days, compares favourably with intramuscular procaine penicillin daily for the same period.

No real difficulty was encountered in the administration of terramycin. Toxic effects were not observed.

We are indebted to Dr. Ivor Marsh, late casualty officer, Belgrave Hospital for Children, for his interest and enthusiasm; to the Medical Research Council Antibiotic Clinical Trials (Non-tuberculous Conditions) Committee; and to Dr. R. K. Phillips, of Pfizer, Ltd., for supplies of terramycin.

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Medical Memoranda

Familial Cystinuria

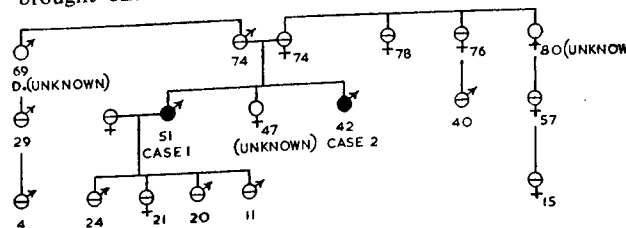
Cystinuria is an inborn error of metabolism in which the amino-acid cystine, together with lysine and arginine, is excreted in greatly increased quantity in the urine. There is also evidence that some cystine is excreted as a labile precursor of unknown composition which liberates cystine on standing. (In the absence of calculi, cystinuria is a symptomless condition.) The output of cystine is not increased by feeding this amino-acid, as it is excreted as a sulphate. However, if cysteine or methionine is fed there is an increased output of cystine. High-protein diets would therefore seem inadvisable. The factors responsible for keeping cystine in solution in the urine are not yet known, but calculus formation does not seem to be directly related to the concentration of cystine in the urine. It has been reported that solution of stones will take place if the urine is kept at a pH of 7.5 by administration of sodium citrate.

The occurrence of cystinuria in families has recently been reviewed by Dent and Harris (1951). In addition to the 11 families reported in the literature they have collected a further 11. As a result of their study they have put forward the view that cystinuria occurs in three types of case: (1) in the Fanconi syndrome, associated with many other amino-acids; (2) in Wilson's disease (hepato-lenticular degeneration); and (3) "classical" cystinuria, the type considered here, in which there is also an increased excretion of lysine and arginine: several of the cases of this type in the literature were, in their opinion, examples of the Fanconi syndrome.

In the past the detection of cystinuria depended mainly on the recognition of the typical hexagonal crystals of cystine in the urine or on the qualitative cyanide nitroprusside test. Lewis (1932) examined the urine of 10,534 students by the cyanide-nitroprusside test and found an increased quantity of cystine to be present in 1 in 600. It seems likely that the use of the newer and more sensitive methods of chromatography and polarography will bring more cases to light.

FAMILY HISTORY

The family reported here was discovered initially through the finding of cystine crystals in the urine of one member. Subsequent examination of the urine of all available members of the family by the cyanide-nitroprusside test and the methods of paper chromatography and polarography brought one further case to light.



The family tree, showing ages of members and presence or absence of cystine in the urine.

Case 1.—A retired coach-driver aged 51 was operated on for removal of bladder stones at the ages of 6, 14, and 25 years. He had a right nephrectomy for "staghorn" calculus in 1943. He was admitted to St. Mary's Hospital in January, 1951, for treatment of cardiac failure following myocardial infarction in May, 1948. On routine treatment he complained of a burning pain on micturition. Microscopical examination of the urine revealed cystine crystals. The cyanide-nitroprusside test was positive and paper chromatography showed an increased excretion of cystine, lysine, and arginine. An x-ray picture of the bladder showed two stones.

Case 2.—A younger brother (aged 42) of Case 1. There is no history of renal or cystic calculus. His only symptoms are those due to a peptic ulcer. Paper chromatography showed the same abnormal pattern of amino-acid excretion as in Case 1.

In both these cases polarographic studies (Reed, 1942) suggested that the output of cystine was about 0.5 g. a day. The range of output in normal persons is 40–80 mg. in 24 hours. In cystinurics the range has been given as 0.4–1.8 g. in 24 hours.

The investigations of Dent and Harris tend to show that classical cystinuria is inherited through a simple recessive factor or is a heterozygous condition with irregular manifestation. The family history reported here would fall into either of these forms of inheritance.

I am indebted to Dr. J. W. Litchfield for permission to publish this case report, and to Dr. H. Harris and Professor F. L. Warren for examining the urine by chromatography and polarography at University College, London.

P. O. WILLIAMS, M.B., M.R.C.P.

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Blackwater Fever Treated with Cortisone

CASE REPORT

A Yoruba boy aged 19 months suddenly became ill at 11 a.m. on August 25, with a high fever, and was given an injection of quinine before admission to hospital the same day. He had been quite well, apart from having attacks of fever at varying intervals since birth, for which he had always received quinine. This treatment had apparently terminated the fever rapidly on each occasion.

On admission he was in a collapsed condition; his temperature was 104° F. (40° C.), his pulse 140 and of a poor volume, but he appeared to be well nourished. The mucous membranes were very pale and no icterus was noticed at the time. The heart was apparently normal. In the lungs scattered sibilant wheezes were audible. The spleen was palpable three fingerbreadths below the costal margin, and the edge of the liver was just palpable. At 11.30 a.m. he passed 10 ml. of almost jet-black viscid urine, and methaemoglobin was demonstrated spectroscopically. The haemoglobin was 4.8 g.%, and a blood film showed large numbers of *Plasmodium falciparum* trophozoites. On August 26 he appeared to be moribund. The conjunctivae were icteric, and his general condition had deteriorated. By 3.45 p.m. only 1 oz. (28 ml.) of black urine had been passed since the last specimen was collected at 11.30 a.m. on the previous day.

Cortisone, 100 mg., was given intramuscularly, and at 8 a.m. on August 27 there was a noticeable clinical improvement: the child sat up and ate; his temperature was 97.2° F. (36.2° C.), and his pulse 94. He had taken 70 oz. (2 litres) of fluid in the past 24 hours and was known to have excreted 8½ oz. (240 ml.) although he had been incontinent since 3.45 p.m. on August 26. The first three specimens following the injection of cortisone were dark, but were lighter than previous specimens, and the next three

specimens appeared normal in colour. Cortisone, 100 mg., was again given intramuscularly. This was followed by a dose of 50 mg. on August 28 and 29. On the 30th he was sitting up; the conjunctivae were icteric, and there was slight oedema of the feet and face. No further cortisone was given.

The urinary output on August 28, 29, and 30 was about 20 oz. (570 ml.) a day, and some urine was voided into the bed; it contained no methaemoglobin. The anaemia was treated with iron, and the malaria from the outset with mepacrine. The child made an uneventful recovery and was discharged.

COMMENT

It is suspected that blackwater fever is a haemolytic disease occurring in those infected with *P. falciparum* and whose cells have been sensitized by quinine. As cortisone lowers the sensitivity of body tissues in certain allergic states (Carey *et al.*, 1950), it was given in the hope that it might reduce the sensitivity of the cells to the circulating haemolysin and relieve the renal cortical ischaemia responsible for the anuria.

Although the clinical state of cases of blackwater fever is known to alter rapidly, it was felt that the condition of this child on the second day was such that a fatal outcome was inevitable. Cortisone seemed to have had an effect in this case.

J. C. LINLEY-ADAMS, M.R.C.P.

From the London School of Hygiene and Tropical Medicine, and University College, Ibadan, Nigeria.

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Carey, R. A., Harvey, A. M., Howard, J. E., and Wagley, P. F. (1950). *Bull. Johns Hopk. Hosp.*, 87, 354.

Advantages of a Perineal Curve Applied to Midwifery Forceps

The first patterns of midwifery forceps—those of Chamberlen in the seventeenth century and of Edmund Chapman (1733) and William Giffard (1734)—were short and straight. William Smellie (1752) recommended the short straight forceps for general use, and he it was who discovered, to his great delight, how this instrument could be used for rotating the head in occipito-posterior presentations. Nevertheless, it was Smellie, too, who lengthened the forceps and added the pelvic curve in order to reach the head higher up in the pelvis—an invention also claimed for André Levret (1751) and Benjamin Pugh (1754). The pelvic curve was also an outstanding feature of the *mains de fer* designed by Palfyn in 1720. In the course of time the long curved forceps has supplanted the straight forceps for general use.

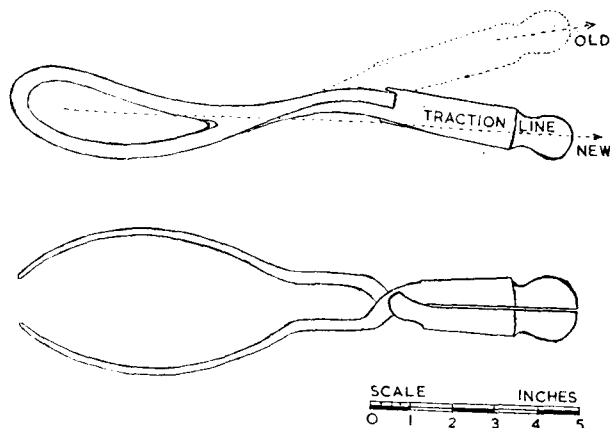
It was soon discovered that there were several disadvantages in the pelvic curve, notably the fact that traction on the handles is inefficient, as the direction of force is not in the axis of the birth canal. Many attempts to overcome this difficulty were made, and it was finally solved by Tarnier in 1877 with the axis-traction forceps. By the time axis traction became definitely established the necessity for the high forceps operation had vanished with the introduction of the relatively safe forms of caesarean operation in use to-day. The principle of axis traction still holds, but the patterns of forceps in general use are unnecessarily heavy and powerful for the low forceps operation, and many obstetricians have abandoned their use. Furthermore, with the long forceps with the pelvic curve, whether with axis-traction rods or without, it is not possible to obtain a good cephalic application when the head, in mid-pelvis or higher, lies in the transverse position. Severe lacerations of the birth canal have followed attempts to use the long curved forceps to rotate the head in this position, and most obstetricians in this country condemn the practice.

As long ago as 1769 R. Wallace Johnson, realizing some of the disadvantages of the long curved forceps, endeavoured

to overcome them by bending back the shanks in a perineal curve, thus bringing the handles more into line with the axis of the blades. This was the first of many attempts to obtain axis traction without the use of additional apparatus. The well-known forceps designed by Kielland (1916) also has a perineal curve for the same purpose, and solves most of the problems of applying forceps to cases of deep transverse arrest, but it has not yet become very popular, probably because of certain other features which require a special technique to be practised if this instrument is to be used as Kielland intended.

During the winter of 1949–50 I had an old forceps of the Ramsbottom type replated, and took the opportunity of getting the shanks bent back at an angle of about 30 degrees, close to the lock (see Diagram). I have used this instrument now for nearly three years, and have found that the alteration exceeded my expectations in making the forceps more efficient and handy. A line drawn through the ends of the handles and passing through the centre of the fenestrae almost exactly corresponds in direction with a line drawn in the same way but passing through the traction crossbar of the Barnes–Neville axis-traction forceps I used formerly. The curve of the instrument as seen from the side very closely corresponds with the curve of the Kielland forceps.

I claim that the addition of a perineal curve in this way gives the following advantages over the ordinary long forceps: (1) It provides axis traction for all low forceps deliveries without the addition of any traction rods, and nearly as efficiently as that provided by the Barnes–Neville forceps. (2) It can be more easily applied to the foetal head in transverse positions, giving a proper cephalic grip. It could be used for rotating the head in much the same way as the Kielland forceps is used, though I have not yet tried it. (3) It is more convenient than the normal type for use on the aftercoming head in breech presentations, as the handles are bent away from the body of the child in the same way as those of Piper's forceps (Piper and Bachman, 1929). (4) It is an ideal instrument for the general practitioner, as it is more versatile and more convenient to carry.



I claim no originality in this instrument, the idea being nearly two centuries old. Peterson (1952) has described a very similar forceps, which he has used for over 100 deliveries with complete satisfaction, and claims much the same advantages for it. It is my view that a special instrument is not necessary, and that it will suffice to give a perineal curve to any standard instrument, such as Simpson's or Anderson's.

WALTER RADCLIFFE, M.B.

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Reviews

A REFUGEE DOCTOR IN ELIZABETHAN LONDON

Hamey the Stranger. By John J. Keevil. (Pp. 192. 21s.) Geoffrey Bles, London. 1952.

There were two Baldwin Hameys: the father—the “stranger”—that is, the alien (1568–1640)—and the son, the “Englishman” (1600–1676). Dr. Keevil has devoted a second volume to the son, who is remembered as a very successful practitioner and particularly as a generous benefactor of the Royal College of Physicians of London. The “stranger” attained no eminence and made little or no impact on the medicine of his day. He would hardly obtain mention in even the most detailed history of medicine, and was, professionally, no more than a reasonably successful and rather unreasonably conservative London practitioner.

And yet Hamey the stranger was well worthy of this memorial. It has been said that the true inner history of any life, however drab and ordinary it may seem, if properly told can be a topic of the most absorbing interest. But the life of Hamey the stranger, though outwardly undistinguished, was very far from being drab or ordinary. Dr. Keevil has told it with allusive charm. He has discovered many documents by or referring to the Hameys at the library of the Royal College of Physicians and, more unexpectedly, in the library of the University of Leyden. Nearly all of these papers are in Latin or Dutch, and their reading and translation was itself no mean task. But the secret of Dr. Keevil's power to arrest the reader's attention lies especially in his skilful use of the contemporary background as the setting of biography.

Hamey was born in Bruges of a family with Protestant sympathies. They suffered much from the acts of that monster of cruelty, the Duke of Alva (1508–83), in command of the Spanish forces that for years ravaged the Low Countries. In the terror which followed the year of Hamey's birth tens of thousands of innocent people were wantonly slaughtered by Alva's troops. Hamey's parents became refugees. They settled in Leyden, and Baldwin became a student in 1584 at its newly founded university. He was admirably taught by the eminent anatomist Pieter Paaw (1564–1617), himself a pupil of Geronimo Fabrizio, Harvey's master, and by Jan Heurnius (1543–1601), an excellent and learned physician who stood for the simpler Hippocratic medicine against the pretentious Galenism fashionable at the time. Hamey was a devoted correspondent of Heurnius and of his son after him. Much of Dr. Keevil's material is drawn from Hamey's letters to these two.

In 1594, being now 26 and having failed to obtain a suitable post in Holland, Hamey accepted, on the urging of Heurnius, the position of personal physician to the Tsar of Russia. He set out for Moscow by the only practicable route, that via Archangel. Much of the interest of Dr. Keevil's book is the description, largely from the Hamey papers, of the conditions in Moscow in the years 1594–7, the domestic and foreign relationships of the reigning house, and the palace intrigues within the Kremlin. He detested the ignorance and bigotry, the suspicion and treachery, the squalor and cruelty and filth that were daily before his eyes. It was not long before he sought a way of escape, but that was by no means easy. Ultimately he obtained permission to go to Archangel to meet his affianced bride, who had ventured to follow him across the sea. The two escaped and sailed for London, where they settled in a house in the Tower ward of the City, from which Hamey practised.

The rest of the life of Hamey the stranger is the story of a refugee slowly and surely adapting himself to the conditions of the country of his adoption, but not without

humiliation and opposition. At that time the Royal College of Physicians had the exclusive right of licensing any practitioner of medicine in and around London. Hamey had much difficulty in obtaining the licence, and was several times rejected by that body on grounds which seem now trivial, unfair, and quite unrelated to his professional competence. His ultimate success was substantial but in no way remarkable. The things that were remarkable about the man are, first, his firm and honest character, admirably backed by an able and devoted wife; secondly, the picture that he has left of the life of a refugee in Elizabethan and Jacobean London; thirdly, his Russian experiences; and, last and by no means least, the picture that he presents of the actual conditions of day-to-day practice. Very few practitioners have left such a record, and the history of medicine would be the richer for more. It is a moving story excellently told.

CHARLES SINGER.

RADIOTHERAPY FOR STUDENTS

X-ray and Radium Therapy for Students. By Basil A. Stoll, F.F.R., D.M.R.(Lond.), D.M.R.T.&D.(Eng.). Foreword by Frank Ellis, M.D., M.Sc., F.F.R. (Pp. 206. 17s. 6d.) London: H. K. Lewis and Co. 1952.

In his preface the author states that this book is intended as a guide to the place of x rays and radium in medical and surgical practice and that its concise format should make it of value to a wide field of students, postgraduate and undergraduate. It is certainly concise in that the diagnosis, pathology, and treatment—surgical and medical—of almost the whole field of malignant disease as well as of some other pathological conditions are discussed in a book of pocket size of 206 pages. But it seems doubtful if the book will serve as a useful guide to the place of radiotherapy in practice, and it may be misleading to students. Its conciseness does not allow of discrimination between the numerous facts and opinions set down. A useful list of references is appended.

B. W. WINDEYER.

DETECTING LIES

The Instrumental Detection of Deception: The Lie Test. By Clarence D. Lee. (Pp. 249. £2 7s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

This book, written by an American police detective, shows again how the spirit of man can be attacked by mechanistic approaches. The lie detector depends on the fact that alterations of blood pressure, respiration, and pulse rate are greater in most normal persons when questions involving personal guilt are put to them. Psychiatrists and psychologists know there are many exceptions to this generalization: one false positive response quoted in this book was due to a suspect under examination seeing a girl start to undress and sunbathe through the police station window. And the author realizes that such tests alone would hardly stand up to critical examination in a court of law, although important information can be obtained.

The purpose of these methods becomes clearer, however, when it is frankly admitted that their real value in the hands of the American police who use them is to enable more confessions to be extracted from frightened and guilty people. If a suspect can only be convinced of the supposed infallibility of the test he can be more easily broken down. In 80% of cases giving positive results confessions were, in fact, extracted afterwards, and a description is given of how these confessions are best obtained from the victims. Even if the test is negative, the police may sometimes pretend it is positive in order to get a confession.

The history of “scientific” examination of religious or criminal suspects throughout the ages shows many general fallacies inherent in such methods. In the olden days examiners, and even the accused, came to believe in skin tests for witches, which we now know were merely the

physical stigma of hysteria often brought on by the tension of the examination itself. One would like to know more about experiments made in those wrongly persuaded of their guilt in a preliminary "grilling" and whether subsequent tests might not become positive by suggestion. Behind the Iron Curtain it is as wrong for the examiner to accept knowingly a false confession as it is in the U.S.A. But fear-provoking methods can also affect the judgment of all concerned in such work, and absurd confessions may come to be genuinely believed. There is no conclusive evidence that the lie detector eliminates this risk in an atmosphere so emotionally charged that the electric chair is often the issue at stake.

A chapter is devoted to the suggested use of the method as a deterrent in department stores, banks, industry, and the investigation of insurance claims. The author rightly points out that most people would be more careful if they knew the test was to be given as a routine. The reviewer was just beginning to think the whole question was hardly "cricket" by British standards, when a London insurance firm was stated in an American magazine article to be willing to reduce premiums for American banks where the entire staff was tested for dishonesty in the first year, and at least one-third of them each succeeding year. We hope this is not really true, or we shall soon find it happening here as we increasingly copy American business methods. Streamlined models might even be provided for hospital gate porters under the N.H.S. to stop the staff from pilfering.

WILLIAM SARGANT.

OPHTHALMIC PATHOLOGY

Ophthalmic Pathology: An Atlas and Textbook. By Jonas S. Friedenwald et al.; with the editorial assistance of Helen Knight Steward. (Pp. 489; 240 illustrations. £4 10s.) Published under the joint sponsorship of the American Academy of Ophthalmology and Otolaryngology and the Armed Forces Institute of Pathology. Philadelphia and London: W. B. Saunders Company. 1952.

A book on ophthalmic pathology running to 477 pages larger than quarto is an event in ophthalmic literature. Sponsored as it is by the American Academy of Ophthalmology and Otolaryngology and the Institute of Pathology of the U.S. Forces, expectation runs high. It carries, in fact, not only the authority of the two sponsoring organizations, but also that of two previous publications, for it is based on the *Atlas of Ophthalmic Pathology*, first published in 1938 by the Ophthalmic Registry of the American Forces, and the *Pathology of the Eye* brought out by Friedenwald in 1930. The dual origin of the present volume is also apparent in the format in which it now appears, for half the book is taken up by plates—contributed by Helenor C. Wilder (who was also responsible for the illustrations in Friedenwald's book)—while the text is devoted to general discussions rather than to histological descriptions. The preface by Dr. W. L. Benedict indicates that, though many authors have contributed to the book, Friedenwald and Maumenee are mainly responsible, and it would appear that its preparation began in 1945.

The text itself follows the usual mixed anatomical and aetiological classifications, but contains in addition lucid chapters on anatomy, physiology, histology, and senescence of the eye in relation to pathological lesions. Clinical discussions are introduced here and there, and these are not always relevant or illuminating. While the text is generally competent, the bulk of the chapters on congenital and developmental anomalies, and the heredo-familial and degenerative diseases, are disappointing; they even include such monstrosities as "atavism." The illustrations—some 1,000 figures on 240 plates—are well chosen and beautifully reproduced. In themselves they fully justify publication of the book, but the legends are open to criticism. In the original atlas full case reports were given; here they have been replaced by more useful short descriptions, but occasionally there is little more than a heading without any explanation

of the details shown. It is also unfortunate that the text appears to have been written without any relevance to these excellent illustrations, so that the volume is in fact two books bound under one cover. It is to be hoped that the next edition will be a happier synthesis, even if drastic revision of the text is necessary with more emphasis on histopathology, for the book could be a landmark in ophthalmic literature.

ARNOLD SORSBY.

CONSTRUCTIVE MEDICINE

Man and Epidemics. By C.-E. A. Winslow. (Pp. 246. £1 5s.) Princeton, New Jersey: Princeton University Press. London: Geoffrey Cumberlege. 1952.

Do you have a son of years enough to be lured towards medicine? Be you student health worker, family doctor, consultant, or of epidemiological persuasion, this book will stir the mind and warm the heart. Some readers, finding pleasure in half-forgotten fact, will pause to wonder that works written for the non-expert can be so much more expertly informative than erudite expositions. Others, perhaps for the first time, will evaluate their contribution to past events and to those events which are in the making. All will be led towards a reasoned perfecting of medical principle and practice. Be warned that, once begun, this book will not be laid aside.

For 50 years Dr. Winslow has been engaged in preventive medicine, or, as he prefers to call it, constructive medicine. Now he is professor emeritus of public health at Yale, and one is grateful not only for his long and continuing contribution to medicine but also for his years of receptiveness in humility and with humanity. His chapters are on such things as the history of disease concepts, water supply, milk, sewage, food hygiene, and insects in relation to disease. To the cynic these may be the subjects of old-time public health, subjects made strangely less worthy by their passing into common acceptance and usage. It is from the past, however, and from these subjects, that Dr. Winslow, with drama, logic, and perfect lucidity, develops and poses a concept for the future. The reader is informed in the preface that Dr. Winslow may follow this volume with other works on preventive medicine. May they be indeed forthcoming.

J. M. MACKINTOSH.

STUDY OF TWINS

Studio dei Gemelli (The Study of Twins). By Luigi Gedda. Preface by Professor Cesare Frugoni. (Pp. 1,381; 548 figures. 15,000 lire.) Rome: Edizioni Orizzonte Medico. 1951.

A monograph covering the biological and other aspects of twinning in creatures ranging from plants to man is something for which there is an unquestionable demand. This book is an attempt to satisfy it. Two chapters are on twins in art, legend, history, and science. The excellent reproductions of paintings and sculpture, from Etruscan times to the present, and quotations from Plautus to Aldous Huxley enrich these most illuminating chapters. A chapter on comparative "gemellology" gives the layman a broad outlook on how complex is the problem of twinning and how useful twins may be as a tool in research. The bulk of the text is on twinning in man—incidence, causation, genetics, and embryology, twin pregnancy, and the anatomy, physiology, pathology, and psychology of twins. A full chapter summarizes the original work of the author on the similarity of glutathione levels in the blood of twins and their rhythmical variation. The significance of this contribution is not easy to assess on the basis of the data supplied.

The book is illustrated by a wealth of photographs and excellent colour plates, which accounts for its price. It is a pity that shortcomings of presentation and of critical selection, together with a lack of conciseness, reduce the value of the book considerably, the compilation of which must have required a large amount of work.

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ORAL PENICILLIN

When penicillin is given by the mouth only a proportion of the dose, varying from about one-quarter to one-tenth, is absorbed, and various antacids, capsules, tablets, oils, and other devices to protect it against destruction by gastric acid increase this proportion little if at all. Moreover, the amount absorbed varies inexplicably from one person to another, and even in the same person at different times. It is thus not surprising that oral administration is often condemned—except in young children, for whom it has obvious special advantages—as both extravagant and unreliable. It nevertheless has its advocates. Binns,¹ reviewing the literature of the subject, concludes that oral penicillin in four-hourly doses of 400,000 units before meals should be satisfactory for fully sensitive coccal infections. Like all others who have reached such a conclusion, he qualifies it by recommending an initial intramuscular dose for seriously ill patients and by restricting such treatment to patients whose life is not in danger. Oral administration is also considered inadvisable for syphilis, deep-seated suppuration and osteomyelitis, bacterial endocarditis, and any infection due to an organism less sensitive than a pneumococcus, haemolytic streptococcus, or gonococcus. Elsewhere in this issue (p. 806) Dr. David Wheatley reports encouraging results in acute infections of the middle ear with combined oral penicillin and sulphadimidine.

The only insuperable objection to oral penicillin is the inconstancy of its effect, and according to Boger and his colleagues² much more consistent and sustained blood concentrations can be secured by giving probenidol ("benemid") at the same time to delay renal excretion. According to these authors' findings 300,000 units of potassium penicillin with 0.75 g. probenidol given every eight hours has an effect equivalent or superior to that of 300,000 units of procaine penicillin injected intramuscularly once daily.

It also seems that more consistent effects can be obtained from a different form of penicillin, although this was first introduced for quite another type of use. We referred recently³ to the introduction of a penicillin compound of low solubility, N,N'-dibenzylethylene-diamine dipenicillin (known also as "penidural" and benzethacil), after a single intramuscular dose of which penicillin may be detected in the blood for as long as one month. This compound is also available in a form for oral administration, and the results of administering this to 101 children at the Great Ormond Street Children's Hospital are reported on page 805 by Drs. I. A. B. Cathie and J. C. W. MacFarlane. A standard dose of 300,000 units was given, and after a single dose a therapeutic blood concentration was invariably found after three hours. When the dose was repeated at six-hour intervals a cumulative effect was observed, with continuous maintenance of a therapeutic concentration. These authors remark that this is "the first oral preparation which has in our experience been reliably absorbed in 100% of patients." The effects of this preparation have also been tested in normal adults by Bayne, Gylfe, Carfagno, and Boger,⁴ who controlled their observations by "cross-over" tests with the same dose of potassium penicillin. The effect of giving probenidol at the same time was to increase the concentration of penicillin in the blood at two hours and sustain it for some hours thereafter. These findings show that what is now known in the U.S.A. as an adequate "penicillaemia" can regularly be maintained by this combination of drugs. But it is a little puzzling that a penicillin compound of such low solubility—with consequently a slow rate of absorption when injected—should be absorbed quite rapidly and regularly when swallowed. Neither of these papers discusses the mechanism of absorption, and it would be interesting to know something about this. Nothing yet published shows whether this compound acts as such or only, as with penicillin esters, after breakdown.

Ideas about oral penicillin evidently need revision, and in this process ease of administration and diminished risk from sensitivity reactions will be given due weight. On the other side of the scale must be weighed the greater risk of indiscriminate use and of inadequate treatment when an infection is due to a less sensitive organism. The possibilities of self-medication when bottles of such preparations find their way into households also need to be considered, particularly if it should become known that a mouthful at the right time is a preventive of most forms of venereal disease.

¹ *Practitioner*, 1953, 170, 273.
² *Antibiot. and Chemother.*, 1952, 2, 555.
³ *British Medical Journal*, 1953, 1, 207.
⁴ *Amer. J. med. Sci.*, 1953, 225, 190.

THE ACCUSED RUSSIAN DOCTORS

We print in this week's *Supplement* a statement issued by the council of the World Medical Association on March 27 in Lisbon on the case of the nine Russian doctors recently accused of grave malpractice—indeed of the murder of some of their patients—and of acting as spies for the U.S.A. and Britain. The statement is restrained in tone, and no attempt is made to prejudge the issue. The last paragraph implies that the W.M.A. Council doubts whether the judicial procedure employed in the case of the nine doctors was such as to establish the truth, or at least in a way to convince those outside the U.S.S.R. On April 4 an astonished world learnt that the new regime in Russia declared that the accusations were false and arrived at "through the use of methods of investigation which are inadmissible and most strictly forbidden by the Soviet law," according to the statement published in *Pravda*.¹ The nine doctors, and six others unnamed, have been released. The W.M.A. Council made its protest on behalf of the 700,000 doctors throughout the world belonging to its constituent member associations. Whether or not it had any effect in Moscow, the W.M.A. has done well to voice its anxiety about the fate of doctors in a country which has no medical organization affiliated with it.

What are the facts? On January 13 of this year the Tass Press Agency in Moscow released a press statement which began thus: "Some time ago the security organs of the State discovered the existence of a terrorist group of doctors who had set themselves the goal of shortening through medical sabotage the lives of active functionaries in the Soviet Union." Nine medical specialists were named as belonging to the group, the majority of them apparently being Jews. Through allegedly wrong diagnosis and treatment they were accused of causing the death of Zhdanov and Shcherbakov, and of attempts against the health and life of five highly placed officers in the Russian armed forces. These accusations were arrived at on the basis of "documentary evidence, of investigations and conclusions arrived at by medical specialists, as well as on the basis of the confessions of those arrested." *Pravda* of January 13 elaborated the accusations in terms meant to leave the reader in no doubt of the guilt of the nine doctors, the majority of them allegedly "recruited by a branch of the American intelligence service—the international, Jewish, bourgeois-national organization 'Joint'." Three of the doctors were accused of being agents of the English secret service. "In front of the whole world," stated *Pravda*, "the true face of the slave-owners and man-eaters from the U.S.A. and England has been revealed."

¹ *The Times*, April 6, 1953.

From January 13 to April 4 these were the facts presented to the world in the Russian press and broadcast widely over the air. As doctors we felt disturbed by this assault upon the professional integrity of our Russian colleagues, and especially by the probable effect of the accusations on the trust patients universally have in the sanctity of the doctor-patient relationship. As members of one of the learned and liberal professions we were alarmed at this renewed threat to civilized values in the anti-Semitism implicit in the charges and echoing the anti-Semitism of the Prague trial at the end of last year. But now the tables have been turned with a vengeance. The accused are released with a clean bill of legal health. The accusers are now accused. The unhappy Dr. L. F. Timashuk, the woman doctor who informed against her colleagues, has had taken from her the Order of Lenin bestowed on her on January 20 for this act. Such a *bouleversement* creates a feeling of both relief and bewilderment. As *The Times* puts it: "Surely there is no precedent in Soviet history for this public admission of fraudulent and evil methods in the State police and judicial system." If this violent loosening of tension between Russia and the non-Communist world is to be more than a nine-days' wonder, we may hope to renew those contacts with Russian doctors that began during the war. The B.M.A.'s invitation of hospitality to individual Russian doctors still stands. The World Health Organization refused to look upon Russia's withdrawal from it as permanent. The World Medical Association, we understand, has informed the Russian medical profession of the First World Conference on Medical Education to be held in London this year in August. If their delegates come to it they will be welcomed. Their colleagues from all over the world want to meet them, to exchange views, to share experiences, to get rid of mutual suspicions in mutual and friendly intercourse. Is it too much to hope that this may yet be possible?

A HAPPY EVENT

Women in labour owe much to the events of April 7 one hundred years ago. The *Court Circular* of that date contained the following announcement:

"Buckingham Palace, April 7.
"At ten minutes past one o'clock this day the Queen was safely delivered of a prince."

This referred to the birth of Prince Leopold, Duke of Albany, Queen Victoria's eighth child. And it was the administration of chloroform to the Queen during her son's birth that did so much to dispel the

¹ *Association Medical Journal*, April 15, 1853, p. 318.² *Lancet*, May 14, 1853, p. 453.³ *Association Medical Journal*, May 27, 1853, p. 450.

prevailing religious and professional objections that made childbirth a needless misery to many women.

In reporting the happy event, this *Journal* (then called the *Association Medical Journal*)¹ remarked that "there are circumstances connected with the event which have likewise imparted to it no small degree of medical importance. We refer to the employment of chloroform having been sanctioned by Her Majesty's Physician in Ordinary, Sir James Clark, Her Majesty's First Physician Accoucheur, Dr. Locock, and Her Majesty's other Physician Accoucheur, Dr. Ferguson; to its having been administered by Dr. Snow; and to the fact of the Queen and the infant prince having gone on favourably from the first." After recording that "the Queen expressed herself as grateful for the discovery of this means of alleviating and preventing pain," the account went on:

"The responsible position, and the acknowledged skill of the physicians who sanctioned the inhalation of the chloroform, the Royal Majesty of the patient, and the excellence of her recovery, are circumstances which will probably remove much of the lingering professional and popular prejudice against the use of anaesthesia in midwifery, even when sanctioned by competent authority, and induced with requisite precaution. It is for this reason that we chronicle the recent accouchement of Her Majesty as an event of unquestionable medical importance."

The mention of professional prejudice comes as a surprise to the reader to-day, but it found forceful expression in the editorial columns of the *Lancet*²—uncharacteristically behind the times. "Intense astonishment," wrote our contemporary, "has been excited throughout the profession by the rumour that Her Majesty during her last labour was placed under the influence of chloroform, an agent which has unquestionably caused instantaneous death in a considerable number of cases. Doubts on this subject cannot exist." The article was concerned to draw a distinction between the necessary use of chloroform as an anaesthetic during surgical operations and what it considered to be its unnecessary use to ease the pangs of normal labour. The *Journal* report, it seemed, was hardly to be believed:

"Probably some officious meddlers about the Court so far overruled Her Majesty's responsible professional advisers as to lead to the pretence of administering chloroform, but we believe the obstetric physicians to whose ability the safety of our illustrious Queen is confided do not sanction the use of chloroform in natural labour."

A fortnight later³ the *Journal* fired a parting shot at the *Lancet* for casting doubt on the accuracy of its original report and expressed its "own humble opinion" that

"the cautious inhalation of the vapour of chloroform during labour is entirely free from danger, and calcu-

lated to afford merciful relief from pain, in one of the most agonizing trials of humanity."

John Snow lived to see this "humble opinion" gain wide acceptance—more emphatically than it would to-day—and attended Queen Victoria again, for the birth of Princess Beatrice in 1857. He died aged only 45 the following year, when appeared his classical monograph *On Chloroform and Other Anaesthetics*.

HEALTH SERVICE INQUIRY

Noisy protests broke out on the Opposition benches last week when the Minister of Health announced that a committee was being set up to inquire into Health Service costs. But obscured in the rancour clothing Mr. Bevan's observations was one of special interest to the medical profession. He complained that the issue of Health Service economies was a matter primarily for the House of Commons and for political decisions, and criticized sending to a committee of inquiry "a matter which is at the centre of British politics." Most doctors agree that one of the most unfortunate features of the Health Service is that it started—under Mr. Bevan's aegis—at the centre of British politics and that it has never gravitated far enough away from that thoroughly unsuitable point. Mr. Bevan's successors, whether Labour or Conservative, have done something to remove the Health Service from the political arena. Clearly it can never be wholly withdrawn from it while it remains a State service. But there are many details in its finance and administration that should be free of political dispute and subject only in the most formal way to political decision. If the new committee is to be seen as a further endeavour to treat the issues non-politically, then it is to be welcomed for that alone. The Government would surely not be so inept as to appoint a committee of this sort merely to prepare the ground for destructive economies.

Given enough powers the committee should discover some much-needed information. It is asked to review the present and prospective cost of the Health Service, and to advise how a rising charge on the Exchequer can be avoided while providing for the maintenance of an adequate service. Dr. Ffrangcon Roberts has done much to show, both in this *Journal*¹ and in a book published last year,² how the cost of medical care has risen, goes on rising, and will continue without limit if allowed to do so. Various checks have been put on it, and the most effective may prove to be the dental charges. This is not to say that precisely similar charges can or should be imposed elsewhere. But, if it is agreed that stability

¹ *British Medical Journal*, 1949, 1, 293.² *Ibid.*, 1952, 1, 321.³ *The Cost of Health*, 1952, London.

is best achieved by proper design of the Service rather than by panic cuts and arbitrary limits, then a committee of inquiry is a move in the right direction. And if the committee is a non-political one only Mr. Bevan and his associates are likely to complain.

The question of block grants to hospitals is apparently to be inquired into—belatedly, the medical profession would add. The present financial methods, quite apart from the irksome restrictions the Treasury imposes when employing them, defeat their object in actually encouraging waste. In withholding that greater measure of independence that block grants would confer on hospital boards, the existing methods impair the sense of responsibility that surely ought to accompany public administration. Yet, when Mr. Macleod said that many people had for a long time considered that block grants were a matter which should be inquired into, there were cries of “No” from the Opposition benches. It is not clear whether they were denying the undoubted fact that many people thought the subject should be investigated or whether they were denying that such an inquiry ought to be held. In any case these dissentients will find no support for their views anywhere in the Health Service.

Whatever the nature of the committee (its chairman is a distinguished economist with experience of arbitration disputes), we may hope that it will fully consult the medical profession in the course of its inquiry. In the past too many Government actions have been decided—at times plotted seemed a better word—behind closed doors in Whitehall. An impartial committee can now do much to dispel the mistrust that is noticeable in the Service, and may help to give a better sense of direction and unity of purpose to all concerned with the nation's health.

ATTACK ON POLIOMYELITIS

An experimental vaccine against poliomyelitis has been prepared in the U.S.A. and its effects studied in human beings. According to Dr. J. E. Salk and his colleagues, who report¹ this important advance, the results are encouraging, but “should not be interpreted to indicate that a practical vaccine is now at hand.” It seems that antibody against all three immunological types has been induced by inoculation of the vaccine.

Behind the preparation of this vaccine lies a multitude of experiments on the recognition, isolation, and culture of poliomyelitis virus strains. Ever since Landsteiner² transmitted poliomyelitis to monkeys the search has gone on for a more convenient laboratory animal for poliomyelitis research. However, strains of the virus, with the exception of a few capable of causing disease in rodents (Lansing, Type II), are pathogenic only to the primates. Attempts to adapt poliomyelitis virus to tissue culture in the past were

largely unsuccessful in that no conclusive evidence was obtained of *in vitro* virus multiplication, except where primate tissue was used. A report by Sabin and Oliitsky³ in 1936 on the cultivation of the virus in human embryonic brain (later confirmed⁴) suggested that the choice of tissue would be limited. Many of the original disadvantages of tissue culture, often technical in nature, have now been overcome. The use of antibiotics has virtually eliminated bacterial contamination, a major obstacle to success before the last war. And the idea of using human tissue for culture, as suggested by Goodpasture and Anderson⁵ for the growth of zoster virus, offered new lines of approach to the study of viruses affecting man.

Although the essential lesion in poliomyelitis is neuronal, primary multiplication of virus probably occurs in extraneural tissues. In 1949 Enders, Weller, and Robbins⁴ at the Children's Hospital, Boston, using tissue culture of human embryonic material, demonstrated that poliomyelitis virus would multiply in neural and non-neural tissues and also in completely differentiated infantile skin.⁶ In a series of recent communications Enders and his colleagues⁷⁻⁹ have shown with abundant clarity that tissue culture is no mere technical exercise but a method of great practicability and even greater possibilities.

Two well-known methods have been found successful in growing all three immunological types of virus. The one is flask culture, when tissue fragments are suspended in a balanced salt solution; the other is roller-tube culture, when tissue fragments are embedded in a plasma clot and covered by salt solution. Opinion is hardening in favour of roller-tube culture as the method of choice.⁹ The selection of tissue for cultures presents certain difficulties. Human embryonic, uterine, and renal tissues among others have given good results but have obvious limitations. Material removed at necropsy is not satisfactory, and growth in species other than man and monkeys has not been observed.⁸ Monkey testicular tissue supports growth well and in many laboratories will be found more practicable.¹⁰⁻¹² A recent observation by Ledinko and Melnick¹³ that testicular tissue from immune and non-immune monkeys is equally satisfactory suggests that serum antibody plays little part in determining *in vitro* susceptibility. Similar observations have been made on other viruses,¹⁴⁻¹⁵ and it will mean that adult human tissue need not necessarily be obtained only from subjects whose immune state is known. Protein-containing cell stimulants are invariably incorporated into the fluid phase in the roller-tube method to ensure good cellular outgrowths. A move

¹ Salk, J. E., et al., *J. Amer. med. Ass.*, 1953, **151**, 1081.

² *Sem. méd. (Paris)*, 1908, **28**, 620.

³ *Proc. Soc. exp. Biol. (N.Y.)*, 1936, **34**, 357.

⁴ Enders, J. F., et al., *Science*, 1949, **109**, 85.

⁵ *Amer. J. Path.*, 1944, **20**, 447.

⁶ Weller, T. H., et al., *Proc. Soc. exp. Biol. (N.Y.)*, 1949, **72**, 153.

⁷ Robbins, F. C., et al., *Amer. J. Hyg.*, 1951, **54**, 286.

⁸ Weller, T. H., et al., *J. Immunol.*, 1952, **69**, 645.

⁹ Robbins, F. C., et al., *ibid.*, 1952, **69**, 673.

¹⁰ Syverton, J. T., et al., *Proc. Soc. exp. Biol. (N.Y.)*, 1951, **77**, 23.

¹¹ Ledinko, N., et al., *Amer. J. Hyg.*, 1952, **55**, 323, 339.

¹² Younger, J. S., et al., *ibid.*, 1952, **55**, 291, 301.

¹³ *Proc. Soc. exp. Biol. (N.Y.)*, 1952, **81**, 144.

¹⁴ Andrewes, C. H., *J. Path. Bact.*, 1930, **33**, 301.

¹⁵ Goodpasture, E. W., and Anderson, K., *Arch. Path.*, 1940, **30**, 212.

¹⁶ *Proc. Soc. exp. Biol. (N.Y.)*, 1952, **81**, 208.

¹⁷ Wood, W., et al., *ibid.*, 1952, **81**, 434.

¹⁸ Enders, J. F., et al., *Fed. Proc.*, 1952, **11**, 467.

¹⁹ Salk, J. E., et al., *ibid.*, 1952, **11**, 480.

towards simplifying the nutrient medium—and this is indeed welcome—is suggested in a report by Melnick and Riordan¹⁶ that such protein stimulants can be replaced by an enzymatic protein hydrolysate. Furthermore they obtained excellent yields of virus when the roller-tubes were kept stationary. Reports on the use of synthetic media have also been made.¹⁷ Evidence of multiplication of poliomyelitis virus in tissue culture can be shown by recognized methods of animal inoculation.⁸ Simpler and equally reliable evidence can be obtained from the degenerative changes seen in cellular outgrowths (cytopathogenic effect) and by alteration in cellular metabolism with decreasing acid production (pH differential test).⁸

Tissue culture offers tremendous possibilities in research not only into poliomyelitis but into other virus diseases primarily infecting man, such as the acute exanthems. With the antibiotic era in full swing, direct isolations can be made from human material (faeces and brain) and the method extended for epidemiological surveys. How to treat or control disease is the ultimate aim of investigation, and the adaptation of poliomyelitis to tissue culture is a signal advance in this direction. Repeated passage of virus in tissue culture reduces its virulence to monkeys with no loss in tissue culture infectivity.¹⁸ Inactivated vaccines have been found antigenic in experimental animals¹⁹ and now in man.

WORLD HEALTH

The publication of the annual report¹ of the Director-General of the World Health Organization closely coincides with World Health Day—April 7—which many of the member States now officially celebrate, some by proclaiming it a public holiday, others by holding meetings and exhibitions designed to increase local interest in preventive medicine and in the advantages that accrue from international co-operation. The practical benefits of such co-operation are plainly set out in the report. W.H.O. is the great co-ordinator of public health work. Not only are backward countries helped to combat malnutrition and such endemic diseases as malaria and yaws, but the Western nations also gain from W.H.O.'s work on the biological standardization of drugs and other therapeutic substances, from its thorough investigation of B.C.G., and from the information being gathered by the World Influenza Centre in London—to mention only a few of the projects in which W.H.O. is interested. The amount of money available last year to finance all its activities came to between 7 and 8 million dollars—not a vast sum in these days of astronomical spending. Lack of trained workers has led to difficulties all over the world, but during 1952 more awards of training fellowships were made than in any previous year—1,147 as against 662 in 1951.

In his foreword to the report Dr. Brock Chisholm states that “the whole organization has now passed through its formative period. Its general policies and procedures and its relationships, both internal and external, have been established.” That they should have been so soundly established is largely due to

Dr. Chisholm himself. Five years ago he was appointed the first Director-General of W.H.O., and he retires in a few months' time. The report for 1952 is the last he will make to the World Health Assembly, and he has taken the opportunity to comment on one of the difficulties which faces any organization whose purpose is to help all the peoples in the world and not just some of them. To do its job properly the World Health Assembly must have unprejudiced advice, and members of its executive board ought to feel themselves responsible to the Assembly alone, and not to Governments or other bodies. Any Government unwilling to allow independence to the members it designates to the executive board should refrain from making designations, and members of the executive board who find themselves unable to act independently should resign. “Nothing short of complete world-mindedness is acceptable in any member of the executive board,” writes Dr. Chisholm. In all the fields of international endeavour perhaps only in that of health could such an idealistic conception be stated with such confidence in its practicability.

BETTER FACTORIES

Sitting between two fat men to keep warm on his journey to work 50 years ago, the man who recalls¹ this experience found strikingly different conditions on arrival at his factory from what is afforded to-day. Then dirty, rat-ridden, cold, and ill-lit, many factories provided neither a healthy climate to work in nor safe machines to tend. The great and beneficial changes wrought by legislation and changing opinion during these years are reviewed at length by the Chief Inspector of Factories in his latest annual report, and if better plumbing, brighter illumination, and purer air were sufficient to man's working needs his contentment at work could never have been deeper than it is now. But there have been other changes too, though they barely come within the report's scope. “A good example of British, and especially Birmingham, methods of production during the years” is the bicycle industry. Formerly one skilled man assembled one bicycle or made a complete handlebar. Now he “adds one screw as the article passes on a conveyor belt.”

All the same, such improvements as the report recounts are exceedingly welcome, though a special cause of concern is the accident rate. Unfortunately, statistics are inadequate for comparisons back to 1901, nor are the numbers exposed to risk clearly known in any year. There were 828 fatal accidents in 1951, which was 29 more than in 1950. But the number of non-fatal accidents fell by 5% to 182,616, which was the lowest total recorded since 1938. The number of accidents connected with transport continued to rise, and the report comments: “While it is not to be expected that the widespread introduction of mechanical methods of handling and transportation would be unaccompanied by an increase of accidents of this kind, a rise of the order of 250% over 1939 is extremely serious.” No

¹ *The Work of W.H.O.*, 1952. Published by the World Health Organization, Geneva.

² *Annual Report of the Chief Inspector of Factories for the Year 1951*. 1953. H.M.S.O.

doubt the use of these new machines has averted many accidents—and more serious accidents—that would have resulted from the contact they often prevent between workmen and other machines that chop, press, saw, and so on. The stricter discipline among users of the new machines that the report calls for would reduce the accident rate, but that is only one of several ways in which the problem is being attacked. Clearly the design of machines as nearly foolproof as possible is desirable, and much work has been done on that in recent years. Again, industrial psychologists are aware that employment too far below a man's intellectual capacity is detrimental to him. Lack of interest will lead to lack of attention; to attribute the resulting accident to lack of discipline is only part of the story.

Perhaps the greatest change noticeable in the last 50 years—certainly to the workpeople themselves—is the reduction of working hours in a week. The Factory and Workshop Act of 1901 allowed a working week of 60 hours for women and young persons in non-textile factories (in textile factories 55½ hours). It was during the first world war that the effects of fatigue on production were first scientifically studied, and partly because of these studies, partly because of changed social attitudes, the 48-hour week came to be recognized as normal in 1918. During the 'thirties the five-day week became popular; since the second world war it has been worked almost everywhere, and with it the mid-morning tea break has come to stay. But how best to enjoy his leisure may be hard to learn for a man who at his work spends every minute, hour, day, and year adding screw after screw.

CANCER OF STOMACH AND BLOOD GROUPING

The search for relationships between blood groups and susceptibility to disease has not as yet proved very fruitful, and attempts to find an association with cancer have been inconclusive. In 1942, for example, Schinz¹ showed the frequencies of ABO groups among 1,000 patients with malignant neoplasms from the Röntgeninstitut at Zurich to be 430 of group O and 456 of group A, compared with 402 and 480 respectively among 1,000 patients with non-malignant conditions, the differences being not quite statistically significant. Now the findings of Professor Aird and his colleagues in cancer of the stomach, reported at page 799 of this issue of the *Journal*, are likely to provide fresh stimulus to such studies. The ABO blood-group distributions of 3,632 patients with cancer of the stomach in a number of hospitals in England and Scotland were compared with those of control groups of people in the same hospitals or localities. In respect of all but two of the Birmingham, Leeds, Liverpool, Manchester, Newcastle, and Scottish hospitals equal numbers of controls were taken at random from cross-sections of patients in the same hospital, and for the other two hospitals estimates were made from the data of the local blood-transfusion centres. In London 1,340 patients with stomach cancer were compared with the

blood-group frequencies in Discombe and Meyer's series of 10,000 from north-west London.

Comparison of the distributions in Scotland, the northern towns of England, and London showed no important differences for the B and AB groups, but group A was more frequent and group O less frequent in patients suffering from cancer of the stomach than in the general population of the same locality, and this difference was present in every hospital from which data were obtained. In Scotland the percentages of group A were 36.4 for patients with cancer and 32.5 for controls; in the northern towns they were 46.4 and 39.3 respectively; and in London they were 46.0 and 42.2. Statistical tests showed the differences to be highly significant. In agreement with this, some hitherto unpublished figures for 704 patients with stomach cancer in Basle reported to the authors by Dr. Holländer showed 53.1% of group A compared with 45.1% among 4,518 controls. It may be noted that this relation is in the reverse direction to that reported from Zurich for cancer of all sites as quoted above, and this suggests that similar studies for other varieties of cancer would probably give very different results.

Interesting as these findings are, their effect on cancer rates for whole populations can be only slight. And a little calculation shows that, even if two populations existed having such unlikely extremes as 25% of group A in one and 65% in the other, the cancer rates would not differ by as much as 10% because of this genetic difference. The authors are at pains to point out that the association with blood grouping, far from accounting for the observed excess of stomach cancer mortality in English northern towns, tends to increase the divergence, which has to be explained, it would seem, by environmental factors not yet identified. The northern town populations have a smaller proportion of group A and would therefore be expected to have slightly less cancer of the stomach. Neither could racial blood-group differences, whatever they may be, go any distance towards accounting for the excess of stomach cancer mortality in North Wales compared with neighbouring English rural areas, which over the last 30 years has been of the order of 70% after allowing for all the local factors capable of assessment at the present time, such as differences in the verification of diagnosis.

The relationship between blood groups and cancer of the stomach shown by the statistics of Aird and his colleagues leads them to conclude that "it is no longer possible to regard blood groups A and O (in adults) as entirely devoid of selective value." The validity of this conclusion depends on the validity of an assumption, tacitly made, that a blood group can never be changed by cancer or by extrinsic factors causing cancer. This cannot be regarded as certainly true until it has been properly tested; and, if it should prove to be incorrect, an explanation of the statistical relationship might be found in a common cause.

Sir Russell Brain was re-elected President of the Royal College of Physicians of London on March 30. He was first elected President in 1947.

REFRESHER COURSE FOR GENERAL PRACTITIONERS THE MANAGEMENT OF LATE AND LATENT SYPHILIS*

BY

G. L. M. McELLIGOTT, M.A., M.R.C.S.

Senior Physician, Department for Venereal Diseases, St. Mary's Hospital, Paddington

The rapid and sustained decline in early infectious syphilis that has taken place in most parts of the civilized world since the end of the war has not been accompanied by a similar fall in the incidence of latent and late infection. In England and Wales the number of these patients attending the treatment centres was higher in 1950 than it was in 1946. With the growing awareness among medical practitioners of the possibility of late and latent infection, and the rapidly growing practice of routine antenatal blood testing, it is likely that still larger numbers of these patients will be discovered in the future, and that we will be increasingly concerned in their management and treatment.

Dangers of Latent Syphilis

The ultimate importance of a disease depends upon its power to shorten life, and syphilis, especially when untreated in its early or asymptomatic stages, is well known as a not uncommon cause of premature death. I have always believed, however, in common with many colleagues both at home and abroad, that the lethal hazards of untreated syphilis, considerable as they may be, are not so great as is popularly supposed, and that in the patient who receives reasonable and fairly prompt treatment they are usually minimal.

The legacy of undetected syphilis, especially in women, that follows a war is bound to be considerable, though we now know that most of the gloomy prophecies about the fate of the untreated thousands during the first world war have not been fulfilled. To-day the growing practice of routine antenatal blood testing is doubtless averting many tragedies, and it seems a pity that these tests do not yet form part of the routine medical examinations of hospital out-patients and in-patients, candidates for life assurance, soldiers and sailors on discharge from National Service, and that these are not performed on those contemplating marriage. Though prompt treatment of the comparatively few cases of early syphilis that we now see, and, of course, of their consorts, is important, the death rate from syphilis during the next 30 years will depend largely on the discovery and treatment of the thousands who must still be at large in the as yet asymptomatic stage of late syphilis, and it is sometimes the doctor's duty to risk personal unpopularity by insisting on the examination and testing of spouses, children, and sometimes of parents.

Obvious late activity in syphilis is almost always preceded by a period of apparent latency, and it is during this time that we can do so much to arrest permanently, and in many cases cure, the still hidden chronic inflammatory process.

Diagnosis

The diagnosis of latent syphilis is one of exclusion, and is always difficult, and sometimes impossible, to make with accuracy. It will depend upon the skill and experience of the physician, on negative results of radiological examinations of heart and great vessels, on examination of the cerebrospinal fluid, and upon the verification by repetition of unexpected positive blood findings. Clerical or technical errors are still the commonest causes of so-called "false positive" serum reactions. Latent syphilis is never an emergency, and, once neurosyphilis and established cardiovascular

disease have been excluded, the danger of delaying treatment for weeks or months is negligible. The notion of treating in order to "play for safety" is nearly always, except in pregnancy, bad medicine and will inevitably confuse the ultimate diagnosis. It is sometimes difficult to persuade the patient that more or less prolonged observation without treatment is necessary if his case is to be properly assessed, but it can be done, and he will appreciate it in the end.

In many cases of late or latent syphilis—possibly in the majority—one cannot even guess at the duration of infection. We are, perhaps, too much inclined to date it to the years of early adult life, or to the period spent in the armed Forces. Occasionally we are deceived; the middle-aged, or even the elderly, do contract syphilis, and primary and secondary signs frequently pass unnoticed in women. Also, the possibility of congenital infection can never be overlooked, and classical stigmata are often absent.

Telling the Patient

When a diagnosis has been reached, the question arises—What is the patient to be told? The answer is, the truth. All, except the very old, or some rare cases of mental instability, must have the facts, as the doctor sees them, carefully explained. The word "syphilis" must not be avoided and vague allusions to a "blood condition" or some such indefinite euphemism must not be substituted in its place. If this frank truth-telling is not done, the necessity for prolonged observation after treatment will be difficult to justify. I have been impressed by the bitterness with which patients have spoken of doctors who had failed to tell them the truth in a mistaken attempt to spare their feelings.

The significance of sero-resistance, and, indeed, of its probability, in spite of adequate treatment, should be explained as soon as possible to all patients who are in any way capable of understanding. If this is not done at an early stage the patient will inevitably associate a persisting positive blood reaction with a lack of response to treatment, and will consequently become either dissatisfied with his physician or apprehensive about or even despairing of his condition. In latent syphilis, perhaps more than in any other chronic condition, the doctor can afford to be optimistic, and it is surely his duty to be so. The findings of the United States Co-operative Clinical Group, which are in line with the experience of many of us, suggest that even without treatment only 20% to 30% of latent syphilitics would develop later manifestations of disease, and that treatment, even of the most moderate nature, would reduce this chance to one of from 2% to 5%. Such a risk is surely minimal when one considers the everyday hazards of life.

Late syphilis, especially when asymptomatic, must not be allowed to spoil lives, but only too often it does so. The medical curse descends upon the unfortunate patient in no uncertain manner, so that much of his outlook and many of his ambitions are conditioned by the knowledge that he is a syphilitic, and a man apart. Victims of far more serious conditions are more optimistic and less depressed by their diseases than are many adequately treated latent syphilitics. This is largely because a venereal infection is so essentially a secret between patient and doctor, and because secrets weigh heavily on many minds.

* *Erbarzt*, 1942, 10, 209.

factory. Many physicians, often obsessed by the bog of persistently positive blood reactions, have traditionally insisted on years of treatment with arsenicals and bismuth, which was only terminated by the collapse of the patient's health from the toxic effects of the treatment, of his morale from anxiety, and not infrequently of his bank balance. Though at least another decade must pass before the results of penicillin in late syphilis begin to be known with certainty, an encouraging indication of its probable effect is already provided by the results in neurosyphilis. In the great majority of patients treated, sustained improvement in the spinal fluid occurs, and, provided that irreversible structural damage to brain or spinal cord has not yet taken place, clinical results are much more impressive than after malaria and arseno-bismuth treatment and are, moreover, more rapidly attained. It is perhaps significant that certified deaths in England and Wales from dementia paralytica declined from 585 in 1943 to 167 in 1950, and those from tabes dorsalis from 313 in 1943 to 123 in 1950—a far more rapid fall than has ever before been recorded in so short a time.

Penicillin and Cardiovascular Syphilis

In this country there has been until recently a certain reluctance to use penicillin in cardiovascular syphilis, mainly because of exaggerated fears of the Jarisch-Herxheimer reaction. Cardiovascular syphilis is often not diagnosed until irreparable harm has been done, and, though even then quite a modest amount of treatment will probably heal the chronic inflammatory process, the resulting structural damage to the aortic wall or valves may inevitably shorten life. I am, however, becoming increasingly convinced that prompt intensive treatment with penicillin will in most cases, by halting the inflammatory process, improve the prognosis and help to prolong life. Earlier diagnosis, rather than better treatment, would seem to be what is wanted for the successful management of this condition. These views are supported by the work of Dr. J. H. Stokes and his colleagues in Philadelphia, who have recently reported the results of treating over 100 cases of various types of cardiovascular syphilis with penicillin alone during the last five years, and it is interesting to note that in this series no evidence of significant therapeutic shock or vasculo-toxic effect was forthcoming, neither were any certain cases of therapeutic paradox encountered. The penicillin was well tolerated even by the decompensated heart, and clinical improvement, particularly of anginal pain, was noted in a high proportion of cases. In the autumn of 1947 I decided to abandon the arsenicals in the treatment of syphilis in all its stages, and up to the present I have had no cause to regret my decision. Bismuth I retained in a modest total dosage of 2-4 g. until two years ago, not so much because I was attracted by the idea of consolidation treatment with a drug whose treponemacidal power fell so far behind that of penicillin, but because I believed that many patients would default from subsequent observation if the treatment time was so short as to bring it into contempt.

Dosage of Penicillin

At this stage it is hard to say how much treatment is necessary in the late or latent stages of syphilis. My present opinion is that, though it certainly should not be less than that recommended for early infections, it may one day be found to be not much more. Careful post-treatment observation with retreatment of considered failures or relapses is, in my view, far more important than the blind, continuous, so-called "insurance" therapy so popular in the past. I would commend without prejudice the idea of following an initial intensive course of six to twelve million units of penicillin, lasting from ten to fourteen days, with not more than two courses each of ten twice-weekly injections of 900,000 units of procaine penicillin in oil with aluminium monostearate (P.A.M.). I am convinced that each one of these injections will be far more therapeutically active than

the fullest dose of any arsenical or bismuth preparation, and, which is perhaps more important, that it can do no harm.

It is perhaps as a preventive of congenital syphilis that penicillin has had its greatest success, and it is now established that as little as eight to ten days' intensive treatment of a syphilitic pregnant woman will almost always ensure that her infant is born free from disease. The expectant mother whose blood tests have proved positive on routine examination can thus be assured of her baby's safety, and every effort should be made to allay her anxiety.

Conclusion

In conclusion, I would restate my belief that in penicillin we have the most powerful, as well as the safest, treponemacidal agent yet known; that the progress of the disease can in most cases be rapidly and effectively halted by its intelligent use; and that its true value in late and latent syphilis will be certainly known only when careful clinical, cardiographic, and pathological observations (to include always examination of the cerebrospinal fluid) become general practice and when post-mortem study of treated cases becomes the rule rather than, as at present, the comparatively rare exception.

Next Refresher Course Article.—"Injuries to the Back," by Mr. E. A. Nicoll.

THE HEALTH OF SCOTLAND SOME ENCOURAGING FIGURES

The 1952 reports of the Department of Health for Scotland and of the Scottish Health Services Council were published last week in one volume. The most striking improvement in the country's health was the decline in mortality from respiratory tuberculosis. The provisional rate of 27 per 100,000 (1,404 deaths) is the lowest figure yet reached for Scotland, and compares with rates of 37 in 1951, 47 in 1950, and 60 in 1949. The reduction was apparent in all age groups of both sexes, except males at the extremes of life. The highest mortality was still among young women, but even here there has been a remarkable fall: for women aged 20-24 the rate fell from 122 in 1950 to 45 in 1952, while for those aged 25-30 it was reduced from 124 to 46. The death rate from non-respiratory tuberculosis, at 4 per 100,000, was also lower than ever before. These encouraging figures were due to "improved medical and surgical treatment, together with the fact that the disease is now being brought under treatment at a much less advanced stage." By the end of 1952 the number of hospital beds in Scotland for respiratory tuberculosis had risen to 6,098, and the waiting-list had fallen to 1,711. To help ease the waiting-list over 400 tuberculous patients have been sent to sanatoria in Switzerland.

The provisional infant mortality rate fell to the record low figure of 35.2 per 1,000 births. A disturbing feature of the mortality in the pre-school years (1.5 per 1,000) is the high place taken by accidents. The principal causes of death among children aged 1 to 4 years, in order of frequency, were accidents, tuberculosis, pneumonia, and infectious diseases. Of the accidents, roughly one-half were caused by motor vehicles.

The Hospitals and General Practitioners

In 1951 the Department of Health published the Scottish Health Services Council's report on "The General Practitioner and the Hospital Service," and this has been studied by both the department itself and hospital boards. The Department of Health has this to say about the integration of the work of general practitioners with the hospitals:

"Some progress has been reported as regards direct access by general practitioners to hospital ancillary departments—for example, laboratory and radiology. There are signs that difficulties may arise in recruiting sufficient full-time hospital staff in some of the intermediate grades, and this factor may encourage the

wider use of general practitioners (especially former registrars) as part-time members of hospital staffs. Generally it seems true to say that the hospital boards are alive to the importance of establishing the closest possible link between the family doctor and the hospital service."

Size and Cost of the Health Service

About 64,000 persons are wholly or partly engaged in the Health Service in Scotland. Nurses and midwives (25,000) and hospital domestics (22,500) form the largest groups, then come doctors (5,300), administrators and clerical staff (4,000), and pharmacists (2,800). There are 1,400 dentists and about the same number of medical auxiliaries, and lastly 900 opticians. Last year about half the doctors were in general practice, there being 2,439 principals (of whom 1,280 were in partnerships) and 306 assistants. In the hospitals there were 750 consultants (372 of whom were whole-time) and 330 S.H.M.O.s (219 whole-time).

The general-practitioner services cost £5.37m. (excluding a back payment under the Danckwerts award of about another million pounds). Of this sum, £83,000 was paid in grants under the trainee assistants scheme and £20,000 as inducement payments. There was a small fall in the number of prescriptions compared with the previous year (from 20,787,000 to 20,371,000), but the average cost of each prescription rose from 5s. 1d. to 5s. 4d. during the year. The slight fall in the number of prescriptions is ascribed partly to the absence of any major epidemic, such as influenza, and partly to the 1s. charge. In all, the pharmaceutical services cost just over £5m. The supplementary ophthalmic service accounted for a little over half a million pounds.

Public Health Matters

Vaccination of children under 1 year against smallpox declined a little during the year, and is still far short of the desirable minimum. "Figures of the order of those shown in recent years (under 30% of the children of that age) do not afford adequate protection of the community." Immunization against diphtheria continued at a high level, although the 1952 figure for primary inoculations showed a decrease. There were eight deaths from diphtheria during the year, all in children who had not been immunized.

Another sign of the times was the continued decline in the number of domiciliary births, both absolutely and in relation to the total number of births. Steps now being taken to adjust maternity benefit rates in favour of the mother who is confined at home may perhaps alter this.

Apart from the subjects mentioned above, the Department of Health's report also deals with welfare services, food hygiene, water supplies and sanitation, housing, and town and country planning.

Scottish Health Services Council

Among the matters inquired into by the Scottish Health Services Council were the future duties, responsibilities, and status of medical superintendents in Scottish hospitals and the serious shortage of almoners in Scotland. At present, out of an estimated 500 almoners required for a complete service, there are only 75 employed. The council's recommendations for relieving the shortage are to reduce the cost of training by making it possible for a complete training to be had in Scotland, and secondly to create a new category of worker intermediate between the almoner and her clerical assistant. The position of these "almoner assistants" would be analogous to that of the assistant nurse. This proposal runs counter to the recommendation of the Cope Committee on Almoners.

The council also initiated an inquiry on co-ordination in the field of child health. While it proved possible to make some specific recommendations, such as that more hospital beds should be provided for children, the general feeling was that it was too soon after the appointed day for a full review of the subject.

¹Reports of the Committees on Medical Auxiliaries. Cmd. 8188. H.M.S.O.

Nova et Vetera

FRANCOIS RABELAIS, M.D.

Born about 1495, Rabelais died 400 years ago on April 9. He spent his youth in a Franciscan monastery until, renouncing holy orders, he entered the faculty of medicine at Montpellier. Here he gained the distinction of being the only person to lecture on Hippocrates and Galen from the original texts, for Rabelais was an enthusiastic humanist who studied the classics avidly.

Some say he was the first to dissect the human body. If not the first, he was certainly one of the first, using criminals who had been hanged. As a result of his demonstrations, it is recorded in the archives at Montpellier, the medical school was allowed two criminals a year for dissection instead of one every sixteen years or so.

Rabelais could never stay in one place for long. He left Montpellier and went to Lyons, then the centre of the printing industry in France, where he was employed as a proof-reader, putting to good use his knowledge of Greek. It was here he published his first medical work—*Epistolae Medicinales Manardi*—an annotated translation. Manardi was a doctor at Ferrara, and Rabelais translated his treatises, pointing out at the same time that the doctrine of *magister dixit* should not be followed too faithfully. In direct opposition to most medical men of the time, he thought the advancement of medicine and science should be viewed with an open mind. Later he published the lectures he had given at Montpellier.

In November, 1532, Rabelais was appointed physician-in-chief to the Hôtel Dieu at Lyons. Here he was in charge of 200 beds—some of them accommodating two or three people—and he saw all the patients daily. The hospital was the only one which admitted all types of case, from fevers to maternity, and he must have been kept busy. It is recorded that during his stay the mortality rate was reduced by 3%. Although Rabelais journeyed a good deal, and rarely settled anywhere for long, he practised medicine almost all his life.

Gargantua and *Pantagruel*, the books which won him immortality, are uninhibited—some critics have said coarse, though in the context of their times they do not seem to be unusually so. He advocated liberal doses of good food and drink, plenty of exercise, and adequate sleep. Nor was he concerned only with man's bodily welfare, for he believed laughter and the mental wellbeing it denotes to be his birthright and salvation. Many of Rabelais's descriptions overflow with physiological information—his picture, for instance, of the birth of Gargantua, miraculous and imaginative though it is. Gargantua's mother was given a drug which caused the child to leap from the womb "and entering the vena cava climb by the diaphragm above her shoulders (where that vein divides in two) and then taking the left branch issue from her left ear." If Rabelais contributed nothing of lasting value to the advancement of medicine—nothing to be compared with the achievements of his contemporaries Vesalius and Leonardo da Vinci—his legacy of laughter may rank as a great contribution to the wellbeing of man.

"An understanding of the scientific basis of good feeding should be part of the everyday knowledge of an educated community" according to the Ministry of Food's *Manual of Nutrition* (3rd edition, H.M.S.O., price 2s.). The book sets out to supply the necessary information. Much of it is elementary, but medical men called upon to advise on diets for varying age and occupational groups may find some useful tips in the sections on nutritional requirements and the composition of food (especially the valuable appendix A).

Correspondence

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

Chlorophyll as a Deodorant

SIR,—From the letters written by Dr. W. Mitchell and Mr. L. Deadman (March 14, p. 621) it would appear that the alleged potency of chlorophyll and the chlorophyllins as deodorants varies so much that the experimentalist would be wise to use only preparations offered to the public by reputable firms. This is precisely what Dr. J. C. Brocklehurst did. He obtained his sodium copper chlorophyllin (so highly valued by Dr. Mitchell) from a chlorophyll manufacturer, and solution "C" was "a true sample of this substance as it is sold to the public" (March 21, p. 674). I have followed Dr. Brocklehurst's example by using a proprietary preparation of chlorophyll in tablet form called "amplex" for an "asparagus test" carried out on myself.

Critics of Dr. Brocklehurst's paper (*Journal*, March 7, p. 541) emphasized the need to allow chlorophyll an adequate period of time for deodorizing offensive gases and to ensure that there is an abundance of chlorophyll available. These exacting requirements are not mentioned on the label of the "amplex" containers, which merely says: "One tablet swallowed or dissolved in the mouth every morning for basic freshness all day." I decided, however, to leave nothing to chance, and took 100 tablets of "amplex" an hour after breakfast; and three and a half hours later I ate 40 more, making 140 in all. The tablets in the first batch were powdered and then washed down with sips of water; the second lot were chewed thoroughly and swallowed. After two and a half hours I ate a dozen asparagus tips (which also contained a considerable quantity of chlorophyll). In less than two hours my urine had the unmistakable and rather offensive smell which is a characteristic effect of eating asparagus. After six hours the odour was intense, and it persisted even in specimens voided on the following day. The timing of the dose of chlorophyll tablets makes no obvious difference. On one occasion I swallowed 100 tablets (powdered), and after seven hours I took another dose of 100 tablets, followed at once by a serving of asparagus. In less than two and a half hours the asparagus smell was apparent in the urine.

Such a test should not be regarded as a single instance of failure of chlorophyll as a deodorant. So long as there is a substantial quantity of chlorophyll in the alimentary canal, every occasion when an offensive urine is voided (say four or five times in 24 hours) must be considered as a separate test and as a separate instance of failure. I may add that during this particular experiment I noticed the taste and odour of asparagus in the occasional eructations that occurred. I have personal knowledge of ten such failures to add to the observations made by Dr. Brocklehurst on himself.

Dr. Brocklehurst says that "it would be helpful if a large number of doctors would themselves repeat this simple experiment." I agree, but we must not forget that the value of physiological and pharmacological experiments carried out on a solitary human subject may be of a very high order—as, for example, in the classic case of the observations on Alexis St. Martin and, more recently, in the studies on pain made by Kellgren and others. It is certainly not unreasonable to suggest that if chlorophyll is offered to the public as a deodorant its reputation must stand or fall by clinical trials on man—a subject which Dr. Mitchell "does not feel competent to discuss." It should be noted that there are special advantages in the asparagus test: it is simple to carry out, and the necessarily intermittent observations eliminate the fallacy of olfactory fatigue. Experimentalists will also take into account the fact that the malodorous substances are rapidly removed *in vitro* by treatment with a small quantity of activated carbon.

Dr. Mitchell speaks as an expert of the deodorant effect of sodium copper chlorophyllin in a chemical plant used for the distillation of garlic oil. This is interesting and doubtless important in the pharmaceutical industry, but it does not follow that the observations must necessarily have any clinical application. A description of the technical procedure which Dr. Mitchell mentions might enable clinicians to determine whether the process could be applied to the practice of medicine. Dr. Mitchell has suggested that chlorophyll "may catalyse oxidation of

odorous material, perhaps by forming a loose combination with oxygen and parting with the latter at the sites of action." But this hypothesis was destroyed by Kohler *et al.*,² who reported that chlorophyll is not absorbed from the gastro-intestinal tract. This disposes of any suggestion that oral medication with chlorophyll can abolish the fetor of, say, bronchiectasis or sinusitis.

Dr. Mitchell promises to produce evidence of the effectiveness of chlorophyll preparations in deodorizing benzyl mercaptan. This will be awaited with interest; but his experiments will be much more significant to clinicians if he will perform his tests with methyl mercaptan, which is known to occur in the human bowel. I therefore suggest that he should use methyl mercaptan. This will make it possible to compare his results with those of Dr. Brocklehurst and other workers. Further, there are fallacies attending the use of benzyl mercaptan for this purpose which do not apply to methyl mercaptan.

Mr. B. E. Chanell (March 14, p. 622) gives the names of two substances not contained in "airwick." Would he care to tell the medical profession the names of the constituents for which a deodorant action is claimed? Is chlorophyll one of them? Even more important, will he be good enough to explain how this preparation acts—if it acts at all? Is it seriously suggested that chlorophyll is dispersed through the atmosphere of a room, or does the air obligingly gravitate to the tiny impregnated wick and filter itself so rapidly that a few thousand cubic feet of air are dealt with in as many minutes?—I am, etc.,

Glasgow.

STANLEY ALSTEAD.

REFERENCES

- ¹ *Retail Chemist*, 1952, 23, 27, 65.
- ² *J. Biol. Chem.*, 1939, 128, 501.

SIR,—Your *Journal* is to be congratulated upon the article by Dr. J. C. Brocklehurst (March 7, p. 541) and upon its stand in connexion with it. I have read with interest the reactions to the article as conveyed by the *New York Times*.

I agree with Dr. Brocklehurst that the responsibility for demonstrating the effectiveness of chlorophyll or of its derivatives lies with the proponents of its use. In this connexion, the manufacturers of chlorophyll derivatives have themselves repeatedly failed to define their materials adequately. Most of the commercial materials now on the market consist of 50–75% alfalfa extractives other than the green pigments derived from chlorophyll. The demonstration that such an impure material has any given property has nothing whatsoever to do with the proposition that this property is inherent in the green pigment fraction of the material used. Since alfalfa oils are commonly left in the extracts used, it is incumbent upon the manufacturers to prove that any "deodorant" properties which the nose may detect are not, in fact, due to a masking of the undesired odour with alfalfa oil.—I am, etc.,

Baltimore, Maryland, U.S.A.

ALSOPH H. CORWIN.

SIR,—Taking note of your evidence that chlorophyll preparations have no, or very little, deodorant action (March 7, p. 554), I would like to state that we have used the water-soluble, copper-treated chlorophyll "J. J." in low concentration, soaked into one layer of gauze in between dressings for foul-smelling carcinomas and ulcerated legs, etc., and the result was quite remarkable. One demonstration was given to the nursing staff on a septic, gangrenous leg which through its intense foul smell was of annoyance to other patients. A piece of such gauze soaked with chlorophyll solution was dropped over the leg, and the smell quite dramatically disappeared. As long as treated in this way, no smell was present in the ward. A daily, relatively short medical inspection which confirmed this could hardly be long enough to render the olfactory nerve endings less capable of detection. Moreover, no crotonaldehyde or other substance than above was used. After many experiments this was the first time we were able to combat satisfactorily smells which arise only too frequently in large wards with chronic sick and at times create a problem. It should be said that chlorophyll does not diminish all smells, and not all chlorophyll preparations, pure or otherwise, have this

effect. Its action is undoubtedly selective, and I feel that in view of the results obtained here, not only as described but also in other forms, the experience of other users may be of interest.—I am, etc.,

Birmingham, 18.

R. S. HOLZER.

SIR,—With reference to the annotation (March 7, p. 554) on the subject of chlorophyll, what most of us want to know is not whether an experiment conducted with elaborate apparatus on purified chemical substances yields a positive result, but whether ordinary people, using their noses in an ordinary way, can detect a deodorizing action in naturally occurring evil-smelling mixtures. It is quite untrue to suppose that such experiments cannot give conclusive results, for nowadays statistical design and experimental methods have been developed for just this kind of case. Attempts to eliminate the subjective element are apt to result in pointless experiments, but it is also true that many other experiments have been reported in which the proper precautions have been ignored and are therefore also nearly valueless.

We have carried out experiments reported more fully elsewhere (*Pharm. J.*, 1953, 170, 209) in which 139 people were used as testers with precautions in design and analysis of results which we think exclude bias. We conclude that chlorophyll on cotton pads does reduce the odour of decomposing blood, the probability of our results arising by chance being less than one in 2,000 million.—We are, etc.,

D. MAXWELL BRYCE.
R. MAXWELL SAVAGE.

Barnet.

Psychosomatic Medicine

SIR,—Most of your readers will have read with profound interest Dr. R. R. Bomford's paper on this subject (*Journal*, March 21, p. 633) and been grateful for the refreshing lucidity with which it was phrased. Most of them would surely agree, too, that in every consultation it is a body-mind something with which doctors have to deal—Dr. Bomford calls it a unity. But there are some of us, like Henry Head, who have never been able to persuade ourselves that there are any "diseases" of mind *qua* mind. The "diseases" are all of tissue, though mind can deeply affect them and is in turn—in its individual terrestrial expression (behaviour)—deeply affected by them. But the things that happen, or can be made to happen, to the individual mind itself, such as the development of tissue-influencing courage and equanimity, must occur, it would seem to us, in some non-material dimension. St. Paul's Cathedral, for example, was once a thought. The thought was as real as the cathedral. But where exactly was it after the moment of its birth? Was it occupying space inside the skull of Christopher Wren? When, as part of his mind, it accompanied him through the years on his daily journeys, was it indeed geographically occupying space anywhere? If mind is only just another aspect of matter, can matter—always occupying space—have an integral part or aspect *not* occupying space? It is because we find it so hard to believe this that we should have preferred, I think, to use the word tenancy rather than unity—though always prepared, I hope, to be shattered by our philosophical superiors.—I am, etc.,

Easton Royal, Wilts.

H. H. BASHFORD.

Blackwater Fever

SIR,—The study reported by Lieutenant-Colonel Inder Singh (*Journal*, March 14, p. 598) is of considerable interest. We consider it unfortunate, however, that the term blackwater fever should have been used in the title of this paper as there is no incontrovertible evidence that this was the correct diagnosis.

An essential characteristic of blackwater fever is intravascular haemolysis, an occurrence which may be recognized by the presence of methaemalbumin in the circulating plasma, an increase in the serum bilirubin, and clinically

by jaundice. In the cases reported there is no mention of jaundice, while no estimates were made of plasma methaemalbumin. Serum bilirubin was estimated in one case and was within the normal range. In that case, tests carried out on serum and urine for haemoglobin and methaemoglobin were negative; in the other oxyhaemoglobin and methaemoglobin were found in the serum, and haemoglobin—presumably oxyhaemoglobin—in the urine. Blackwater fever is not the sole possible cause of the findings in the latter case, and is contraindicated by those in the former. Without further information the diagnosis must be regarded as unproved.—We are, etc.,

London, N.W.1.

P. C. C. GARNHAM.
A. W. WOODRUFF.

Smoking and Lung Cancer

SIR,—If one may descend for a moment from the clouds of speculation and somatomorphology to the more pedestrian subject of tobacco smoke, I should like to point out an aspect of aetiology which I have not so far seen mentioned.

Theories of carcinogenesis have had to be revised in the light of recent work by Berenblum and Shubik.¹ These workers have presented evidence that the process of carcinogenesis may be divided into two distinct stages. There is an initial phase when a carcinogen, and only a carcinogen, causes a specific cell change which may remain latent. Actual tumour formation can only be brought about by further application of either a carcinogen or a non-specific irritant which acts as a co-carcinogen. Many such irritants are now known which, though incapable of causing carcinoma by themselves, are able to do so when applied to a tissue previously exposed—even only on a single occasion—to a carcinogen. In experimental work the total tumour incidence is found to depend on the strength of the carcinogenic "initiator," and the latent period before the appearance of a tumour depends on the time and intensity of subsequent applications of a co-carcinogenic "promoter."

We know that the atmosphere of cities, and road dust, contain benzpyrene and probably other carcinogens derived, no doubt, from tarred roads, coal smoke, and soot, etc. Here are known sources of an initiating carcinogen which must often be inhaled. Continued exposure to these carcinogens can by itself lead to tumour development, as they also possess a promoting action. But it may well be that other irritant substances not carcinogenic in themselves could, if inhaled regularly over long periods, have a powerful co-carcinogenic promoting action on cells already transformed by the carcinogen into latent tumour cells.

It would seem worth investigating whether tobacco smoke contains any such co-carcinogenic irritants. If it were found to do so, it would explain the apparent "carcinogenic" significance of cigarette smoking in the absence of any recognized carcinogen (of the initiating type) in tobacco smoke. It might then even be possible to remove by suitable filters the noxious agent from tobacco smoke, to the relief and joy of nicotinephils.—I am, etc.,

Swansea.

D. K. SAMBROOK.

REFERENCE

- ¹ *Brit. J. Cancer*, 1947, 1, 379 and 383.

SIR,—It may be a good thing for the patients to stop smoking, but if the doctors were to do so what would become of the statisticians' experiment?—I am, etc.,

Hove.

CONSTANCE M. OTTLEY.

Cancer Education

SIR,—The circular sent to general practitioners by the British Empire Cancer Campaign has just been brought to our notice.

It might interest your readers to know that the Central Council for Health Education has also been considering for some time the desirability of cancer education, and has conducted experimental educational campaigns in about a dozen areas, both rural and urban. In each case the mayor

or chairman of the health committee invited all interested parties from the medical side and representatives of local lay organizations to a meeting at which there was a talk by a cancer authority on the present position of cancer and its treatment. Discussion then ensued, and the audience were asked whether they considered it a suitable subject on which to call meetings of the organizations they represented. In nearly all cases it was resolved to set up a cancer education committee, and these are now functioning under varying constitutions in many areas. The reaction of the representatives of general practitioners varied from area to area, but with one or two exceptions was favourable, mainly because they were able to see the interest of the public in the subject and their level-headed appreciation of the issues, and were able to satisfy themselves that the type of education proposed was not such as to cause alarm or hold out extravagant promises.

Reading the British Empire Cancer Campaign questionnaire, it seems to us that many practitioners may answer "No," mainly because they have frequent experience of cancer-phobes, and have not had the opportunity of taking part in such a conference. We hope very much that this questionnaire, which seems prejudiced in favour of the answer "No," will only be interpreted as a very slender piece of evidence.—We are, etc.,

Central Council for Health Education,
London, W.C.1.

S. G. DEAN.
JOHN BURTON.

Intravenous Iron

SIR,—I have read with considerable interest the article on "Toxic Reactions due to Intravenous Iron" (January 3, p. 21) just received. We work in an area where there is a 95% infestation with hookworm, and patients with haemoglobin levels of 15–20% (Sahli) are admitted almost daily. There is no blood available for transfusion, and it is a matter of some urgency to raise the haemoglobin level in the blood, particularly in cases of advanced pregnancy, where this degree of anaemia is usually associated with gross oedema and a dilated heart. Although we are only a 50-bed hospital, we give literally hundreds of intravenous-iron injections a year. The preparation available out here is "iviron," and we usually give 5 ml. (100 mg. of iron) on admission and 10 ml. (200 mg. of iron) on alternate days for three doses, which usually brings the haemoglobin to 50% or so.

It would be interesting to know the percentage incidence of toxic reactions in England. We have never encountered any here except a rise of temperature up to 102° F. (38.9° C.) on the day of injection. I only hope these are not "famous last words."—I am, etc.,

Narsapur, India.

BETTY D. HOLT.

Frustration in the Hospitals

SIR,—Some may be indignant and surprised at the interference of the Minister of Health with the details of management of the great teaching hospitals of London. May I express my opinion that they need be neither surprised nor indignant? The "frustration" that has happened is strictly in sequence and conformity with the previous actions of the Minister, whatever his political colour. In my presidential address to the Surrey Branch of the British Medical Association last June, I drew attention to the vast progress made in medicine by the initiative of the individual doctor since the times of Hippocrates of Kos over 2,000 years ago. It was exemplified in the last 300 years in England by Harvey's discovery of the circulation of the blood, Jenner's discovery of vaccination for the prevention of smallpox, Lister's discovery of antiseptics, Ross's discovery of the transmission of malaria by the mosquito, and Bruce's discovery of the transmission of Malta fever by the goat and of sleeping sickness and allied diseases by the tsetse fly, to mention but a few. When medicine became the "plaything of politics" under the so-called National Health Scheme, it was, as Bertrand Russell pointed out, to invite interference with the general practitioner and also,

as admitted by the late medical adviser to the Ministry of Health,¹ to make his work more difficult. The confiscation of the Kingston Hospital, in spite of the strongest local protest supported by the medical profession throughout the country, shows that public opinion counts for less than nothing in the mind of the case-hardened official. What happened in Kingston is only a forerunner of what is happening in the London hospitals to-day. Only by removing all medical services from politicians and Civil Servants, the former of whom just catch votes, and the latter work by rule, can a satisfactory medical service become possible.

What are now required are English, Welsh, and Scots corporations elected by the medical profession, not nominated by the Minister. They should be charged with organizing and operating the best possible medical services with the money available. The Minister of Health would then be free to study the cost, with the Government co-operating, of removing the unhealthy influences, which I set out in my address and copied from the statement of the British Medical Association, affecting good food, good houses, clean air, etc., which the medical profession is not competent to carry out. Guided by the medical profession, the Minister would have abundant work to do and he would provide the global sum required.—I am, etc.,

Peaslake, Surrey.

MALCOLM WATSON.

REFERENCE

¹ Supplement, 1951, 1, 89.

Handwriting and Personality

SIR,—The medical profession should be grateful to you that you have given so objective and lively an account of "Handwriting and Personality" (*Journal*, March 14, p. 607). As I have been a student of handwriting for over 30 years (and a psychiatrist), I hope you will allow me to write about some points regarding graphology.

First, there are many more than two camps of graphologists. In my opinion, and according to my experience, the schools following Dr. Ludwig Klages (Germany), and especially Robert Saudek (Czechoslovakia), are the only ones which should be taken very seriously. Any serious graphologist considers not only single signs, such as peculiar characters, t-bars, i-dots, etc., but the handwriting as an entity. There is the size of the characters, the spacing both vertical and horizontal, margins, pressure, speed, signature, and some more projected features of personality. The one and only difficulty lies in that the interpretation of these signs is not uniform, although many graphologists have arrived at identical interpretation and evaluation of the main features. After all, science is based, in general, on observation, comparison, and relevant conclusion. These principles are applied in serious graphology, and I am convinced that the fundamentals of personality can be assessed by means of graphological analysis.—I am, etc.,

Prudhoe-on-Tyne.

A. D. HELLER.

Lung Resection for Pulmonary Tuberculosis

SIR,—Mr. F. Ronald Edwards claims (March 7, p. 561) that "resection is not carried out through an area of active tuberculous endobronchitis." I wonder what evidence Mr. Edwards may have to support this claim. In an investigation carried out on behalf of the British Tuberculosis Association¹ I found active tuberculous bronchitis at the site of amputation in no less than 91 of 95 specimens. These specimens were limited to those cases in which the proposed site of amputation was within range of bronchoscopic vision, and in all cases the bronchus was reported upon before operation. In 56 cases no abnormality was detected. In the remaining 39 cases in which some abnormality was reported this usually took the form of slight redness or slight oedema. Clearly the value of a negative report by the bronchoscopist in suspected cases of tuberculous bronchitis is of very limited value. This is largely due to the fact, well known to pathologists though often ignored by clinicians, that quite serious bronchial disease is often covered by intact and normal epithelium. These figures go a long way towards solving the question posed

by Dr. F. H. Young (*Journal*, February 7, p. 287): "Are we paying too little attention to minor bronchoscopic findings?" It should also be mentioned that the material for the British Tuberculosis Association's investigation came from six different hospitals.

Mr. Edwards asks for a fuller explanation of the statement that "pulmonary tuberculosis is a generalized disease." The following points may assist him: (1) In the majority of resected specimens there is evidence of tuberculous endobronchitis at the site of surgical amputation. Similar lesions may be found very frequently in the normal parts of resected lobes and lungs. These lesions are frequently separated from frank, obvious tuberculous lesions by quite wide areas of lung and bronchus which are normal both to the naked eye and on histological examination. The exact significance of these lesions is still unknown, but nevertheless they are clear evidence of a generalized disease. (2) In the vast majority of a very large number of surgical specimens from cases of pulmonary tuberculosis the pathological areas have been found to be more extensive than was expected from the critical study of a long series of radiographs. (3) Where a limited resection had been intended but has, at operation, been found impossible and the "sacrifice of healthy lung tissue resorted to," the healthy lung tissue has almost without exception been found to contain macroscopic foci of either pneumonic or bronchial tuberculosis.

The fact that these lesions may be impossible to visualize in radiographs, and difficult to find in the specimen unless adequately searched for, does not constitute a licence to ignore them. On the contrary, they provide a challenge to the clinician, the radiologist, and the pathologist to co-operate in solving the problem of their significance.—I am, etc.,

London, S.W.3.

REFERENCE

¹ *Tubercle*, 1953, 34, 74.

J. W. CLEGG.

Tuberculosis Case-finding

SIR,—My colleagues and I are grateful to Dr. H. G. Calwell (February 14, p. 404) for drawing attention to the omission in our article (January 10, p. 64) of any reference to the examination of the teachers in the infant schools where the children were tuberculin-tested. No sort of attempt was made to examine the teachers. We entirely agree with Dr. Calwell that schoolteachers are a most important group who should be routinely examined, but such a project raises a number of various issues which we rather sought to avoid in the present investigation. We decided before the investigation began that if in any one school or class an unusually high proportion of tuberculin-positive reactors appeared our first measure would be to x-ray all the teachers concerned. However, that did not arise. Analysis of our material showed very little difference in the proportion of positive reactors in each age group from school to school in the different parts of the town. There was a slight, but not significant, suggestion that schools serving new housing estates in particular had a lower proportion of positive reactors.

We entirely agree with Dr. Calwell that the regular x-ray examination of schoolteachers is a most desirable, and reasonable, measure for an education authority to adopt.—I am, etc.,

Bournemouth.

W. H. TATTERSALL.

Compressive Lesions of the External Popliteal Nerve

SIR,—I read with interest the article by Drs. Hugh Garland and Doreen Moorhouse on "Compressive Lesions of the External Popliteal Nerve" (*Journal*, December 27, 1952, p. 1373). About the time this article appeared I was consulted by a European male, aged 54, who had been suffering from foot-drop on the left side for one week. There were no paraesthesiae. He was a heavy drinker and had suffered at one time from delirium tremens. He attributed the paralysis to the wearing of puttees.

On examination there was a complete paralysis of the muscles supplied by the anterior tibial nerve; the peronei were normal

and there was no anaesthesia. Palpation of the leg revealed a softish sausage-shaped swelling 3 in. (7.5 cm.) long, the upper border of which was 1½ in. (3.7 cm.) below the neck of the fibula. It was not easily palpable, as it was beneath the deep fascia and his legs were rather fat. The swelling was transilluminated and evidently contained clear fluid. There was nothing abnormal palpable at the neck of the fibula. Ten days later the nerve was explored. Beneath it, as it crossed the neck of the fibula, was a small ganglion about the size of a pea, and this was removed. The swelling lower down consisted of a chain of similar cysts arising in the septum between the peronei and the soleus. These were also excised. The day after the operation there was substantial recovery in the affected muscles and their power was normal in two weeks.

The interest in this case lies in the nature of the compressing agent, which was not palpable clinically; the fact that, though the nerve was involved before its bifurcation, the muscles of the anterior compartment only were affected—one would, of course, expect motor nerves to be more susceptible than sensory; and the rapid recovery after operation. Had the other ganglia not been palpable one would presumably have treated the case conservatively.—I am, etc.,

Nairobi.

J. A. S. GREEN.

Fatal Anaphylactic and Anaphylactic-like Reactions

SIR,—With reference to the report by Mr. G. S. Ramsay (*Journal*, February 21, p. 439) of a death following intravenous administration of iodoxyl, and the letter of Dr. H. J. Barnes (March 14, p. 618), I wish to add the following comments on the pathogenesis of fatal anaphylactic and anaphylactic-like reactions. Solutions or suspensions of any substance whose molecules possess a highly active surface-acting force are liable to precipitate an anaphylactic-like response if given intravenously. These molecules initiate a rapid and chaotic proteolysis by a physico-chemical mechanism, resulting in the liberation of toxins identical with those acting in anaphylactic shock (Godlowski¹). The activated tryptic enzymes can be again inactivated by heparin, which, if given in high dosage, forms a heparin-tryptic enzyme compound deprived of hydrolytic potency (Rocha a Silva²). Adrenaline, a potent agent in combating the hypotension in the anaphylactic reaction, cannot avert the fatal issue of these reactions, because it does not influence the basic pathogenetic phenomenon of toxic proteolysis. The rational treatment of anaphylactic and anaphylactic-like reactions in men is intravenous infusion of adrenaline (Godlowski³), with the addition of heparin in high dosage (Godlowski⁴) and any potent antihistaminic compound, all in glucose saline solution. Problems of anaphylactic and anaphylactic-like responses are dealt with at length elsewhere (Godlowski⁵).—I am, etc.,

Edinburgh.

Z. Z. GODLOWSKI.

REFERENCES

- ¹ Edinburgh University, Ph.D. thesis, 1952.
- ² *Histamina e anafilaxia*, 1946. Edigraf. Sao Paulo.
- ³ *British Medical Journal*, 1946, 1, 717.
- ⁴ *J. Endocr.*, 1952, 8, 102.
- ⁵ *Enzymatic Concept of Anaphylaxis and Allergy*, in press. E. and S. Livingstone, Edinburgh.

Modern Treatment

SIR,—Sir Robert Hutchison's letter on modern treatment (March 21, p. 671) brings back the memory of another great teacher and colleague of Sir Robert's at the London Hospital—the late Mr. Russell Howard.

Russell Howard, like Sir Robert, did not approve of the "prevailing fashion of obscuring things by calling them by their initial letters." In fact, he abhorred this type of abbreviation, and when a student asked him: "What about N.A.B. in this case, Sir?" he replied with a characteristic smile: "I will answer you in your own coinage, N.B.G."—I am, etc.,

London, W.1.

MICHAEL SMYTH.

SIR,—I read Sir Robert Hutchison's letter (March 21, p. 671) with interest and no little comfort. I am one of those to whom the majority of articles in the *Journal* of

to-day mean little or nothing, and it is a comfort to know that I am, in this, in such good company. Many of the titles to such articles do little for me beyond recalling the lines of Goldsmith describing the village schoolmaster:

"While words of learned length, and thundering sound,
"Amazed the gaping rustics ranged around."

In the last line put in the words "general medical practitioner," or, to be in the fashion, G.M.P., and so add to the long list of letters in place of words, and thus still further confuse and exasperate the reader.—I am, etc.,

Watford.

THOMAS FENTEM.

SIR,—I am reassured to learn that such a distinguished physician as Sir Robert Hutchison (March 21, p. 671) often finds, as I do, that many of the articles in the *Journal* mean nothing to him. I suppose these articles and the work that goes into them may be expected to contribute to medicine in the future, though it is sometimes difficult to see just how and why.

The ultra-scientific spirit in medicine seems now to have got out of control and is perhaps a reflection of our time. Younger members of the rank and file cannot escape these influences. Perhaps it represents a *trahison des clercs* in the medical profession—as doctors are taught so they will approach clinical medicine.

Dr. R. R. Bomford's Bradshaw Lecture (March 21, p. 633) on "Changing Concepts of Health and Disease" exemplifies the critical and thoughtful leavening and corrective we need to counteract mere "scientism." A welcome addition to the otherwise disheartening mountain of textbooks on the scientific aspects of medicine would be a textbook on such features of the art of medicine as these. It would benefit those of us suffering from an excess of mechanics and super-science and could well be written by a man of the experience of Sir Robert Hutchison.—I am, etc.,

Bridgend, Glam.

H. M. FLANAGAN.

An Unusual Case of Chickenpox

SIR,—A 6-year-old schoolboy received a boosting dose (0.2 ml.) of A.P.T. by deep intramuscular injection into the left arm, above the insertion of the deltoid. Next day he complained of stiffness and pain in the arm, which was red and slightly swollen around the site of injection. On the fourth day the arm was red, hot, and swollen from the shoulder to the elbow, yet there was little constitutional disturbance. Each day thereafter a steady improvement was noted. On the ninth day, however, a crop of vesicles appeared on the left arm concentrated around the site of inoculation. Examination of the rest of the body surface, and of the mouth, proved negative. Next day (the tenth day) the lateral surface of the arm was heavily studded with vesicles, so numerous as to be almost coalescent, while a few vesicles were found on the scalp, chest, abdomen, and in the groins, justifying a diagnosis of chickenpox. There had been numerous cases of chickenpox among pupils of the school which this boy attended.

It is presumed that this boy received his booster dose of A.P.T. while actually incubating chickenpox. The selective action of the virus for an area where slight tissue damage and hyperaemia were present is well demonstrated.

My thanks are due to the general practitioner, Dr. E. R. L. Gregson, for his co-operation.—I am, etc.,

Kirkcaldy.

JAMES A. PETRIE.

Advertising

SIR,—The recent flood disaster has given to all men of good will a great opportunity of eliminating waste in every department of expenditure. It seems that the world in general is going to go short of food in some five years' time, and we are all encouraged to take such steps as we can to increase our productivity against this imminent disaster. It has been stated officially that our share of the earth's surface is adequate, whereas the manpower to match it is deficient. Some of us are aware of serious waste in

the use of valuable manpower in advertising to, and by, the medical profession. I presume my case can be multiplied by thousands. In a fortnight I received 18 circulars, two of them 7 in. by 9½ in. Most of them are printed on expensive paper, nearly all of them are illustrated, and some of the illustrations appear to reflect in the mind of the advertiser some symbolical significance which does not readily jump to the eye. The amount spent in postage, once a valuable item in the Postmaster's returns, is now a source of understandable dissatisfaction on the part of the Post Office staff. This spate of advertising comes down to the competitive element in free distribution. I will be told by the professional advertisers that I do not understand the importance of building up and maintaining goodwill and good name. Perhaps this is so, but no one can get away from the fact that manpower is being wasted in producing and circularizing on a scale so vast.

I suggest that medical men should approach, in a conciliatory spirit, the Chancellor of the Exchequer, in the hope that he will put a stop to the overflowing waste-paper baskets of a profession which has already too much paper with which to cope.—I am, etc.,

Harrow.

H. CRICHTON-MILLER.

Intravenous Barbiturates for Drunkenness

SIR,—I feel that certain points from Dr. A. H. Bartley's letter (January 17, p. 163) require further comment, since this method of treatment as described therein is potentially dangerous, the more so as it is a method which by its very simplicity may well appeal to the harassed casualty officer or other hospital resident, particularly if newly qualified, when confronted with patients who are violent and disorientated in their drunkenness.

The quelling of a drunken patient by intravenous thiopentone, unless preceded by thorough stomach wash-out, contravenes one of the most important rules regarding the administration of an intravenous anaesthetic—namely, that thiopentone must never be given to a patient where a full stomach is suspected. The well-recognized phenomenon of "silent regurgitation" of gastric contents up the oesophagus and their inhalation into the trachea constitutes a very real risk if thiopentone is used in such cases. Even if no inhalation of gastric contents occurs, the risk of severe glottic spasm is a grave hazard to some patients, particularly the elderly hypertensives, where the subsequent strain imposed upon the myocardium is badly tolerated.

Apart from the increased likelihood of local venous thrombosis following the use of a 10% solution, as Dr. Bartley suggests, the risks mentioned are in no way diminished, for it is then more difficult to inject a given dose of the drug as slowly as if the customary 5% solution were used. Assuming that the stomach is empty, and even though the injection of a mere "sleep dose" is contemplated, some means of positive-pressure oxygen administration should be immediately at hand. For those interested, the excellent article by Drs. H. J. V. Morton and W. D. Wylie (*Anaesthesia*, 1951, 6, 190) on anaesthetic deaths due to regurgitation or vomiting should be read.

In view of the points mentioned, the writer feels that a far safer, if less dramatic, method of calming the obstreperous drunk is the intramuscular injection of 10 to 20 ml. of paraldehyde. Alternatively, subemetic doses of apomorphine have been found effective by some clinicians.—I am, etc.,

London, W.2.

PETER NOBES.

Polypharmacy

SIR,—It is with regret that I note in your columns an advertisement for a new haematinic which recalls the palmy days of polypharmacy; it is said that each capsule of this preparation contains 192 mg. ferrous sulphate, 10 micrograms vitamin B₁₂, 0.85 mg. folic acid, 50 mg. ascorbic acid, 100 mg. powdered hogs' stomach, and 350 mg. of an insoluble liver fraction; and it is recommended as "the greatest step forward yet made in the treatment of the

common anaemia," and "invaluable in the treatment of nutritional hypochromic anaemia, post-infectious anaemia, the megaloblastic anaemias of pregnancy, infancy, pellagra and sprue and allied dyscrasias."

Whatever may be the situation in the United States, this polypharmacy is not needed in Britain. The megaloblastic anaemias of pregnancy, infancy, pellagra, and sprue are so rare that a full-scale investigation is needed before any such diagnosis can be accepted; treatment may then be with folic acid, vitamin B₁₂, and ascorbic acid, nicotinic acid, etc., whichever is indicated. Nutritional hypochromic anaemia—an elegant term for iron deficiency—can be treated quite efficiently by simple iron salts or by injection of saccharated iron hydroxide.

Further, such blunderbuss preparations are dangerous, because they prevent accurate diagnosis. I was asked recently to study an anaemic patient who had received iron salts, folic acid, liver extract (parenteral and oral), vitamin B₁₂, and a mixture of other B vitamins. This treatment had effectually destroyed the clues on which I depend, and I could not help the patient. Another patient, referred to a colleague for diagnosis of a suspected pernicious anaemia, received oral and parenteral liver extract only 24 hours before reference to hospital for investigation—making the diagnosis unnecessarily difficult. No one can exaggerate the importance of diagnosis in anaemia, or the difficulty of establishing it after treatment has started. In more than nine cases out of ten a simple history and simple laboratory tests suffice to establish the diagnosis—and laboratory tests are becoming available to more and more practitioners.

One must conclude that the manufacturers of this new concoction are hoping to divert a larger proportion of the nation's drug bill into their own pockets. This is a lawful—and perhaps even a commendable—aim: but the money available for the Health Service is limited, and the cost of curing a patient with the new remedy is likely to exceed that of curing him with some simpler and less elegant preparation. It is difficult to escape the conclusion that to order so elegant a preparation is against the best interests of patients and of the country.

Such sentiments are spreading among the younger consultants and their registrars. Our task to-day is to restore to health (and work) as many patients as possible, and to do this with the minimum of expense. Recently it was pointed out that about £240,000 has been wasted by ordering a proprietary preparation in place of its official equivalent. When public moneys are wasted on this scale those who encourage such expenditure are challenging the Government of the day, one of whose chief tasks is to secure value for money. The introduction of unnecessary, high-priced polypharmaceutical mixtures encourages waste of public money and must bring forward the day when practitioners are allowed to prescribe only from a standard formulary and manufacturers will have to secure a licence to use a proprietary name for their preparations. The introduction of such mixtures is against the best interests of the medical profession and of the pharmaceutical industry.—I am, etc.,

London, N.W.10.

GEORGE DISCOMBE.

Treatment of Impetigo

SIR,—In the reply to the question on the treatment of impetigo ("Any Questions?" March 14, p. 631) your expert wisely stresses the undesirability of interference with lesions. But it is surely impossible to avoid interference if pastes or creams are used, as recommended. It is my experience that a foolproof method of treatment is that of eau d'Alibour (lot. cupri et zinci sulph. N.F.) with 50% spirit, applied every three or four hours in the form of a spray. Exudation ceases after 24–48 hours, and within a few days the crusts will have separated and will drop off spontaneously. The de Vilbiss spray or similar apparatus could presumably be loaned to the patient on the payment of a returnable deposit.—I am, etc.,

Portsmouth.

RONALD SCUTT.

Operative Treatment of Hallux Valgus and Rigidus

SIR,—I would like to support Mr. N. Ross Smith (January 31, p. 274) in his contention that arthrodesis of the metatarso-phalangeal joint is the operation of choice for hallux rigidus and valgus. Whilst agreeing with Professor

Bryan McFarland (p. 275) and Mr. J. M. P. Clark (January 17, p. 162) that Keller's operation and Mayo's operation are both capable of producing good results in a high proportion of cases, there is no doubt that occasionally they may both produce a very bad result. The bad results are invariably due to interference with the head of the metatarsal, weakening the transverse arch and aggravating still further the well-known disabilities produced by a short metatarsal.

I have not yet seen a single bad result following arthrodesis of the metatarso-phalangeal joint, but would like to suggest the following variation in technique, which was suggested and introduced to me by Mr. J. B. Leather and is what he appropriately called a "two-stage Girdlestone." First, the metatarso-phalangeal joint is arthrodesed in the straight position, by simply denuding the articular surfaces of cartilage, leaving a smooth concave base of proximal phalanx and a smooth convex head of metatarsal. The foot and great toe are then immobilized in a plaster case, the metatarsal arch being well moulded. One month later, the plaster is removed, and the distal half of the proximal phalanx is excised extra-osteally in order to restore dorsiflexion of the toe. Two to three weeks later the patient has a good strong foot and no physiotherapy is usually needed. In elderly patients not wishing to engage in strenuous activities, I modify the technique in leaving out the second stage, but anticipating this by arthrodesing the metatarso-phalangeal joint in 30 degrees dorsiflexion.

Finally, I would make a plea for careful selection of patients. If the symptoms are essentially due to the bunion and exostosis, provided the joint shows no evidence of arthritis, then simple removal of the exostosis is all that is necessary; the valgus deformity in itself is not an indication for interference with the joint, but arthritis is.—I am, etc.,

Wolverhampton.

J. H. KIRKHAM.

Treatment of Threadworms

SIR,—Dr. W. Ivon Hayes's inquiry (February 28, p. 510) about the relation of the incidence of threadworm infection to the consumption of meat is a stimulating one, but it is probably unanswerable. Unless surveys are made by National Institute of Health (N.I.H.) swab, pestle, adhesive cellulose tape, or one of the other reliable methods (Watson and Mac Keith¹) they are of little value. Most infected people have no symptoms, and clinical impressions of incidence cannot be trusted. Unfortunately the only surveys in this country are of 1941 and 1946 (Young² and Mac Keith and Watson,³ and a fuller report to be published). Furthermore, is it not true that with rationing the consumption of protein has changed more in its distribution than in its total, the present consumption being 90% of pre-war?

The suggestion made by Dr. Hayes may well be correct, but I doubt whether it is true that children with oxyuriasis are more often "hungry, especially for sweets and sugar." It was evident from asking the mothers of a large number of children that the incidence of bulimia, of nail-biting, and of nose-picking was not higher in the infected ones. The only symptoms attributable to oxyuriasis were perianal itchiness and consequent disturbed sleep and fatigue.

Although the generally better hygienic habits of adults may account for their relative freedom, there is evidence (Schüffner and Swellengrebel⁴) that infection may occur per anum, vitiating the benefits of hand-washing before meals. A chemical difference in bowel contents is perhaps the reason. What is the incidence of oxyuriasis in the well (protein) fed children and adults of Melbourne?—I am, etc.,

London, S.E.1.

RONALD MAC KEITH.

REFERENCES

- ¹ *Arch. Dis. Childh.*, 1952, 27, 526.
- ² *Proc. roy. Soc. Med.*, 1941-2, 35, 684.
- ³ *Practitioner*, 1948, 160, 264.
- ⁴ *J. Parasit.*, 1949, 35, 138.

Intercourse after Syphilis

SIR,—When asked in the first place to answer this question I realized that the period advised for resumption of intercourse after treatment would arouse some critical comment.

Colonel L. W. Harrison (February 28, p. 510) quotes in full the statement made by Klauder in the discussion following the

Obituary

IRWIN MOORE, M.B., C.M.

Dr. Irwin Moore, who died at his home in Wimpole Street on March 23 at the age of 86, was almost the last of the older generation of British laryngologists, and was a link with the golden age of consulting practice in London, which ended in 1914. In earlier years he had made many important contributions to laryngology.

Dr. Irwin Moore's father, Dr. George Moore, of Hertford Street, London, had been a young assistant in Staffordshire until he was called, in the absence of his principal, to attend at Trentham the famous Duchess of Sutherland, who in her day ruled London society—Queen Victoria, attending some function at Stafford House, is reputed to have said, "I have come from my home to your palace." Dr. Moore was a handsome young man, to whom the Duchess took a fancy, telling him that if he would come to London she and her friends would support him, and he quickly built up an aristocratic practice in Mayfair.

Dr. George Moore's son, James Lennox Irwin Moore, was born in 1866, and was educated at Westminster School and Edinburgh University, where he graduated M.B., C.M. in 1893. After the usual house appointments at Edinburgh, he spent five years in general practice at Market Harborough, but in 1900 came to London to devote himself to laryngology. He became chief assistant in the throat department at King's College Hospital, and for a number of years was private assistant to Sir StClair Thomson. He was appointed honorary surgeon to the old London Throat Hospital in Great Portland Street, which amalgamated with the Throat Hospital, Golden Square, in 1914. Irwin Moore was never particularly happy about this amalgamation, and it was without regret that he left Golden Square, where he was honorary surgeon, to join the staff of the Metropolitan Ear, Nose and Throat Hospital in 1922 as senior assistant surgeon. He had been promised promotion to full surgeon after a short probation, but when after two or three years this did not eventuate he resigned. The committee of management were happy to assuage an old grievance in 1946, when he was appointed consulting surgeon to the hospital.

He was an energetic honorary secretary of the Section of Laryngology of the Royal Society of Medicine in 1919, and in the nineteen-twenties there was hardly a meeting of the Section where he did not show cases and never a volume of the *Journal of Laryngology* without one or more important articles from his pen. In 1925 he was vice-president of the Section of Laryngology and Otology of the B.M.A. at the Annual Meeting at Bath, where he showed an important collection of early endoscopic instruments. His contributions to the literature included articles on "Achalasia of the Oesophagus" (1918), "Angeiomata of the Larynx" (1921 and 1923), "Prolapse of the Laryngeal Ventricle" (1922), "Stenosis of the Larynx" (1923), "Cartilaginous Tumours of the Larynx" (1925), "An Historical Survey of Peroral Endoscopy" (1926), and "Oesophagectasia" (1927), all of them well illustrated and with copious bibliographies. He was one of the leading British pioneers of endoscopy, and invented ingenious instruments for use in bronchoscopy and oesophagoscopy, perhaps the most notable being his large-diameter

paper by Pariser,¹ but the dermatologists and syphilologists of Philadelphia who followed this work very closely testify to the fact that no spirochaetes were found in the semen unless there were active lesions in the genital tract. Stokes and his collaborators in the standard textbook on syphilis² state: "The source of spirochaetes in the semen seems to be the real question at issue. . . . This [the work of Pariser] would seem to set at rest, if confirmed, the belief that there is a rest form of *Spirochaeta pallida* capable of being carried in the sperm or semen and capable of transmitting the disease to the ovum instead of to the foetus through the mother. Kemp has established for late syphilis the same principle which Pariser established for early syphilis."

None of the correspondents has presented any new evidence to support his point of view, and a great deal of their thinking is based on the pre-penicillin therapy of syphilis when the time required to effect a cure was much longer than it is now. Penicillin has revolutionized the treatment of syphilis, and the writer has used it in a large number of cases with no relapses and only two reinfections. It may also be noted that the incidence of the disease, especially in this country, is now extremely low, and before many years have elapsed it may well be as rare as rickets or chlorosis.

The available scientific evidence supports the overwhelming evidence of practical experience that intercourse without protection is permissible six months after completion of treatment.—I am, etc.,

"YOUR EXPERT."

REFERENCES

¹ *J. Invest. Derm.*, 1942, 5, 311.

² *Modern Clinical Syphilology*, 1944. Philadelphia.

SIR,—The correspondence recently published in the *Journal* suggests that this is a difficult question. I think the answer depends on whether we consider the problem from a theoretical point of view or in the light of ordinary practice.

Theoretically, as long as we have no test of cure that is 100% reliable, any intercourse between married or unmarried people is to be forbidden. In ordinary practice, this sort of prohibition would not be complied with, and it seems to me that it cannot be enforced, for the following reasons: (a) Experience has shown us that after using "modern" treatment (9 or 15 mega units penicillin, in France) no contaminated partner and no syphilitic newborn children have been seen, even if the patients do not wait for six months' negativity before resuming intercourse; (b) with such treatment we have not seen true relapse (reinfections and minute modifications of serological tests being disregarded, after a period of six months of negativity. We know one case only, a muscular gumma (?) in a tabetic patient (which is a rather uncommon case), the diagnosis of which could not be made from a biopsy. Rationally the contamination of partners or of babies remains still more unlikely than the occurrence of some late manifestation in the treated patient; and (c) disclosure of syphilis means a severe psychological shock to the patient and for a married couple. To forbid intercourse for years, because of a very slight risk, creates an obsession that syphilis is incurable and may wreck the marriage. Indeed, this possibility seems more dangerous to me than a contamination which could be treated very easily, and this social aspect deserves consideration.

The fact that a treponema can be present in a spermatozoon head (or rather stick to its surface) is a very interesting one, for it will support the hypothesis of foetus contamination by the father, without contamination of the mother. In any case, this is not relevant, for Finger and Landsteiner, Uhlenhuth, Bessemans, Levaditi, and Vaisman's experiences were drawn from non-treated people or animals with active syphilis.

I consider that we must be satisfied with your expert's answer, and allow intercourse after a six months' period of serological and C.S.F. negativity, especially when the usual serological tests are controlled by a treponemal immobilization test. However, in pregnancy, in order to prevent any possibility of trouble, I suggest that the mother be treated as follows: 9 mega units of procaine penicillin at the very beginning and 9 mega units near the end of pregnancy, when she has no more intercourse. When the husband's syphilis cannot be disclosed to his wife, a gynaecological excuse is easy to find.—I am, etc.,

L'Hôpital St. Lazare,
Paris

P. DUREL.

oesophagoscope and his useful cutting-shears. In 1921 he published a book entitled *Intrinsic Cancer of the Larynx and the Operation of Laryngo-fissure*, based on his experience "in performing or co-operating in over 50 cases of laryngo-fissure," and he was perhaps a little naïve in being surprised that Sir StClair Thomson was annoyed at the appearance of the book, of which he knew nothing until its publication, for most of the recorded cases were those at which Irwin Moore had assisted StClair Thomson, though Irwin Moore had designed a useful set of instruments for the operation. In 1928 he published a large volume entitled *Tonsils and Adenoids and their Diseases*, fully illustrated and with numerous references; in this he laid much emphasis on the value of treating chronic tonsillitis with an escharotic paste, "London paste," the formula of which he had found in Morell Mackenzie's classical textbook on diseases of the throat, and with which he treated many patients who wished to avoid operation.

He was an outstanding advocate in favour of the rehabilitation of the professional reputation of Morell Mackenzie, and wrote many letters to newspapers and journals on this theme. In 1919 he became the tenant for a decade of Mackenzie's old country house at Wargrave, on the Thames, and in 1921 arranged a memorial service in the churchyard there in connexion with the summer meeting of the Section of Laryngology. He had been given a portrait of Mackenzie by his elder daughter, and when he wished to present this to the Royal Society of Medicine the then president refused to accept it. Irwin Moore, in high dudgeon, did not attend a meeting of the Section of Laryngology again for over 20 years. It is pleasant to relate that a year or two ago the portrait was accepted and hangs in the council room of the Royal Society of Medicine, and Irwin Moore, then in his eighties, became again a welcome attendee at the Section of Laryngology.

Irwin Moore had a large and fashionable practice, including royalty from home and abroad. He was distinguished by the courtly manners of the old school, and had a kindly, hospitable, and indeed lovable nature, though his righteous indignation was easily aroused and he could be irascible as well as generous. He had a fishing-lodge down in Radnorshire, and used to dash off there for a week-end's fishing even at an advanced age. He was one of the oldest members of the Savage Club, was happy to be a leading member of the famous old London dining club, the Knights of the Round Table, and for many years was honorary treasurer of the Hunterian Society, in which he took a great interest. His only son died in 1916, his first wife died in 1919, and his second wife and his brother both died last year. Nevertheless he was in active practice and attending patients right up to his last illness, and his ardent spirit was full of vitality to the end.—R. S. S.

W. J. N. VINCENT, C.B.E., M.D.

We record with regret the death of Dr. W. J. N. Vincent at his home at Sheffield on March 15 at the age of 85. He was medical superintendent of the South Yorkshire Asylum from 1911 to 1933. William James Nathaniel Vincent was born on August 24, 1867, the second son of the late Mr. H. J. Vincent, and was educated at the University of Durham and at the London Hospital, graduating M.B., B.S. in 1892 and taking the diplomas of M.R.C.S., L.R.C.P. in the same year. He proceeded to the degree of M.D. in 1914. After acting as assistant medical officer at the Durham County

Asylum and at the Borough Asylum, Mapperley Hill, Nottingham, he was appointed assistant medical officer at the South Yorkshire Asylum, Wadsley, Sheffield (now the Middlewood Hospital) in 1898. He succeeded the late Dr. W. S. Kay as medical superintendent in 1911, the same year in which he was appointed to the lectureship in mental diseases in the University of Sheffield. His services in that connexion were officially recognized by the University in 1934, when the honorary degree of M.A. was conferred upon him.

Dr. Vincent, who was accorded the rank of lieutenant-colonel in the R.A.M.C., was in charge of the Wharncliffe War Hospital at Sheffield from 1915 to 1920 and of the Ministry of Pensions Hospital at Wadsley. For his services during the first world war he was appointed C.B.E. in 1919. He took a lively interest in clinical psychiatry and in 1924 was enthusiastic in the use of malarial therapy for general paresis, a method of treatment which might be regarded as a forerunner of more recent physical methods. Among the distinctions which came his way was the presidency of the Sheffield Medico-Chirurgical Society. His keenness on hospital administration and design was exercised during his last years of office by the planning and building of the new admission block at Middlewood, which was opened in 1935. Kind and gentle in manner, and disliking formality, Dr. Vincent was highly esteemed by his colleagues and well loved by his patients. He resigned from the superintendency of his hospital in 1933 and enjoyed many years of retirement. His favourite hobby was painting, and his portrait of Dr. Kay still hangs in the medical superintendent's office at Middlewood Hospital, together with a useful pen drawing of the hospital buildings. Astronomy and alpine climbing were among his other recreations. He married Miss Kate Helen Barker, of Sheffield, in 1917, and she survives him, together with two sons, one of whom is a member of the medical profession, and two daughters.—F. T. T.

J. BARNES BURT, M.D.

Dr. J. Barnes Burt, well known as a rheumatologist on the Continent as well as in this country, died at his home at Bath on March 18 at the age of 72. His death was unexpected, for he had been in active practice until a fortnight before his fatal illness began.

Joseph Barnes Burt was born at Kendal, in Westmorland, in 1880, the son of Dr. J. K. Burt, and was educated at Epsom College and at University College Hospital, qualifying M.R.C.S., L.R.C.P. in 1902, and taking the London M.B. in the same year. He proceeded to the M.D. in 1904. After qualification he held the appointment of house-surgeon at University College Hospital, and then went to Cambridge as a research scholar in special diseases. Deciding to specialize in the treatment of gout, rheumatism, and allied diseases, he set up in practice at Buxton, where he was on the staff of the Devonshire Royal Hospital for many years. During the war of 1914-18 he served as a temporary captain in the R.A.M.C., and was in Mesopotamia from 1917 to 1919. It was relatively late in life, in the year 1935, that Dr. Barnes Burt moved from Buxton to Bath. He was immediately elected to the staff of the Royal Mineral Water Hospital—now the Royal National Hospital for Rheumatic Diseases—and remained an active member from 1935 to 1946, when he retired and was appointed consulting physician. Shortly before the beginning of the last war he was very actively engaged with the plans to rebuild the hospital, and was in fact

chairman and organizer of the medical appeal committee. It was a sad blow to him when the outbreak of war in 1939 put a summary end to the rebuilding, for which the plans had been proposed and most of the money collected.

Barnes Burt was the first president of the Section of Physical Medicine of the Royal Society of Medicine and a past chairman of the International Society of Medical Hydrology. On the death in 1940 of Dr. Fortescue Fox, who was the creator and father of the society, Barnes Burt took over the chairmanship, and largely through his efforts the society was revived at the end of the last war. When the British Medical Association held its Annual Meeting at Plymouth in 1938 he served as a vice-president of the Section of Physical Medicine and Physical Education. He had interested himself in the work of the Association some years before the Plymouth meeting, however, and was a member of the Spa Practitioners Group Committee from 1927 to 1946. He also served on the Physical Medicine Group Committee from 1945 to 1950, and was chairman of the Bath Division in 1932-3. A fine physician and a cultivated and a forthright colleague, he will be deeply missed. His kindness and consideration inspired a real affection in both his patients and his colleagues. During his long association with the treatment of the rheumatic diseases he wrote extensively, particularly on gout and neuritis.

Among his other activities Barnes Burt was a city councillor in Bath from 1939 to 1946, representing the Bathwick ward. He was an authority on etchings and water colours, and among his collection were some fine examples by Rembrandt and John Cotman. His own efforts in this field were of a high standard. At one time he was a governor of the Whitworth Art Gallery.

He married Miss Dorothy Armitage, and she survives him, together with the two sons and one daughter of the marriage. His eldest son has followed his father not only into the medical profession but also as president of the Section of Physical Medicine of the Royal Society of Medicine.—L. C. H.

Medico-Legal

MEDICAL EVIDENCE ON INSANITY

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

The vexed question of the respective functions of the jury and of medical expert witnesses was once again ventilated in the Court of Criminal Appeal on March 30.¹

The appellant, Joseph Holmes, had been convicted at Nottingham Assizes of the savage and frenzied murder of his landlady and duly sentenced to death. His defence was that of insanity, and it was conceded by the prosecution that he suffered from paranoid schizophrenia. After the murder he had gone to the police station, had told the police that he had killed his landlady, and had made a full statement about it. Under the M'Naghten rules the issue for the jury on which criminal responsibility for his act depended was the state of his mind at the time the act was done—that is, did he know what he was doing, and, if so, did he know that what he was doing was wrong?

The principal ground of the appeal was that one of the medical witnesses called on this issue had been asked whether in his opinion the appellant's conduct in going to the police immediately after the murder and making a full statement would indicate that the appellant had known that what he was doing was wrong in law. This, argued counsel, was an improper question, in that a medical man, however

eminent, should not be asked his opinion on the very question which it was for the jury, not for the expert witness, to decide. He submitted that a doctor, having first proved that the accused was suffering from a disease of the mind, might then be asked whether in his experience such a disease would affect his judgment of right and wrong, but that he must not be asked what was in the man's mind when the act was done.

During the argument the Lord Chief Justice, Lord Goddard, interjected to ask what was the point of the appeal, since everyone was now agreed that the appellant was certifiably insane. Whatever the result of the appeal the appellant would become a patient in Broadmoor. Counsel replied that, though the matter in respect of this appellant might be academic, it was one of general importance, and, if the judge at the trial had been wrong in allowing the question to be put to the doctor and answered, this ought to be plainly laid down by the court.

The judgment of the court dismissing the appeal was given by the Lord Chief Justice. He said that the doctor called for the defence was asked in cross-examination whether in his view the appellant's behaviour when he went to the police indicated that he knew that what he was doing was wrong in law. No member of the court had ever heard of objection being taken to such a question. If the answer the doctor had given to the question had been "No," to exclude the question might have placed an insuperable difficulty in the way of the defence. The court considered the question to be a perfectly proper one, and one which if held inadmissible could possibly produce injustice in the case of an innocent prisoner.

The court might well have gone further and asked how in the world a jury of twelve laymen could draw a conclusion about what was in the mind of a paranoid schizophrenic without the assistance of the opinion of a doctor with professional experience of that condition being given upon that very question. On the opinion being given, it is of course the responsibility of the jury to make up their minds whether it is an opinion on which they ought in conscience to act.

Medical Notes in Parliament

INQUIRY INTO HEALTH SERVICE COSTS

THE MINISTER OF HEALTH announced on April 1 his decision, taken in conjunction with the Secretary of State for Scotland, to refer the costs of the National Health Service to an independent committee for investigation. The chairman of this committee will be Mr. C. W. Guillebaud, a Cambridge don and economist, who has served on a number of trade wages councils and industrial arbitrations. The names of the other members are to be made known as soon as possible.

Mr. Iain Macleod, in his statement, said that he and the Secretary of State for Scotland had had under close review the whole problem of the present and future cost of maintaining a proper and adequate National Health Service. They had already initiated a number of administrative and other measures designed to alleviate, so far as possible, the considerable cost to the taxpayer without impairing the quality of the service provided. But these were inevitably measures of detail and the general long-term problem remained essentially unsolved. After a great deal of thought the Secretary of State and he both felt that the many issues involved in this problem were so complex that the wisest course would be to refer the whole matter for an independent and objective inquiry by a committee. They therefore proposed to appoint a small committee with the following terms of reference:

To review the present and prospective cost of the National Health Service; to suggest means, whether by modification in organization or otherwise, of ensuring the most effective control and efficient use of such Exchequer funds as may be made available; to advise how, in view of the burdens on the Exchequer, a

rising charge upon it can be avoided, while providing for the maintenance of an adequate Service; and to make recommendations.

Opposition Protests

The announcement provoked an immediate storm of protest among Opposition Members. Mr. ANEURIN BEVAN assailed it as an abuse of Parliamentary procedure, because immediately after the Easter recess there was to be the Budget, which naturally bore on the cost of the Health Service. That was the appropriate time for this kind of statement. Had the Cabinet seriously decided that this was an issue to be remitted to a committee of inquiry? It was primarily a matter for the House of Commons and for political decisions. This was an act of the most unprecedented political cowardice—to send to a committee of inquiry a matter which was at the centre of British politics. Why had the Minister not asked the Central Health Services Advisory Council for its advice about modifications in the organization of the Service? It had been set up for that purpose. What the Minister was doing as a consequence of struggles between himself and the Treasury was seeking another instrument by which he might mutilate the Service. Everyone knew the Minister was an avowed enemy of the National Health Service. He had publicly declared it, and in his own hands it had received many grievous blows. The best service he could render to it would be to resign.

Long-term Problem

Mr. MACLEOD said that he had seen Mr. Guillebaud the previous afternoon, and thought it was his duty to inform the House as soon as he could. The matter had been considered at the highest level by the Government, who thought that it was essentially a departmental matter and that the announcement should be made by him and not by the Chancellor of the Exchequer as part of the Budget, because it was the long-term problem which remained essentially unsolved. It was because the Central Health Services Advisory Council was representative of wide interests within the Service that he did not consider it to be the appropriate body for an inquiry of this nature. In his view what was needed was an entirely independent inquiry—not a political one, nor one linked in any way to membership of a committee or tied to any of the professions in the Health Service. He would never have agreed to the committee, nor would Mr. Guillebaud have accepted the chairmanship, if it had been designed to mutilate the Health Service. On a matter that so deeply concerned the finances of the Service the House would give the fullest value to the view of a Minister of Health who never got his estimates to within £100m. of the right figure.

Mr. BEVAN retorted to the last observation that on his last estimate expenditure was £14m. less. Was expenditure equal to £400m. of the National budget, and concerning the welfare of all the citizens of Great Britain, a fit subject to be remitted to a committee of inquiry? Why did not the Chancellor of the Exchequer remit to such a committee the question whether taxes should be higher or not? Why did he not hand over the whole of his Budget to such a committee? What the Minister was doing was to seek the most respectable auspices under which to destroy the Health Service.

In the considerable uproar Mr. C. J. M. ALPORT protested that a vicious personal attack was being made on the Minister; and Mr. S. SILVERMAN said the Minister had taken a large chunk of public expenditure and proposed a revolutionary and unconstitutional method of dealing with it. Mr. BEVAN repeated that an essential feature of the Budget would be expenditure on the Health Service, and the purpose of this statement by Mr. MACLEOD, made so shortly in advance of the Budget, was to nullify a great deal of the discussions on the Budget.

Mr. R. FORT, on the other side, said that many, inside and outside the House, would welcome the Minister's statement. It would enable a great deal of information about the cost and expenditure on the Service to be brought together in a form which could be appreciated. In putting

the matter before the committee, he asked, would the Minister ask its opinion about the effect of making block grants to hospitals to give regional boards greater independence than they had enjoyed under the organization set up by Mr. Bevan? Mr. MACLEOD said that it was true that many people had for a long time considered that this was a matter which should be inquired into. The question of block grants came within the terms of reference.

Mr. A. WOODBURN suggested that as an economist was being put in charge of the inquiry the purpose of the committee was to find out, as the Organization and Methods Division of the Treasury could, whether the existing Service could be more economically run. Mr. MACLEOD said that this was a general inquiry into the financing of the Service. It was not an economy cuts committee. He thought a committee not tied to the professions nor to any political party was the best way of dealing with a long-term matter, which might take months and perhaps a year.

Free Drugs for Private Patients

SIR EDWARD KEELING asked the Minister of Health on April 2 how much it would cost the taxpayer to give drugs, dressings, and appliances to private doctors' patients after deducting the 1s. prescription charge, but without allowing for the transfer of many National Health Service patients to private doctors which would follow such gift. Miss PAT HORNSBY-SMITH informed him that if the net cost per person were the same as for patients under the National Health Service (which assumed that private doctors would be bound to observe the same conditions as National Health Service doctors) the total cost to the taxpayer might be nearly £1½m. per annum.

Untreated Flour

VISCOUNT HINCHINGBROOKE asked the Minister of Food on April 1 whether he was aware of fresh evidence that consumption of wheat-flour treated with nitrogen trichloride (agene) or chlorine dioxide produced eczema and mental disturbance in allergically responsive persons and what steps he was taking to make chemically untreated flour or bread available to such persons and to those who preferred it. Major G. LLOYD GEORGE said he assumed that Lord Hinchingbrooke was referring to a recently published article in a medical journal (*Lancet*, 1953, 1, 577) reporting a single case of allergic response to flour treated with agene or chlorine dioxide. He was assured that flour which had not been treated with either of these improvers, and bread made from such flour, would, as hitherto, be available on special request.

Industrial Noise

Dr. BARNET STROSS questioned the Minister of Labour on March 31 about the effect of noise in metal-working industries on hearing, and the steps being taken to protect the workers from deafness of this type.

Mr. HAROLD WATKINSON, the Parliamentary Secretary, replied that the department was aware of the recent report of a committee of the Medical Research Council on the medical and surgical problems of deafness and that exposure over many years to noise above certain intensities might cause deterioration in hearing. Much research was being carried out into this question, and a committee had been set up jointly by the Department of Scientific and Industrial Research and the Medical Research Council which would consider, among other things, the effect of noise in relation to human efficiency. The harmful effects of noise on the individual could be reduced to some extent by the wearing of protective ear coverings and by eliminating injurious noise at its source by improved designs of machines and their mountings and the sound insulation of walls and ceilings; but the subject had been found to bristle with practical difficulties. He added that there was to be specific research into finding the right type of protective ear covering.

Hospital Staff Wage Awards.—The estimated cost in 1953-4 of wage and salary awards made to all full- and part-time hospital staff during the last 12 months was approximately £6½m.

¹ *The Times*, March 31.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 21 (No. 11) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	20	3	10	0	1	53	5	9	0	1
Dysentery ..	433	41	102	9	1	642	57	35	1	1
Encephalitis, acute ..	6	1	0	0		3	0	4	0	
Enteric fever:										
Typhoid ..	3	0	1		1	4	1	0	0	1
Paratyphoid ..	2	0	0			7	0	3(B)	1	1
Food-poisoning ..	47	11		0		117	13		0	
Infective enteritis or diarrhoea under 2 years ..					12				12	18
Measles*	27,226	1439	434	202	200	7,121	256	514	303	279
Meningococcal infection ..	49	6	15	1	3	46	7	12	1	6
Ophthalmia neonatorum ..	39	2	4	0		33	4	10	1	
Pneumonia†	1,044	61	347	10	4	950	38	506	13	3
Poliomyelitis, acute:										
Paralytic ..	20	0	1	2	1	13	0	1	0	2
Non-paralytic ..	6	1				9	1			1
Puerperal fever‡	256	40	8	2		240	35	4	1	2
Scarlet fever ..	1,625	94	178	41	47	1,546	118	211	24	72
Tuberculosis:										
Respiratory ..			188	28				146	42	
Non-respiratory ..			39	3				33	4	
Whooping-cough ..	3,104	202	320	23	88	3,086	158	310	163	91

DEATHS In Great Towns	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	1	0	1	0	0	0	0	1	0	0
Dysentery ..	0	0	0	0		0	0		0	
Encephalitis, acute ..		1				0				
Enteric fever ..	0	0				0	0		0	
Infective enteritis or diarrhoea under 2 years ..	13	0	2	1	1	8	0	1	1	
Influenza ..	133	16	14	0	4	33	3	23	0	1
Measles ..	1	0	0	1		0			0	0
Meningococcal infection ..		0	0				0	1		
Pneumonia ..	365	56	25	26	17	322	53	12	6	
Poliomyelitis, acute ..	0					1	0		0	
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis:										
Respiratory ..	120	14	15	6	9	142	26	27	4	13
Non-respiratory ..	0	0	2	0	1	2	3	2	1	
Whooping-cough ..	1	0	0	0	0	7	0		0	1
Deaths 0-1 year ..	253	28	20	12	14	259	34	29	9	16
Deaths (excluding stillbirths) ..	6,207	879	644	148	204	5,732	875	712	128	170
LIVE BIRTHS ..	8,182	1215	913	216	318	8,072	1203	957	228	437
STILLBIRTHS ..	220	27	18			198	32	25		

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

Vital Statistics

Smallpox in the North Country

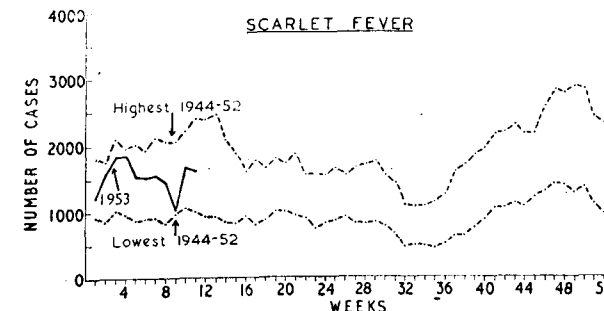
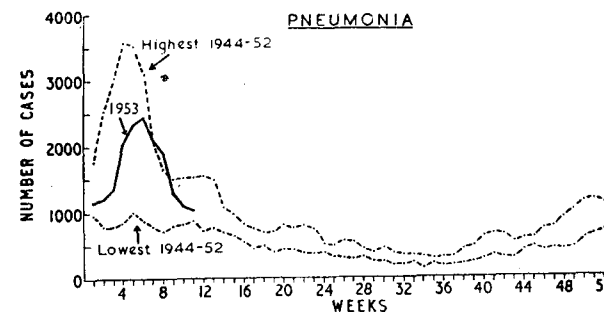
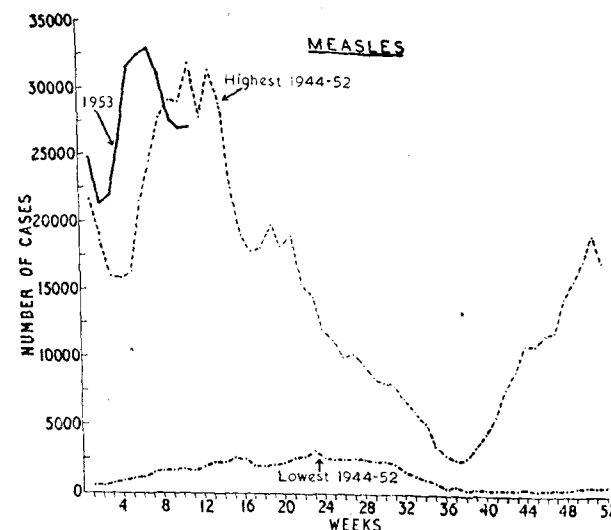
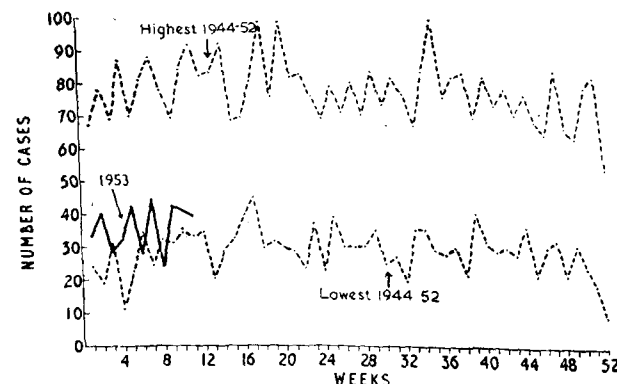
Up to noon, April 7, 21 cases of smallpox, including 4 deaths, had been reported from Yorkshire and Lancashire. Cases (deaths in parentheses) were distributed as follows:—*Todmorden M.B.*: 11 (3); *Bacup M.B.*: 2 (1); *Oldham C.B.*: 2; *Bury C.B.*: 2; *Halifax C.B.*: 4. Five cases have been notified since last week's report (which made the erroneous statement that 2 cases in *Todmorden M.B.* were both contacts of a new *Bacup* case). The new cases were as follows:—*Halifax C.B.*: 4 cases, which were contacts of one of the original cases at *Halifax General Hospital*; *Oldham C.B.*: 1 case, which was a contact of a previous case. Cases continue to be in the direct lines of contact with previous cases, and the outbreak appears to be well contained.

In reply to a question in Parliament, the Minister of Health stated on April 2 that of the 19 cases confirmed up to the previous day 10 had had no original vaccination, 7 had not been vaccinated since infancy, and 2 had been vaccinated in infancy and again in the 1914-18 war. After the outbreak had started 14 were vaccinated or revaccinated.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.

OPHTHALMIA NEONATORUM



Infectious Diseases

The largest fluctuations in the returns of infectious diseases during the week ending March 21 in England and Wales were a rise of 302 in the number of notifications of measles, from 26,924 to 27,226, 71 for dysentery, from 362 to 433, and a fall of 50 for scarlet fever, from 1,675 to 1,625.

The largest rises in the number of notifications of measles were 251 in Hertfordshire, from 858 to 1,109; 127 in Worcestershire, from 346 to 473; and 106 in Cornwall, from 263 to 369; and the largest falls were 250 in Essex, from 1,615 to 1,365; 156 in Surrey, from 1,961 to 1,805; 107 in Kent, from 1,415 to 1,308; and 103 in Oxfordshire, from 434 to 331. Only small fluctuations occurred in the local trends of scarlet fever. The notifications of whooping-cough rose from 3,072 to 3,104; the largest fluctuation was an increase of 67 in Lancashire, from 528 to 595. 20 cases of diphtheria were notified, 11 fewer than in the preceding week. A decrease in Lancashire from 10 to 5 was the chief feature of the returns of diphtheria.

26 cases of acute poliomyelitis were notified; these were 5 more for paralytic and 4 more for non-paralytic cases than the preceding week. The largest return was 3 in Sussex.

The largest centres of dysentery were Lancashire 80 (Liverpool C.B. 40), Leicestershire 64 (Leicester C.B. 63), London 41, Middlesex 43 (Edmonton M.B. 31), Yorkshire West Riding 37 (Leeds C.B. 12), and Cheshire 17.

133 deaths were attributed to influenza in the great towns, 6 fewer than in the preceding week.

Industrial Accidents and Disease

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in February was 121, compared with 101 in the previous month and 114 (revised figures) in February, 1952. The number of cases of industrial disease reported was 41, including 3 from lead poisoning, 4 from anthrax, 14 from epitheliomatous ulceration, and 20 from chrome ulceration. There were no deaths.—*Ministry of Labour Gazette*, March, 1953.

The Services

A Supplement to the *London Gazette* has announced the following awards:

First Clasp to the Territorial Efficiency Decoration.—Major A. M. Rennie, R.A.M.C.

Territorial Efficiency Decoration.—Major A. M. Rennie, Captain (Honorary Major) D. R. Beaton, and Captain H. J. Minford, M.C., R.A.M.C.

Medical News

Association of the Royal College of Surgeons in Ireland.

The annual general meeting of the association was held in the Royal College of Surgeons in Ireland on March 21 with the president, Dr. Paul Murray, in the chair. Professor A. K. Henry, professor of anatomy at the R.C.S.I. and emeritus professor of clinical surgery of Cairo University, was elected president for 1953-4. Dr. J. D. H. Widdess was elected vice-president, Dr. Catherine A. Quinn hon. treasurer, Dr. P. D. J. Holland hon. record secretary, and Mr. W. A. L. MacGowan hon. corresponding secretary.

Medical Aspects of Civil Aviation.—The standing medical committee of the International Air Transport Association held its third annual meeting at Estoril, Portugal, during the week March 21 to 28. The members represented 18 international airlines, and Sir Harold Whittingham was in the chair. The committee discussed the practical application of the W.H.O. International Sanitary Regulations, medical requirements for aircrew, medications contraindicated for use by aircrew when on duty, methods of disinfection of aircraft, and the maintenance of wholesome water supplies on aircraft. It was considered that aircraft could be kept virtually free of insects if fabric and paint were impregnated with a synthetic resin containing an effective insecticide. This would save time in transit and the personal annoyance caused by aerosol spraying.

Bravery in Kenya.—The award of the M.B.E. (Civil Division) to Mrs. Dorothy Meiklejohn, M.R.C.S., L.R.C.P., of Aberdare District, Kenya, was gazetted in London on March 27. The citation was as follows:

On an isolated farm Mrs. Meiklejohn and her husband were in their sitting-room when, suddenly, four Africans burst into the room and immediately launched a savage attack on them. At least one of the Africans was armed with a pistol, while the others were in possession of native knives. Mrs. Meiklejohn shouted to her husband and tried to reach for a firearm which was in her handbag, but was slashed on the wrist. Both Mrs. Meiklejohn and her husband were attacked again and again until the Africans thought they were dead; they then left. Mrs. Meiklejohn's husband climbed the stairs to his bedroom and collapsed there. Mrs. Meiklejohn was suffering from multiple and very serious wounds. Her face and arms were slashed and she was fast losing blood, but, determined to obtain help for her injured husband and raise the alarm, she staggered to her car and drove to the police station, at Thomson's Falls, a distance of nine miles, over a rough and lonely road. On arrival she was only able to identify herself before she collapsed. She was taken to hospital and recovered, but her husband succumbed to his injuries.

Mrs. Meiklejohn showed outstanding fortitude in the face of grave danger.

Award of Manson and Chalmers Memorial Medals.—The council of the Royal Society of Tropical Medicine and Hygiene has awarded the Manson Medal, 1953, to Professor Jérôme Rodhain, director of the Institute of Tropical Medicine, Antwerp. The medal is awarded triennially to the living author of original work in any branch of tropical medicine or hygiene. The Chalmers Memorial Medal, 1953, has been awarded by the council to Mr. D. J. Lewis, medical entomologist in the Sudan Government Service. This medal is awarded biennially for research of outstanding merit on tropical medicine or hygiene. Only those under 45 years of age are eligible.

Dangerous Drugs.—Two new Statutory Instruments affecting dangerous drugs came into force on March 31. The first, the Dangerous Drugs Regulations, 1953, consolidates and amends certain earlier Regulations and, apart from a few scheduled exceptions, applies to all substances covered by the Dangerous Drugs Act, 1951. The second, the Dangerous Drugs Act (Relaxation) Order, 1953, frees morpholinylethylmorphine from control by Subsection (1) of Section 11 of the Dangerous Drugs Act, 1951. This drug, which is obtained from one of the phenanthrene alkaloids of opium, is now controlled by Part III of the new Regulations.

Sir Howard Florey, F.R.S., is on a three months' visit to Canberra in his capacity as adviser to the Australian National University on the John Curtin Memorial School of Medical Research.

Dr. William Storrar, formerly assistant administrative medical officer of the South-western Regional Hospital Board, has been appointed medical director of the Montreal General Hospital. He graduated from Edinburgh in 1939, and went to Canada in 1951.

Professor R. M. Titmuss, formerly a member of the Medical Research Council's Social Medicine Research Unit and now professor of social administration at the London School of Economics, has been appointed a member of the National Insurance Advisory Committee.

The Rev. A. C. Irvine, M.D., senior missionary of the Church of Scotland Mission in Kenya, is to receive the honorary degree of D.D. at the summer graduation at Aberdeen University.

COMING EVENTS

National Association for the Prevention of Tuberculosis.—A meeting for members of all sections of the N.A.P.T. is to be held in the Great Hall, B.M.A. House, Tavistock Square, London, W.C.1, on Saturday, April 18, at 2.30 p.m. The subject to be discussed is "The Modern Management of Tuberculosis by Chemotherapy and Otherwise." Application for tickets should be made as early as possible to the National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C.1.

Seminar on World Health.—During the World Health Assembly at Geneva the World Federation of United Nations Associations is organizing a Seminar to be held at the Palais des Nations in Geneva from May 4 to 15. The Seminar will be opened by Dr. Brock Chisholm, and there will be lectures on world health problems. Applications may be sent through a United Nations Association or directly to the World Federation of United Nations Associations, 1, Avenue de la Paix, Geneva, or 19, Avenue Kléber, Paris, 16.

NEW ISSUES

British Journal of Industrial Medicine.—The next issue (Vol. 10, No. 2) will be available in a week's time. The contents include:

RESPIRATORS FOR PROTECTION AGAINST MERCURY VAPOUR. V. B. Vouk, Z. Topolnik, and M. Furgas.
THE ACTION OF FLINT OF VARIABLE SIZE INJECTED AT CONSTANT WEIGHT AND CONSTANT SURFACE INTO THE LUNGS OF RATS. E. J. King, G. P. Mohanty, and C. V. Harrison.
DUST SAMPLING TO SIMULATE THE HUMAN LUNG. H. H. Watson.
PNEUMOCONIOSIS OF COAL-MINERS IN SCOTLAND. John Black.
A PILOT INVESTIGATION INTO THE OCCURRENCE OF PNEUMOCONIOSIS IN LARGE POWER STATIONS IN SOUTH WALES. Idris Davies.
EXPECTED FREQUENCY OF BLADDER TUMOUR IN WORKS POPULATION. R. A. M. Case.
METHYLOCTYLBENZENE SULPHATE: A NEW INDUSTRIAL SENSITIZING AGENT. C. N. D. Cruickshank and H. Howard-Swaffield.
PSYCHOLOGICAL HANDICAP IN RELATION TO PRODUCTIVITY AND OCCUPATIONAL ADJUSTMENT. M. Markowe and L. E. D. Barber.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d.

Abstracts of World Medicine.—The April issue (Vol. 13, No. 4), which is now available, contains abstracts of important papers on both medical and surgical subjects drawn from the medical literature of some 20 different countries and of all five continents. In addition to clinical medicine and surgery, the subjects covered include pathology, bacteriology, pharmacology, and chemotherapy, and there are also sections dealing with public health, industrial medicine, forensic medicine and toxicology, aviation medicine, anaesthetics, radiology, and the history of medicine.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; a specimen will be sent free on request.

These journals are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, April 13

MEDICAL SOCIETY OF LONDON.—8.30 p.m., meeting of Fellows. Discussion to be introduced by Dr. K. Harris and Dr. S. Oram: Early Manifestations of Coronary Disease.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. F. Masina: Surgical Approach to Tumours of the Bladder; 6.30 p.m., Mr. V. H. Riddell: Thyroid Tumours.

ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: Astigmatism and its Treatment. Factors Affecting Binocular Vision.

Tuesday, April 14

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Lumsden Lecture by Dr. E. A. Carmichael: Hemiplegia of Early Onset and the Results of Hemispherectomy.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. R. Furlong: Pseudocoxalgia; 6.30 p.m., Mr. P. Clarkson: Injuries of the Hand.

Wednesday, April 15

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, W.C., 4.30 for 5 p.m., Dr. E. G. B. Calvert: Surgery and the Diabetic.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Professor Lambert Rogers: Costoclavicular Syndrome; 6.30 p.m., Mr. Harold Edwards: Treatment of Inguinal Hernia.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. B. E. Schlesinger: Tuberculosis in Childhood (Illustrated).

Thursday, April 16

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Dr. A. E. Jones: Clinical Aspects of Carcinogenesis; Dr. A. Glucksmann: Histological Aspects of Carcinogenesis.

EPSOM AND SUTTON INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At Horton Hospital, Epsom, 5.30 p.m. Films: (1) Dr. T. F. Main: Grief; (2) Dr. H. R. Rollin: three short films illustrating manic and depressive psychoses.

FARNBOROUGH HOSPITAL, Kent.—5.30 p.m., Dr. C. J. Gavey: Physician's Evaluation of Surgical Risks.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At 11, Chandos Street, W., 8.30 p.m., Dr. Michael Kremer: Modern Views on Epilepsy and its Treatment.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Lumsden Lecture by Dr. E. A. Carmichael: Hemiplegia of Early Onset and the Results of Hemispherectomy.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Dr. Kenneth Perry: Tuberculous Glands of Neck; 6.30 p.m., Mr. Cecil Flemming: Fractures of the Foot.

ROYAL EYE HOSPITAL.—5.30 p.m., Miss J. M. Dollar: Problem of Iridocyclitis and its Investigation.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor W. C. W. Nixon: Physiological and Clinical Aspects of Uterine Action.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. A. S. Paterson: postgraduate demonstration in neurology.

SOCIETY OF CHEMICAL INDUSTRY: MICROBIOLOGY GROUP.—At Medical Society of London, 6.15 p.m., Dr. Lois Dickinson: Use of the Bacteriophage in the Study of Viruses; Mr. L. J. Meanwell: Bacteriophages of the Lactic Streptococci.

Friday, April 17

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members; 6.30 p.m., Professor J. Rotblat: Study of the Distribution of Thorotrast in the Body by Autoradiography.

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 4 p.m., Professor R. J. V. Pulvertaft: Study of Radiosensitivity in Vitro; Dr. Edith Paterson: Factors Influencing Recovery after Whole Body Radiation; Dr. W. M. Court Brown: Some Aspects of Water and Electrolyte Metabolism in Radiation Sickness.

KENT AND CANTERBURY HOSPITAL.—8 p.m., clinical meeting.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8.30 p.m., Mr. C. E. Shattock: Lumps in the Breast.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.30 p.m., Mr. Roland Jones: Surgery of Peripheral Vascular Disease.

ROYAL EYE HOSPITAL.—4.30 p.m., Mr. A. J. Cameron: Problem of Retinitis Pigmentosa.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Brittain.—On March 21, 1953, at the Christopher Nursing Home, Wigan, Lancs. to Dr. Ina (formerly Eakins), wife of Dr. George Brittain, a daughter.

Eason.—On April 2, 1953, at the Lambeth Hospital, London, S.E., to Ruth (formerly Towler), wife of Thomas John Eason, F.R.C.S.Ed., a brother for Robert and Charles.

Griffiths.—On March 26, 1953, at Overton Lea Maternity Home, Cheltenham, Glos. to Elizabeth, wife of Dr. Eric Griffiths, a daughter—Lynn Elizabeth.

Johnston.—On March 26, 1953, at the Varborough Nursing Home, Southsea, Hants. to Kay, wife of Dr. C. L. Johnston, a brother for Heather and Moya.

Levien.—On March 26, 1953, at Hamilton, New Zealand, to Norah Margaret (formerly Mathers), wife of G. H. Levien, F.R.C.S., a daughter.

MARRIAGES

Owen—Griffith.—On March 28, 1953, at Moriah Chapel, Caernarvon, Kelyth Lloyd Owen, M.R.C.S., L.R.C.P., to Jean Griffith.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Sound-proofing the Surgery

Q.—What are the best ways of sound-proofing a doctor's surgery? Often attempts seem to fail because of leakage at the door.

A.—As a general rule the insulation of the partitions themselves will be adequate if they are of brick or breeze, and plastered. Even a timber stud partition has moderate insulation if constructed with heavy lath and plaster, and it is only likely to give trouble when it is a light or temporary structure such as fibreboard or plain plasterboard on a light framing. Weight is the main requirement. For new work, therefore, I would suggest 4½ in. (11.5 cm.) brick if possible, but 3 in. (7.6 cm.) clinker concrete plastered ½ in. (1.3 cm.) thick on both sides would be reasonable.

Any weakness in a sound-insulating barrier has a marked influence on the overall insulation. In the case of surgery partitions the weakest part of the insulation is almost invariably the doorway, the leakage of sound being due to a double cause: (a) the air gaps round edges of the door, especially at the bottom; and (b) the door itself (or the door panels) being lighter than the main partition structure—the lighter the weight the poorer the insulation.

In taking remedial action the first step is to aim at sealing the air gaps all round the door. This can be done fairly well by means of metal draught-strip, in conjunction with a splayed or rebated threshold. An alternative method is to put rubber strip all round the door stop, but the door must be made to close tightly against it. The door itself must be reasonably heavy—either solid wood throughout or with thick panels, or covered with a heavy sheet material. Nevertheless, however heavy the door or however well sealed the edge gaps, the doorway will nearly always remain the weak point in the partition unless double doors are provided, separated either by an air space of not less than 6 to 8 in. (15 to 20 cm.), or better still by a lobby. The airspace or lobby should contain as much absorbent-lined surface as possible—say "acousti-celotex" or similar tiles fixed to the reveals, to the wall and ceiling, or to the door face. Double doors are certainly recommended whenever possible, both for new work and for adaptations. Single doors, even if heavy and with very tight closure all round, do not give real privacy.

If the surgery is sparsely furnished it may also be useful (in addition to the measures for sound insulation) to provide a reasonable area of absorbent treatment (acoustic tiling) on the ceiling and/or wall surfaces; but this is not worth while if the room already has a carpet and curtains and some upholstered furniture.

Best Antibiotic in Meningitis

Q.—What is the best antibiotic to use initially in meningitis due to the following organisms: (a) *Haemophilus influenzae*, (b) *Pseudomonas pyocyanea*, (c) *Bact. coli*, (d) *Proteus vulgaris*, and (e) *Strep. faecalis*? Please indicate dosage and route of administration.

A.—(a) *H. influenzae* is at least moderately sensitive to all the main antibiotics as well as to sulphonamides, and succeeding years have witnessed the use of sulphadiazine, penicillin, and streptomycin individually and in combination, and with or without antiserum. Still better results have more recently been obtained with both aureomycin and chloramphenicol. The organism is highly sensitive to both:

chloramphenicol is probably to be preferred because it attains higher concentrations in the cerebrospinal fluid (one-third to one-half of those in the blood, a level unapproached by any other antibiotic). The dose should be 200 mg. per kg. body weight per day in divided doses by the mouth.

(b) *Ps. pyocyanea*.—The antibiotic to which this species is most sensitive, and regularly so, is polymyxin. It must be injected intrathecally in daily doses of 20 mg. If systemic as well as meningeal infection exists, it may also be given intramuscularly (an average dose is 2.5 mg. per kg. body weight daily), but prolonged systemic treatment involves a risk of renal damage. The second choice is streptomycin, provided that the strain is sensitive (this must be tested: some are totally resistant). This also must be given intrathecally, the initial dose being 100 mg. daily. The newer antibiotics are less useful and penicillin useless. Failing anything else, full doses of sulphadiazine may help.

(c) *Bact. coli* meningitis is probably best treated with streptomycin if the strain is sensitive: chloramphenicol would be the second choice.

(d) *Proteus vulgaris*.—This form of meningitis is fortunately so rare that there are no adequate data on which to base any dogmatic statement about treatment. The organism is relatively insensitive to the three newer antibiotics, and streptomycin again offers the best hope of success, but with the same proviso as before.

(e) *Strep. faecalis*.—The rarity of this infection again precludes confident judgment, but the antibiotic to which this species is most sensitive by far is aureomycin: the dosage (exclusively oral) should be as for chloramphenicol (see (a)). In view of the synergic action of penicillin and streptomycin in endocarditis due to *Strep. faecalis*, it is possible that this combination might also be effective in meningitis due to it.

All the suggestions made are based on normal bacterial sensitivities, and should serve for initial treatment, but this may have to be varied in some cases following laboratory studies. There is no condition in which accurate assessment of the susceptibility of the organism to all appropriate and available chemotherapeutic agents is more important or more urgent than meningitis due to such awkward bacteria as those named here. The doses stated are those for adults: about one-quarter of these is usually given to infants.

Infectious Diseases and Public Laundries

Q.—I have recently seen a leaflet which states: "Since May, 1952, tuberculosis has been a notifiable infectious disease, and the 1936 Public Health Act requires that all materials contaminated by the organisms of notifiable infectious diseases must be sterilized before being sent to a public laundry." Is it therefore illegal for a tuberculous person in an infectious state to send his washing to a public laundry?

A.—The statement is incorrect. It was probably inspired by a misinterpretation of the Public Health (Tuberculosis) Regulations, 1952 (Statutory Instrument No. 904 of 1952), which came into force on May 1, 1952.

The nomenclature in respect of the notification of infectious disease tends to be confusing and may be briefly summarized thus:

S.144 of the Public Health Act, 1936, requires the notification of a "notifiable disease" to the local medical officer of health. "Notifiable disease" is defined in s.343, and the provisions of the Act apply only to the diseases thus defined. A local authority may add to the list of notifiable diseases so far as its own area is concerned in accordance with the provisions of s.147. It will be seen, therefore, that there are two types of "notifiable disease," (a) those specifically mentioned in s.343, which applies to all local authorities in England and Wales, and (b) those added by the local authority with the Minister's approval and having a territorial limitation. Both types are "notifiable diseases" and the sections of the Public Health Act (s.144-153, s.155-160) dealing with the notification and prevention of "notifiable diseases" apply to them.

By s.143 of the Public Health Act, 1936, the Minister of Health may make Regulations regarding the treatment and prevention of spread of infectious, epidemic, or endemic disease. The Minister

has exercised this power so as to require the notification of a number of diseases not notifiable under the Public Health Act, 1936—e.g., plague, malaria, measles, tuberculosis, etc. Diseases thus declared notifiable by the Minister are not "notifiable diseases" within the meaning of that term defined in the Public Health Act, 1936, and the provisions of that Act do not apply to them.

The Public Health (Tuberculosis) Regulations of 1952 merely revoke and re-enact the Public Health (Tuberculosis) Regulations, 1930, with minor administrative changes rendered necessary by the National Health Service Acts.

I do not know of any statutory prohibition on a tuberculous person in an infectious state sending his washing to a public laundry, but he might well incur a common law liability if damage resulted from his action. It is general practice in the laundry trade for the terms of the contract between laundry and customer to contain a clause excluding "infected articles" until they have been disinfected. In any event there is a moral duty not to spread infection, and the public should be thus advised.

"Cortisone Fractures"

Q.—What is the mechanism of fracture of the spine during cortisone therapy?

A.—Fracture-collapse of the vertebrae during cortisone therapy is due to osteoporosis and increased functional activity. Osteoporosis is in most cases the result of prolonged inactivity, usually bed-rest in cases of rheumatoid arthritis; occasionally it is of the senile type. If cortisone has been given for prolonged periods, it may have some slight additional effect, since it tends to produce osteoporosis. (This is well seen in Cushing's syndrome, essentially a hyper-corticoid state.) However, collapse is sometimes seen in rheumatoid patients being enthusiastically "rehabilitated" without any cortisone treatment. The increased mobility following the loss of pain and stiffness on cortisone is probably the major factor in the production of these "cortisone fractures."

Premature Orgasm in the Female

Q.—A woman of 38 years and married 15 years says that her marriage has been marred by the fact that she experiences a sudden premature orgasm after which she cannot bear her husband to touch her. What are the possible causes of this condition? She states that she is very anxious to have a child and the only time that she remembers being at all happy in her married life was once when, her period being late, she thought that she might be pregnant. What treatment is advised?

A.—Once a woman has reached orgasm it is usual for coitus to become difficult because the secretions dry up and the pelvic muscles contract to close the vagina. However, such strong aversion to continued attempts by the husband is abnormal. Premature orgasm in the female is also exceptional. Indeed, the account of the case suggests that the main symptom is only a cloak to a more important background, and sympathetic probing of the problem by the family doctor or by a psychologist might well help to elucidate the picture. The most obvious possible basis for the trouble is the sterility, and the best approach might well be to investigate both husband and wife from this standpoint. If sterility is the real problem, and if investigation shows that there is no absolute bar to conception in either partner, artificial insemination using the husband's semen might well circumvent the immediate problem of coitus and result in pregnancy. If the wife achieved a pregnancy by this or other means, her emotional upset might settle and this lead to spontaneous cure of her other symptoms.

Other questions which arise are: How long does the husband take to achieve orgasm? Does he in fact have an emission, or is he suffering from partial impotence?

If it be decided to treat the case symptomatically, orgasm in the wife might be deferred if preliminary love play is omitted entirely and by coitus *a tergo*.

NOTES AND COMMENTS

Alcohol and Barbiturates.—Dr. D. R. WOOD (Sheffield) writes: I was interested in the reply under "Any Questions?" (January 24, p. 232) to a query about alcohol and barbiturates. I wonder in what sense your expert is using the words "potentiated" and "synergistic"? In the papers to which the reader is referred the question is dealt with from the point of view of the LD50 of each substance. From the point of view of "drunk in charge" it would be important and interesting to know whether the substances reinforce each other's action in producing ataxia, euphoria, etc.

OUR EXPERT writes: Despite an exhaustive search I have found no reports on the effect of alcohol and barbiturates when used together on ataxia, euphoria, etc. I think in my original answer I might have been wiser to have used the word "synergism" rather than to have talked about "potentiation." The synergistic effect between ethyl alcohol and phenobarbitone has been well demonstrated experimentally by Jetter and Maclean.¹ When the maximum sublethal dose of one drug plus half that of the other was used, death was produced regularly. Similar fatal synergism is suggested by observation on three poisoning cases in human beings. Nevertheless Sandberg² has demonstrated a potentiative type of synergism between ethyl alcohol and six short-acting barbiturates—the degree of potentiation varying with the dose and the derivative.

REFERENCES

- ¹ *Arch. Path.*, 1943, 36, 112.
- ² *Acta physiol. scand.*, 1951, 22, 311.

Recurrent Parotid Enlargement.—Dr. M. SECKBACH (London, N.W.11) writes: Your correspondent ("Any Questions?" February 7, p. 348) asks whether there is any known relationship between menstruation and recurrent parotid enlargement. I am reminded of a case I saw 20 years ago which had previously been labelled "recurrent parotid enlargement." When I saw the patient she told me she had noticed a swelling, associated with tenderness, in the region of the parotid gland shortly after an abortion six years previously. This swelling subsided after a few days, but recurred at every menstruation. She had never noticed anything like that before the abortion. On examination I was able to feel a small soft nodule constantly present. There was no other pathological finding. Any lung or blood disease had been excluded and there was no evidence of calculus in the parotid duct. The fact that the swelling started after an abortion and had recurred with each menstruation for six years raised my suspicion of an accessory thyroid gland. Portions of this gland may be displaced during the course of development. The existence of a lingual thyroid and of small pieces of thyroid tissue at some distance from the normal thyroid gland between the tongue and the arch of the aorta is known. Puberty and pregnancy are among the predisposing factors of goitre. A minor swelling of the thyroid gland during or just before onset of menstruation, particularly in young girls, has often been observed. The thyroid gland was in its normal position in my particular case. An exploratory operation confirmed the diagnosis of an accessory thyroid. The small tumour consisted of thyroid tissue and had a fibrous capsule. The possibility of aberrant thyroid tissue has therefore to be borne in mind in the case mentioned by your correspondent.

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MAGIC, MEDICINE, AND RELIGION

THE PERSISTENCE OF AN IDEA*

BY

Sir SYDNEY SMITH, C.B.E., M.D., F.R.C.P., D.P.H., F.R.S.E.

Regius Professor of Forensic Medicine, University of Edinburgh

Although the probable age of the world and of living matter has been the subject of many estimations it would be unsafe to assume that they are even remotely correct. Our knowledge of anything in prehistoric days is highly conjectural, and history itself is a peculiarly inexact science even if it does not warrant the dictum of Mr. Henry Ford.

It is impossible to say when man arose, but relics of manlike creatures who lived about half a million years ago have been found in divers places. Somewhere about 50,000 years ago Neanderthal man flourished, leaving many indications of his artistic and medical skill and of his belief in an after-life, as shown by his method of disposal of the dead.

About 10,000 years ago man began to cultivate crops and to breed animals, and from that date a good deal of evidence has accumulated about his activities and beliefs. Nothing very definite could be learned, however, until some method had been devised for recording his experiences, devices which arose, strangely enough, in several different parts of the world at approximately the same time—namely, about 5,000 to 6,000 years ago. Since then we have acquired a considerable knowledge of his affairs, especially from Egyptian and Mesopotamian sources.

Disease is as old as living matter. Evidence of its presence is found in prehistoric fossil bones, and indeed one of the earliest evidences of disease in humans or manlike creatures was found in the femur attributed to the Java man, which Keith considers to be about 350,000 years old. From that time onwards much evidence of disease has been found, particularly in material from the Nile Valley, where the dry climate, together with the methods of disposal of the dead, has had a preservative effect. Evidence of disease has been found not only in the bones but also in the soft tissues,¹ and in addition to signs of various pathological processes it is interesting to note the prevalence of osteoarthritic changes and arteriosclerosis in those remote periods, which indicates that we are not necessarily correct in attributing such processes to the stress and strain of modern life.

Primitive Medicine and Religion

We may take it that disease of some kind has always afflicted man and must have led him to search for means of easing pain and curing disability. In his quest for

food he had to discriminate between things that were good for him and things that were not. By process of trial and error he obtained not only dietetic acumen but also knowledge of drugs which had a beneficial effect in disease, drugs which prevented pain, and drugs which were capable of causing death. In course of time this skill in the use of drugs became the special province of certain individuals, and by it they were able to exercise power and authority in the community. These were the original medicine men, but it would be wrong to think that they relied on drugs alone in the treatment of disease. If the condition was simple or the cause of it apparent, no doubt such herbs or simples as were available were used, together with primitive surgical procedures, but we must remember that many disabilities have no obvious cause, and for the treatment of those other methods had to be devised.

To-day we regard disease as being subject to natural laws, but before such laws were known it surely was reasonable to assume that phenomena which could not be otherwise explained were due to the action of some supernatural power. For example, the sudden onset of pain, the eruption of a fever, the convulsions of epilepsy, etc., had to be explained in some way, and in default of any natural explanation they were assumed to be due to the action of demons who had gained entrance to the body or had forced something of a toxic nature into it. Assuming this to be correct, the logical response was an appeal to a higher power to curtail the activities of the demon, to drive him out or destroy him. This entailed appeal to higher supernatural powers, and thus arose the priest, whose functions were closely associated with or were performed by the medicine man.

The fundamental aim of primitive religion as of primitive medicine was to safeguard the life of the individual, and, to effect this, steps were taken which were strictly rational, although they may have been based on false premises; hence, from the earliest times religion and medicine had similar objectives—medicine endeavouring to control natural processes by natural means, religion trying to control the same phenomena directly by appeal to some higher power. In addition, certain rites and procedures were used to combat disease, the efficacy being inherent in the rites themselves or in the user, and this constituted magic. Medicine, religion, and magic, therefore, have been associated since the beginning and have worked together for the alleviation of human suffering.

*A Finlayson Memorial Lecture delivered before the Royal Faculty of Physicians and Surgeons of Glasgow on December 10, 1952.

¹ *Palaeolithic Pathology of Egypt*, by M. A. Ruffer. 1921.

Egyptian Theology and Medicine

In Egypt, in quite remote times, there was not only a very advanced state of culture, including a well-developed system of medicine, but also a remarkably complicated system of theology. All varieties of sickness and disability were attributed to the action of gods, certain of whom had health and disease as their special responsibility. Health depended to a great extent on paying proper attention to the edicts of these gods and propitiating them with offerings. Even after death the comfort and well-being of the dead depended on such propitiation. The Books of the Dead deal in great detail with the judgment after death, the "weighing of souls" as it was called, and the various proceedings in connexion with the passage of the soul through the underworld. There was therefore, from a very remote period of history, a strong belief in the power of the gods during life and in their authority after death, for belief in existence in some form after death seems to have been present since human life began. It is interesting to note that in the trial of souls, although Osiris sat in judgment with a court of lesser gods, there is a suggestion that over and above them all there was a supreme being. This idea of a day of judgment has remained a part of human beliefs.

In addition to the inscriptions on tombs and temples a number of medical papyri have been discovered, the two most important, and probably the oldest, being the Ebers Papyrus, which is mainly medical and magical in its outlook, and the Edwin Smith Papyrus, which is surgical and rational. The Ebers Papyrus contains sections dealing with various diseases and their treatment, concerning which it shows quite a remarkable standard of knowledge. Throughout the manuscript, in addition, there are directions for the use of incantations, invocations to the gods, and the words to be recited when healing a patient, indicating the important place of religious and magical procedures in medical treatment, though there is a suggestion that the incantations may have been used to reinforce the action of the drugs and not for the value of the magic alone. Even when knowledge of the uses of drugs became more profound, medical treatment by the doctor, spiritual treatment by the priest, and magical treatment by the sorcerer continued to be used side by side in active collaboration.

The Edwin Smith Papyrus is a surgical treatise and deals in a common-sense way with lesions of a traumatic nature, beginning from the head and working downwards. The diagnosis, prognosis, and treatment of fractures, dislocations, and wounds; the effects of injuries on the brain; and the processes of healing are dealt with in a skilful manner. The method of reducing a dislocation of the jaw, for example, is the method in use at the present time. The suturing of wounds, the use of adhesive plaster for bringing the edges of a wound together, the use of properly padded splints and other retaining apparatus, a very efficient system of bandaging, and various other surgical procedures are described, indicating a fairly high degree of medical knowledge. There is one case only in which an incantation is used. The treatise as we have it is a copy of an ancient work and unfortunately is incomplete.

Breasted hazarded a guess that the original work from which the papyrus was copied was written about the time of the pyramid-builders, about 5,000 years ago, and possibly was used by Imhotep himself. Imhotep was the earliest physician that we know by name, and combined the offices of Chief Physician, Chief Magician, and Chief Vizier to Zoser, the Pharaoh of the Third Dynasty. He was also the architect of the Step Pyramid at Sakkara, the first important public building of which there is any record. Though we have little information about his medical activities we do know that his name was revered for about 3,000 years, which is rather longer than most reputations last, and, more

important from our point of view, numbers of temples were erected in his honour, where treatment of the sick by incubation or temple sleep took place. We may look upon him as the founder of psychotherapy. By the time that Egypt was conquered and overrun by the Greeks, about 300 B.C., the worship of Imhotep was general throughout the land, and the temples erected in his honour became seats of medical science and instruction.

We note, therefore, not only that the Egyptians had a relatively advanced system of medical treatment, but also that magical and religious procedures and cults existed side by side with rational medicine from the most ancient times of which we have any knowledge. In other places where there are medical records, such as in Sumeria, Babylonia, and other Eastern countries, the same relationship of religion, magic, and medicine is found.

Among the ancient Hebrews medicine as a science did not exist, and disease was looked upon as a punishment for sin which incurred the wrath of God. There appears to have been little use made of ordinary medical practices, although physicians are mentioned in the Scriptures, and the hygienic and sanitary code evolved by them was unique and masterly. Healing seems to have been the province of the priests, and possession and exorcism were of importance. The healing pilgrimage of Christ and the diseased conditions which he is recorded to have cured must have appeared miraculous. Many of the cures described by St. Luke, such as the cure of epilepsy, of chronic arthritis, and of dropsy, the cleansing of lepers, the casting out of devils, the cure of the dumb and the blind, are all strongly suggestive of actual cases, and it is a question whether Christ should be looked upon as a psychotherapist of remarkable ability or whether he was in fact possessed of divine powers. It would be unsafe to assume that the diseased conditions which he healed were all psychogenic in origin. Many of the miracles may perhaps be explained on that assumption, but certain of the cures cannot—for example, the immediate cure of a withered hand² and of a case of leprosy,³ and the restoration of a dead person to life.⁴ These cannot be explained as the result of psychological treatment, but must be attributed to something beyond our understanding.

Developments in Greece

The Greeks were no doubt impressed by the standard of medical knowledge in Egypt and particularly by the success of the religio-magical treatment by incubation in the temples of Imhotep, and as a result many such institutions were established in Greece. Not only was the system of temple healing adopted, but it is also suggested that the name Asklepios, the Greek god of healing, was derived from Imhotep. Certainly in Egypt after the Greek conquest the two names were used indiscriminately, and many of the temples founded by the Greeks in honour of Imhotep were called Asklepieia.

In early Greek medical practice emphasis was laid on the religious or spiritual element, and the importance attached to incubation or temple sleep is shown by the fact that in and about the eighth and seventh centuries B.C. there were erected something like 300 of these temples, dedicated to Asklepios. The most beautiful of these was situated at Epidauros, where in addition to the central shrine and abaton, or sleeping-place for the sick, there were baths, hostels, and gymnasia, as well as a large theatre and stadium.

On arrival at the temple the sufferer was subjected to a ritual which predisposed him to suggestion. After bathing in the cleansing waters of the fountain he was admitted to the porch of the temple, where he spent one or two days in prayer and meditation. This period, which would exert a soothing influence on his mind, was followed by sleep in the abaton, where the depth of sleep may have been assisted by narcotics. During sleep the god appeared to the sufferer, and quite often a cure was effected overnight. More frequently it required several days of treat-

ment by incubation supplemented by baths, massage, gymnastics, and strict dietary measures. The inscriptions round and about the temples and the number of votive offerings indicate that many cures resulted.

About 460 B.C. there was born in the island of Cos a man who was later to become the greatest of all physicians—Hippocrates. In Cos at that time there was a temple and shrine dedicated to Asklepios to which thousands of sick people resorted. The family of Hippocrates was associated with the temple, and the youth no doubt acquired at an early age a training in medical methods. In the fifth and fourth centuries Greece had remarkable efflorescence of genius in arts and science, in philosophy, history and drama. I need mention only Herodotus, Sophocles, Pheidias, Socrates, Plato, Aristotle. It might therefore have been expected that a great medical man would arise. With the advent of Hippocrates there began a rational system of medicine in which disease was dealt with as a natural phenomenon due to disordered processes in the body itself, and treated by paying particular attention to all the conditions which tended to preserve health. When disease occurred, the natural forces of the body were encouraged to effect a cure. All magical and religio-magical methods were dismissed, as well as the idea that disease was a punishment for sin. Even in connexion with epilepsy, which was always spoken of as the "sacred disease," Hippocrates said, "It is not in my opinion any more divine or sacred than any other disease, but has like them a natural cause and its supposed divine origin is due to man's inexperience."

The system of faith healing and magic in the temples continued, however, throughout the Hippocratic era and well beyond it, and it is difficult to credit that Hippocrates attributed no importance to suggestion in his treatment, even though he did not believe in direct divine intervention. Speaking of the way in which doctors attribute the phenomena seen in epilepsy to divine causes, he says: "In treating sufferers from this disease by purification with blood and like things they behave as if the sufferers were ritually unclean, the victims of divine vengeance or of human magic or had done something sacrilegious. It would have been better if they had taken the sick into the temples, there by sacrifice and prayer to make supplication to the gods. I do not believe that the body can be polluted by a god, but if it is polluted by some other agency the presence of a god would be more likely to purify it, for it is the deity who purifies, sanctifies, and cleanses us from sin." This suggests that Hippocrates by no means discarded the importance of the temples in the healing of the sick. He considered that most diseases were to be cured by restoring the disturbed harmony in the elements and humours of the body, such restoration being carried out by the powers of nature aided by the physician, who removed any disturbing factors. Before the Hippocratic era, Alcmaeon of Croton, a pupil of Pythagoras and contemporary of Empedocles, had already introduced the doctrine that health depended on the harmony of elements within the body and disease upon their discord. Though Hippocrates betrayed no enthusiasm for drugs, he had quite an extensive pharmacopoeia at his disposal, and many of the drugs in use then are still used.

In this wonderful period of Greek development, therefore, we find that healing by the use of drugs, by physical means, and by religious and magical procedures existed side by side. In this regard it is to be noted that in 380 B.C. Plato recognized the importance of the mind in healing. Through one of his characters, who was a physician, he said: "The cure of a part should not be attempted without the treatment of the whole. No attempt should be made to cure the body without the soul, and if the head and the body are to be healthy, you must begin by curing the mind." I shall refer to this view later when dealing with the importance of the mind.

After the death of Hippocrates about 350 B.C. medicine gradually fell from the high standard set up by him and his

followers, and the air was full of turmoil and disputation. Philosophic argument again asserted the sterilizing influence from which Hippocrates had rescued it, and in the following eras the Dogmatists, the Empiricists, the Methodists, the Eclectics rose. These sects were very dogmatic, very rational, very argumentative, and no doubt added zest to living by their scholarship; but they were of little value in progressive medicine and showed little sign of attention to psychological medicine. Aristotle (384-322 B.C.) closely followed Hippocrates, and, though not a medical man, exercised a profound influence on science generally, and as a biologist his work was of great importance to medicine. It is of interest that he also believed in the importance of balance in the humours of the body in the maintenance of health.

The Roman Attitude

In passing into the early years of the Christian era it is of interest to note what Seneca (3 B.C.-A.D. 65) thought about those things of the spirit which we have been discussing. In his *Quaestiones Naturales* he wrote: "There are many things akin to highest deity that are still obscure. Some may be too subtle for our powers of comprehension, others imperceptible to us because such exalted majesty conceals itself in the holiest part of its sanctuary, forbidding access to any power save that of the spirit. How many heavenly bodies revolve unseen by human eye! . . . How many discoveries are reserved for the ages to come, when our memory shall be no more, for this world of ours contains matter for investigation for all generations. . . . God has not revealed all things to man and has entrusted us with but a fragment of His mighty work."

These are noble words, and had the Roman attitude to religion, science, and medicine been consistently inspired by such sentiments, then Rome would surely have added a fuller measure of glory to her undoubted grandeur.

In Rome, however, indigenous medicine was never of a high standard, although the infiltration of Greek physicians and Greek writings exerted a favourable influence. Celsus in medicine and Dioscorides in materia medica stand out in this connexion. These two were followed by the colossal figure of Galen, whose views dominated medicine for centuries. Galen, though a master in the use of drugs, was well aware of the importance of the mind in treatment. "We have proof," he said, speaking of temple cures, but prophetically withal, "that many serious illnesses can be cured solely by a shock administered to the mind."

Galen was the last of the great ancient physicians. Even before his death in A.D. 200, and more so afterwards, the level of medical practice in Rome was distinctly low. The city was full of quacks, charlatans, poisoners, and magicians. Both the worlds of which I have been speaking were represented—the realm of magico-religious healing and that of systematic medical practice—but Rome made the best of neither. The genius of Rome lay in other directions and its power was waning.

The adoption of the Christian religion effected little or no improvement in the healing arts. Indeed, in some ways it was disastrous, for it appears to have favoured positive fixation at a low level instead of a negative stagnation, in which some stir and upsurge might eventually have developed. In A.D. 360 Basil, Bishop of Caesarea, insisted that disease was a manifestation of divine purpose and action, effected by means of demons, and indicated that the Church would look with disfavour on treatment by any means other than prayer.

A Vanishing Inheritance

By the seventh century the scientific attitude and the cultural inheritance from Greece were in process of vanishing. Theodosius decreed that Christianity and paganism could not both exist in the empire, pagan rites were prohibited and pagan temples destroyed, including the temples of

²From *Magic to Science*, by Charles Singer, 1928. Benn, London.

Asklepios, where the incubation ceremonies were competing successfully with the Church's own saints and shrines.

Not only was science in a moribund state and discouraged by the Roman Catholic Church, but there was also a falling away in the genuine faith healing which was a feature of earlier pagan times. The teachings of Hippocrates were forgotten, and even the influence of Galen became subversive on account of the unquestioned authority which had to be accorded to his written word.

For a thousand years or so there was no real progress in medicine or science, nor any advancement in the knowledge of the mind and its disabilities. The dominance of the Church, with its hostility towards science and intolerance of anything unorthodox, had a reactionary influence. A ferocious tenderness towards the true faith led to dreadful attempts to save the soul by torturing the body. Witches and heretics were destroyed, not only for the safety of the Church, but also for their own good. Dogma and religious observances were of paramount importance, and the needs of the body and its reaction to disease became relatively insignificant. Against this disastrous catalogue, however, there can be set at least one redeeming feature, and it is one of importance. The Christian belief in charity, not always easily discernible in action, did lead to a greater appreciation of the propriety of caring for the sick and needy. This was a Christian virtue which coloured the whole outlook of medicine when it did eventually emerge as a progressive discipline after the long depression of the Dark Ages. Fortunately the flame of science was never quite extinguished, and something of its true spirit remained alive, notably in that strange flowering of civilization among the Arabs, through whom much of the ancient learning returned to Europe and led to the Renaissance there.

It is a curious circumstance that this revival in Europe should have been partly due to the fact that the Nestorians, who were driven from Constantinople and expelled from Church and State, devoted themselves to Greek scientific writings, which they transmitted to the Persians. There they were translated into Syriac, retranslated into Arabic, and eventually translated back again into Latin, and thereby gave Europe its first access to Greek science when men's minds began to waken after the Dark Ages.

Throughout the Dark and Middle Ages Anglo-Saxon medicine was of a very primitive nature, and the magical element predominated. The Teutonic peoples had not the same belief in possession by demons which was characteristic of the Near East, but attributed many diseases to the action of elves and witches who fired baleful shafts into the body. It is pretty clear, however, that other early and mediaeval Christians accepted the doctrine that disease was due to the action of demons. St. Augustine, in the fifth century, said, "All diseases of Christians are to be ascribed to demons, chiefly do they torment the fresh baptized, yea, even the guiltless newborn infant." Under these beliefs those suffering from disease of any kind were subjected to various procedures for driving out devils, such as prayers to the Almighty God, the exposure of the sufferer to holy relics, and the laying-on of hands by a member of the Church. Medicine reverted to a form of healing which was in vogue a thousand years before Christ.

A Great Awakening

From the fifteenth century onwards there was a great awakening of the scientific spirit and improvement in the methods of treatment in comparison with those of the earlier ages, though it must be confessed that medical practice remained in a shocking state of ignorance for a very long period and only gradually approached the Hippocratic standard.

Throughout this period methods of healing by suggestion or by divine intervention continued. In addition to the healing methods already described, succeeding centuries saw the advent of newer methods of suggestion such as mesmerism, hypnotism, couéism, Christian Science, and so on, all

of which contributed in some degree to our knowledge of the effect of the mind on the body, and have led to a more scientific approach by the methods of Freud, Jung, Adler, and our modern psychologists and psychiatrists.

This brief outline of medical thought over the ages has clearly shown the close association of medicine, magic, and religion throughout, and, though the conception that disease is due to natural causes has gradually matured, man has never lost his belief that there is something beyond human knowledge which may either cause disease or cure it. We have seen the application of these beliefs in the temple treatment in Ancient Egypt, in Greece and Rome; in the exorcism of devils; in healing by anointing and by the laying-on of hands; in healing by animal magnetism and mesmerism; in healing by visits to holy shrines or exposure to holy relics; in healing by Christian Science, by psychotherapy, and by prayer and intercession by ministers of religion. It may be that all the people have been wrong all the time, but that would be an unsafe assumption on which to formulate a policy of investigation.

All of these forms of healing have been shown to be of service in combating disease, and there is no doubt that they are effective in certain cases. It is of interest, therefore, to consider how these beneficial results are produced; whether there is some common factor operative in all of them, and, if so, whether it can be defined in the light of the knowledge which we possess. In considering this problem I do not intend to enter the arena of metaphysics or discuss the possible intervention of a divine power, but to confine myself to the question whether these results are associated with definite physical phenomena in the body.

Modern "Miracles"

First, with regard to magic and miracles we should remember that many things which are accepted as commonplace to-day would have been considered miraculous not so many years ago; of these, radio and television are outstanding examples. But, apart altogether from the apparent miracles due to the application of physical science, there are many methods of medical treatment in common use to-day which produce results that would have appeared miraculous 100 years ago. For instance, when the first cretin was given thyroid gland, when quinine was first used in malaria, or when the first patient received a dose of opium, the results appeared to be miraculous then. Not so long ago myasthenia gravis was considered to be an incurable disease with permanent muscular dysfunction. A dose of neostigmine, however, causes immediate recovery of muscular power; when a sufferer from severe asthma receives an injection of adrenaline immediate recovery may occur; when cortisone was first used on arthritic cases it appeared to give immediate relief in those permanently crippled.

These cures, temporary though they may be, are quite as impressive as some of the early miracles of healing. The control of bacterial activity by penicillin and other antibiotics, and the almost immediate relief from suffering by their use, have all the appearance of magic or the exorcism of devils, the devils in this case being infective bacteria. It is to be noted that in the exorcism of devils the operator was enjoined to keep his mouth shut on account of the ease with which the demon might make an entry into his body. This is reminiscent of the modern practice of wearing a mask to keep the bacteriological demons in or out as the case may be.

The modern miracle whereby persons suffering from certain diseases of the mind are treated by shock therapy is reminiscent of the old practice of exorcism, for whether the demon is forced out by certain rites, whether it is let out as it was in ancient days by trephining a hole in the skull, or whether it is driven out by the passage of an electric current through the brain seems to me to make very little difference so far as science is concerned. In each case something is done of the nature of which we know little, and something happens of the nature of which we know less, and a "cure" results—temporary, perhaps, but a cure.

Much more could be said about these matters, but I hope to have made the point that a miracle at one period of time may be a normal method of treatment at another, depending upon the knowledge available at the particular time.

Before dealing with the method of action of the various forms of so-called faith healing or healing by suggestion, let us consider on what health and disease depend. The answer must be that health depends on the accurate, harmonious, and constant co-ordination of an enormous number of factors in the human organism, some of which we have cognizance of, such as the endocrine balance, the electrolytic balance, the correct proportion of metallic elements, the proper balance of protein and non-protein constituents of the tissues and fluids of the body, the control of the body temperature, blood glucose and oxygen levels, and hydrogen-ion concentration, and on the efficient removal of waste products of metabolism. We have little precise knowledge of how the accurate balance of all these substances is maintained, but we do know that derangement of whatever nature may throw out of harmony the whole system and cause ill-health.

This may be the result of definite physical causes, as by deprivation of essential substances, by traumata, or by infection, but, what is more important for our present discussion, it may be a result of mental processes.

Body-Mind Relationship

That definite physical phenomena can be caused by mental processes or emotion is well known. For example, anger may cause the blood pressure to rise; fear may cause it to fall; pity may produce the secretion of tears; excitement may produce insensibility to pain, terror temporary paralysis; fear may cause increased secretion of urine, increased peristalsis, and increased sweating. These physical phenomena are all produced by emotion and may be observed in the absence of any external stimulus.

The state of the mind, therefore, may alter the body functions, and if health depends on their continuous harmonious relationship anything which disturbs that harmony may cause ill-health, whether the disturbance arises from known physical or mental causes or otherwise.

That being so, any form of treatment which might lead to the restoration of harmony is apt to have a beneficial effect. It may be that this adjustment can be effected by everyday medical or surgical treatment, directed towards a definite physical cause. It may be that physical manifestations produced as a result of some troubled state of the mind may be successfully treated only by restoring harmony to the mind.

Here, then, may be the explanation of the effects common to the various procedures, religious, magical, psychological, etc., which we have been considering. All of them are directed towards the restoration of the harmonious relationship in the functions of the body through the removal of some source of disharmony in the mind. This may result from so-called psychotherapy, but it may also be the result of prayer or of faith in a divine power or in the doctor, or in the drug that is used, or, in fact, in any of the procedures that we have been discussing. We have all seen the improved physical condition of patients which sometimes results at once from the visit of the doctor—an improvement in the general condition which is often accentuated when an examination of the body takes place by "the laying on of hands," and most of us, I have no doubt, have witnessed the beneficial effect of prayer. By whatever means the effect may be induced, the troubled mind seems to be calmed and harmony restored. We have been accustomed to think and talk of "psychogenic conditions" and certain diseases of an organic nature which have been described as "psychosomatic" in origin, but I want to suggest the possibility that disturbance of harmony in the body-mind relationship may be a contributory factor in producing ill-health of any kind, and that the terms psychogenic and psychosomatic are simply convenient labels for the

moment; for if worry may cause a peptic ulcer to occur it may equally well lead to the breakdown of resistance to tubercle or other pathogenic organism, and cause a general upset or a so-called nervous breakdown.

We should picture mind and body working continuously together and mutually dependent, so that any slight alteration in the rhythm of the one is at once reflected in the activity of the other. We see health as the normal outcome of this harmonious relationship and disease as the result of disharmony. It is unlikely that we shall be able to observe an early fault in this relationship until we evolve new methods of investigation, and it is to my mind certain that in such early perception lies the root of preventive medicine. By the time that we can observe signs of what we call disease the tissues have undoubtedly sustained physical damage, which may have reached the stage when restoration of harmonious relations may be a matter of difficulty or even of impossibility.

It seems to me, therefore, that much of the future in medicine lies in obtaining better knowledge of the relationship of the mind and body in the maintenance of health. We must know more about the way the balance of various substances is maintained, to what extent the mind affects the control of the bodily secretions, whether there is in fact any recognizable physical change produced by different mental or emotional states, and whether any physical or measurable effect can be produced by prayer or other forms of healing here discussed. If any deviation from the normal can be recognized early enough, we must ascertain how an adjustment can be made before physical damage occurs. In short, it seems to be essential to study these matters and conduct our researches as we have done in connexion with physical sciences.

Conclusion

We have seen, within the last decade or so, such advances in our knowledge of the structure of matter and the relationship of matter to energy that the borderline between living and non-living substances has almost disappeared, and we can expect at no remote period to hear that living matter has been produced in our laboratories. During that period we have seen something of the intricacy and interrelationships of the sex hormones in connexion with growth, of the number and complexity of the enzyme systems essential to the life of the cell, and of the importance of the endocrines individually and in relation to one another. The development of radioactive isotopes has given us further insight into the role of various elements, including the highly important trace elements, in cellular activity, and into the localization of injury within the cell from biochemical action.

Notwithstanding all this, we are still only at the periphery of knowledge of living processes, and so far as the mind is concerned and its relationship to the rhythm of bodily processes we are almost as much in the dark as our predecessors of the time of Empedocles, Hippocrates, Plato, Aristotle, and others who nevertheless saw its importance. Let us not fall into the error, however, of thinking that because a thing is unknown it is unknowable, but remember that as the miracles of yesterday are the common practices of to-day, so the mysteries of to-day may be the commonplace of to-morrow.

To attempt to unravel the relationships of body and mind in man is a formidable undertaking, but it must be undertaken, and if we could obtain insight into this relationship we should not only see the road towards the maintenance of health but also obtain light in matters which at present are quite obscure.

I have pleasure in acknowledging help in the preparation of this paper from Mr. Gilbert Watson, formerly of the Scottish Education Department; from Dr. Fidds of my own department; and from various publications, including Sigerist's *History of Medicine*, Guthrie's *History of Medicine*, Haggard's *Devils, Drugs, and Doctors*, Frazer's *Golden Bough*, various books in the Legacy series and of Professor Charles Singer.

THE ROLE OF THE ADRENAL CORTEX IN FLUID AND ELECTROLYTE METABOLISM*

BY

F. T. G. PRUNTY, M.D., F.R.C.P.

With the Collaboration of H. E. M. KAY, M.D., M.R.C.P.,
G. de J. LEE, M.D., M.R.C.P., and R. R. McSWINEY,
M.B., B.S.(From the Department of Chemical Pathology, St. Thomas's
Hospital Medical School, London)

It is apparent that in analysing the effects of the adrenal hormones on the water and electrolyte balance it is necessary to consider each separately. It is the interplay of these two factors which ultimately controls the long-term water-balance of the individual. The aspect of the problem which has received most study is the

cortone is to increase sodium and chloride reabsorption, since low serum sodium levels are rapidly elevated and excretion of these ions is decreased. Whether there is a direct effect on water reabsorption or whether this is secondary to the electrolyte change is uncertain. The work of Verné shows that under normal conditions the posterior pituitary is a rapid reactor to water losses and seems to be stimulated by hypertonicity of the plasma. In Addison's disease the plasma becomes hypotonic, and this would seem to act as a bar to the stimulation of the posterior pituitary and correction of its decreased volume.

That cortisone has a specific effect on water reabsorption, unaffected by treatment with deoxycortone, is shown by the restoration of normal diuresis to water load after the administration of 100 mg. of cortisone daily. It will be seen from the lower part of Fig. 1 that in D previous administration of 100 mg. of cortisone intramuscularly daily restored a normal diuresis in the second hour after a water load given at the arrow. The presence of an 800-mg. deoxycortone acetate (D.C.A.) implant did not modify the abnormal pattern after water-loading seen in C and E. During the diuresis in D no increase of sodium excretion occurred, and there was therefore a fall in the urine concentration of this substance. In the upper part of Fig. 1, B shows that a dosage of 20 mg. of cortisone was insufficient to restore the diuretic effect in this instance. Fig. 2 shows the same effect of cortisone in a patient with hypopituitarism who was given 1,100 ml. of water at the time indicated at the arrows. The figure also shows the tendency to reduce the volume of urine excreted during the night.

Similar observations have been made by several other workers, and under the correct conditions A.C.T.H. (commercial samples of which contain appreciable amounts of "pituirrin") has been shown to have the same effect as cortisone in patients with hypopituitarism. It therefore seems as though the effect of cortisone in these experiments is a direct one on the reabsorption of water by the distal renal tubules. However, in spite of this there is a body of evidence

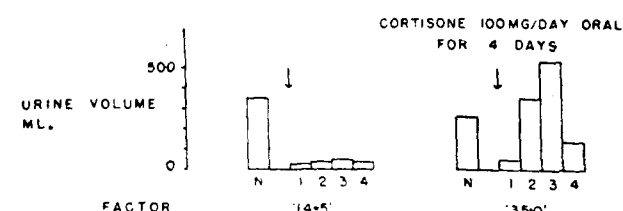


FIG. 2.—Kepler tests applied in a woman aged 30 with hypopituitarism, before and after cortisone treatment.

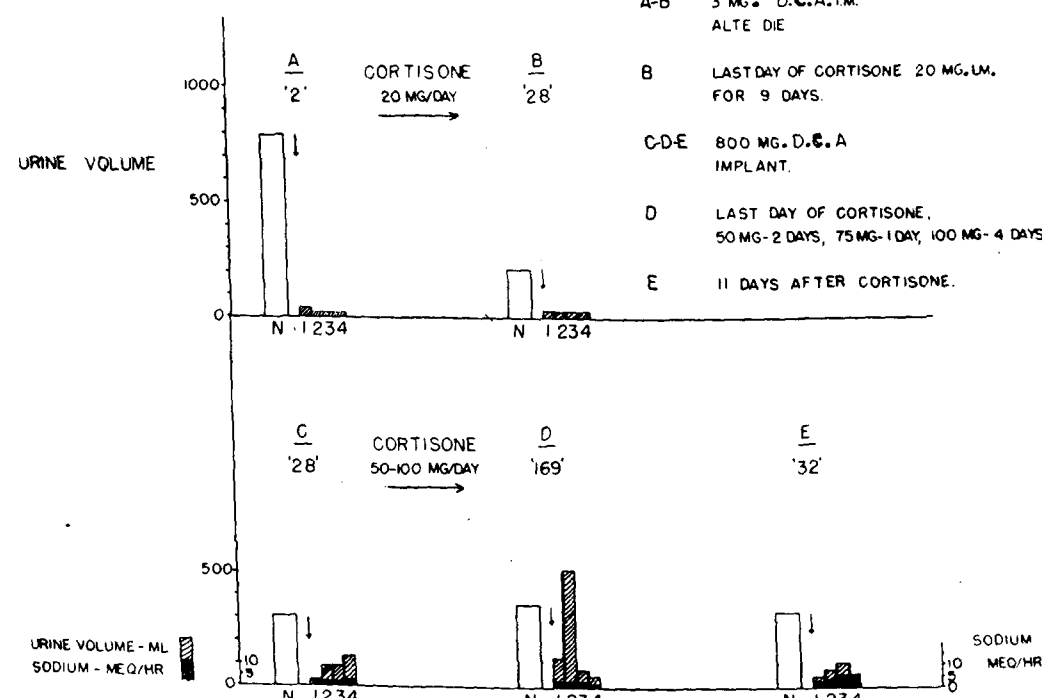


FIG. 1.—Kepler tests applied in a woman with Addison's disease, before and after cortisone treatment. N represents urine passed between 10 p.m. and 8 a.m. At the arrow the water load was given, and 1, 2, 3, and 4 represent hourly collections of urine. The figures in quotation marks above each test represent the Kepler "factor."

renal response to these hormones, but it is now becoming clear that they may cause considerable internal transference of fluid within the body itself, and this phenomenon demands increased attention.

Water Excretion and Hydration

A patient with Addison's disease is unable to respond in a normal way to the withholding and administration of water, the basis of the "Kepler water test" for the diagnosis of this condition. Maintenance of the patient in normal hydration with deoxycortone does not rectify this abnormality. The fact that deoxycortone returns sodium and chloride losses in this disease to normal and clinically maintains hydration demonstrates that over a period of time extracellular fluid volume and composition are favourably controlled. It may be argued that an early effect of deoxy-

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to suggest that endogenous antidiuretic activity may be increased in adrenal deficiency states, both in the experimental animal and in the human, as first suggested in the hypothesis of Corey *et al.* (1939). Gaunt (1951), using rats, and Lloyd (1952), supported by Slessor (1951) with human subjects, agree that in adrenal cortical insufficiency there is excess antidiuretic "hormone" (A.D.H.) in the blood. It has been found that "pitressin" causes retention of water but not loss of sodium in man. Hence the presence of such a substance would not account for all the findings in Addison's disease, even allowing for the fact that it would inhibit normal diuresis. Water retention by A.D.H. without comparable sodium retention would be expected to lead to a hypotonic plasma and a condition of water intoxication with cellular hydration. Study of bilaterally adrenalectomized patients by Pearson *et al.* (1952) suggests that this in fact is the case. However, more remains to be known of the effects of the medullary hormones in this regard.

The position concerning the possible increase of an A.D.H. is confused. The action of pitressin in the experiments of Chalmers and Lewis (1951) was uninfluenced by cortisone in Addison's disease, suggesting that deficiency of adrenal hormone is not responsible for the suggested decreased destruction of A.D.H. or increased renal tubular sensitivity to it. This leaves open the unlikely hypothesis that if in adrenal insufficiency posterior pituitary A.D.H. is increased there is an alteration of the response of the osmoreceptors in the face of hypotonicity. Nearly all the reported experiments on the increase of A.D.H. in adrenal insufficiency depend upon the assay technique of Birnie *et al.* (1949), using intraperitoneal injection, a method of administration criticized on the grounds of lack of specificity at a recent symposium of the Society for Endocrinology on "The Posterior Pituitary." Pending further elucidation of the problem of A.D.H. it is wisest to regard the effect of cortisone on the promotion of normal water-handling in Addison's disease as a direct one in restoring flexibility of distal tubular water reabsorption.

Effects on Sodium and Chloride Excretion

The injection of A.C.T.H. for periods of days produces now-well-recognized effects, but these are at present unpredictable in a given individual. There can, for example, be

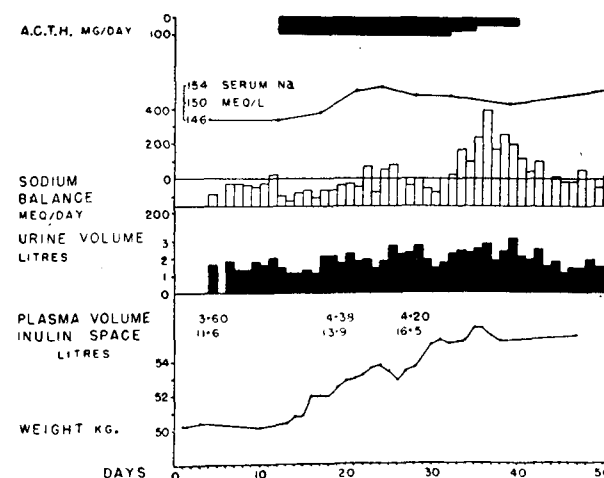


FIG. 3.—Effect of continued A.C.T.H. injections (25 mg. six-hourly) on sodium retention in a man aged 39 with rheumatoid arthritis.

long-continued sodium and water retention with oedema formation, even requiring careful "unephral" (formerly "neptal") administration. This is largely avoidable by employment of low sodium diets. Fig. 3 is an example of this type of response. The balance data for sodium are plotted so that intake is measured downwards from the horizontal zero line and urine excretion upwards from the base. It

can be seen that between days 12 and 32 sodium retention continued to take place, as only on three days did excretion exceed intake. The rise in weight is largely accounted for by fluid retention. Plasma volume and extracellular fluid volume, as indicated by the inulin space, are seen to be increased. After reduction of dosage of the hormone,

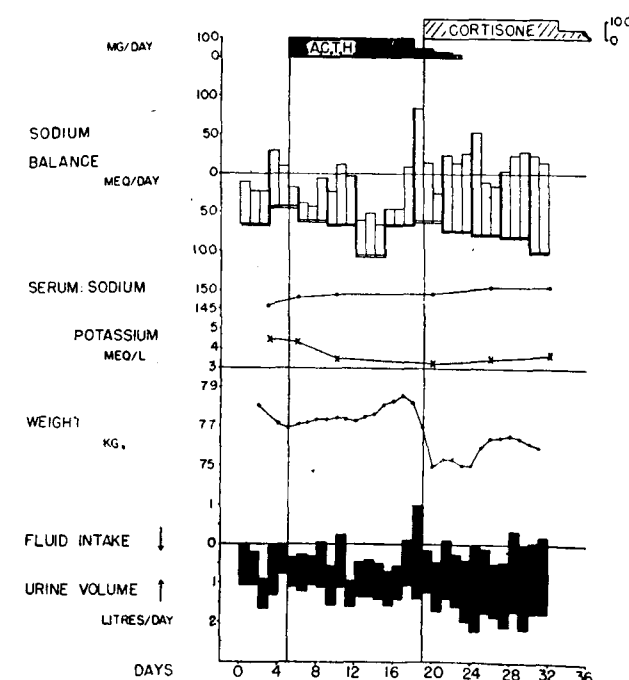


FIG. 4.—Effect of A.C.T.H. (given intramuscularly in divided dosage six-hourly) and cortisone (given intramuscularly once daily) on sodium retention in a woman aged 64 with rheumatoid arthritis.

diuresis occurred, particularly of sodium. At the other extreme, in other individuals, sodium retention may be transitory, but even here sodium concentration in the serum has been observed to rise significantly.

Many cases seem to show an intermediate type of response. Excretion of sodium with water loss may occur, either during A.C.T.H. administration or perhaps to a greater extent after withdrawal. It has been suggested that the sodium and water loss may be due to a sudden relative adrenal cortical insufficiency after withdrawal of the hormone. The fact that sodium loss occurs during A.C.T.H. administration or during cortisone administration started at the time of stopping A.C.T.H. is against this being the only cause. Fig. 4 shows the loss of sodium and water which can occur under these conditions. Intramuscular cortisone after the end of A.C.T.H. therapy permitted continued losses. It will also be noted that on a free fluid intake this patient's intake of fluid, and urine volume, both increased towards the end of the period of observation. The presence of pituitrin in the commercial preparation of A.C.T.H. available for study renders difficult the interpretation of findings of water retention and weight gain with oedema formation so frequently observed.

Experiments using more highly purified preparations of A.C.T.H.—pepsin digest (Luft *et al.*, 1949); the oxycellulose preparation of Astwood (Renold *et al.*, 1952)—indicate that these substances have similar properties to those of the cruder protein preparations in this respect. In addition, Sprague's (Sprague *et al.*, 1951) observation with cortisone in rheumatoid arthritis has shown that this adrenal cortical steroid is capable of reproducing the same effects as A.C.T.H., and it has been shown by Fourman *et al.* (1950), too, that in experiments of three days' duration hydro-

retaining properties. Fig. 5 summarizes the classical sequence of events with regard to sodium and water retention with these hormones, showing three phases: (a) active retention, (b) the reversal of this process, and (c) a diuresis after

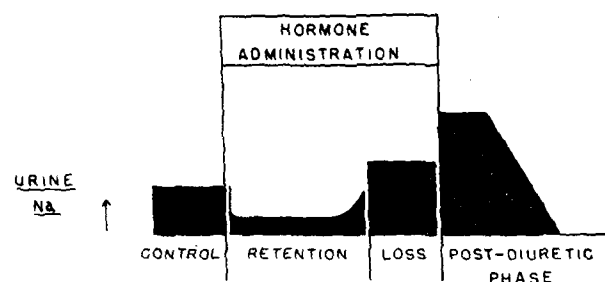


FIG. 5.—Effect of A.C.T.H. and adrenal cortical hormones on sodium and water excretion.

hormone withdrawal with loss of sodium, often so great as to cause the net sodium losses to exceed the initial gain. In a recent report of cases of dermatomyositis (Prunty, 1952) the tendency for A.C.T.H. and cortisone to cause diuresis in the presence of oedema was clinically valuable, and many diuretic responses are now on record in cases of subacute nephritis. We, and others, have found that not only do these substances cause increased reabsorption of sodium by the kidney, but they also cause reduction of the volume and sodium content of induced sweat, and reduction of the amount of sodium rejected in the faeces.

The ability of cortisone and hydrocortisone to cause retention of water and sodium and potassium loss in a similar way to A.C.T.H. and deoxycortone has led to the formulation of the view that a single adrenal cortical hormone (hydrocortisone) would account for all the phenomena of increased adrenal cortical activity. We have carried out balance studies in an Addisonian (Fig. 6) with D.C.A. and cortisone acetate. When entirely depleted of D.C.A. this patient's response to the intramuscular injection of 2.5 mg. of D.C.A. was compared with that of 100 mg. of oral cortisone daily. Each substance was given alone and two periods of D.C.A. administration were employed. It will be seen that during the first six days and during the 17th to 22nd day, when the patient received D.C.A. alone, she was in positive sodium balance. During the 7th to the 16th days, whilst receiving cortisone only, the sodium balance became very definitely negative. Both urine volume and fluid in-

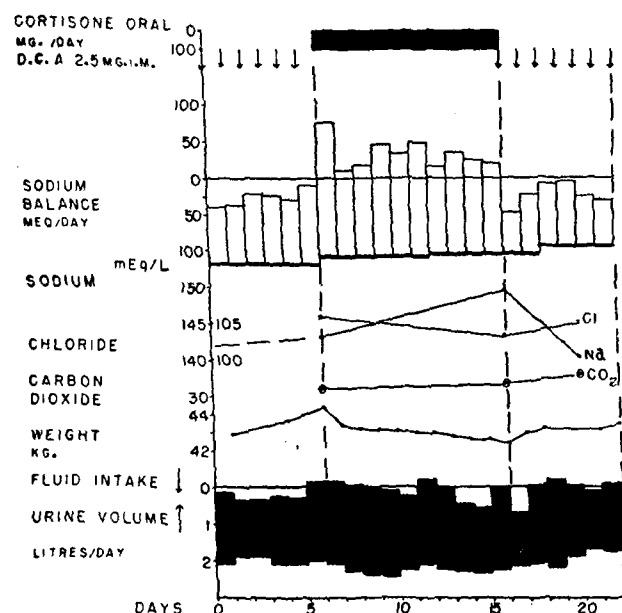


FIG. 6.—Effect of deoxycortone or cortisone on sodium balance in a woman aged 50 with Addison's disease.

take increased and serum sodium rose during this period. She lost 2 kg. in weight. These results are in agreement with those of Sprague *et al.* (1951) under similar conditions, but using intramuscular injection of the hormone.

If it can be assumed that comparable biological doses of these substances were used there is a striking difference in their effects in these circumstances. In the absence of endogenous adrenal cortical activity (Addison's disease) D.C.A. overdosage with salt has so far been found to cause sustained sodium retention and oedema, and death from cardiac failure. In patients with intact adrenals its behaviour is more like that of cortisone, sustained dosage being accompanied by spontaneous diuresis of retained water and sodium (Luft and Sjögren, 1952). On the other hand, totally adrenalectomized patients have been kept in good condition by the use of cortisone alone by Pearson *et al.* (1952) and others. These facts are conflicting when one is considering the problem of whether there exists a natural adrenal cortical hormone of special potency in electrolyte metabolism. Ingle has again emphasized (Ingle *et al.*, 1952) that cortisone and hydrocortisone will not quantitatively account for the biological potency of natural products in his "work test," and he once more reminds us of the active material present in Kendall's amorphous fraction. Simpson *et al.* (1952) have also presented convincing evidence of the multiplicity of secretion by the separation of natural material from the adrenal blood of the monkey and dog with quantitatively far greater electrolyte effects than those of cortisone. These experiments give new impetus to the problem of the number of biologically active adrenal cortical secretions in man.

Internal Transference of Fluid and Electrolyte

It has been shown that the rapid increase of weight of patients treated with A.C.T.H., together with measurements of fluid balance, indicates that water is retained along with sodium and chloride and oedema may become a problem. However, clinically, oedema has been noticed both by us and by Soffer *et al.* (1951) to occur in the absence of obvious fluid retention, suggesting internal transference of fluid in the body from cells to extracellular fluid. It will be recalled that increases of extracellular fluid are indicated by measurement of inulin space, and plasma volume may rise to a lesser extent. Study of daily weight changes compared with calculated changes of extracellular fluid volume from chloride balances has suggested confirmation of the view that fluid shifts occur outwards from the tissues.

Fig. 7 shows the data obtained from a patient with rheumatoid arthritis. The data on the top line show the effect of A.C.T.H. on the extracellular fluid volume calculated from chloride balances. The hatched blocks represent changes in extracellular fluid volume occurring during each period, blocks above the line representing an increase, those below the line a decrease. In the same way the second line shows the weight changes from period to period, which can be taken as a fair measure of fluid retention or loss over a relatively short time period. The bottom line shows the volume changes superimposed on the weight changes. In periods 2 and 3, the volume increase far exceeds the weight increase, whilst in period 6, during diuresis, the reverse occurs. This would seem to indicate expansion of extracellular fluid, as we have previously found by this technique (Prunty *et al.*, 1948). However, recent work indicating the presence of large quantities of chloride in the tissues would seem to question the validity of this line of approach, which necessitates the assumption that significant amounts of chloride are not transferred to the tissues.

In spite of this, measurement of the extracellular space with inulin in patients on low sodium intakes receiving cortisone or A.C.T.H. has revealed in the hands of Levitt and Bader (1951) considerable increase in its volume. In this instance chloride apparently was supplied from the tissues. Potassium depletion occurring at the initiation of these changes is also indicative of tissue losses of this sub-

stance, probably associated in part with loss of tissue water, and reminds us of the need in some patients for the increased administration of this substance. Only recently have extensive studies begun to reveal the effects on renal

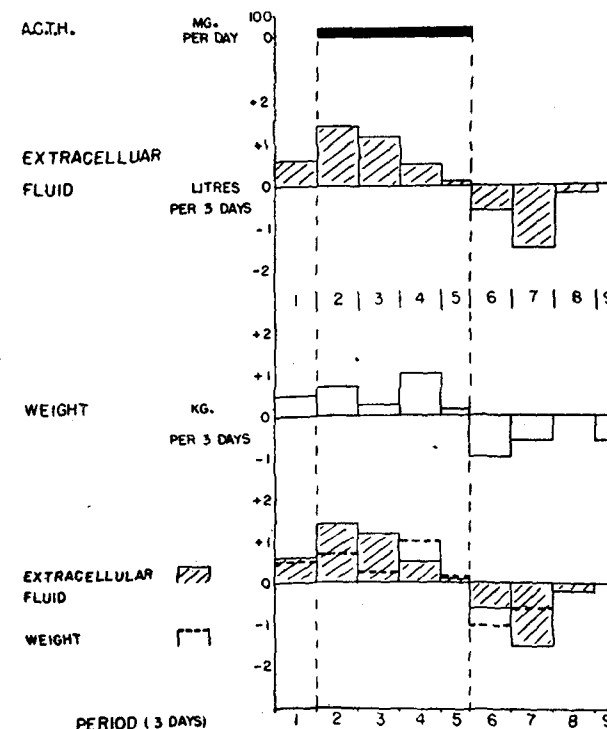


FIG. 7.—Effect of A.C.T.H. on fluid shifts within the body of a woman aged 56 with rheumatoid arthritis (see text).

excretion of water and electrolytes in response to expansion of extracellular fluid volume—a basic requirement in evaluating the response to cortical hormones. These observations have also stressed the importance of posture and of diurnal variation in the responses obtained. Increase in extracellular fluid volume seems to limit the water- and electrolyte-retaining properties of the adrenal hormones in the normal individual, the concentration of sodium in the fluid being a matter of secondary importance.

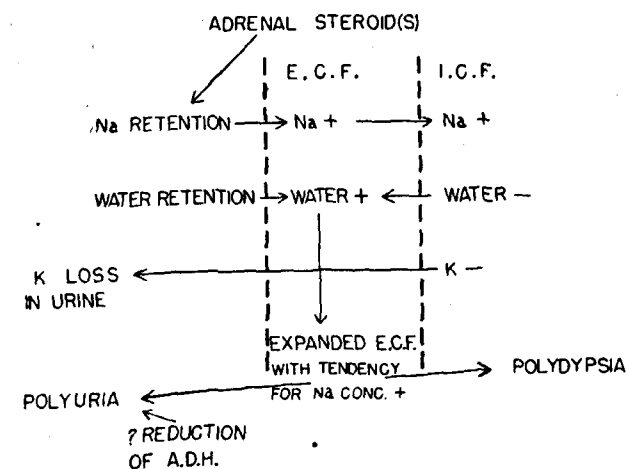


FIG. 8.—Working concept of effects of adrenal cortical hormones on water and electrolyte metabolism (see text).

Fig. 8 indicates a working hypothesis for the effects of these hormones, indicating how extracellular fluid volume expansion occurs, with resulting tendency to increase in water exchange and even diuresis. On the left, adrenal cortical hormone is seen to cause initial sodium and water retention. At the same time water is transferred from the

tissues to the extracellular fluid, the sodium concentration of which is often found to rise. The tissue water loss seems to account for some of the urinary losses of potassium, and, in addition, the serum level of this substance falls. With extracellular fluid thus expanded, water intake and excretion show a tendency to rise. After the action of the hormone ceases there is a large diuresis of water and sodium from the expanded extracellular fluid. This diagram admittedly glosses over many gaps in our knowledge, which we hope will be better explained after future research.

Summary

The problem of how the adrenal cortex affects abnormalities of renal handling of water and electrolytes has been examined. Primary and secondary adrenal cortical insufficiency leads to impairment of normal diuresis, and this may be corrected with cortisone and, in the case of the latter, with A.C.T.H. It is uncertain how far antidiuretic activity in the serum of these patients may be a factor in this abnormality.

Sodium and chloride retention is induced by cortisone and A.C.T.H., but may not persist as long as the hormone is administered. Under certain conditions diuresis may occur with increased excretion of these ions.

Further data on the effect of cortisone on sodium retention in Addison's disease again raise the question of the secretion of a "salt hormone" by the adrenal cortex.

It is pointed out how internal shifts of fluid from the cells occur with administration of these substances, and the difficulty of integrating all the effects observed is discussed.

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Reports of initial victories made in the fight against yaws were made at a recent conference at Bangkok organized by the World Health Organization in collaboration with the Government of Thailand. Yaws is prevalent in humid tropical climates, and particularly common among undernourished people living in overpopulated areas. Doctors trying to combat its spread must break down a barrier of popular local superstition. Results so far obtained indicate that one, or at most two or three, intramuscular injections of a repository penicillin are sufficient to ensure a definite cure. Up to the end of 1952 nearly eight million people had been examined in Haiti, Indonesia, Thailand, and the Philippines, of whom some three million (mostly in Haiti) were found to be affected and have been treated. The individual figures are: Haiti, 2,270,051 examined and 2,270,051 treated; Indonesia, 3,529,831 examined and 553,587 treated; Thailand, 1,679,342 examined and 216,047 treated; and Philippines 415,000 examined and 24,000 treated. It is calculated that the cost of treatment given, including expenditure on staff and equipment, amounts to less than three dollars per head.

BENIGN FORM OF ACUTE OSTEITIS OF
THE SPINE IN YOUNG CHILDREN

BY

A. E. BREMNER, F.R.C.S.Ed.

Associate Orthopaedic Surgeon, Royal Victoria Infirmary,
Newcastle-upon-Tyne

AND

G. A. NELIGAN, M.R.C.P.

Lecturer, Department of Child Health, University of
Durham

During the year ending April, 1951, we had under our care seven young children suffering from what we believe to have been a low-grade pyogenic osteitis of the lumbar spine. The strikingly uniform clinical picture observed in these children does not seem to have been satisfactorily described, and we think it worth while to record our experience of it.

The children were aged between 9 months and 2½ years at the onset of the illness, which seems to be insidious

and undramatic. The parents did consult the family doctor within the first few days in all cases, but most of them were not unduly worried by the delay of up to four weeks which occurred before the children were referred for a second opinion. There was in most cases a further delay before admission to hospital. That this was due to the very misleading impression which the parents and children may give during an out-patient consultation and examination is apparent from Table I. The children were initially seen by five different consultants.

TABLE I.—Summary of Out-patient Experience

Case No.	Age on Admission	Duration at First Visit	Initial Diagnosis by Consultant	Duration on Admission
1	Yrs. Mths.	2 weeks	Pott's spine	3 weeks
2	2 2	4 "	Painful limp	4 "
3	1 7	4 "	? Encephalitis	6 "
4	2 4	2 "	Abdominal pain	2 "
5	1 1	1 week	? Hip lesion	5 "
6	1 5	3 weeks	? Urinary infection	10 "
7	1 11	4 "	Limp? Sacro-iliac joint	3 "
	1 7	½ week		

On admission to hospital, however, with the opportunity for more leisurely and detailed history-taking and examination, these seven children presented a strikingly uniform clinical picture. The constant outlines of the picture of spinal disease were only slightly blurred by variation in the severity of the symptoms. In four cases there was superimposed upon it a "hip syndrome" (limp, with some limitation of movement). Though at first this was misleading, we later came to regard it as reassuring evidence that the spinal lesion was likely to be pyogenic rather than tuberculous.

At the onset in all cases the symptoms of a mild or moderate febrile illness and those of a spinal lesion appeared within a few days of each other. Irritability, loss of appetite, and feverishness had been noticed in most of the cases; and a previously active child would develop a stiff back and begin to have spasms of pain and later object to sitting or walking, or even to being handled (though he might remain surprisingly active for some weeks in any posture which avoided flexion of the spine). These symptoms usually increased in severity very gradually for up to five to six weeks and then became stationary or began to improve. The four children with the "hip syndrome" were noted to have a well-marked limp at the onset or within the first two weeks of illness; and in three of them these symptoms had cleared up by the time of admission to hospital.

On examination the children were very mildly or at most moderately ill. There was evidence of weight loss in six of them. Case 7 was apyrexial throughout his hospital stay of 10 days; the rest had temperatures

ranging up to 103° F. (39.4° C.). All objected strongly to sitting up; two were still prepared to crawl on all fours or even to stand with support. On the whole they preferred to lie prone in their cots, when they would appear comfortable and play with their toys, though very liable to an occasional interruption by a bout of pain, apparently produced by movement. The lumbar spine was held fixed in slight lordosis by spasm of the paravertebral muscles, and we noted that attempts to flex the spine passively were more strongly resisted than was hyperextension. There was no neck stiffness. Only Case 4 had tenderness of the spinous processes of the affected vertebrae.

X-ray films of the lumbar spine showed narrowing of a disk space, with erosion of the adjacent margin of the body of either or both the vertebrae bounding it, as seen in the lateral view (see Fig. 1). These changes were evident at the time of admission in six cases, but not definite until two weeks later in Case 4. In Case 3

there was also a posterior displacement of the upper of the two affected vertebrae. In Cases 5 and 6 the antero-posterior view showed an angular scoliosis at the level of the lesion (see Fig. 5). In every case the Mantoux test was negative to a dilution of 1/100. The Wassermann reaction and agglutination tests against the *Salmonella* group and *Brucella abortus* were also negative.

All the children were treated by rest in a plaster bed (six of them being sent home in their beds

and kept under observation as out-patients). Case 4 received penicillin in addition. They were allowed up again, without any restriction in their activity, after periods ranging between 7 and 22 weeks from the onset. They have subsequently been followed for between 4 and 16 months, and all remain well.

Brief case histories of four of the cases give an idea of the range of variation in detail within the uniform general outline of the clinical picture.

Case 1

A girl aged 2 years and 2 months was admitted with her mother on March 21, 1950, with a provisional diagnosis of Pott's disease. Three weeks previously she had refused to get out of her cot one morning: her back seemed very stiff and remained so up till the time of admission, particularly when walking or picking things up off the floor. She would cry out as if in pain at times, and began to wake crying during the night. She remained fairly cheerful, and her appetite was very little impaired. X-ray examination in the out-patient department a week before admission had shown narrowing of the disk space between the fourth and fifth lumbar vertebrae with some erosion of the adjacent margins of these two vertebral bodies. Her temperature on

admission was 99.8° F. (37.7° C.). She was not obviously ill, but there was evidence of some weight loss. She was quite active and would even walk with support, but objected to sitting. Her lumbar spine was held fixed in slight lordosis, with marked spasm of the paravertebral muscles; no localized tenderness was found. She was sent home in a plaster bed to be nursed by her mother, and was not allowed out of her plaster bed until 22 weeks from the onset. Sixteen months later her back was still clinically normal.

Comment.—This case was the mildest in our series in respect of both local disability and constitutional disturbance. The patient was immobilized for a much longer period than we now consider necessary; she was the first case we saw and we were not familiar with the course of the disease with which we were dealing.

Case 4

A girl aged 1 year and 1 month was admitted with her mother on October 11, 1950; the provisional diagnosis was perinephric abscess. Her father was suffering from an attack of boils when, three and a half weeks before admission, the child had a number of screaming attacks one day and appeared to be in pain. These attacks recurred with diminishing frequency for several days, lasting up to two hours at a time; and she then became quite well again for four days. Two weeks before admission she began to get attacks of pain again; she cried if sat on her pot, and in her high chair would shuffle her bottom forward till she was nearly lying on her left side. She would no longer attempt to walk. At the same time she became feverish, and ate less than usual. She got steadily worse, and by the time of admission the parents had learnt to leave her lying in her cot, not daring to pick her up even to try to comfort her. She had eaten nothing at all for the previous four days.

On examination she was seen to be moderately ill. Her temperature was 103° F. (39.4° C.); there was no evidence of weight loss. She lay on her back comfortably, but her lumbar spine was held stiff and there was well-marked tenderness of the spinous processes of the fifth lumbar and first sacral vertebrae. The spleen was enlarged to ½ in. (1.3 cm.) beyond the costal margin. A scanty growth of haemolytic streptococcus and *Staphylococcus aureus* was obtained from her throat swab. X-ray films at that time were only suspicious, but two weeks later definite changes had developed in the fifth lumbar vertebra with narrowing of the disk space below it. The contact history, the degree of constitutional disturbance, and the splenomegaly all seemed indications for penicillin therapy: she received 50,000 units intramuscularly every three hours for three weeks. She was put into a plaster bed during her stay in hospital, and was sent home on October 31, by which time all tenderness had disappeared. She was allowed out of her plaster bed seven weeks from the onset of the progressive symptoms of spinal disease, and remained clinically well a year later.

Comment.—This child was the most severely ill in our series, and was the only one treated with penicillin. Her temperature became normal after one week's treatment, which is the expected course in severe osteitis of long bones responding to antibiotic therapy. It was impossible to be sure whether the drug affected the course of the disease, but it is noteworthy that the period from onset to resumption of unrestricted activity was shorter in this case than in any other.

Case 2

A boy aged 1 year and 7 months was admitted with his mother on May 31, 1950, for investigation of a painful limp. The mother had developed tuberculosis five years previously and her artificial pneumothorax had been let out ten months before we saw her. Four weeks before admission the boy had begun to limp on the left leg, and held his back stiff with his tummy sticking forward when



FIG. 1

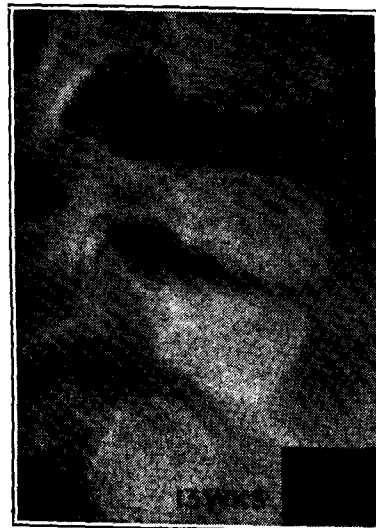


FIG. 2



FIG. 3

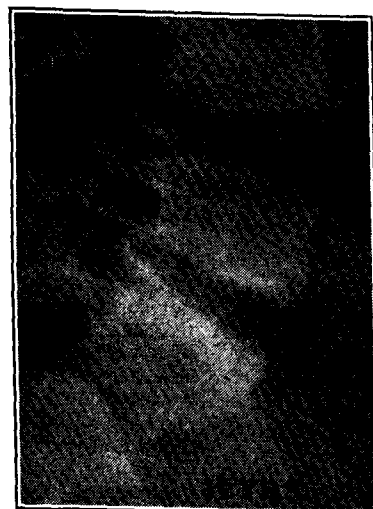


FIG. 4

FIGS. 1, 2, 3, and 4.—A case of benign acute osteitis of fifth lumbar and first sacral vertebrae; patient aged 1 year and 7 months. X-ray films at 4 weeks, 13 weeks, 26 weeks, and 1½ years after the onset, showing early appearance of recalcification (at 13 weeks) and later sclerosis, with some bridging of the disk space posteriorly.

walking. During the second week he refused to walk, but crawled actively on all fours; he also refused to sit properly in his high chair, shuffling forward until he was half-lying on his right buttock. His appetite became poor; he was very miserable, and often woke up crying through the night. During the third week his general condition deteriorated further: he refused to eat anything at all, and was losing weight. By the fourth week he would no longer crawl; he refused to go into his high chair at all, and took his drinks lying in his cot. He was obviously feverish.

Examination was made difficult by his terror of being handled, and had to be completed under light sedation. He was moderately ill, with a fever of 100° F. (37.8° C.) rising to 102° F. (38.9° C.), and evident loss of weight. The left hip was held in 45 degrees flexion; extension and both rotations were resisted towards the limits of the normal range, but flexion was full. His lumbar spine was held stiff by spasm, and if he was sat up the lordosis became exaggerated: he preferred to lie prone with his head supported by his arms. No tenderness was found. An x-ray film showed the typical lesion involving the fifth lumbar and first sacral vertebral bodies; the appearances in the hip were normal. He was sent home in a plaster bed to be nursed by his mother (in whom we had found no evidence of active tuberculosis). He was allowed up again seventeen weeks from the onset. His back was still clinically normal fourteen months later.

Comment.—This was the only case in which the symptoms and signs of the "hip syndrome" were still present on admission. We were then unfamiliar with it, and strongly suspected two lesions (probably tuberculous in view of the mother's history). The hip signs cleared up in under a week, and relieved our minds on that score; the likelihood that the spinal lesion was tuberculous was excluded by the negative Mantoux test and by the subsequent course of the x-ray changes. We were again overcautious about releasing from immobilization this case of what was still an unfamiliar disease at that time.

Case 5

A boy aged 1 year and 5 months was admitted with his mother on November 15, 1950. The final choice of diagnosis in the out-patient department lay between osteitis of the spine and urinary infection. Five weeks previously he had fallen off a step 6 in. (15 cm.) high, appeared to have hurt his back, and refused to walk for two days, crying bitterly and frequently. He then improved for a week, but walked with a marked limp and undue prominence of the right hip. His back seemed stiff and abnormally arched. After this first week he deteriorated steadily again. He preferred crawling to walking. By the time of admission he virtually refused even to stand, and completely refused to sit on his pot, so that he passed water infrequently, and only when lying down. During the third week after the injury his appetite began to fail and he appeared to be losing weight. He also began to have screaming attacks lasting five minutes or so, during which he would clutch his right leg, but his mother could not be sure where the pain was.

On examination he was only slightly ill; his temperature was 99.4° F. (37.4° C.), and there was evidence of weight loss. He could lie flat in any position and crawled fairly freely on all fours, but resented attempts to make him sit or stand. His lumbar spine was held fixed in slight lordosis; no deformity or tenderness was detected. X-ray films showed the typical lesion at the level of the fourth and fifth lumbar vertebrae, but with minimal bone involvement as yet. He was left free in his cot for two weeks, and began to stand and even to sit spontaneously, and was eating better. But he developed an angular scoliosis, convex to the right, at the level of the lesion. This was obvious clinically and radiologically, and it was decided to put him into a plaster bed, in which he was sent home. He was allowed up again eleven weeks after the initial injury, by

which time the scoliosis was no longer detectable clinically and was much improved radiologically. This improvement was maintained ten months later.

Comment.—This is the only case with a clear history of an injury at the onset. His "hip syndrome," which dominated the picture at first, was no longer evident by the time of admission. He is one of two cases which had an angular scoliosis that was very much improved by a brief period of immobilization in a plaster bed.

Discussion

We are far from certain about the exact pathology of the condition from which these children suffered. But we think, after considering the clinical and radiological evidence, that it is probably the same condition as that form of "osteomyelitis of the spine" which has been variously described as "benign" (Smith, 1933), "gradual" (Butler *et al.*, 1941), and "chronic" (Flemming, 1935; Martin, 1946). A similar form is mentioned in the more general accounts of osteomyelitis of the spine by Wilensky (1929), Kulowski (1936), and Guri (1946). There is no direct evidence about the pathology in these reports, but there is ample direct and indirect bacteriological evidence that the infection of the spine is staphylococcal. Our confidence that the condition they describe is the same as that which we have been seeing is not very great in the case of some of these reports, none of which is concerned with patients in the same age group as ours; but we feel reasonably sure about Guri's (1946) 19 cases "with a gradual onset," since he makes up for lack of clinical details by insistence on the difficulty of distinguishing them from cases of tuberculous spondylitis, and also reproduces some x-ray films which are adequate for purposes of comparison. In four of these cases an abscess developed over the lesion in the spine, and *Staph. aureus* was grown from the pus, while another five cases had a focus of gross staphylococcal infection elsewhere in their bodies. These observations have weighed heavily with us, since in only one of our much younger patients (Case 4) did we find even indirect evidence of staphylococcal infection. Somewhat similar lesions have been described complicating brucellosis and salmonella infections, but all agglutinations were negative in our cases. Having concluded that the infection of the spine is probably staphylococcal, we have also accepted the view (embodied in the titles of the reports quoted above) that the pathology is likely to be a haematogenous infection of bone.

A different view of the pathology is put forward by Saenger (1950) in the most recent report we have seen. His "spondylarthritis in children" is the same condition as we have described: we are in no doubt about that, since he publishes fuller details and more complete series of x-ray films than any previous author. Three of his four cases were in the same age group as ours, and he argues from the admittedly better blood supply of the intervertebral disk in the young child that the infection is more likely to start in the disk itself, with only secondary involvement of the adjacent vertebrae. Yet he describes as "analogous" the condition of "acute infectious lesions of the intervertebral disks" described by Ghormley *et al.* (1940), although the youngest of their 20 cases was 9 years old, and their average age 34 years.

As to the age incidence, only Saenger has reported the condition in toddlers. Indeed, Butler *et al.* state that the sudden and fatal form of the disease occurs "as a rule" in children, and is relatively common; while they regard the form with a gradual onset as rare enough to make it worth while publishing a single case, adding that "this type is most often seen in adults." This would be in surprising contrast to the behaviour of osteitis in other sites. Excluding the neonatal period, we see eight mild cases for every severe one under the age of 3 years, whereas between 3 and 12 years the proportions are almost reversed. The discrepancy as regards age incidence between previous reports and our own experience is probably partly explained

by a freakishly high incidence of the condition in this part of the world during the year in question. But it also seems possible that some of the cases which do occur escape recognition.

That the diagnosis of osteitis of the spine may be difficult in any age group is generally agreed. One would expect the difficulty to be greater when the disease occurs in a benign form in a child who is not old enough to make known the site of his pain. The facts recorded in Table I lend some support to this view. However, little harm would probably be done in most cases by failure to detect the presence of a spinal lesion: the child is likely to make a satisfactory recovery without any treatment other than rest in bed during the active stage of the infection. The chief penalty would be the unnecessary anxiety on the part of relatives and doctors resulting from uncertainty about the cause of the trouble. The more worrying possibility is that some of these cases may be diagnosed and treated as cases of tuberculous spondylitis. This danger was emphasized by Smith: of his 17 cases, with an average age of 29 years, 11 had originally been diagnosed as tuberculous. Kulowski and Guri have been impressed by the same danger. Reference to the case histories of our children makes it clear that the differentiation will usually be impossible on the history and examination alone. However, the presence of the "hip syndrome" noted in four of our cases may lead one to suspect the correct diagnosis, since, so far as we know, it is much less common in cases of tuberculous spondylitis. Two of Saenger's cases presented the same picture; and so did two of Guri's more severe cases. Fortunately, from the patient's point of view, the tuberculin skin test will nearly always be negative in these young children, so that further confusion should be avoided. And, more important still, one can confirm opinions based on this evidence, and avoid unnecessarily prolonged immobilization in cases in which a skin test is positive for reasons not connected with the spinal disease, by observing the course of the x-ray changes.

In the early stages the x-ray films of the pyogenic lesions seem to us indistinguishable from those seen in tuberculous spondylitis of about the same duration. The picture at that stage has already been briefly described and can be seen in Fig. 1. The subsequent course of the destructive changes is very different in the two diseases, however. Recalcification of the eroded portions of the vertebral bodies is already evident within three months of the onset in the pyogenic cases; actual sclerosis soon follows (our findings are set out in Table II and illustrated by Figs. 1-4). The striking contrast between this course and that of tuberculous cases should enable the two conditions to be distinguished with confidence at this stage of the disease.

On the question of treatment there are two different aspects to be considered. Appropriate chemotherapy would seem to be indicated if we assume (as we now do) that the infection is a staphylococcal one. But by the time we reached this conclusion we had seen two cases run a satisfactory course without it, and have subsequently withheld it unless there were clear indications for its use (as in Case 4). Saenger used penicillin in two of his cases, with no more conclusive results than our own. The second aspect concerns the orthopaedic measures to be used. All our cases were immobilized in plaster beds for varying periods (see Table II).

TABLE II

Case No.	Weeks Elapsing from Onset till		
	Immobilization Started	Recalcification Evident in X-ray Films	Immobilization Ended
1	4	7	22
2	6	13	17
3	8	11	11
4	3	7	7
5	8	11	11
6	11	13	17
7	4	10	10

We know of a patient, not treated by us, who has made a good recovery without ever having been immobilized at all: he restricted his own activity by lying in his cot until eleven weeks from the onset, and then gradually resumed normal activity. But in our view the use of a plaster bed during the stage of active infection is justified in most cases by the way in which it relieves the children's anxiety about being handled and contributes to their comfort: in cases with an angular deformity there seems to be a more direct indication for its use (see summary of Case 5, and Fig. 5). But we believe, after our experience with Cases 3, 4, 5, and 7, that it is usually safe to allow unrestricted activity as soon as recalcification is evident on the x-ray film (by which time the spine was clinically normal in all our cases). Cases 1 and 2 were immobilized longer than they need have been for reasons explained. Case 6 was immobilized for an extra month because it took that long for the x-ray appearances of the angular scoliosis to improve. Saenger was much more cautious.

He used casts or braces in his first three cases for periods of seven months, a year, and seven months respectively. His fourth case seems to have been a very unusual one: he was not seen and treated until five months after the onset, and this may possibly explain why he still had to wear a body brace three and a half years later.

The ultimate prognosis for these children is not known. All our cases were still well when last seen at periods ranging from four to sixteen months after resuming unrestricted activity. We have been fortunate enough to obtain details of a case of a patient aged 1 year admitted to the Ashford County Hospital, Middlesex, in 1943, and subsequently followed for a period of five and a half years. He was still clinically normal and tuberculin-negative at that stage of his follow-up, but the grossly abnormal x-ray appearances seen in Fig. 6 had developed in spite of his having been immobilized in a plaster bed for eight months initially. None of our cases has yet shown signs of developing such bizarre radiological appearances, though sclerosis of the affected bone persists in all of them, with probable narrowing of the affected disk space. We have not seen convincing evidence of the "restoration of width" of this space, which Saenger claims for three of his cases, but we find this interesting point difficult to decide. In addition to minor variations in radiographic technique, one has to allow for the relative narrowing of disk spaces in proportion to the height of the vertebral bodies which occurs in the unaffected portions of the spine during the normal course of development at this age. It remains to be seen if any disability occurs in later life, since it appears that a radiological abnormality persists.

Summary

The clinical picture of a benign inflammatory disease of the lumbar spine which we have seen in seven children under the age of 3 years is described. There is circumstantial evidence in previous reports to suggest that the lesion is a staphylococcal osteitis.



FIG. 6.—Ashford case. Aged 1 year on admission. X-ray film taken 5½ years after the onset of benign acute osteitis of second and third lumbar vertebrae, showing gross residual radiological changes in a clinically normal boy.

The clinical picture is strikingly uniform from case to case, and strongly resembles that of tuberculous spondylitis. The distinction may be made by the tuberculin skin test, and is confirmed by the appearance of recalcification in the x-ray films within three months of the onset in the pyogenic cases.

We believe that it is wise to immobilize these children during the active stage of the disease, but that unrestricted activity can safely be allowed as soon as recalcification is evident in the x-ray films.

We are most grateful to Mr. J. A. Cholmeley and Mr. N. M. Matheson for information about the case treated at Ashford in 1943, and for permission to reproduce Fig. 6; also to Dr. Donald Court, who brought the case to our notice. We are also much indebted to Mr. J. K. Stanger for his helpful criticism of this paper.

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PATHOGENESIS OF HODGKIN'S DISEASE

BY

M. H. GORDON, C.M.G., D.M., F.R.S.

Consultant Bacteriologist, St. Bartholomew's Hospital

Is Hodgkin's disease caused by the elementary bodies, and its malignancy by the allergy aroused by them? Both of these questions have been raised by the results obtained during the later stages of a combined clinical and pathological study of the aetiology of lymphadenoma. Investigation began when Mrs. T. E. Rose founded the Rose Research on Lymphadenoma in memory of her daughter, who lost her life from the disease, and also because lymphadenoma appeared to be a condition eminently in need of investigation. The fund apportioned for this research consisted of an endowment for a period of 10 years, and it was administered by the medical school and staff of St. Bartholomew's Hospital. An invaluable part was played also by St. Bartholomew's men in practice, who kept a keen look-out for acute cases and forwarded lymph glands removed by biopsy without preservative of any kind, so that if a piece should prove positive on section the rest of the gland could be used for bacteriological examination or animal test.

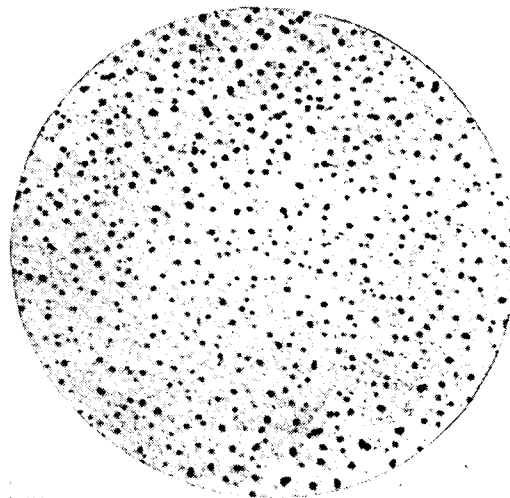
When the Rose research ended, the investigation was continued for the Medical Research Council, as it formed an important part of the study I was then making of virus infections generally, but mainly of vaccinia, psittacosis, and Shope's fibroma, with a view to applying the information thus obtained when searching for evidence of a virus infection in diseases such as the present one.

Although the most careful research had failed to reveal the presence of micro-organisms of known pathogenic significance in cases of Hodgkin's disease, elementary bodies (E.B.s) were found to be present in large numbers in most of them, particularly when the disease was in the acute

stage. In one of these in which the condition resembled acute tuberculosis—the glands being soft and almost purulent—films of them stained for tubercle bacilli showed no acid-fast organisms, but when the same film was counterstained with Löffler's methylene blue for several hours at 37° C. swarms of E.B.s stained blue were visible when it was mounted in water and examined microscopically. As these E.B.s were similar in morphology to those seen in other virus infections in which they have now been established as the actual *materies morbi*—for example, vaccinia—it was decided to prepare a vaccine of these Hodgkin bodies, and, after its attenuation by heat, to test its effect.

The late Dr. A. E. Gow, then senior physician to the hospital, co-operated in this, and it was found that a patient suffering from lymphadenoma was extremely allergic to even a minute dose of the E.B. suspension; so that attempts to immunize her with it were out of the question. This difficulty, however, was surmounted in the same way that had succeeded in acute cases infected by bacteria—namely, by uniting them with the specific antibodies present in immune serum before injection, and then giving the flocculated antigen a series of washings in saline so as to get rid of the serum. This sensitized E.B. vaccine was given a thorough trial in cases of lymphadenoma by Dr. E. C. Warner, who has reported on the encouraging results obtained in a large proportion of the patients, especially in young adults at an early stage of the disease. The relief, however, was only a temporary one, as lymphadenoma is a form of malignant disease at present.

When these results with the sensitized E.B. vaccine were published *La Presse Médicale*, of Paris, printed a note on the treatment, and the information spread to Chile, where great interest was aroused, as Hodgkin's disease is met with there as also in other parts of South America. Through Dr. Maxwell Chance, physician to the Chilean Legation in London, some of the sensitized E.B. vaccine was sent to Chile and tried there. Further particulars are given in the following brief account.



Photomicrograph of Hodgkin elementary bodies. (×1,250.)
(From the Rose Report on Lymphadenoma, 1932.)

The following Chilean cases were treated by E.B. vaccine in 1937, and the report on them was received through Dr. Chance and translated by him from the Spanish in July, 1937.

Report on Chilean Cases

(Lymphadenoma sensitized vaccine. Specimen used: suspension of E.B.s from patient's gland flocculated with antiserum twice over. Strength of original gland suspension, 1:100,000; sent to Chile by aeroplane by Dr. Maxwell Chance on March 4, 1937.)

Case 1: H.I.O. Antofagasta; 22 Years; Single

A young man came to consult me for glandular swelling of the neck, which had been present for less than seven years. The glands were hard, not attached to the skin; evening temperatures, obstinate itching, night perspiration, pain in the bones. Early symptoms of mediastinal compression. Neutrophil leucocytosis. Biopsy, Hodgkin's disease.

Subcutaneous injections given weekly: 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.33 ml.

Results.—With the first injection loss of weight and increase of evening temperature up to 38.5° C. were observed. After the fourth injection, disappearance of temperatures, but the other symptoms persisted. After the seventh injection, disappearance of pain in the bones, perspiration, and itching. After the eleventh injection the number of leucocytes was normal, but the neutrophilia remained high. The laboratory made a note that the pathological alterations of the neutrophils had disappeared. After the twelfth injection the symptoms of mediastinal compression, which had already begun to diminish after a few previous injections, disappeared; but with the thirteenth injection a temperature of 40° C. appeared, and lasted three days. As the symptoms had fully regressed, except for the neutrophilia, and as we did not possess sufficient experience about prolonging the treatment, we agreed to suspend it and keep the patient under observation.

Comment.—We would be profoundly grateful to Professor Gordon if he would give us advice about the future of our patient. This surprising result has caused great astonishment at the medical clinic of Professor Pradotag, who offered a vote of thanks to Professor Gordon at a conference given by the undersigned.

(Signed) Dr. R. ALLENDES, M.

Comments by M. H. G.—Dr. Allendes misunderstood my directions, which were *not* to raise the dose if a reaction occurred. He increased it each time, and after the fourth injection, still more after the seventh, the case improved. ? *Desensitization* here to E.B.s the reason.

Case 2: Signor G.K. Santiago; 28 Years

A patient who had suffered from Hodgkin's disease in the last six years. He had more or less prolonged intervals of freedom as the result of three series of radiotherapy.

He consulted the undersigned in October, 1936, who advised a new series of radiotherapy combined with blood transfusion, extracts of liver, and iron for the severe hypochromic anaemia (red cells 1,700,000). Did not obtain success. Advised arsenious acid and symptomatic therapy. Regression of nearly all the objective symptoms was observed, but the unfortunate anaemia, the alterations in the haemoglobin (neutrophil leucocytosis), and the consistent size of the abdominal glands persisted. In April of this year, as the result of a sharp wound with haemorrhage, the anaemia increased—R.B.C. 850,000. At the same time a syndrome of mediastinal compression appeared through increase of the glands in the region, with stubborn diarrhoea, itching, and obstinate perspiration. Fever 39.5° C.

The family refused a thorough course of treatment, but with the repeated suffering of the patient the physician recommended symptomatic therapy for mitigation, and they accepted the use of the Gordon vaccine but rejected other very important measures, such as blood transfusion.

The undersigned recognized that after the seventh injection used in the same dosage as in Case 1 above, the injections being given for five days, symptoms of relief such as diminution of the mediastinal compression, the neutrophilia, the diarrhoea, the itching, and the perspiration had resulted.

Unfortunately, the anaemia, each time more pronounced, caused a series of syncopal attacks with peripheral circulatory failure which terminated with the life of the patient.

(Signed) D. R. ALLENDES, M.

In August, 1937, the Chilean legation applied for more sensitized E.B. vaccine, to be tried under the care of the Minister of Health in Chile, Dr. Edward Cruz Coke, so I sent some to go out in the official bag of the Embassy. Nothing came of it. They wanted more, but I refused because no reports were made.

As I have now retired no further attempts have been made to prepare vaccine of the sensitized E.B.s of Hodgkin's disease. It is, however, interesting to note that, by employing E. W. Goodpasture's method of cultivating viruses in the embryonated egg, confirmatory evidence of the presence of a virus in Hodgkin's disease has been obtained by W. L. Bostick (1948), of the pathological department of the Uni-

versity of California, San Francisco, and also by H. Lundbäck and S. Löfgren (1950), of the State Bacteriological Department and Virus Laboratory at the Caroline Institute, Stockholm.

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PUBERTAS PRAECOX CAUSED BY INTERSTITIAL-CELL TUMOUR OF TESTICLE

BY

J. ANAGNOSTOU, M.D.

Professor of Pathological Physiology

AND

G. J. FRANGOPOULOS, M.D.

(From the Laboratory of Pathological Physiology, University of Athens)

It has been proved by many authors that the interstitial cells of the testis are the part of the testicle which secretes testosterone. In cases of precocious puberty caused by interstitial-cell tumours of the testis large amounts of the hormone have been found. Tumours consisting of such cells have been characterized as false tumours by Altmann and by Oberndorfer (1926), but others (Kaufmann, Chevassu, Durk) have recognized in them the characters of a true tumour. Masson (1943) regarded them as true tumours, and said that they were usually malignant and gave rise to secondary deposits after a long period. He thought they were reported as benign because the patients had not been observed for a long enough time after operation.

Cases of precocious puberty of such aetiology have been described by Rowlands and Nicholson (1929), Stewart, Bell, and Roehlke (1936), Sutherland (1948), Sandrom (1948), Werner *et al.* (1942), and, in Greece, by Demetriadis *et al.* (1948). The removed testicle of this last case was examined by us and proved to be of interstitial-cell origin. Sacchi (1895) described a similar case, but did not give a clear pathological report.

The case described by Budd (1937) is unique. An interstitial-cell tumour of the testicle developed in a man and gave rise to impotency and gynaecomastia, which subsided after removal of the tumour, found to contain large amounts of oestrogens.

Case History

We have had the chance to study a case of interstitial-cell tumour of the testicle causing precocious puberty. The patient, a 6½-year-old boy without any important familial



FIG. 1. — The patient before operation.

or hereditary history, developed normally until the end of his fourth year, when his voice began to become deeper and his penis increased in size.

His physician found a smooth swelling in his left testicle, thought to be of tuberculous origin. The patient was growing rapidly and hair gradually appeared in his pubic area and lower limbs.

We examined the boy two and a half years later; he was then 6½ years old.

His physique was that of a 15-year-old boy; he weighed 42 kg. and was 140 cm. tall. His upper limbs were in normal proportion to his trunk, while the lower limbs were shorter and robust. Hair growth was abundant in the pubic area, thighs, and legs. His face had a velvety appearance due to fine hair. No axillary hair was present. The cardiovascular and respiratory systems were normal. His teeth were normal for his true age. No abnormalities were found in the nervous system. The fundi of the eyes were normal. His psychological state and behaviour were those of his true age. The penis was of adult proportions (see Fig. 1). The left testicle showed a hard swelling the size of a small apple, with a round smooth surface. The epididymis was normal. The right testicle was normal, the size of a walnut. No erections, ejaculations, or masturbation were reported by his parents.

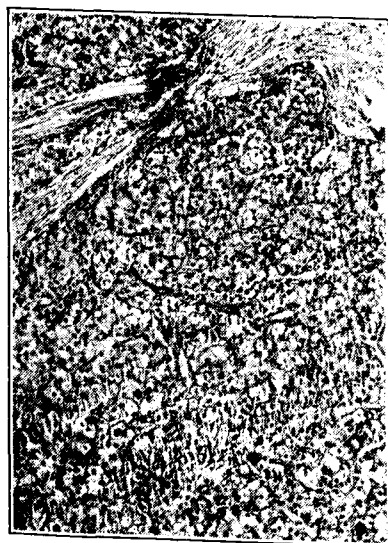


FIG. 2.—The compact and in some places strap-like disposition of the neoplastic cells is shown. The neoplastic tissue is divided into islet-like gatherings by bands of connective tissue containing blood vessels. ($\times 120$.)

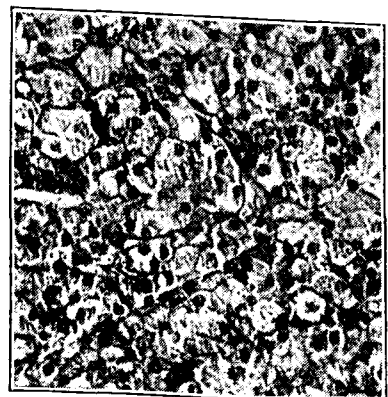


FIG. 3.—The neoplastic cells are closely packed, and have relatively abundant protoplasm with vacuoles and clear limits, giving a mosaic-like picture. No nuclear divisions can be seen. ($\times 540$.)

Laboratory Examinations.—X-ray examination showed a normal sella turcica. Nothing abnormal was found in the kidney regions. X-ray films of the hands showed the bone formation of a 15-year-old person. The basal metabolic rate was -20% . Blood examinations gave: red cells, 4,160,000 per c.mm.; white cells, 9,800 per c.mm. (polymorph neutrophils 62%, proleucocytes 3%, polymorph eosinophils 1%, lymphocytes 32%, monocytes 2%); thrombocytes, 250,000 per c.mm.; haemoglobin, 80%; blood sugar, 0.106%; blood calcium 13 mg. per 100 ml.; red-cell Cl. 0.199%; red-cell NaCl 0.315%; plasma Cl. 0.333%; plasma NaCl, 0.549%; blood cholesterol, 0.164%. Wassermann reaction, negative; Mantoux reaction, negative; glucose-tolerance test showed a normal curve; urine, normal.

The only positive finding, then, was the tumour of the left testicle, and the probable diagnosis was that of an interstitial-cell tumour.

In July, 1947, his left testicle was removed. The pathological examination of the tumour showed the following. The removed testicle was $4 \times 4 \times 3$ cm. in size with a normal epididymis. In section a diffuse growth of a whitish-grey neoplastic tissue was seen. The normal tissues were pushed to the surface. Microscopically, large neoplastic cells were seen, having in the majority a polyhedral shape, sometimes ellipsoidal, with abundant eosinophil protoplasm. The nuclei were round, with a fine net of chromatin, and had a nucleolus. These cells were closely packed, and formed masses, between which there was very little connective tissue. The new growth was divided by bands of connective tissue containing blood vessels, in different-sized areas. In some places the nuclei of the neoplastic cells were different in size and coloration, but nuclear divisions were rare. Generally no tense proliferation was found. In some places cloudy degeneration of the protoplasm was seen, and many small droplets of fats and lipoids were present in the protoplasm of the neoplastic cells (Figs. 2 and 3).

Professor Catsaras concluded that it was a myeloid neoplasm, arising obviously from the interstitial cells of the testicle, with no characters of malignancy.

The patient was examined nine months after the operation and found healthy. Somatic growth continued, although not as rapidly. Weight, 43 kg.; height, 146 cm. The hair growth in the thighs and legs appears to be diminished, but remained the same in the pubic area. His voice was still deep. Behaviour was normal.

Two and a half years after the operation the weight was 55 kg. and height 148 cm. Hair was scanty in the lower limbs. He had a childish expression and his voice was now much less deep. The size of the penis had diminished. There was no evidence of metastases.

Summary

A case of interstitial-cell tumour of testis causing precocious puberty is described.

No evidence of metastases was found 2½ years after operation.

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Anaesthetists and surgeons from nine Western European countries recently took part in a two weeks' course on anaesthesia in London. The course was arranged jointly by the British Council and the Faculty of Anaesthetists of the Royal College of Surgeons of England. Members of the course visited several of the London teaching hospitals to watch practical demonstrations of modern methods of anaesthetic technique in all fields of surgery, and at the end of each day they were able to discuss current problems with the demonstrators. Countries represented at the course included Austria, Finland, France, Germany, Italy, the Netherlands, Norway, Sweden, and Switzerland.

THE CEREBROSPINAL FLUID PRESSURE

BY

DAVID BOWSER, M.B., B.Chir.

(From the Department of Anatomy, University of Liverpool)

In the course of a study of the effects of variations in pressure within the azygos venous system it was discovered that such variations are reflected in alterations in cerebrospinal fluid pressure. Since this feature could be used experimentally as a method of investigating changes of pressure within the subarachnoid space, it was decided to undertake a full examination of the dynamic factors concerned in changes of cerebrospinal fluid pressure.

Theoretical Considerations

Fluids are virtually incompressible, and so do not obey Boyle's law. Fluid may not therefore be contained under pressure in a closed rigid container, as once the container is full it is impossible to introduce more fluid. If the container, for example a glass cylinder, is open to the air by

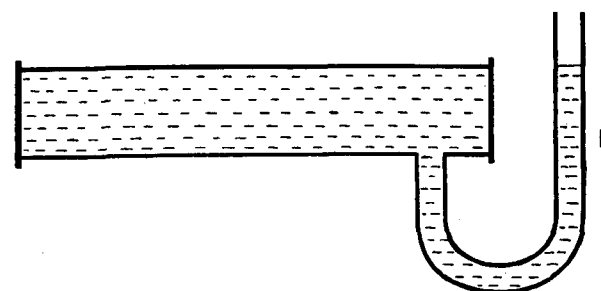


FIG. 1.—A rigid system, full of fluid, connected to the exterior by a U-tube. The level of fluid in the distal limb (D) of the U-tube is the same as that of the uppermost part of the fluid in the cylinder.

a side-tube, the level in the side-tube will be that of the uppermost part of the fluid in the cylinder, as shown in Fig. 1. Any further fluid introduced into the cylinder will be displaced volumetrically into the distal limb (D) of the U-tube, and the height of this displacement would vary with the diameter of the U-tube.

Fluid contained in an elastic-walled tube has pressure exerted on it by the sides of the tube, and if such an elastic-walled tube is contained within a rigid cylinder filled with

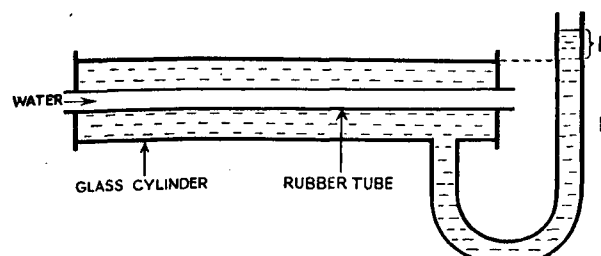


FIG. 2.—A rigid system (glass cylinder) through which is running an elastic-walled tube. If water is running through the tube, and a pressure is exerted on its walls, this will be transmitted to the fluid in the glass cylinder, and will be measured by the height (H) in the limb (D) of the U-tube. It should be emphasized that this is a true pressure and is not affected by the diameter of the U-tube.

fluid and open to the exterior the average pressure within the elastic-walled tube will be transmitted to the surrounding fluid, and will show as a height (H) in the distal limb of the manometer-tube (Fig. 2). This height H, being a measure of true pressure, will be constant whatever the diameter of the U-tube.

Supposing that the rate of flow through the rubber tube is such that the tube is partially collapsed—that is, its cross-section is not round but elliptical—it still exerts a pressure on the contained fluid; but if more fluid is now passed through the rubber tube so that it just increases its cross-section from an ellipse to a circle, the cross-sectional area is increased with practically no increase of pressure (Fig. 3).

If these conditions obtain in the system shown in Fig. 2, a volume increase in the rubber tube, bringing it from an elliptical to a circular cross-section, will cause no increase of pressure, but will displace a volume of fluid into the limb (D) of the U-tube equal to the increase in volume of the rubber tube. Thus the level of fluid in the limb (D) will rise by a new height (h_1) above H, but the amount of this rise will obviously depend on the diameter of the tube. Thus, to summarize, the height H is constant, and, being a measure of true pressure, is independent of the diameter of the tube, while the additional height (h_1) caused by distending the rubber tube is a measure of volume of fluid displaced, and so depends on the diameter of the tube.

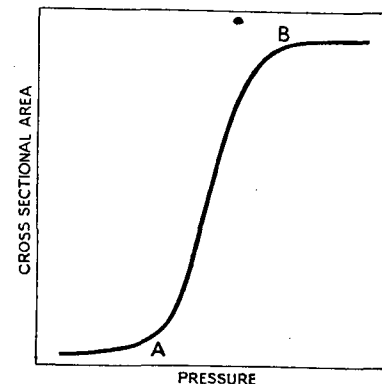


FIG. 3.—Graph representing rise of pressure with gradual distension of elastic-walled tube (modified from Ryder, Molle, and Ferris, 1944). In the segment A-B the cross-section of the tube is changing from the elliptical to the circular, with corresponding increase in volume but very little increase in pressure.

Application of the Theory to C.S.F. Pressure

The cerebrospinal fluid (C.S.F.) is contained in the subarachnoid space between the arachnoid mater and the pia mater. The former lines the dura and the latter the central nervous axis, so for practical purposes the C.S.F. may be regarded as lying between the dura mater and the central nervous axis. The dura is inelastic, and Holbourn (1943) has shown the brain to be virtually incompressible. Thus these structures cannot exert pressure on the C.S.F. However, the subarachnoid space also contains a large number of elastic-walled blood vessels, and the resting pressure of the C.S.F. must be due to the transmitted pressure of these vessels, expressed as an average of all the pressures exerted in the spinal subarachnoid space. The resting pressure is thus the same whatever diameter manometer tube is used in lumbar puncture (see Table).

Volumetric Displacement of C.S.F. Caused by Compression of the Abdominal Inferior Vena Cava. The Differences in Resting Pressure are Due to the Zero Mark on the Manometer not being quite Level with the Puncture Needle

	Diameter of Manometer Tube		
	0.2 cm.	0.5 cm.	1 cm.
Initial (resting) pressure	9 cm.	10 cm.	8 cm.
Pressure on abdominal compression	20 "	13 "	8.8 "
Rise in height of fluid (h)	11 "	3 "	0.8 "
Volume of fluid displaced ($\pi r^2 h$)	0.6 ml.	0.6 ml.	0.6 ml.

Ryder, Molle, and Ferris (1944) have shown that in partially collapsed veins the cross-section area, and therefore the volume, can be increased from an ellipse to a circle without increase in pressure as in elastic-walled rubber tubes (see Fig. 3). If, when the abdomen is compressed, the rise of C.S.F. "pressure" is due to diversion of blood from the pelvis and lower extremities into the internal vertebral venous network rather than the inferior vena cava, the rise

in "pressure" would in fact be a volumetric displacement and would thus differ according to the diameter of the manometer. This supposition has been confirmed by an experimental lumbar puncture in a man of 55 in whom the resting pressure and the pressure after manual compression of the abdomen was measured with three manometer tubes of differing bore (see Table). In this subject, then, 0.6 ml. of fluid was displaced into the manometers in all cases by compressing the abdominal vena cava. The rise was immediate, and the level was maintained for the total time during which compression was exerted. On removing the compression the pressure immediately fell to the resting level.

It has hitherto been held that when venous pressure is raised, as by abdominal compression or Valsalva's test, the pressure gradient between the C.S.F. and the veins surrounding the arachnoid granulations and elsewhere is abolished, but that C.S.F. formation by the choroid plexuses continues. Thus the rise observed in C.S.F. "pressure" was believed to be due to continued formation and failure of absorption of C.S.F. Masserman (1934) has shown that C.S.F. is formed at the rate of 0.3 ml. a minute. In the case cited in the Table the displacement of fluid was immediate, whereas if the reabsorption theory be true it would take two minutes to form the amount of fluid actually displaced (0.6 ml.).

The above experiment, while largely invalidating the previous theory of failure of reabsorption of the C.S.F. being the cause of physiological rises in pressure, does not, of course, prove that venous distension is the cause of the rise.

It is known that the intradural and extradural vertebral veins communicate with the caval system of veins (inferior and superior venae cavae, the azygos vein, and the deep neck veins, such as the vertebral, deep cervical, and occipital) at every intervertebral interval; this pattern has been thoroughly investigated by Breschet (1829), Northway and Greenway (1944), and Robinson (1949). Moreover, Batson (1940), in his classical work on the spread of prostatic cancer, has shown that, when the abdominal vena cava is compressed, blood from the pelvic veins travels upwards in the veins of the vertebral system.

It can be shown by the following experiment that C.S.F. "pressure" can be raised by diverting pelvic venous blood into the vertebral venous system.

A kitten was heparinized and then killed. Cisternal puncture was immediately performed and the C.S.F. pressure stood at 6 cm. A small cannula was inserted into an internal iliac vein, and saline, at a pressure of 10 cm. of saline, was infused. The abdominal vena cava was digitally compressed, and after the infusion of about 1.5 ml. of saline the C.S.F. "pressure" rose by 2.5 to 8.5 cm. Immediately compression of the vena cava ceased the pressure fell again to 6 cm., proving that the saline had not diffused out of the veins into the C.S.F.

The rise of C.S.F. pressure may similarly be produced by diversion of blood from other veins—for example, the azygos vein—into the vertebral veins, as in an experiment performed on a fully grown Alsatian dog. This was killed by electrocution; unfortunately it was not possible to heparinize the animal before death, but the experiment was performed within an hour of death and gave satisfactory results, indicating that extensive intravascular clotting had not occurred. Cisternal puncture was performed, and the resting pressure was found to be 12 cm. A cannula was tied into the azygos vein at its arch and saline infused retrogradely at a pressure of 30 cm. of saline. The cisternal "pressure" rose by 3.5 to 15.5 cm.

It would appear that every time intrathoracic pressure rises—that is, in expiration—some blood is pushed out of the valveless azygos system (Gruber, 1866; Charpy, 1898) into the internal vertebral venous network, whereas when intrathoracic pressure falls in inspiration the azygos vein distends and blood flows in the opposite direction, from the internal vertebral veins to the azygos. It is suggested that this to-and-fro flow between the azygos and the vertebral veins is responsible for the normal respiratory variation in

the C.S.F. pressure, the level of fluid rising in expiration and falling in inspiration. This contention was confirmed by performing cisternal puncture on a rabbit which had been given a lethal dose of pentobarbitone sodium. The level of C.S.F. in the manometer tube (1-mm. polythene tubing) was 9 cm., with a respiratory variation of about 0.25 cm. As the animal died of respiratory failure, ending in a complete expiration, the C.S.F. pressure rose 2 cm. This can be explained only by the mechanism suggested above. In another such experiment on a moribund rabbit it was shown that the respiratory excursion ceased as soon as the thoracic cavity was widely opened to the atmosphere, although the lungs and diaphragm continued to contract for a short time.

When Queckenstedt's test is performed, blood from the cerebral sinuses and upper part of the jugular veins, through their connexions with the intradural and extradural vertebral veins, returns by a collateral route in these vessels. As the intradural veins distend so C.S.F. is displaced into the manometer, causing the "pressure" to rise. The intracranial sinuses are held open by the layers of dura between which they lie, and they probably do not increase much in volume when jugular compression is applied, but the smaller cerebral veins which are tributary to the sinuses increase in volume, and they and the spinal intradural veins between them cause the increase of C.S.F. "pressure." The outflow from these spinal intradural veins probably occurs just below the point of compression, into the deep cervical veins, so that if the subarachnoid space is blocked below this level the C.S.F. below this point will not be displaced. However, it is well known that, in some cases of subarachnoid block, jugular compression still causes a rise of C.S.F. "pressure" below the block. In these cases it must be presumed that the blood in the cervical spinal collateral channels does not return to extradural channels immediately below the point of jugular compression, but continues further down the spinal subarachnoid space, past the block, to produce the effects of venous distension in the lumbar region.

Exercise, or any other cause of a rise of venous pressure, has long been known to produce a rise in C.S.F. pressure, and this is presumably due to increased venous volume within the subarachnoid space.

It may be concluded, then, that, apart from space-occupying lesions within the cranial or spinal subarachnoid space (including haematomata), the chief cause of so-called increase of C.S.F. pressure is displacement of C.S.F. into the manometer by increase in volume of the intradural veins.

Discussion

Many previous investigators, notably Weed and his collaborators, have studied the pressure of the C.S.F., but in general more attention has been paid to changes in pressure than to the resting pressure. Weed and Flexner (1932) conceive of the total C.S.F.-containing system as a rigid tube with an elastic membrane at either end; as a result of their tilting experiments, they postulate that the elastic membrane at one end (the spinal end) must be of greater elasticity than that at the other (the cranial end). They also state that the dura must be regarded for practical purposes as being relatively inexpandable—that is, its coefficient of elasticity at physiological pressure is negligible. However, they do not make a clear distinction between expansibility (power to undergo deformation) and elasticity (power to resist deformation). The rigidity of the dura had in fact already been demonstrated by Weed (1922) and Weed and McKibben (1919), when they showed that negative intradural pressures could be produced by the intravenous administration of hypertonic solutions. If the dura were capable of collapsing inwards, such negative pressures could not be produced. The dura must therefore be looked upon as adhering to the cranium and vertebral canal.

Weed, Flexner, and Clark (1932) and Weed (1933) have calculated the overall coefficient of elasticity of the dural sac and its contents. They found the coefficient of elasticity

(E) to be on average 4.2×10^5 dynes per cm.² in dogs. Clark (1933), working on the excised veins of dogs, found E for veins at a pressure of 3–4 cm. of mercury to be 4.2×10^5 dynes per cm.²

Despite this obvious comparison, no previous author has precisely maintained that the resting C.S.F. pressure is dependent mainly on the pressure exerted by the elasticity of intradural veins. It must be emphasized, however, that the resting C.S.F. pressure represents an average of the pressures of all the intradural vessels, including arteries. Because there are many more veins than arteries, two conclusions follow. First, although C.S.F. pressure is higher than venous pressure, it approximates far more nearly to venous than to arterial pressure; secondly, given the inelasticity of dura and central nervous axis, the coefficient of elasticity of the total intradural contents will approximate very nearly to that of the veins alone.

To increase the C.S.F. pressure for experimental purposes Weed and his collaborators have used almost exclusively the method of vertical tilting. By this method, with the manometer open to the air, the pressure recorded must be equal to the hydrostatic pressure of a column of C.S.F. from the needle to the highest point of the intradural space, plus or minus the effects of elasticity and/or collapse of the intradural vessels, as has been pointed out by Merritt and Fremont-Smith (1937). The present paper is concerned with the rise in "pressure" brought about by the various techniques of venous compression; or, rather, techniques which divert blood from the caval to the intradural veins. Weed (1922), in his classical experiments on decrease of C.S.F. pressure by the intravenous injection of hypertonic saline, noted that, although hypertonic saline eventually reduced the pressure considerably (even to negative values), during the time of injection there was a rise of C.S.F. pressure. This can have been due only to increased venous volume. Stookey (1924) realized the importance of venous dilatation when he stated that a rise of C.S.F. pressure on straining was probably due to a temporary block of venous outflow from the cranial cavity and vertebral canal; though, of course, as Batson (1940) has shown, it is a diversion of blood into the vertebral veins rather than a blockage of outflow that occurs.

Weed and Flexner (1933), referring again to tilting experiments, state: "With the experimental increase of cerebrospinal pressure brought about by the introduction of fluid into the subarachnoid space, a certain diminution of intradural venous volume must follow; but the pressure in these cerebral veins remains unaltered. Conversely, when the pressure of cerebrospinal fluid is reduced mechanically or by tilting, the cerebral venous bed apparently compensates by dilatation, the venous walls expanding and permitting an increase of intradural venous volume, though maintaining in these expanded channels the same pressures." It requires only a short step from this, aided by the work of Ryder, Molle, and Ferris (1944), showing that veins do in fact dilate without increase of pressure, to the hypothesis put forward in the present paper—namely, that, owing to diversion of blood from the caval to the extradural and intradural vertebral venous system, the intradural veins do in fact dilate without increase of pressure, and thus volumetrically displace a corresponding amount of C.S.F.

Summary

There has been a fundamental misconception with regard to spinal manometry; Boyle's law of gas pressure does not apply to liquids.

It is suggested that the resting pressure of the C.S.F. is due to the pressure transmitted from the walls of blood vessels within the spinal and cranial subarachnoid space.

Rise of "pressure" above the physiological norm is thought to be due to the increase in volume, without

rise of pressure, of the veins within the subarachnoid space which displace an equal volume of C.S.F. into the manometer.

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TRANSVERSE ARREST OF HEAD AND THE OCCIPITO-POSTERIOR POSITION

BY

BRYAN WILLIAMS, M.D., F.R.C.Sed., F.R.C.O.G.
Senior Obstetrician and Gynaecologist, Middlesbrough Maternity Hospital and North Ormesby Hospital

The occipito-posterior position is generally thought to be a common cause of difficult and prolonged labour, carrying a high risk to mother and baby, causing much worry to midwife and doctor, and often ending in a difficult instrumental delivery. Evidence is presented, however, that these risks and difficulties have been greatly overestimated in those cases in which the occiput is found posteriorly late in labour, or the true persistent occipito-posterior positions. On the other hand, if the occiput fails to rotate anteriorly from a lateral position there is serious foetal risk and often great difficulty in operative delivery. It is these cases which have given the occipito-posterior position its bad reputation, as they are usually looked upon as posterior positions in which incomplete rotation has occurred. It is probable, however, that in most of them the head has been lying transversely throughout labour, and to describe them as occipito-posterior positions is therefore incorrect. The methods of operative delivery, moreover, differ in the two complications, and it now seems desirable to separate transverse arrest of the head from the persistent occipito-posterior position.

Incidence

The figures given in the literature for the incidence of the occipito-posterior position vary widely, and this is doubtless due to the differing times in pregnancy or labour at which examination has been made and to varying criteria of diagnosis. Munro Kerr and Chassar Moir (1949) have also pointed out the importance in this respect of the incidence of abnormal pelvic types in the material studied.

In practice, however, it is important to know the proportion of cases in which anterior rotation of the head fails with conservative midwifery, and also the exact position of the head in these cases. Such figures have been obtained from the records of Walton Hospital, Liverpool, for the year 1937, and are given in Table I. This gives the posi-

TABLE I.—Incidence, Method of Delivery, and Results of Transverse Arrest of the Head and the Persistent Occipito-posterior Position in 2,958 Labours

	Transverse Arrest	Persistent Occipito-posterior Positions
Total No. of babies ..	54 (38 primigravidae, 16 multigravidae)	53 (22 primigravidae, 31 multigravidae)
Method of delivery:		
Caesarean section ..	5	2
Manual rotation, forceps ..	21	2 (spontaneous rotation in 1 case)
Forceps ..	17	8 (face-to-pubes)
Craniotomy ..	5	0
Normal delivery ..	6 (head transverse)	41 (face-to-pubes)
Results:		
Maternal mortality ..	0	0
" morbidity ..	11 (20%)	1 (2%)
Foetal mortality ..	13 (24%)	9 (17%)

tion of the vertex in these cases at the time of delivery or intervention, together with the method of delivery and the results to mother and baby. In that year great attention was paid to accurate diagnosis of position, and diagrams were often drawn in the records. A few cases are excluded in which a caesarean section was done for disproportion and in which the exact position of the head was not noted. It is probable that in these cases transverse positions of the head were more common than occipito-posterior positions.

The figures in Table I show that transverse arrest is more common in primigravidae and that operative delivery is always required, except in a few cases in which spontaneous delivery of a transverse head occurs, and in these the baby is usually small. The true occipito-posterior position, on the other hand, is more common in multigravidae and spontaneous delivery is frequent. The greater incidence of difficult labour and intervention in transverse arrest is reflected in a higher morbidity rate. Although there is no marked difference in the figures for the combined stillbirths and neonatal deaths, analysis of the causes of these, however, shows that in transverse arrest at least 11 out of 13 deaths were due to complications of labour, whereas in the persistent occipito-posterior position 8 out of 9 deaths were due to developmental abnormality or prematurity. The craniotomies were all carried out on dead babies, and two of them were in "failed forceps" cases.

In Table II the forceps deliveries in the same year are classified according to the position of the head at the time of interference. These figures show that with conservative

TABLE II.—Position of Head in 172 Forceps Deliveries

	Anterior Positions	Transverse Arrest	Persistent Occipito-posterior Positions
Total ..	124 (72%) (including 1 mento-anterior position)	38 (22%)	10 (6%)
Maternal mortality	2 (1.6%) (heart disease; pulmonary tuberculosis)	0	0
morbidity ..	18 (14.5%)	7 (18.5%)	0
Foetal mortality ..	11 (9%)	7 (18.5%)	0

Incidence of forceps delivery, 5.8%.

midwifery transverse arrest of the head is a more frequent indication for forceps delivery than the persistent occipito-posterior position, and that such delivery has a much higher risk for mother and baby.

As the number of cases of the persistent occipito-posterior position delivered with forceps in one year was small it seemed advisable to review a larger series to determine the risks to mother and baby, and Table III shows

TABLE III.—Results in 63 Face-to-pubes Deliveries with Forceps

	Primigravidae	Multigravidae	Total
No. of cases ..	55	8	63
Maternal mortality	2 (both from shock following manual removal of the placenta and pregnancy toxæmia)	0	2 (3%)
Maternal morbidity	3	0	3 (5%)
Foetal mortality ..	1 (tentorial tear)	3 (hydrocephalus; prolapse of cord, baby 3½ lb. (1.6 kg.); asphyxia, baby 10½ lb. (4.8 kg.))	4 (6%)

the results in 63 patients delivered in the course of six years, from 1936 to 1941 inclusive, with forceps in the face-to-pubes position. These figures show the striking fact that in 55 primigravidae there was only a single foetal death, and do not support the view usually held that this method of delivery has a high risk for the baby.

The problem of the non-rotated head, therefore, is seen to be mainly that of the transversely arrested head and not that of the persistent occipito-posterior position. The former demands intervention more often, and delivery is usually difficult and carries a high foetal risk.

Mechanism of Transverse Arrest

Transverse arrest of the head is a complication familiar to all obstetricians and was well described by Smellie. While American and Continental obstetricians lay stress on it, however, it receives inadequate attention in this country, and it is usually looked upon as a stage in the mechanism of the occipito-posterior position. This is doubtless the result of the standard teaching that the head normally enters the brim in one of the oblique diameters, and the transverse head is therefore considered to be an occipito-posterior position in which partial rotation has occurred.

There has long been clinical evidence, however, also going back to the time of Smellie, and referred to by Munro Kerr and Chassar Moir, that the head most commonly engages in the transverse diameter of the brim. The terms "occipito-lateral" and "occipito-transverse" are in common use. Radiological evidence now supports these clinical findings. Caldwell, Moloy, and D'Esopo (1934) showed that the head entered the brim transversely in 60% of their cases, and Steele and Javert (1942) found a slightly higher percentage of transverse heads both at the brim and in the cavity of the pelvis. Clinical observation shows that in those cases in which transverse arrest occurs the head has been transverse throughout labour. It seems inaccurate, therefore, to describe these cases as persistent occipito-posterior positions, and it is better to separate them from the true occipito-posterior positions.

The adjective "deep" is commonly used in connexion with transverse arrest. This term presumably refers to the depth inwards from the pelvic outlet at which arrest occurs rather than to the depth downwards from the pelvic brim. While arrest is most common in the pelvic cavity it may take place at any level, and as the term seems to have little value its use might be discontinued, as also might the use of inverted commas with the words "transverse arrest."

In face presentation a similar problem may arise, though such cases are infrequent. The figures for the incidence the various positions in face presentation are often con-

by the inclusion of cases of anencephaly, in which the position of the chin is of no importance. The so-called persistent mento-posterior position is usually a transverse arrest of the face, and might well be included under the heading of "transverse arrest of the head."

Diagnosis

The signs of the non-rotated head have been well described by Douglas Miller (1930). Early in labour the occipito-lateral and occipito-posterior positions can usually be differentiated by abdominal examination. In the occipito-lateral position the smooth back will be felt in one flank with the anterior shoulder some way out from the midline, limbs will not be prominent, the foetal heart sounds will be heard on the same side as that on which the back is found and will usually be faint, and the forehead will be felt well laterally till a late state of labour. In the occipito-posterior position there is a characteristic flattening or even a depression above the symphysis, the back and anterior shoulders are well out posteriorly with limbs easily felt on the opposite side and sometimes showing active movements, and the foetal heart sounds will be heard either well out in the flank and faintly or nearer the midline and more loudly.

Although in most cases the position of the head may be diagnosed from that of the back and vice versa, there is occasionally much twisting of the neck in labour. This has been found radiologically by Hedley (1932), and by Munro Kerr and Chassar Moir. In two remarkable cases reported by Smith (1949) much untwisting of the neck had to be carried out before delivery could be effected with forceps.

Vaginal examination is rarely called for early in labour, and later on the ease with which the classical features of the sutures and fontanelles can be recognized will depend on the extent of caput formation. It is often advised that before any intervention is carried out a final diagnosis of position should be made by palpation of the ears and face. This, however, needs deep general anaesthesia, and a degree of manipulation that is undesirable, and should be unnecessary, in a case followed throughout labour. Useful diagnostic features not often stressed are the characteristic feel of the external occipital protuberance and the saw-like edges of the parietal bone commonly found in the region of the posterior fontanelle.

In the real occipito-sacral position when the head is low and well moulded the incorrect diagnosis of a fully rotated occipito-anterior position is easily made. This mistake is due to the sagittal suture being found in the midline and to the frontal suture being inconspicuous. If forceps are applied the blades lie easily on the sides of the head, though early perineal distension on traction should make one suspect the accuracy of the diagnosis. The mistake, fortunately, is not a serious one, as will be shown later, but it can usually be avoided by careful abdominal examination.

In those cases in which the head has entered the pelvis but has failed to reach the perineum after an adequate period of good contractions it will usually be correct to assume that transverse arrest has taken place. In patients seen for the first time later in labour an exact diagnosis of position by clinical methods is often difficult. Abdominal examination in a restless patient may be inconclusive, and a ring is often present and the uterus tightly moulded round the foetus. A large caput may obscure the usual landmarks looked for on vaginal examination.

Facilities for intra-partum x-ray examination of such cases should now be available in maternity units, and this method of investigation will also be of great help in deciding the best technique of delivery. Otherwise examination under general anaesthesia with all its disadvantages may be necessary, and even then an exact diagnosis of position may be impossible. Early in labour, however, an accurate diagnosis by ordinary clinical methods will rarely be difficult.

Treatment

There has long been clinical evidence that deformities of the pelvic outlet in particular are commonly associated with defective rotation of the head (Plass, 1916). In recent years the extended use of x-ray examination has greatly increased our knowledge of the mechanism of labour in both normal and abnormal pelvises. Caldwell and Moloy (1938) showed the importance of basing the method of operative delivery on the type of pelvic abnormality present as shown by stereoscopic radiological studies, and they found, moreover, that these studies decreased the incidence of difficult forceps delivery. The importance of uterine action, and the resistance of the soft parts, however, is shown by the fact that normal delivery may take place, and, indeed, is usual in subsequent labours, although intervention has been necessary for transverse arrest in the first one.

The incidence of mid-forceps operations can nowadays be greatly reduced by the extended use of caesarean section with an improvement in foetal mortality and a decrease of maternal injuries. Nevertheless the minor degrees of pelvic deformity still present difficulties in treatment, and a small number of cases of mid-cavity arrest will occur with conservative practice. Among the most disappointing cases in obstetrical practice are those in which, in spite of good antenatal care, slow and difficult labour occurs as a result of the combination of inertia, slow dilatation, minor pelvic contraction, and delayed rotation of the head. If labour is allowed to continue unduly in the hope that spontaneous delivery, or at any rate a low forceps delivery, will be possible the optimum time for abdominal delivery may be passed, and the difficulty of extracting the foetus by lower-segment caesarean section is then great and the risk to the baby therefore high. In such cases the use of x-ray examination during labour, if it has not been carried out before, is of great help.

The method of delivery of the non-rotated head still gives rise to much controversy. The technique usually advised is that of manual rotation followed by the application of forceps. It is probable, however, that manual rotation is still advised too lightly and that its difficulties and dangers are underestimated. It may be very easy in a multigravida with a deficient perineum to rotate the head through two right angles and to complete delivery with forceps. In such cases the failure of rotation is due to deficiency of the pelvic floor or perhaps to some other factor such as deflexion of the head by an arm under the chin or to increased extensor tone in the neck muscles.

In a primigravida with a transversely arrested head, however, the problem is different. The outlet is usually narrow, and manipulations are difficult. Failure of rotation is due to the head having failed to reach the pelvic floor. Rotation at the level of arrest cannot take place, and in most cases the manipulation is inadvisable and should not be attempted. Caldwell and Moloy have shown the risks of attempts at anterior rotation in certain types of pelvis, and this has been supported more recently by Williams and Arthure (1949) as a result of their radiological studies of the pelvic outlet.

In considering the technique of delivery it becomes important to distinguish between the transversely arrested head and the persistent occipito-posterior position. The former should be delivered as an occipito-anterior position, while the latter should in most cases be delivered in the face-to-pubes position. Occasionally spontaneous delivery of a small head may occur in the transverse position, as shown in Table I, and this receives little mention in the textbooks. Irving Potter (1928) has also recommended deliberate delivery of the head in the transverse position when carrying out forceps delivery in order to save the perineum. Nevertheless it is usually agreed that delivery should be effected with the head fully rotated, and if forceps traction alone without any other manoeuvre is carried out spontaneous rotation will nearly always occur.

In view of the attention which is always paid to manual rotation it must be emphasized that the trouble is not failure of rotation but failure of the head to reach the level of the pelvis at which rotation normally occurs. Manual rotation is therefore not only impossible in most cases but attempts to carry it out may increase the risk to the foetus and need deep anaesthesia and much manipulation. In many of the cases in which it is thought to have been successful the position of the forceps marks on the baby's head will show that the blades have been applied to a more or less transverse head.

The pelvic application of the classical forceps with the use of axis traction is commonly employed in these cases. This involves an unsatisfactory grip with one blade over the forehead and carries a high risk of tentorial tears and eye injuries. The use of the Kielland forceps in this type of case is very satisfactory and is now widely recommended. The classical method of rotating the anterior blade of this instrument inside the uterus cannot, however, be free from risk either to the baby or to the uterus and anterior vaginal wall, and is nowadays unnecessary. This blade can be passed into position over the face by a wandering, gliding, or migratory movement. Sometimes the anterior blade is easy to apply and the posterior one difficult, and sometimes the reverse is found. Study on the manikin and considerable practice are required, and even then it is occasionally difficult to obtain a perfect cephalic application. Deep general anaesthesia is unnecessary and the instrument may be applied with only two fingers in the vagina. Spontaneous rotation usually occurs as the head reaches the pelvic floor, but this may be aided with the forceps.

The Kielland forceps is no more or no less dangerous than any other one. The application of forceps to the non-rotated head should be carried out only by those of experience, and all who practise obstetrics should master the use of the Kielland forceps. The exact diagnosis of position and the careful following of the proper mechanisms of labour which are both necessary with this instrument are perhaps largely responsible for its success. In skilled hands, as pointed out by Caldwell and Moloy, good results may be obtained by other methods and other instruments. In America a few authors have written enthusiastically of the Barton forceps, which has a hinged anterior blade and gives a cephalic grip of the transverse head. Some obstetricians recommend a cephalic application of the classical forceps. Nevertheless the delivery of a transversely arrested head with the Kielland forceps provides nowadays one of the most satisfactory experiences in obstetrics.

The type of anaesthetic needed will depend largely on the operative procedure. For manual rotation general anaesthesia of some depth is necessary, with all its disadvantages to mother and baby. The application of the Kielland forceps, however, may be carried out under some form of conduction anaesthesia, such as spinal anaesthesia. Although there has been much discussion about the risks of spinal anaesthesia for caesarean section there is little dispute over its safety for vaginal delivery, and it has been warmly advised in recent years by several authors in this country. Anderson (1946) has particularly recommended its use for difficult forceps deliveries. The records of 3,000 obstetrical cases in which spinal anaesthesia was used in Walton Hospital in 11 years up to the end of 1946 show that, although two deaths followed its use for caesarean section, there were no deaths or major complications due to its use for vaginal delivery. Its only serious disadvantage is the occasional occurrence of troublesome headache, though there is some evidence that the use of a very fine needle to puncture the theca may greatly reduce the incidence of this distressing complication. For the delivery of the non-rotated head a rather bigger dose is required than is necessary for perineal anaesthesia. This method of anaesthesia is so safe for mother and baby and so satisfactory to the obstetrician that it should now no longer

be considered to be on trial, but it is rather the continued use of general anaesthesia which should be justified for difficult forceps deliveries.

In face presentation the anomalies of rotation are similar to those of vertex presentation, and the so-called "persistent mento-posterior position" is usually a "transverse arrest of the face." The true mento-posterior position is rare, and differs from the persistent occipito-posterior position in that delivery with the chin posteriorly, either spontaneously or with forceps, must be exceptional, and caesarean section will usually be needed for it. The same treatment is required for transverse arrest of the face as for transverse arrest of the vertex, and the Kielland forceps is also valuable, in these cases. One point of distinction, however, between face and vertex presentations which is not emphasized enough is that in face presentation the caput may involve the upper air passages and cause increased foetal risk from pulmonary and feeding complications, and a less expectant attitude than in vertex presentations is therefore advisable.

In occipito-posterior positions the desirability of manual rotation has also been overemphasized. In practice many face-to-pubes deliveries are carried out with forceps in cases in which the correct diagnosis of position is not made until the appearance of the face from under the pubes causes discomfiture to the obstetrician. When the head is low and well moulded manual rotation should not be attempted, and its dangers here also have been shown by Caldwell and Moloy. This position is often found with the anthropoid pelvis, which is an efficient type of pelvis, and a deliberate face-to-pubes delivery does not usually present great difficulties if the normal mechanism is followed, though there is undoubtedly a great risk of lacerations, and extensive episiotomy is often necessary. The figures given in Table III show that there was only a single foetal death from cerebral haemorrhage in 55 primigravidae delivered with forceps as face-to-pubes cases. It would seem, therefore, that forceps delivery in the occipito-posterior position is no more dangerous than in the occipito-anterior position, and this is doubtless due to the forceps blades lying easily on the sides of the head and causing no stretching of the tentorium.

The presentation of a slightly bigger diameter has been traditionally put forward as the explanation of the difficulty with delivery of the occipito-posterior position, but a more reasonable one is the theory advanced by Chassar Moir (1938) of the maladjustment of the foetal and pelvic curves. The same idea is found in the "pivot points" theory of Buchanan (1920) and demonstrated by his very ingenious models.

The high incidence of easy spontaneous delivery and the low foetal risk of face-to-pubes delivery with forceps in occipito-posterior positions are in contrast with the findings in transverse arrest of the head, and it seems advisable, therefore, to consider these two forms of the non-rotated head separately. In both complications, however, a fascinating opportunity for the exercise of obstetrical judgment and skill is offered, especially with the rare need nowadays for axis traction and with our increased knowledge of the mechanism of labour obtained from radiological studies.

Summary

The head is usually found to be transversely arrested in cases of the so-called persistent occipito-posterior position which give rise to difficulty in labour. Transverse arrest of the head is not a stage in the mechanism of the occipito-posterior position, and the two conditions should be separated.

A cephalic application of forceps and traction without rotation is the best treatment for the transversely arrested head, and the Kielland forceps is very suitable for this purpose.

In the true occipito-posterior position a deliberate face-to-pubes delivery with forceps is usually indicated when the head is low, and this has a small foetal risk.

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SUBARACHNOID HAEMORRHAGE IN PREGNANCY

BY

JOHN N. WALTON, M.D., M.R.C.P.

(From the Department of Medicine, King's College,
University of Durham, and the Royal Victoria Infirmary,
Newcastle-upon-Tyne)

Since Lazard (1899) reported a case of cerebral haemorrhage arising during labour, many authors have described spontaneous intracranial haemorrhage occurring during pregnancy. Cerebral haemorrhage, often with extension to the subarachnoid space, has been noted in patients with eclampsia (King, 1933; de Carle, 1949) and toxæmia (Masten, 1935; Strauss and Tarachow, 1937), and these observations have inspired the view that generalized vascular changes are usually responsible for subarachnoid haemorrhage in pregnancy, labour, or the puerperium (Dahle, 1946). While this is true of many cases it is now evident that subarachnoid haemorrhage of aneurysmal or angiomal origin is an occasional complication of an otherwise normal pregnancy.

Of the 312 cases of spontaneous subarachnoid haemorrhage reported elsewhere (Walton, 1952a), two occurred during pregnancy; these cases are here reported in detail.

Case 74

A housewife aged 35 was admitted to the Royal Victoria Infirmary under the care of Professor F. J. Nattrass on January 27, 1948. Six years previously she had had an illness which began with sudden headache and prostration, and she spent three weeks in an isolation hospital, with a diagnosis of meningitis. For several months afterwards she had occasional headaches. On the day before admission, when in the thirtieth week of her first pregnancy, she was straining at stool, when a bursting frontal headache developed; this was followed by a generalized epileptic fit and a period of unresponsiveness lasting twenty minutes.

On examination on admission, twenty-four hours later, she was rational though drowsy and irritable; there was moderate neck stiffness, but no other abnormal signs were found in the central nervous system. The pulse was 60 a minute, blood pressure 140/90 mm. Hg, and temperature 99.2° F. (37.3° C.). Lumbar puncture revealed a deeply supernatant fluid under a pressure of 200 mm., and the blood-stained fluid was bright yellow. The urine contained small amounts of albumin and sugar.

The patient improved steadily and was transferred to the Princess Mary Maternity Hospital on February 13; she came into spontaneous labour on April 10 and was delivered of a healthy baby. Labour and the puerperium were uneventful. Although troubled for some months by headaches and anxiety symptoms, she is now living a normal life.

Comment.—The illness suffered by this patient six years previously was probably subarachnoid haemorrhage. In the absence of signs of toxæmia it is likely that both attacks arose from rupture of an intracranial aneurysm or angioma. There is no evidence that pregnancy was related to the haemorrhage, and normal labour did not provoke a recurrence of bleeding.

Case 273

A housewife aged 40 was admitted to the Princess Mary Maternity Hospital on October 25, 1942, for investigation. Three days previously, while in the twenty-sixth week of her third pregnancy, she was found to have albuminuria. Her blood pressure was normal and she had no symptoms. Shortly after admission she suddenly became confused and irrational; two hours later a generalized epileptic convulsion occurred, she became comatose, and neck stiffness was noted. She was transferred to the Royal Victoria Infirmary under the care of Dr. F. J. Nattrass three hours later.

On examination she was comatose, with Cheyne-Stokes respiration. The pulse was 68 a minute, blood pressure 140/90 mm. Hg, and temperature 100° F. (37.8° C.). There was severe neck stiffness and Kernig's sign was positive. A large subhyaloid haemorrhage was seen in the right eye; the retinal veins were engorged and small flame-shaped haemorrhages were seen in both retinae, but there was no papilloedema or any evidence of arteriopathy. The pupils were widely dilated and non-reacting; all four limbs were flaccid, and the left plantar response was extensor.

Lumbar puncture five hours after the ictus revealed deeply blood-stained fluid under high pressure; the supernatant fluid was faintly yellow. The urine contained a considerable quantity of albumin but no sugar. The patient deteriorated, and died eight hours after the onset.

At necropsy the following day much blood was seen in the basal cisterns and cerebral sulci. A ruptured aneurysm, 0.5 by 0.5 cm. in diameter, was found at the junction of the left anterior cerebral artery with the anterior communicating. The corpus callosum was ploughed up and haemorrhage had entered the right frontal lobe, reaching the lateral ventricle. Histological examination of the renal and cerebral vasculature showed no evidence of acute vascular pathology. The hepatic parenchyma was also normal on section. A normally formed six-months foetus was found in utero.

Comment.—Although albuminuria was noted before subarachnoid haemorrhage developed, there was no clinical or pathological evidence of toxæmia, and the necropsy findings were such as are commonly seen in non-pregnant patients with ruptured intracranial aneurysms; it cannot be suggested with any authority that the coexistence of pregnancy provoked the haemorrhage or influenced the outcome.

Discussion

Clinically typical attacks of spontaneous subarachnoid haemorrhage complicating normal pregnancies have been reported by Sands (1929, 1 case), Russel (1933, 1 case), Moskowitz and Schneider (1938, 3 cases), Richardson and Hyland (1941, 3 cases), Dahle (1946, 1 case), Rhoads (1947, 2 cases), Hamby (1948, 4 cases), Garber and Maier (1948, 3 cases), Ramstad (1948, 1 case), Olivecrona and Riives (1948, 1 case), de Carle (1949, 3 cases), Bell (1949, 2 cases), Gershenfeld and Savel (1950, 1 case), Ask-Upmark and Ingvar (1950, 2 cases), and Conley and Rand (1951, 8 cases). This complication may pose important problems of management, and, as Mackenzie (1933) has pointed out, diagnostic difficulties may arise, since hypothalamic irritation by subarachnoid blood may produce hypertension and albuminuria. If these signs are discovered in a comatose patient a misdiagnosis of eclampsia is possible, particularly if no search is made for signs of meningeal irritation. Even in a confirmed case of subarachnoid haemorrhage it may be difficult to be sure that toxæmia has not played some part in the aetiology (Conley and Rand, 1951). However, many

cases have now been reported in which toxæmia could be excluded completely, but no authoritative evidence is yet available to confirm the significance of the association.

Before an opinion on this point can be expressed and a rational scheme of management formulated, the following questions must be answered: (1) Does subarachnoid haemorrhage occur significantly more often in cases of non-eclamptic pregnancy than in other female members of the population in the same age group? (2) Is the aetiology of the illness different during pregnancy? (3) Is the time relationship of the illness to the stage of pregnancy constant enough to suggest a connexion between the two? (4) Does the coexistence of pregnancy affect the outcome of the illness?

1. *Incidence.*—De Carle (1949) found only three cases of subarachnoid haemorrhage complicating normal pregnancy in 15,417 deliveries, whereas subarachnoid bleeding, usually secondary to intracerebral haemorrhage, had occurred in 15 eclamptic patients in the same series. In the Newcastle series of 312 cases of subarachnoid haemorrhage there were 48 female patients between 20 and 45 years of age, and two of them were pregnant. By taking the average birth rate in the years 1940-9 it is possible to estimate that at any one time during that period approximately one in 20 to 25 women in the given age group would be pregnant. Thus the incidence of pregnancy in these cases was identical with that to be expected in the general population. Although somewhat greater in the series reported by Richardson and Hyland (1941), Dahle (1946), Hamby (1948), and Ask-Upmark and Ingvar (1950), the incidence was never high enough to nullify this conclusion.

2. *Aetiology.*—About 80% of cases of spontaneous subarachnoid haemorrhage arise through rupture of an intracranial aneurysm, perhaps another 10% through bleeding from an angioma, and in the remainder many pathological conditions may be implicated (Walton, 1952a). Ruptured aneurysms have been demonstrated by angiography or at necropsy in many pregnant patients (Sands, 1929; Richardson and Hyland, 1941; Rhoads, 1947; de Carle, 1949; Conley and Rand, 1951), while in at least three cases (Olivecrona and Riives, 1948; Conley and Rand, 1951) an arteriovenous angioma was the cause. Although in Thompson's (1949) three cases the bleeding was of unusual origin, the available evidence does not suggest that the aetiology of the illness in non-eclamptic pregnancy differs significantly from that in the general population.

3. *Time of Occurrence.*—It has been suggested that the burden of pregnancy and the strain of labour are responsible for provoking bleeding. If physical stress is the operative factor it would be expected that most cases would occur in labour or the early puerperium. Conley and Rand (1951) have pointed out that this is not so. They tabulated 20 reported cases and added eight of their own; when the two cases reported by Ask-Upmark and Ingvar (1950) and the two described here are added, it is seen that, of 32 cases, only four (12.5%) occurred during labour. In 18 (56%) the haemorrhage developed before birth (usually late in the second or in the third trimester) and in 10 (31.5%) after birth (within twenty-four hours of delivery in six). Clearly the time relationship is by no means constant.

4. *Outcome of the Illness.*—Of the 32 patients mentioned above, 13 (40%) died and 19 (60%) recovered. Separate consideration of the 10 cases occurring during labour or in the first twenty-four hours afterwards has shown that half of them survived. In 1,300 reported cases of subarachnoid haemorrhage the mortality rate was 45% (Walton, 1952a); it is clear that the prognosis of the illness during pregnancy, labour, or the puerperium is similar. Of the patients who recover from subarachnoid haemorrhage, 10.5% suffer a further attack within six months (Walton, 1952b), but there is no evidence that such recurrent haemorrhage is more likely to occur, even during labour, in a patient who has survived an attack in pregnancy; indeed, recurrent bleeding after an interval during the same pregnancy has been reported in only one case (Rhoads, 1947).

In the two cases reported above, the onset, progress, and outcome of the illness did not appear to be related to the associated pregnancy. Subarachnoid haemorrhage seems to occur no more commonly during a normal pregnancy than in an unselected group of women of the same age. The aetiology of the illness is not unusual in pregnant women, and the coexistence of pregnancy does not affect the prognosis. Admittedly most cases occur late in pregnancy or during labour or the early puerperium, when physical stress is greatest; as in any case of subarachnoid haemorrhage, exertion may promote rupture of an anomaly which was

about to bleed spontaneously (Walton, 1952a). However, from the evidence quoted, it seems that the association of subarachnoid haemorrhage with non-eclamptic pregnancy is, in general, fortuitous.

Management

If an attack of subarachnoid haemorrhage begins during labour, alleviation of physical strain is an urgent matter; in selected cases, depending upon the stage of labour, emergency caesarean section or instrumental delivery will be indicated before adequate treatment for the subarachnoid haemorrhage, whether conservative or surgical, can be implemented. Occasional cases of grave outlook in later pregnancy may require caesarean section in order to save the child. During pregnancy or the puerperium, however, it is usually wise that each patient should be treated as would any other case of subarachnoid haemorrhage. Details of treatment have been discussed elsewhere (Walton, 1952a); probably, if surgery is indicated, the pregnancy should not influence the decision on the optimum time of operation.

Rhoads (1947) has suggested that when a patient has recovered from subarachnoid haemorrhage during pregnancy termination is the wisest course; one of his patients suffered a fatal recurrence of bleeding during labour. However, this event is apparently unique, and it has been shown that restriction of activity is of no value in the avoidance of recurrent bleeding, while undue emphasis on caution may lead to disabling psychiatric sequelae (Walton, 1952b). It is suggested, therefore, that termination is unjustifiable and that the pregnancy should be allowed to progress to term. After four to six weeks in bed, and if the pregnancy is progressing normally, graduated activity should be permitted in patients who have made a good recovery. The obstetrician must then consider the most satisfactory method of delivery. Conley and Rand (1951) have suggested that caesarean section is indicated in order to avoid undue effort. This view may have some validity if bleeding has occurred within two or three weeks and the causal lesion has not been given adequate time to heal, but it should be remembered that the procedure carries with it the risks of a major abdominal operation. In view of the evidence quoted on the infrequency of recurrent bleeding, it is surely preferable in the majority of cases to allow spontaneous labour in hospital, with adequate analgesia and sedation, and possibly instrumental assistance in the second stage.

It will undoubtedly be asked whether a woman who has recovered from an attack of subarachnoid haemorrhage should undertake further pregnancies. In the series of cases reported by Symonds (1923), Sands (1929), Ask-Upmark and Ingvar (1950), and Walton (1952a) many women had weathered previous pregnancies, uncomplicated by subarachnoid bleeding. Five patients in the Newcastle series have passed through uncomplicated pregnancies since recovery from the illness. It seems that recurrent haemorrhage is no more likely to occur in pregnancy than during ordinary activity, and hence there is no justification for advising against further pregnancies when satisfactory recovery has occurred.

Summary

Two cases of spontaneous subarachnoid haemorrhage complicating otherwise normal pregnancies are reported.

From a study of these and of 30 similar cases previously reported it is suggested that the incidence of pregnancy in patients with subarachnoid haemorrhage is no greater than in the general population. The aetiology of the illness is not unusual in pregnant women, nor does the association affect the prognosis. It is concluded that the two conditions are associated fortuitously, except in so far as the burden of pregnancy or the exertions of labour may provoke rupture of a vascular anomaly which is about to bleed spontaneously.

Except during labour, when caesarean section or instrumental delivery may occasionally be necessary

for the alleviation of physical stress, patients should be managed as would any other case of subarachnoid haemorrhage.

After recovery from the acute illness, pregnancy should be allowed to progress to term. Spontaneous delivery, with adequate pharmacological and instrumental assistance, is advised, save in cases with recent haemorrhage, when caesarean section may occasionally be indicated.

After recovery has occurred there is no justification for advising against further pregnancies.

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Medical Memorandum

Acute Appendicitis in the Newborn

Acute appendicitis is rare in young infants, and extremely so in the first few weeks of life. The literature on this subject has been widely surveyed by Etherington-Wilson (1945), who reported an additional case in an infant aged 16 days. Including his own case, Etherington-Wilson found sixteen cases in the age group 0-4 weeks. In six of these the appendices were in hernial sacs; in the remaining ten the diseased appendices were intra-abdominal. Of the sixteen infants ten died and six recovered. In all six recoveries the appendices were in hernial sacs.

A further search of the literature has revealed one other case, reported by Ch'eng and K'ang (1937). The infant was 3 days old, and presented with constipation, intense meteorism, and vomiting. A diagnosis of acute diffuse peritonitis was made. The treatment was expectant and the child died on the 12th day of life. Necropsy showed an acute gangrenous appendicitis, without macroscopic perforation, which had given rise to a diffuse purulent peritonitis.

CASE REPORT

The infant, a first-born male, was premature and weighed 4 lb. 12 oz. (2,150 g.) at birth. There was no abnormality of labour or delivery, but the infant was stated to be feeble at birth. At first he had difficulty with sucking, but by the age of 10 days he had improved and was taking expressed breast milk satisfactorily from a bottle.

On the eleventh day difficulty in breathing was noticed, and pneumonia was diagnosed. Penicillin was started and there was some clinical improvement, followed by a

relapse. He was then transferred to Southmead Hospital, where he was found to be pale and wasted, with gross dehydration. The abdomen was enormously distended and tympanitic. There were many visible coils of bowel. No abnormal mass was felt, and the liver, spleen, and kidneys were not palpable. Rectal examination was normal and the stools were small, hard, and yellow. The heart, lungs, and nervous system were normal, and there was no abnormality of pulse, temperature, or respiration rate. The left tympanic membrane was inflamed.

An intravenous infusion of glucose-saline was begun. This produced an apparent improvement in the general condition, but diarrhoea had now developed, and there was much mucus in the stools. Sulphaguanidine and penicillin were given without effect, and deterioration was rapid. A generalized oedema was now present; the respiration rate became rapid, the temperature rose, and the left ear began to discharge. Death occurred suddenly on the 20th day of life.

At necropsy the significant findings were: (1) Gangrene of the appendix, with the formation of an appendix abscess. The appendix had sloughed off about 0.5 cm. from its base and lay in an abscess cavity, whose walls, formed from the caecum, terminal ileum, and omentum, were held together by delicate fibrinous adhesions; the cavity contained about 3 ml. of thin pus. Organisms present: *Staphylococcus aureus* (coagulase-positive), and *Bact. coli*. (2) Left otitis media: *Staphylococcus aureus* (coagulase-positive) and *Proteus vulgaris* were found.

COMMENT

In the above case the diagnosis of an acute intraperitoneal condition was not considered; the symptoms and signs were thought to be due to acute otitis media, with secondary diarrhoea leading to dehydration and a marasmic state. The diagnosis of acute intra-abdominal appendicitis in the very young appears to be fraught with difficulty, and so far does not seem to have been made at a stage early enough for treatment to be effective.

Localizing signs are more often absent than present (Holt and McIntosh, 1940), as in the case here reported. Abt (1917), in his review of 80 cases under the age of 2 years, and Etherington-Wilson (1945), both emphasize the fact that vomiting is almost invariable. However, vomiting is a feature of many neonatal states and therefore cannot be of much value in diagnosis. In the present case it was absent throughout.

Abdominal distension seems to be a frequent finding, and, if associated with constipation and visible peristalsis, may mimic intestinal obstruction. Diarrhoea may further confuse the diagnosis. On several occasions the condition has been mistaken for pneumonia on account of the rapid respiration rate.

If the diagnosis could be made early enough, before the apparently inevitable gangrene and perforation have occurred and before peritonitis has become general, operation would surely save some of these infants. Etherington-Wilson is convinced that spinal analgesia is the anaesthetic of choice, and this, combined with proper fluid and electrolyte replacement and antibacterial therapy, should go far towards improving the prognosis of this rare but very fatal condition.

I am indebted to Dr. H. J. L. O'Sullivan for details of the infant's birth and early life, and to Dr. R. Sandry for the report on the necropsy.

R. D. G. CREERY, M.D., M.R.C.P., D.C.H.
Lately Paediatric Registrar, Southmead Hospital, Bristol.

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Reviews

A TEXTBOOK OF THERAPEUTICS

Pharmacology in Clinical Practice. By Harry Beckman, M.D. (Pp. 839; illustrated. £3 3s.) Philadelphia and London: W. B. Saunders Company. 1952.

This is an unusual but refreshing book. Its first sentence runs as follows: "You will probably observe, as I have, that allergists are an apprehensive group." The text occupies over 700 pages, and on the whole the standard of the first sentence is well maintained. The serious purpose of the book is to look at pharmacology from the point of view of the doctor standing by his patient, and not to teach the subject as a science. While a list of references concludes each chapter, the writing is didactic and few authors are quoted. One would expect that an ill-considered and inaccurate work would result, but surprisingly enough this has not happened. Wherever details of the scientific background are filled in, as, for example, in discussing the relation of vitamin B₁₂ and the intrinsic factor, it appears that the author is well acquainted with the most modern research. This, then, is a textbook of therapeutics. It is an excellent work written with good judgment and wide knowledge, in advance of books on therapeutics which are available in Britain. On the whole the book is a reflection of American medicine, but the outlook is often wider. Thus, in the treatment of heart disease the use of digoxin is compared with that of lanatoside C and of digitoxin to the advantage of digoxin. As is well known, digoxin was introduced in Britain and in consequence has received little attention in American literature.

There are, nevertheless, odd features. On page 462 the author gives a list of analgesics. It contains a large number of substances, and among them occur curare and acetylcholine, mustard, and turpentine. It is true that the text on analgesics is written with sanity, but why the author should include in this list mustard and turpentine is almost impossible to guess, and why he should include curare and acetylcholine is quite beyond conceiving. He would rightly fail in any examination if he made statements like that; curare has no effect on sensation, and acetylcholine causes pain. But probably most readers would not notice the substances in the list, and so no harm would be done. The book is to be recommended to the consultant as well as to those in general practice, for it is a comprehensive and very practical guide to modern therapy.

J. H. BURN.

CHADWICK'S CAREER

Edwin Chadwick and the Public Health Movement 1832-1854. By R. A. Lewis. (Pp. 411; 24s.) London: Longmans, Green and Co. 1952.

Edwin Chadwick is receiving his full meed of recognition. We recently reviewed Professor S. E. Finer's authoritative biography of Chadwick in this *Journal*, and we now have this detailed and documented study by Dr. R. A. Lewis before us.

Chadwick's career was a failure, albeit a glorious one. This occurred not only because he was in many respects a hundred years before his time—his arguments for State intervention in public health which now seem self-evident to us alarmed the early Victorians—but chiefly because of his aggressive personality. This book shows that he was his own worst enemy. He was conceited, arrogant, and rude; he refused to compromise and advocated central control when it was most inopportune. In contrast one has only to recall the great achievements of Sir John Simon at a later date to see how much could be won for public health by enlightened medical knowledge guided by conciliation and tact.

Chadwick was not a doctor, but he was instructed by Southwood Smith, Arnott, and Kay in the sanitary evils that prevailed in the first half of the nineteenth century and in the means of combating them.

"And from the first," writes Dr. Lewis, "when Chadwick sent Arnott, Kay, and Southwood Smith on their tour of investigation in 1838, the doctors were the strongest supporters of the sanitary movement, from the Queen's physician, Sir James Clark, and the University professor, W. A. Guy, down to the dispensary and hospital physicians, Joseph Toynbee, Thomas Laycock, William Duncan, and the unnamed rank and file of the Union surgeons and general practitioners."

Chadwick, in his self-exaltation, would never acknowledge his debt to these medical pioneers. He refused to give doctors the first place in the campaign for public health reform, and tried to subordinate their efforts to those of the administrator and engineer. He held that as sanitarians eliminated the causes of disease from the environment the traditional ministrations of the doctor would become less necessary. He even quarrelled with the inoffensive Farr when he pointed out statistical errors in Chadwick's statements.

Chadwick was wrong in thinking that the prevention of disease was solely a matter of environmental hygiene, although this was of great importance. But his driving energy and fanatical zeal aroused the public conscience, and he achieved the following important results before he was forced to retire from the General Board of Health in 1854: first, his *Report on the Sanitary Condition of the Labouring Population*, 1842; secondly, the first Public Health Act, 1848; and thirdly, the setting up of a central health authority with a medical department in the same year. Then he established the linking of State medicine with the medical profession, the importance and desirability of medical officers of health, the value of co-operation with the Registrar-General and the guidance afforded by vital statistics, the principle of medical inquiry by the State into disease and the sanitary condition of the nation, and the encouragement of voluntary agencies for the education and public health service of the people.

This book will be read with interest by public health workers. It is well printed and produced.

ARTHUR S. MACNALT.

DREAM ANALYSIS

The Handbook of Dream Analysis. By Emil A. Gutheil, M.D. (Pp. 710; 85 illustrations. £2 8s.) New York: Liveright Publishing Corporation. London: George Allen and Unwin. 1952.

The author hopes that this book, "a product of thirty years of research and practice, will help move scientific dream interpretation forward towards the advanced position which several other psychoanalytic techniques have attained." About 600 pages are devoted to interpretations of as many dreams, but the final result is disappointing. This is not because there is little in the book that is fresh or scientific about dream interpretation. Dreams have occupied a central place for half a century in the writings of Freud and Jung and their pupils, and, in view of all the accumulated knowledge and experience, any major revision of theory or approach would scarcely be expected. The disappointment is, rather, related to the author's endeavour in the book to use dream analysis as a basis for teaching psychotherapy.

Dr. Gutheil clearly has much insight into patients' emotional conflicts, as many of his interpretations of their dreams show. But by devoting attention too exclusively to dreams he gives the impression that he is creating a "dream book" rather than presenting the basic principles of unconscious dynamics from which the student can understand the neurotic patient as a whole as well as his dreams. Moreover, certain other features do little to dispel this impression. First, there are far too many assertions made about what is or is not established. Secondly, the author is sometimes inconsistent about the role of unconscious dynamics.

Thus, although he states that artificial or invented dreams can be interpreted as if they were real ones (because unconscious forces go into the selection of the content), later on he is worried about the unreliability of the free associations of many patients because they are influenced by reading psycho-analytic literature. Thirdly, the author tries to cater for students much too diverse in their backgrounds. The glossary, for example, includes the following: "*Haemorrhage*: Bleeding; *Typical*: Pertaining to a type, an example, or a characteristic." In short, for the elementary student, as for the experienced psychotherapist, there is not much here that is not to be found in the classical texts.

J. D. SUTHERLAND.

CORRELATIVE CARDIOLOGY

Correlative Cardiology: An Integration of Cardiac Function and the Management of Cardiac Disease. By Carl F. Shaffer, M.D., F.A.C.P., and D. W. Chapman, M.D., F.A.C.P. (Pp. 525. £2 7s. 6d.) Philadelphia and London: W. B. Saunders Company. 1952.

My dictionary states that to correlate means "to connect together by the disclosure of a mutual relation." A conscientious teacher of cardiology spends much of his time correlating, and it is good to see that the authors of this book for students emphasize this important didactic principle in their preface, even to the exclusion of all other matters. The shock comes at once, for the work is presented in summary form, an impossible medium for serious correlation.

Students undoubtedly like lists when preparing for examinations, and it may be fairer to judge the book as a means of "hastily filling the mind with information for a temporary purpose." Scanning the lists of concise statements, a reviewer, if human, finds himself on the alert for error; for one of the great dangers of the summary form is that it favours the parrot mind and, being unencumbered with explanatory text and references, can impart almost any information, correct or false, without exciting the critical faculty. Unfortunately serious errors of fact, of omission, and of judgment are rather obtrusive; these, together with the lack of good pen portraits of clinical syndromes, poor differential diagnosis, indifferent physiology, substitution of fine drawings for skiagrams, electrocardiograms, and other photographs or tracings, and a bad index, make this book difficult to recommend.

PAUL WOOD.

MÉNIÈRE'S DISEASE

Ménière's Disease. By Professor Henry L. Williams, M.D., M.S. in Otol. (Pp. 349. £2 10s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

The most interesting part of this monograph is the full account of Ménière's original work and his explanation of the labyrinthine origin of the paroxysms of vertigo and vomiting, which had previously been considered to be cerebral in nature. The author emphasizes the importance of Ménière's contribution and explains the facts about the famous necropsy in which a haemorrhagic effusion was found in one labyrinth. He makes it clear that Ménière did not consider this to be the usual lesion of the disorder to which his name was later given. He also points out that Knapp suggested hydrops of the labyrinth as the cause of Ménière's disease in 1871, some 67 years before it was demonstrated pathologically.

Dr. Williams thinks that the basic disturbance in the disorder is an allergic vasospasm with resulting labyrinthine hydrops, but describes a second group of cases in which there are typical attacks of labyrinthine vertigo without clinical evidence of cochlear involvement; he assumes without pathological proof that in these cases there is vasospasm but no hydrops. The section on differential diagnosis is rather inadequate, no mention being made of

paroxysmal positional vertigo or of vestibular neuronitis, which may easily be confused with Ménière's disease, and the author gives scant consideration to episodes of vertigo as an early symptom of disseminated sclerosis. He discusses in detail the possible lines of treatment, in general favouring a low fluid and salt regime together with vasodilator drugs, and in cases where surgery is needed preferring destructive labyrinthotomy to intracranial section of the vestibular nerve.

This monograph should be useful to doctors who often see sufferers from Ménière's disease, for it gives a large amount of information about previous writings on the condition and an adequate account of cochlear and labyrinthine tests. But unfortunately there is a good deal of repetition, and there is no assessment, based on an adequate series of cases, of the natural history of the disease and the prognosis. That would have been invaluable in a monograph of this type.

J. W. ALDREN TURNER.

PRACTICAL DERMATOLOGY

Dermatology: Essentials of Diagnosis and Treatment. By Professor Marion B. Sulzberger, M.D., and Jack Wolf, M.D. 4th ed. (Pp. 592; 65 figures, and 8 plates. \$10 or £3 18s.) Chicago: Year Book Publishers. London: Interscience Publishers. 1953.

In this fourth edition of their work the authors are presenting a practical textbook of dermatology dealing with a wide range of common dermatoses but omitting any discussion of rare affections, aetiological theories, general pathology, and histopathology. In the foreword the work is commended to the student and the busy general practitioner, and both will find it a useful book of reference; but the dermatologist will find it of interest also.

The plan of the work, the introduction, and the exposition of the principles of diagnosis, topical medication, and management generally are excellent. The authors draw attention to the physical characters of the applications and the purpose they serve, and they discuss in detail the methods of application and removal and the techniques of bandaging, enjoining their readers to know everything about a few useful remedies and to administer them properly. Not only must the physician give instructions, but he must himself demonstrate these procedures and techniques and must repeatedly check the results of treatment. This is all most admirable and might well be studied by nurses as well as students and doctors.

The authors consider that infantile eczema and the so-called "atopic dermatitis" of adolescent and adult are allergic diseases distinct from eczematous dermatitis of external and unknown origin. They pay great attention to keeping away from potential allergens, especially by elimination diets and by making bedrooms "allergen free" or at least "hypoallergenic." Moving to a warm dry climate is advocated. In discussing pyoderma they emphasize the value of antibiotics applied locally, impetigo being cured in three to five days. Some regard this procedure as unwise and likely to favour the spread of resistant strains of organisms. Leg ulcers and chilblains are not discussed.

"Irritancy," "allergenicity," "morbidity," and "zoonoses" for diseases due to animal parasites are not attractive terms. "Sharply focussed history" and "symmetrical paired comparison" are expressions that need explaining. The latter refers to the use of different applications to symmetrical sites on the patient to judge which may be the more effective. It is a common practice but not one calculated always to increase the confidence of the patient. The experience of the authors with A.C.T.H. and cortisone is particularly interesting, for it is so much more extensive than that of anyone in Britain. The presentation is balanced and impressive. This is a stimulating and useful textbook; it will be welcomed by dermatologist and general practitioner.

J. T. INGRAM.

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GAMMA GLOBULIN AND POLIOMYELITIS

The preliminary reports of the strictly controlled studies by Hammon and his colleagues on the value of American Red Cross gamma globulin in the prophylaxis of paralytic poliomyelitis were recently reviewed in this *Journal*.¹ The gamma globulin used gave substantial protection from the end of the first week to the end of the fifth week after inoculation. In the pilot trial made in Utah in 1951 the incidence of poliomyelitis in the control group, whose members received an injection of a gelatin solution, was apparently no higher than in the uninoculated of the same age. And there was no undue incidence of paralysis in the right leg—in which all inoculations were made. But the figures for the larger trials in 1952 in Texas, Iowa, and Nebraska have not yet been published. We must wait for a detailed analysis before we know whether the administration of gamma globulin interferes with the production of active immunity in people who are exposed to infection but do not develop symptoms. Now that the protective power of gamma globulin has been demonstrated, this is the most important question to be answered, for upon the answer will depend the readiness with which passive immunization will be accepted as a practical procedure in the control of poliomyelitis. "Silent" active immunization does not occur in measles contacts exposed to infection while protected with gamma globulin. It may occur in infectious-hepatitis contacts under similar conditions, and there is experimental evidence that it occurs in monkeys infected with poliomyelitis virus and given gamma globulin at the same time.

Medical authorities in the U.S.A. are now making plans to meet the prodigious demands for gamma globulin they expect in future epidemics. The American National Red Cross has undertaken to expand its programme for the collection of blood, and blood-fractionation plants have been asked to work at full capacity. For all purposes, including transfusions, the American Red Cross estimates it will require five million pints of blood a year. Presumably commercial firms in the U.S.A. will also attempt to increase the supplies of globulin from blood plasma and placentas.

¹ *British Medical Journal*, 1952, 2, 1035.

The gamma globulin issued by the American Red Cross was prepared from large pools contributed by "tens of thousands of donors" and contained antibodies to the three known types of poliomyelitis virus—Lansing, Brünhilde, and Leon. Most of the first 100 strains of virus typed in the U.S.A. belonged to Brünhilde type, and this is probably the one most commonly associated with paralytic cases there. In North America epidemics have been common for the last fifty years; in Britain extensive epidemics have occurred only in the last seven years. The prevalent type of virus here is not known, and we do not know the antibody content of gamma globulin prepared from plasma from British donors, though MacCallum has found Lansing antibody in a small number of batches he has tested. In Britain gamma globulin is prepared from small pools of plasma, and, even if antibodies to Brünhilde and Leon types of virus are found in some batches, they may not be present in batches from all parts of the country. Much of our ignorance here could be quickly dispelled if appropriate investigations were put at the top of the small list of virus research projects possible with the facilities available.

The supply and distribution of gamma globulin raises more difficult problems. It is a generous assumption that about 1 g. of gamma globulin is prepared from a pint of blood. For the 27,000 children given gamma globulin in the American trials about 30,000 g. of gamma globulin were used, representing donations from some 30,000 donors. With the aid of these assumptions we can calculate that roughly one paralytic case was prevented for every 1,000 g. of globulin administered in the trials. The present supply of gamma globulin in Britain is about 1,800 g. annually. It has been issued through the Public Health Laboratory Service for the prophylaxis of measles or infectious hepatitis, and for these diseases the demands greatly exceed the supplies, which are restricted to children in hospital, children suffering from intercurrent diseases, and children aged between 6 months and 2 years. In the near future, when new buildings and plant at the Lister Institute have been completed, the supply of gamma globulin may be increased to about 9,000 g. annually. Even then the total annual output will obviously be inadequate for the protection of large numbers of persons in a widespread poliomyelitis epidemic. More buildings and plant would be needed to increase production beyond 9,000 g. annually, and to satisfy expected minimal demands 50–75% more blood donors would be required. There are now some 500,000 donors in the Blood Transfusion Service, and almost all the blood is issued as whole blood or plasma.

If all these difficulties could be surmounted, and if gamma globulin were available in unlimited quantities, the question of whom to inoculate would still have to be settled.

Paralytic disease in the close contacts of cases is uncommon. By the time a case is diagnosed, three-quarters of the family contacts are already excreting virus in the stools. These contacts have probably begun to develop their own immunity, which is usually sufficient to prevent a paralytic infection. Therefore the protection of family or other close contacts is unlikely to reduce the incidence of the disease much. About 84% of notified cases of poliomyelitis are in people below 25 years of age. Should everyone in this age group be inoculated when poliomyelitis is epidemic in an area? The decision might be taken to carry out such a blunderbuss attack in a town of 100,000 inhabitants (though the case fatality rate is much higher in people aged over 25). Arrangements would have to be made to inoculate 34,000 people, for whom 34,000 donors would have to contribute about one pint each. The protection would last for five weeks, during which time a few might develop an active immunity without symptoms of infection. At the end of the five weeks, if, as might well happen, cases were still occurring, the 34,000 people would have to be inoculated again, and a further 34,000 blood donations would be required. If there were a number of epidemic foci, huge quantities of gamma globulin would have to be made available at short notice, and medical practice in the areas would be disorganized. Every year in which epidemics broke out the process would have to be repeated. We do not pretend to know how the problems which have been raised by the careful field studies of Hammon and his colleagues can be solved. Passive immunization has never been satisfactory for the control of any infectious disease and will certainly not be the method of choice in poliomyelitis.

APNOEA IN ANAESTHESIA

Times change—and with them the meaning of words. The danger signal of yesterday becomes a desirable thing to-day. Respiratory arrest, till recently regarded as warning of approaching death, is now something which the anaesthetist sets out to induce. No longer is it ominously called "respiratory arrest," but, with some familiarity, "apnoea." The profound depression of deep general anaesthesia has very largely given way to other methods. For example, the method, introduced by Mushin,¹ of combining nitrous oxide, pethidine, and a relaxant is now widespread. The patient is not far from consciousness, and his

quiescence during the operation is largely due to the relaxant. In these circumstances the apnoea of to-day differs very much from the respiratory arrest of yesterday. Respiratory arrest after the administration of large doses of, say, ether or thiopentone is still a danger signal, since it indicates that the respiratory mechanism has been poisoned and has ceased to function. Spontaneous breathing will not take place until some of the drug is excreted from the nervous system. Apnoea, on the other hand, is the result of administering a peripherally acting relaxant in sufficient dose to paralyse the respiratory muscles. The anaesthetist maintains adequate ventilation by rhythmically squeezing a bag containing oxygen connected to the patient's respiratory tract. The central nervous system is little depressed, since the accompanying anaesthesia is light.

The advantages offered to the patient and the surgeon by such methods are great. Profound depression of the brain and vital organs by drugs generally regarded as anaesthetics is avoided, and delayed convalescence due to complications becomes more of a rarity. The surgeon is given a nearly motionless field of operation, with muscles relaxed to a degree hitherto almost unknown. The patient's recovery is rapid, and the hazards to which he is exposed when slowly coming round from profound anaesthesia have been almost eliminated.

The practice of deliberately inducing apnoea for major abdominal and thoracic surgery is spreading throughout the world. The present position was summarized a short time ago in this *Journal* by Gray and Rees,² who maintained that apnoea should "be looked upon as an integral feature of the technique for anaesthesia in major surgery and not as something to be avoided if possible, or regarded as a nuisance if inevitable." In describing the role of apnoea in anaesthesia, they pointed out, among other things, that the physical effort of breathing was removed, so that strain on the patient was to that extent lessened. Depression of the central nervous system by the anaesthetic was minimal, and at the conclusion of the operation, when the relaxant was neutralized, recovery was almost immediate. An additional advantage of the use of controlled respiration was that smaller doses of relaxant were needed to maintain the desired state of muscular quiescence.

It must be clearly realized that the patient with paralysed respiratory muscles becomes wholly dependent upon his anaesthetist for the maintenance of his life. The latter must therefore be well aware both of the pharmacological actions of the relaxants and

¹ *Proc. roy. Soc. Med.*, 1951, 44, 840.
² *British Medical Journal*, 1952, 2, 891.

of the dangers inherent in any interference with the mechanism of respiratory control. In addition he needs to know not only what to do to maintain efficient ventilation, but also how to do it in the best possible manner. The rhythm and volume exchanges of artificial ventilation should so approximate to those of normal life that metabolism continues unaltered. Further, the differential pressure changes occurring in the lungs and respiratory tract should not be such as to cause disturbance to the cardiovascular system.

ADDISON'S DISEASE

The diagnosis and the treatment of chronic adrenal insufficiency were discussed at a recent meeting of the Royal Society of Medicine, subjects in which there have been some important advances in the last five years. In many instances a correct diagnosis can be made on clinical grounds, and Professor Dunlop painted a vivid picture of the patient with Addison's disease who suffers invariably from weakness, tiredness, and loss of weight, almost invariably shows increased pigmentation and a fall in blood pressure, and often has associated gastro-intestinal symptoms, such as nausea or diarrhoea, and a tendency to develop hypoglycaemia after fasting. But in one-third of 62 cases the diagnosis was not clinically obvious to physicians experienced and familiar with the disorder, and various tests were required to establish the diagnosis.

The large number of tests available suggests that none is entirely satisfactory and is an indication of the many functions normally influenced by adrenocortical hormones. A radiograph of the abdomen showing calcification in the adrenal area is highly suggestive of tuberculosis of the adrenal glands. A decrease in the serum sodium and an increase in the serum potassium concentrations, together with dehydration, haemoconcentration, and a raised blood urea, may be observed, but so effective are the homeostatic mechanisms that these changes may not be present until the patient goes into an adrenal crisis. Similar abnormalities may be found in febrile patients and those who are losing sodium and extracellular fluid through vomiting, diarrhoea, or renal insufficiency. Evidence of decreased adrenal secretion of androgenic hormones may be obtained by estimating the urinary excretion of 17-ketosteroids. Women with Addison's disease usually excrete less than 1 mg. in 24 hours, but in men higher values are obtained because of androgens secreted by the testes. Moreover, low 17-ketosteroid excretion may occur in many conditions in which adrenal hypofunction cannot be directly implicated, and the estimation requires a well-equipped laboratory and is costly in time and money. The decreased ability of a patient with adrenal insufficiency to excrete a given water load forms the basis of the Robinson-Power-Kepler test.¹ This

is a relatively simple test to perform, carries no risks, and is of considerable diagnostic value. Unfortunately it is not specific, and a decreased diuretic response may occur in other conditions, notably hypothyroidism, cirrhosis, and some cases of nephritis. The response of the adrenals to adrenocorticotrophin (A.C.T.H.) is the simplest and the most informative test if carried out properly. The original four-hour Thorn test,² in which the eosinophils were counted for four hours after a single intramuscular injection of 25 mg. of A.C.T.H., has not proved reliable, because this may not be an adequate stimulus. Thorn himself has found this,³ and his experience is shared by de Mowbray and Bishop.⁴ However, 25 mg. of A.C.T.H. infused intravenously over an eight-hour period is an adequate stimulus, and the Boston workers now recommend this procedure.⁵ The most direct diagnostic approach is to estimate the concentration of adrenocortical hormones in the patient's plasma, and Bayliss, Hunter, and Steinbeck reported that negligible amounts were present in the plasma of patients with Addison's disease and that the concentration remained at zero after an eight-hour infusion of 50 mg. of A.C.T.H.

"The principle of treatment in Addison's disease is to provide satisfactory replacement of the adrenal cortical substances which are lacking or are present in insufficient quantities," wrote Abbie Knowlton in a recent article.⁶ At the R.S.M. Simpson spoke of the value of deoxycortone acetate (D.C.A.) as replacement therapy, and emphasized the danger of implanting too much of this compound, causing sodium retention. There was general agreement that, after the patient had been stabilized on intramuscular injections, pellets of D.C.A. could be implanted at the dosage of 80 mg. by implant, being equivalent to 1 mg. by injection. The pellets are effective for about nine months, and finer adjustment of sodium balance is achieved by varying the salt intake. Spence spoke of his experience with deoxycortone trimethyl acetate in microcrystalline form, a single injection providing adequate control for one month. But D.C.A. is by no means complete replacement; the patient may continue to develop hypoglycaemia, and, as Dr. F. T. G. Prunty and his colleagues point out elsewhere in this issue, the ability to excrete a given water load is not restored. Both these defects are corrected with cortisone. Although many patients remain comparatively well on D.C.A. therapy alone, the addition of 12.5 or 25 mg. of cortisone a day by mouth causes a striking improvement in their sense of well-being and in their ability to work and withstand the stresses of everyday life, and allows them to take their place in a competitive world.

BENIGN HODGKIN'S DISEASE

Sometimes a patient diagnosed on pathological evidence as suffering from malignant disease or other disease carrying a grave prognosis survives unexpectedly long and escapes the expected sequelae. Review of the pathological material may necessitate revision of the original diagnosis. Harrison¹ has recently recorded several cases diagnosed as Hodgkin's disease up to twelve years previously and now apparently healthy. Re-examination

of the original biopsy material disclosed in each case a characteristic histological picture. Harrison identifies it with a supposedly benign form of Hodgkin's disease earlier described by Jackson and Parker.² They called it "paragranuloma" to distinguish it from the ordinary form of Hodgkin's disease, which they called "granuloma." Paragranuloma was said to arise mainly in isolated groups of superficial nodes and to be unusually benign. Progressive involvement of other groups of nodes could occur, but the characteristic appearances often remained unaltered and the benign course continued. Unfortunately, at any time and unpredictably the condition could change to classical Hodgkin's disease with its unfavourable prognosis. Of 28 patients, 5 were well fifteen years or more after diagnosis of paragranuloma, another 10 were well five years or more afterwards, but 7, in whom the disease changed its character, died of classical Hodgkin's disease within 10 years of the original diagnosis.³

The existence of a benign variant of Hodgkin's disease has not been generally accepted in Britain. This is mainly because the wide variations in survival time, and the infinitely subtle gradations in the histological patterns from predominantly cellular to densely fibrosing lesions, have not appeared to justify attempts at subdivision. Further, as Peters⁴ has pointed out, the benign course of paragranuloma may be related to the fact that it often arises in a single group of superficial nodes rather than to any particular histological features. Ordinary Hodgkin's disease also has a better prognosis when its first appearance is local and superficial. As to the pathology of the condition—a subject touched on by Dr. M. H. Gordon in an article at p. 860—Harrison considers that the appearance of various non-specific chronic inflammatory reactions could fulfil the diagnostic criteria of paragranuloma as defined by Jackson and Parker. Further, if the change from paragranuloma to the graver form "is common, it would make recognition of paragranuloma relatively valueless."

It is clearly important to determine whether paragranuloma is a distinct entity, for a diagnosis of ordinary Hodgkin's disease bears serious implications for the patient and his family. Moreover, if the incidence of unrecognized paragranuloma is high in a particular series of cases recorded as Hodgkin's disease, then long average survival will be erroneously attributed to the superiority of whatever treatment was given.

The microscopical appearances of the lymph nodes in Harrison's six cases were remarkably uniform, and the pleomorphism so characteristic of classical Hodgkin's disease was lacking. The main features were that the nodal architecture was largely destroyed and the tissue subdivided by coarse and fine bands of collagen and reticulin; there was diffuse uniform infiltration by small lymphocytes, and among them were scattered variable numbers of typical Hodgkin giant cells. Eosinophils and a few plasma cells were also present. Since all the elements characteristic of ordinary Hodgkin's disease are found, the diagnosis must rest on an assessment of

their relative proportions, density, distribution, and general pattern. It is not surprising, as Jackson and Parker recognized, that transitions between paragranuloma and ordinary Hodgkin's disease are met with. What is perhaps more serious is that, when lymphocytic infiltration is much in excess of the Hodgkin giant cells, the case is likely to be mistaken for lymphosarcoma, as happened to a boy of 12 years in Harrison's series. Harrison nevertheless believes that paragranuloma is morphologically distinct from ordinary Hodgkin's disease and that it is a form of progressive lymphadenopathy: in two of his cases the response to radiotherapy and the subsequent recurrence seemed to exclude a simple reactive lymphadenitis. But he is uncertain whether the clinical course is sufficiently often distinct from that of Hodgkin's disease to make it important to distinguish the two conditions. To decide this will require careful and long clinical and pathological follow-up of large numbers of cases. Harrison is to be congratulated on presenting "benign Hodgkin's disease," as he prefers to call it, as a problem requiring solution rather than as an established fact.

ENGLAND'S HEALTH

If the health of a country could be defined and epitomized in a single figure, many people would choose the infant mortality rate as that index. By this test the health of England and Wales has been steadily improving for many years. Even so, much remains to be done, as the Chief Medical Officer of the Ministry of Health points out in his latest report.¹ In 1951, the year he is reviewing, the rate was 29.7 per thousand live births, whereas in the previous year it was 29.6. The difference is negligible, but the fact that the rate did not decline is disappointing, for in some towns, even large ones, the rate is much lower. In Bristol in 1951, for example, it was 20, and in Croydon it was 19; while in Southgate M.B., with a population of 78,000, it was 15. Analysing infant mortality rates in county boroughs, Martin² has recently shown that the decline of the rate experienced in all towns during the last 30 years was smaller in most of the northern towns than the southern. While the standard of nutrition throughout the country has approached a common level during these years, it is surprising to find that the disparity between the infant mortality rates in its several parts has actually increased.

Surveys of the nutritional state of children since the end of the war have shown almost no evidence of malnutrition or under-nutrition, but some surprising observations have been made in the west country. The data at first indicated that mean heights, weights, and haemoglobin levels of 14-year-old boys were, as might be expected, higher in those boys who were on better diets. But when they were analysed a different picture appeared. Boys from grammar schools were found to be on the average taller and heavier than boys from modern schools whatever the "dietary pattern." Simi-

¹ *Proc. Mayo Clin.*, 1941, 16, 577.

² *J. Amer. med. Ass.*, 1948, 137, 1005.

³ *Amer. J. Med.*, 1951, 10, 595.

⁴ *British Medical Journal*, 1953, 1, 17.

⁵ Thorn, G. W., et al., *Trans. Ass. Amer. Phys.*, 1952, 65, 281.

⁶ Knowlton, A. I., *Med. Clin. N. Amer.*, 1952, 36, 721.

¹ *J. Path. Bact.*, 1952, 64, 513.

² *New Engl. J. Med.*, 1944, 230, 1.

³ *Hodgkin's Disease and Allied Disorders*. New York: Oxford University Press, 1947.

⁴ *Amer. J. Roentgenol.*, 1950, 63, 299.

¹ *Report of the Ministry of Health (April 1, 1950, to December 31, 1951), Part III*. H.M.S.O.

² *Monthly Bull. Minist. Hlth (Lond.)* 1953, 12, 56.

³ *British Medical Journal*, 1953, 1, 552.

larly, those whose parental care was assessed by a health visitor as good were taller and heavier, irrespective of diet, than those in whose homes parental care was judged to be normal or bad. The same conclusion was reached after analysing parents' occupation by social class. Again, whatever the social class, school, and family size, the 154 boys who shared beds were on the average lighter than those who did not. The publication of fuller details will be awaited with interest. While dysentery "continues to be as inexplicable as ever," the report also mentions the condition sometimes called epidemic nausea or winter vomiting, which we commented on recently,³ another presumed infection whose epidemiology and even cause are at present obscure. A number of outbreaks have been investigated by medical officers of health and the Public Health Laboratory Service, but further investigation is badly needed.

Every chapter in this report is a tacit tribute to the work of the public health service. To preventive medicine we owe much of our opportunity to live in better health and for longer than our forefathers did. It is to be hoped that legislation will never be blinded by the sometimes spectacular achievements of curative medicine to the no less beneficial achievements of preventive medicine recorded in these annual reviews.

SEXUAL PRECOCITY

Sexual precocity is less rare than is often believed, although some causes of the condition are very uncommon. Drs. J. Anagnostou and G. J. Frangopoulos give an example of one of these rare causes in this week's *Journal* at page 861, where they report the case of a boy aged 6½ years with an interstitial-cell tumour of the testis. Only 14 other cases of this condition have been reported.

Sexual precocity occurs more often in girls than boys; in a recent survey Jolly¹ describes 49 cases in girls and 19 in boys. The causes of the condition fall into three main groups—cerebral, adrenal, and gonadal, with the cerebral group claiming most of the cases. It is only in this cerebral group that true puberty is initiated as shown by spermatogenesis in the male and ovulation in the female. Two main subdivisions of the cerebral group are found—"constitutional" and organic. The constitutional group covers all those cases of a spontaneously early, but otherwise normal, puberty in which no organic cause exists. This type, though rare in boys, is relatively common in girls. In Jolly's survey there were 30 girls in this category, comprising almost half the children in the study. The prognosis for children with constitutional precocity is excellent, and on no account should any form of therapy be attempted. The only permanent disadvantage is that, as with all varieties of sexual precocity, the epiphyses unite early. Consequently, despite rapid growth at first, the patients end up well below the average adult height. The girls should be closely supervised, since pregnancy is possible. The famous Peruvian child, Lina Medina, described by Escomel,³ was one such: at the age of 5 years 8 months she was delivered of a live baby.

The organic cerebral group is of particular interest, since these cases give some indication of the physiological mechanism controlling the onset of normal puberty. Only lesions involving the posterior hypothalamus can cause sexual precocity, and in addition the anterior pituitary must be intact. It is believed that the anterior pituitary initiates puberty and that normally throughout childhood inhibitory impulses pass from the posterior hypothalamus to the pituitary in order to prevent the onset of puberty. If the posterior hypothalamus is damaged, these inhibitory impulses no longer go out, and consequently puberty is released, provided the pituitary has not also been damaged.

In the adrenal group the precocity results from cortical overactivity; this is due most often to hyperplasia of the cortex, but sometimes to carcinoma. Most of the cases of sexual precocity from this cause are boys, since the lesion in girls usually results in virilism, a condition not included in sexual precocity. These boys have to be distinguished from those with precocity of cerebral origin, and here there are two main points to be considered. First, in precocity of cerebral origin spermatogenesis has taken place and the testicles are of adult size, whereas in adrenal precocity they remain infantile. Secondly, in cerebral precocity the urinary 17-ketosteroids are normal or only slightly raised, whereas in adrenal precocity very high figures are obtained. The diagnosis of adrenal hyperplasia from carcinoma used to be very difficult except by laparotomy, but now cortisone has made it much easier. If it is given to a patient with adrenal hyperplasia, the 17-ketosteroids immediately fall. No such drop occurs in the patient with an adrenal carcinoma. Because of this fall, patients with adrenal hyperplasia are also being successfully treated with cortisone. Surgery in these cases is contra-indicated, for the hyperplastic tissue recurs.

The gonadal cause of sexual precocity in the female is the granulosa-cell tumour of the ovary and in the male the interstitial-cell tumour of the testicle. Fortunately, in all the reported cases of a granulosa-cell tumour causing precocity an abdominal mass has been palpable by the time signs of precocity have developed. Therefore surgery is indicated only if an abdominal mass is present. This means that girls with suspected constitutional precocity need not be subjected to an unnecessary laparotomy for fear of overlooking a granulosa-cell tumour. Even when a mass is palpable and laparotomy performed, the majority will still be found to be constitutional cases with an associated follicular cyst of the ovary rather than the very rare granulosa-cell tumour. The diagnosis of an interstitial-cell tumour of the testicle is made on the finding of one enlarged testicle in a child with sexual precocity. This tumour, like the granulosa-cell tumour, is usually benign, but both should be removed as soon as the diagnosis is made. But it is as well to bear in mind always that many cases of sexual precocity need no treatment, since much the largest group of them is the constitutional.

¹ Jolly, H. R., *Sexual Precocity*, M.D. thesis, University of Cambridge 1951.

² — *Proc. Roy. Soc. Med.*, 1951, 44, 459.

³ Escomel, E., *Presse méd.*, 1939, 47, 875.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

INJURIES TO THE BACK—I

BY

E. A. NICOLL, C.B.E., M.D., F.R.C.S.Ed.

Surgical Director of Orthopaedic and Accident Services, Chesterfield Royal Hospital and Mansfield General Hospital; Surgeon, Harlow Wood Orthopaedic Hospital

The human spine was originally designed to be supported at both ends, so that when our remote ancestors assumed the erect posture a structure designed as a crossbar was converted into a flexible tent pole eccentrically placed on a narrow base, with its guy ropes tethered so close to the pole that their mechanical advantage was reduced to a minimum. It is this poor architectural arrangement that makes the human spine so vulnerable to injury and so prone to backache resulting from failure of its supporting mechanism. On the other hand, the hips are soundly constructed and

ments (Fig. 2). The anterior common ligament is the chief check to hyperextension. The neural arches are united by strong elastic ligaments—the ligamenta flava—and the spinous processes by the supraspinous and interspinous ligaments, which are also strong except at the lumbo-sacral junction, where they may be defective or even absent, thus further weakening this already weak spot. This region is in fact the site of numerous anatomical abnormalities the clinical significance of which is still a matter of controversy.

Finally, the whole system is supported by muscles (the guy ropes referred to above), which according to their attachments can flex, extend, or rotate the spine. The most important of these muscles—and the most vulnerable—is the complex extensor system known collectively as the erector spinae.

The fulcrum of movement between any two vertebrae is not, as might be thought, at the intervertebral joints, but at a point towards the posterior aspect of the intervertebral disk occupied by the nucleus pulposus. The structures that resist a flexion force, which is the commonest form of trauma, are therefore all those ligaments and muscles behind this fulcrum—namely, the intervertebral joints and their capsular ligaments, the ligamenta flava, the supraspinous and interspinous ligaments, and the erector spinae muscles. Any or all of these may be overstretched or even ruptured, leading to the familiar and by far the commonest of all back injuries, the "sprained back."

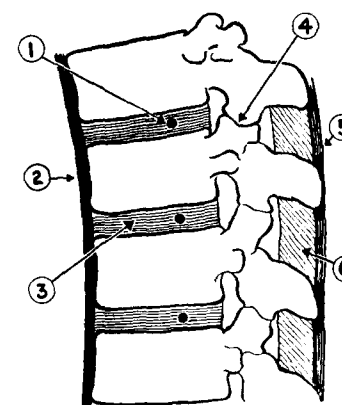


FIG. 2.—Anatomical diagram of spine. 1. Fulcrum of movement. 2. Anterior common ligament. 3. Intervertebral disk. 4. Intervertebral joints and their capsular ligaments, the ligamenta flava, the supraspinous and interspinous ligaments, and the erector spinae muscles. Any or all of these may be overstretched or even ruptured, leading to the familiar and by far the commonest of all back injuries, the "sprained back."



FIG. 1a

FIG. 1b

FIG. 1a.—Correct method of lifting heavy weights. FIG. 1b.—Incorrect method of lifting heavy weights.

mechanically strong, so that in bending and straightening against resistance, as in lifting weights, the spine should be fixed in the neutral position while the actual movement occurs at the hips and knees (see Fig. 1a). This is the correct method as used by professional weight-lifters and furniture removers, and it should be impressed on all patients with "weak backs," whether resulting from trauma, "disks," postural defects, or any other cause.

Anatomy

The vertebral column is divided into cervical, dorsal, lumbar, and sacral segments, each of which has its characteristic curvature. The cervical and lumbar segments are convex forwards, while the dorsal and sacral segments are convex backwards. Exaggeration of the dorsal curve is called kyphosis and of the lumbar curve lordosis. The weak spots are at the junctions of these curves; the dorso-lumbar region is the common site for fractures and fracture-dislocations; the lumbo-sacral region for sprains, prolapsed intervertebral disks, and spondylolisthesis. In considering the effects of trauma on the spine it is necessary to think in terms of the soft tissues as well as the bones, because the former are injured far more often, and the fact that they cannot be seen on an x-ray film makes them liable to be overlooked.

The individual vertebrae are joined in front by a system of shock absorbers—the intervertebral disks—and behind by the intervertebral joints with their strong capsular liga-

Soft-tissue Injuries

It used to be thought that ligaments were in the nature of check reins, and that they came into full stretch only when the muscles failed. This is not so. In the normal spine, for example, electro-myographic studies have shown that during certain phases of flexion and extension the erector spinae muscles are acting strongly, while at other phases, even under load, they are relaxed, so that the patient is literally "hanging on his ligaments." It follows that if the ligaments have been damaged the muscles are suddenly called on to "take over" during certain phases of movement in which they are normally relaxed, thereby giving rise to spasm and pain.

Sprains can occur in two ways: by hyperflexion or rotation injuries, or by violent muscle contraction producing localized rupture of muscle fibres—the equivalent of the footballer's "pulled muscle." The first is exemplified in mining accidents in which the victim is "jack-knifed" by a fall of earth. This can overstretch ligaments as well as muscles. The second is exemplified in the common "lifting sprain," and is a lesion of the erector spinae muscles, practically always in the lumbar region. In both varieties the

patient complains of sudden pain in the back, and often adds that he "felt something go." On examination the lumbar muscles are in spasm with the patient standing erect (they are relaxed in this position in the normal subject) and there is an area of localized deep tenderness. The pain may persist for three to four weeks and the patient often complains that a slight stoop, as in leaning over a wash-basin, is the most uncomfortable posture of all to maintain. This is explained by the fact that in the fully erect position the spine is balanced and the muscles are relatively relaxed, whereas with the slightest degree of forward bending they contract strongly to fix the spine against the effects of gravity while the actual movement takes place at the hips.

The overstretched muscles and ligaments take three to four weeks to heal, and during that time rest is essential and all movements apt to stretch the healing tissues should be avoided. In severe cases an initial period of rest in bed is advised till pain subsides, followed by a plaster-jacket for three weeks. All cases of any severity should be radiographed to exclude a compression fracture, the lesser degrees of which are not clinically obvious. Radiant heat, massage, and local injections of lignocaine are helpful during the first three weeks, and after that carefully graduated remedial exercises should be carried out. In six to eight weeks the patient should be fit for heavy work. If the symptoms persist beyond this, in spite of efficient treatment, some underlying cause should be looked for, such as a pre-existing arthritis or postural defect.

It may sometimes be difficult to differentiate between a severe lumbo-sacral sprain and an acute disk prolapse, either of the central type or before sciatic radiation has occurred. Both may show painful limitation of forward bending and straight-leg raising with a lumbar spine fixed by spasm. If recovering from the flexed position is more painful than actual flexion—that is, coming up is more painful than going down—it is more likely to be a muscle sprain. In some cases, however, the true diagnosis becomes clear only as the result of future developments, so in any doubtful case it is advisable to be on the safe side and insist on two to three weeks' complete rest in bed. Many prolapsed disks with a fully developed clinical picture give a history of past episodes in which the diagnosis could not have been made and which might well have been regarded as sprains at the time.

Fractures and Fracture Dislocations

At one time all fractured spines were regarded as terrible calamities. The patient learned that he had a "broken back" and promptly wrote himself off as a permanent cripple. This was particularly true of mining communities, in which the injury is much more common than elsewhere. It is an entirely unjustifiable attitude, for, whereas some fractured spines are extremely dangerous, the majority are of no serious significance and, properly handled, give the same high proportion of good results as in other fractures. There is no doubt, however, that traumatic neurosis is much more frequent after back injuries than after limb injuries, and this is in no small measure due to the ill repute which still surrounds the term "fractured spine" or "broken back" in the mind of the patient. He should therefore be reassured at once and disabused of any ideas that may be forming the basis of a future neurosis, particularly in the less serious cases, which include all isolated fractures of the transverse and spinous processes and all stable compression fractures. There is no doubt that many patients in this category would be better off if their fractures were never discovered, or at any rate never disclosed to them, but, as this is indefensible, the next best thing is to make the patient see his injury in its proper perspective.

Bony injuries of the spine can be divided into four clinical types, and their relative frequency is as follows:

Isolated fractures of the transverse or spinous processes	42%
Simple compression fractures	42%
Fractures of the laminae	5%
Fracture dislocations	11%

These figures are from a series of 200 consecutive cases seen by me over a five-year period. Of these types, the first two are stable and relatively innocuous; the last two are unstable and dangerous. It will be seen that 84% of the cases fall into the relatively benign class.

Isolated Fractures of Transverse Processes

These are really avulsion fractures produced by muscular violence. The transverse processes give attachment to several very powerful muscles—psoas, quadratus lumborum, and the deeper parts of erector spinae. When these muscles contract strongly in response to a sudden flexing or twisting force they can produce avulsion fractures of the transverse processes (Fig. 3). The degree of damage is roughly proportionate to the degree of separation of the fragments. Once separation has occurred, replacement is impossible and fibrous union inevitable. This does not prevent a perfect result, however, and all these cases should be treated as severe musculo-ligamentous injuries, which indeed they are. If plaster fixation is used it should be for the same reason as in severe sprains—namely, to rest the healing soft tissues—and not with any idea of promoting bony union of the fractures.

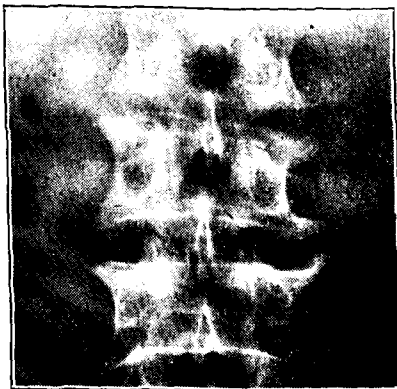


FIG. 3.—Radiograph of fractured transverse process.

Isolated Fractures of the Spinous Processes

The spinous processes give attachment to the erector spinae muscles, and a violent extension effort may produce an avulsion fracture. A professional footballer attempted to head a ball backwards. He misjudged it, missed the ball altogether, and was carried off the field with a severe pain in the neck. An x-ray film showed a fracture of the spinous process of the fifth cervical vertebra. "Shoveller's" fracture, seen occasionally in labourers and stokers, is an avulsion fracture of the spinous process of the seventh cervical vertebra produced by sudden contraction of the rhomboid muscle. Like isolated fractures of the transverse processes, these cases should be treated as soft-tissue injuries.

[Part II will appear in our next issue.]

In his report for the year 1952 Dr. J. F. Warin, school medical officer for Oxford, remarks favourably on the results obtained with a sweep test pure-tone audiometer. He concludes that this technique constitutes a big advance over the gramophone audiometer for purposes of routine audiometry in schools. 663 school entrants have been tested, and 25 children have been referred for specialist advice because they failed to pass the test. Three of these 25 children have been found to have a moderately severe hearing loss, though none had been thought to be deaf by either parents or teachers. Dr. Warin writes: "The advantages of the sweep test are that it is quick and easy to carry out; it can be used on school entrants; it does not depend on intelligence or on a knowledge of figures; and can be carried out in any school without difficulty, as no special accommodation is required."

A MODIFICATION OF THE HUBBARD TANK

BY

J. B. STEWART, M.B., Ch.B., D.Phys.Med.

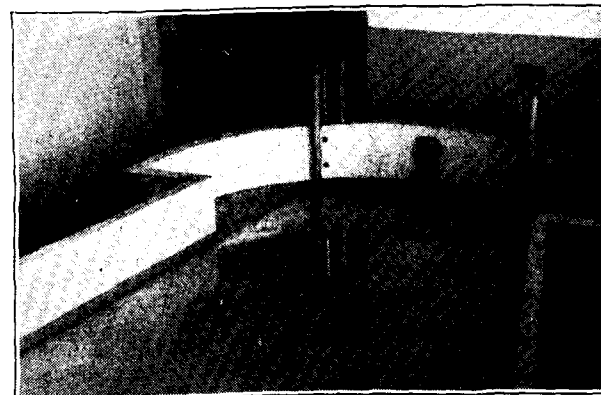
Consultant in Physical Medicine to the Cirencester, Pewsey, and Swindon Hospital Management Committees, Oxford
Regional Hospital Board

During the course of work amongst mentally defective children with spastic paralysis, the Hubbard tank was found to be a most useful means of securing relaxation, or in imparting to the patients a sensation of free movement, such as they often fail to obtain on a treatment table or even with a springs and slings apparatus.

In order to retain the full confidence of small patients it was felt that a movable platform or false bottom in the tank would be an advantage. Such a platform would have to fulfil the following requirements: it must be moved with minimum effort on the part of the physiotherapist; it must move very gently, with freedom from jerking or other sensation of instability; it must be readily and easily detached from the tank for cleaning purposes; and it must be under the complete control of the physiotherapist.

The Apparatus

Standard Jackall hydraulic jacks as motive power have been used. They are relatively cheap and easy to install and have the supreme advantage of being easily serviced with standard spare parts, if required. The Jackall pump unit and fluid reservoir are mounted at one end of the tank. An extension arm is fitted to the pump release valve with



Photograph showing the movable platform in a Hubbard tank.

a control knob mounted on the flange of the tank. Four standard Jackall jacks are mounted on the outer sides of the tank and give an upward thrust to the extension arms of the platform.

The platform or false bottom is made of two light aluminium sheets screwed to a framework of piping. At the four corners of the platform the piping is extended upwards and welded to an inverted metal cup, which rests on the jack head. In order to give complete stability to the platform during movement, a second pipe has been welded to the cup by means of a short piece of metal. This second short length of piping passes through a close-fitting hole in the flange of the tank and also through a small guide mounted on the outer side of the tank, near its base. The entire platform can therefore be easily removed, as it simply rests on the jack heads.

The platform is pumped up and warm water is run in through a thermostatically controlled mixing valve, to a depth of 6 in. (15 cm.) above the level of the platform or

false bottom (see Fig.). By means of the control valve the platform can be made to sink slowly, giving an additional depth of approximately 8½ in. (21.5 cm.). The platform can, of course, be kept at any intermediate depth if so desired.

So that additional warm water may be added without distracting the patient by splashing from taps, the water inlet to the tank is in the form of a hood projecting downwards and opening close to the bottom of the tank. Provision is also made for overflow to take place at a constant level.

No fixed head-rest is fitted to the tank. A standard 16-in. (40-cm.) air cushion partially inflated, doubled on itself, and secured by a tape, has been found to give enough buoyancy when placed under the nape of the neck. It does not have the disadvantages associated with ordinary water wings in hydrotherapy.

Experience gained by the physiotherapy staff during the past nine months has shown that this type of platform has a wide field of usefulness not only amongst cerebral palsy cases but also in cases of poliomyelitis.

Exercises in the bath can be given either with gravity almost eliminated and the patient fully immersed or with the platform raised and the patient only partially supported by water. By means of a simple knob, the physiotherapist can adjust the platform to suit the type of exercise she wishes to give the patient.

Summary

A hydraulically operated platform for incorporation in a Hubbard tank is described and illustrated.

The device has been found to be exceedingly useful in hydrotherapy during the course of treatment of cerebral palsy and poliomyelitis cases.

I wish to record my thanks to Mr. Kenny, chief engineer, and his staff at Pewsey Hospital for the Mentally Defective, who carried out this work for me. A similar platform is being constructed at the Marlborough Children's Convalescent Hospital by Mr. Jefferies and his staff, of Swindon Hospital Management Committee.

BRITISH COUNCIL FOR REHABILITATION

The hope that a blue-print to guide the activities of all concerned in the rehabilitation and resettlement of disabled persons will emerge from the deliberations of the new Committee on the Disabled* was expressed by Sir Walter Monckton, Q.C., Minister of Labour and National Service, at the annual general meeting of the British Council for Rehabilitation, held at the Royal Institution on March 25. He said that the setting up of the committee was proof of the Government's wish to learn from the far-reaching developments that had taken place and the knowledge gained since the interdepartmental committee under the chairmanship of the late Mr. George Tomlinson issued its report 10 years ago.

The Minister went on to say that he thought one of the most encouraging trends of the past 10 years had been the ever-widening interest in the problems of rehabilitation, and he paid a warm tribute to the work of the British Council for Rehabilitation in this field. With regard to the work of his Ministry, Sir Walter Monckton said that there were 14 industrial rehabilitation units with a total capacity of 1,500 places; these were usually filled to 85% of their capacity, and over three-quarters of the men and women came from hospitals and medical practitioners. More than 70% of those who completed courses at the units were placed in employment, and the fullest use was being made of the training facilities provided at residential colleges operated by voluntary organizations.

*Sir Walter Monckton announced in the House of Commons on March 12 that, in conjunction with the Minister of Health and the Secretary of State for Scotland, he had decided to set up a committee under Lord Piercy's chairmanship to review the existing provision for the rehabilitation, training, and resettlement of disabled persons.

Following the Minister's speech there was a film illustrating rehabilitation work in America which was shown by the courtesy of the American Ambassador. At the business meeting of the Council the chairman, Lord Sempill, was re-elected. A working party which had been set up to deal with the special problems of patients with heart disease had completed the collection of preliminary data, and it was hoped that another working party on peptic ulcer in industry would begin its labours during this year.

SUPPLEMENTARY LIST OF APPROVED NAMES

The General Medical Council has authorized the following "approved names" selected by the British Pharmacopoeia Commission. This list supplements the consolidated list of names published in January, which included all the approved names issued since 1948, together with some issued earlier for substances not dealt with in official monographs.

Approved Name	Other Names
Benethamine penicillin	N-Benzyl-2-phenylethylamine salt of benzylpenicillin
Bismuth glycolylarsanilate	Bismuthyl N-glycolylarsanilate. "Milibis."
Cetrimonium chloride	Hexadecyltrimethylammonium chloride.
Hexachlorophane	Di-(3:5:6-trichloro-2-hydroxy-phenyl)methane. "Hexachlorophene."
Hyaluronidase	Enzymes which depolymerize hyaluronic acid.
Iodothiouracil	4 - Hydroxy - 5-iodo-2-mercaptopyrimidine. "Itrumil" is the sodium derivative.
Iopanoic acid	2-(3-Amino-2:4:6-tri-iodobenzyl)-butanoic acid. "Telepaque."
Methylpentynol	3-Methylpent-1-yn-3-ol. "Oblivon"; "somesin."
Nitrofurazone	5 - Nitrofurazone-2-aldehyde semicarbazone. "Furacin."
Pentaerythritol tetranitrate	2:2 - Bishydroxymethyl-1:3-propanediol tetranitrate. "Pentaerythritol tetranitrate."
Phenylephrine	(-) - 1-m-Hydroxyphenyl-2-methylaminoethanol. "Neophryn" is the hydrochloride; "neosynephrine" is the hydrochloride.
Procainamide	4 - Amino - 2-(diethylaminoethyl)-benzamide.
Procyclidine	1 - cycloHexyl - 1-phenyl-3-pyrrolidinopropan-1-ol. "Kemadrin" is the hydrochloride.
Sulphasomidine	6 - p-Aminobenzenesulphonamido-2:4-dimethylpyrimidine. "Sulfisomidine"; "elkosin."

WORLD HEALTH DAY

The fifth birthday of the World Health Organization was celebrated on April 7 at a meeting arranged by the United Nations Association at Caxton Hall, London, where the speakers were the Minister of Health, Mr. Iain Macleod, and Dr. H. S. Gear, Assistant Director-General of the Organization.

Mr. Macleod said he thought the specialized agencies of U.N.O. were all too often overlooked to-day; in contrast, much publicity was given to the happenings in the General Assembly and in the Security Council. It might well be that the agencies' contribution towards peace would not be less than that of the political organizations. It was at least certain that W.H.O. had an immense part to play in bringing about peace. In this country, with its National Health Service and standards of medical care second to none in the world, it was difficult to understand the problems confronting professional men, scientists, and administrators in some

of the more primitive communities. Here a child at birth had an expectation of 63 years of life; in many of the more primitive countries the expectation was only half this. In some of the undeveloped countries grim and dreadful diseases were part of the ordinary pattern of life. The aim in view was that the countries which were assisted by W.H.O. should be able themselves to take over in due course the projects that had been started. There was nothing more cruel than to embark upon grandiose projects that were incapable of being maintained. It was important, therefore, that whatever new techniques or modern methods were introduced into the undeveloped communities should fit easily into the ordinary community life.

The expert committees which had been formed by W.H.O. were immensely important, as they afforded an opportunity for experts from many different countries to get together and discuss their problems. He also thought that the new international sanitary regulations which had come into force in most countries in October, 1952, were a great step forward.

Dr. Gear then explained the working of W.H.O., its machinery and staffing, and its achievements during the first five years of its life. Part of its work was in helping countries which had a particular problem and had applied for assistance and advice. W.H.O. would then seek out the appropriate expert, wherever he might be found, and send him, with any necessary assistants, to the country concerned, where he would develop a control plan, launch it, and hand it over as a going concern to the national health administration. Problems so dealt with included health matters, water supplies, nursing services, and so on. Other activities of W.H.O. were concerned with education and training and the introduction of medical standards.

Nova et Vetera

SIR JAMES MACKENZIE

Sir James Mackenzie, "the beloved physician," was born at Scone, Perthshire, on April 12, 1853. After qualifying at Edinburgh he settled in general practice in Burnley from 1879 to 1907, during which time he began the exhaustive and patient studies which lasted until his death. These included the researches into the nature of arrhythmias which first aroused widespread interest in Mackenzie and his work. He invented a polygraph to take his records, and his *Study of the Pulse* (1902), recording his earlier observations, stimulated others to take up similar work.

In a series of papers in this *Journal* (1905) he demonstrated the remarkable effect of digitalis in auricular fibrillation, while in 1908 his *Diseases of the Heart* included a classical clinical description of this condition and also embodied fuller studies of the pulsations as well as rich experience of cardiovascular disease in general. Another outstanding work was his monograph on *Angina Pectoris* (1923), a disease from which he himself suffered for fifteen years and to which he succumbed on January 26, 1925.

In 1907 Mackenzie moved to London and entered consulting practice. In 1918 he left for St. Andrews, where he founded the Institute for Clinical Research, but he soon returned to the more kindly climate of London.

His character is admirably assessed by Sir Thomas Lewis, who wrote: "Mackenzie's vigorous and impressive personality, blunt but enlivening humour, combative form of argumentation, and clear vision of essentials, combined to make him a teacher of great stimulating power. An uncommon faculty of criticism, a deep-rooted distrust of authoritative statement, gave him rare discrimination between the known and the unknown; this, associated in unusual degree with originality of mind, a retentive memory, and determined purpose, underlay his success as an investigator. A true appreciation of his character and of his work can be obtained only if it is remembered that his chief discoveries were made in time snatched during the routine of a heavy industrial practice."

Correspondence

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

Chloroform for Bronchography in Children

SIR.—We read with great interest the suggestion by Drs. M. I. Griffiths, T. Culbert, and N. Sher (*Journal*, March 14, p. 601) that chloroform should be used for bronchography in children.

The only advantage in the use of chloroform seems to be its non-explosibility. In our experience the whole secret of success in the employment of an open method of anaesthesia for this procedure is the rapid attainment of a short period of deep anaesthesia. Even for a matter of minutes deep anaesthesia with chloroform seems to us undesirable for children. Furthermore, as the authors state that "by the time the child leaves the x-ray department he is invariably a good colour," one is led to suppose that at one time during the procedure he may not have been. A combination of hypoxia and chloroform would appear to be particularly lethal.

The method we advocated (Temple and Gray¹) is exactly that suggested by Griffiths, Culbert, and Sher, but ether, for the reasons stated above, was preferred to chloroform. A minor difference was that we did not find the routine use of an airway necessary. We are assured by our radiologist colleagues that modern x-ray apparatus is spark-proof, and the danger of explosion following the administration of open ether is, in practice, non-existent. This opinion is confirmed by the fact that we have employed our method routinely for the last five years with success and without incident.—We are, etc.,

L. J. TEMPLE.
CECIL GRAY.

Liverpool.

REFERENCE

¹ *Lancet*, 1950, 2, 116.

Radioactive Phosphorus in the Treatment of Menorrhagia

SIR,—I would like to congratulate Professor H. C. McLaren and his fellow authors on the article (*Journal*, February 14, p. 358) on an ingenious technical therapeutic device, but some shortcomings and possible dangers of the method are apparent.

The first question to be considered in judging the suitability of this method must surely be the cause of the original menorrhagia. Although occasionally no local cause can be found, or a general disorder such as congestive heart failure is responsible, in the majority of cases the underlying disorder is an excessive or unbalanced production of oestrin by the ovaries, often accompanied by the well-known hypertrophic endometrial changes of metropathia or by fibroids, or both. Even from the point of view of immediate results, either of these conditions would militate against the success of the method, because the thickness of the disordered endometrium or irregularity of the uterine cavity would prevent adequate uniform destruction of the endometrium. Even supposing that a sufficiently extensive area of surface endometrium may be destroyed to cause temporary amenorrhoea, when regeneration eventually occurs, will not menorrhagia recur also from the continued operation of the original cause? The authors themselves appreciate that no more than temporary haemostasis can be expected of the method. It is not clear why they should consider that "menstruation when re-established might be normal." The pathology of menorrhagia surely lies deeper than in the superficial 3 mm. of the endometrium. In the case of younger women, where it is desired to preserve ovarian function, one would question the likelihood of normal pregnancy occurring in a patient suffering from menorrhagia and treated by this method.

A more serious, though as yet unproved danger—also mentioned by the authors—is that of the induction of malignant change. A section illustrated shows areas of "irradiation distortion" of the regenerated endometrium three months after P³².

It is precisely from such areas that malignant change might be expected to arise later. X-irradiation of the ovaries has the great advantage that it attacks the cause of the trouble—namely, hyperoestrinism of ovarian origin. Whatever the first cause of ovarian dysfunction (anovular menstruation, failure of luteinization, or excessive follicular activity), x rays destroy the radio-sensitive Graafian follicles, and lead within a few weeks to marked reduction of the output of oestrin and subsequent regression of metropathia, fibroids, and endometriosis, if present. Correction of hyperoestrinism would seem desirable from other points of view—for example, its possible carcinogenic action on the breasts.

A great practical advantage of x-ray therapy is that it can be given in a few brief applications as an out-patient, thus saving the patient the ordeal of an operation and sparing hospital beds and theatre time. With correct technique radiation sickness is seldom met with, and in any case is preventable with pyridoxin. The somewhat sensational remark that "radium or deep x rays practically castrate the patient" does not carry great weight considering the age group of the patients mainly affected, most of whom are in the late forties, so that one is only anticipating the natural menopause by a few years.

In conclusion, the unpleasant sequelae of x-ray menopause have been greatly exaggerated; they are seldom distressing, except in young women, and can in any case be easily controlled by small doses of synthetic oestrogens.—I am, etc.,

Swansea.

D. K. SAMBROOK.

Dosage of Stilboestrol

SIR,—Dr. E. C. Dawson (March 21, p. 676) asks for comments on the suggested dose of 25 mg. of stilboestrol each day in a pregnant woman who has suffered from habitual abortion. It is a remarkable fact that huge doses of the synthetic oestrogens can be taken during pregnancy without any toxic manifestations.—I am, etc.,

London, W.1.

JOHN BEATTIE.

SIR,—Dr. E. C. Dawson's letter (March 21, p. 676) stirs me to admit the same perplexity concerning the large doses of stilboestrol so generally prescribed. In the early days of the agent I soon discovered the disadvantages of not keeping to small administrations, and I settled to the following routine: At first, 5 mg. three times a day until the breasts became tender or toxic symptoms developed; and then the 5 mg. were replaced by 3 mg., and, in most cases, ultimately by 1 mg.

Occasionally it is wise to swing back from the lesser to the greater quantity. In fact, many of my cases of histologically proved carcinoma of the prostate have been kept in excellent health in this way, and able to carry on their work in comfort for years. Indeed, a number have had no more than 1 mg. once a day for several years. Of my two best cases on this routine, one died at the age of 85, after 11½ years of stilboestrol, and the other died at the age of 69 after nine years of stilboestrol. Both remained ambulatory till within a few months of death.

A common feature, after treatment was well established, has been the rarity of any increase of urinary obstruction. For various reasons there are odd cases that do not do well; but it is correct to say that the majority do. I never attempt any operative radical cure, nor do I eviscerate the testes. Stilboestrol renders the latter small and soft.

Stilboestrol is certainly one of the blessings of modern medicine.—I am, etc.,

London, W.1.

H. P. WINSBURY-WHITE.

Haemolytic Jaundice of the Newborn

SIR,—Dr. George Cheselden's account of icterus gravis neonatorum quoted in your issue of March 7 ("Nova et Vetera," p. 558) is of great interest. There are a number of descriptions of severe and often mortal neonatal icterus published in the seventeenth century, of which Panarolus (1654), Kerckring (1670), Schultze (1676), Sylvius (1679), and Hagendorn (1698) are representative examples; a dissertation was published on the subject in 1673. The eighteenth century, on the other hand, seemed to provide very few new descriptions, as the dissertations of Vaetter (1753) and Müller (1788) show.

I have been unable to trace any reference to this disease occurring in several children of the same family earlier than Pearson's experience of May, 1796. In what form his description first appeared I cannot determine, but it is related, with slight differences, in Underwood's fourth edition of *A Treatise on the Diseases of Children* (1799) and in Cheyne's second *Essay on the Diseases of Children* (1802); Cheyne himself mentions another family in which two children were affected. Dr. Cheselden's observation described in his letter is thus about 70 years earlier than the first published report that I have so far been able to trace.—I am, etc.,

Cambridge.

G. FULTON ROBERTS.

Gastro-enteritis and Labyrinthitis in Influenza

SIR,—In answer to "Any Questions?" (February 21, p. 465) it is stated of gastric 'flu that "the term may be a useful label for practitioners to use, but it has no scientific basis. . . ." Surely this is not the opinion of general practitioners who deal with this common condition. Just because the bacteriologist is unable to prove the presence of the influenza virus, is it unscientific to use one's clinical experience in diagnosing a common illness and naming it by its best-known term?

I was very interested in the letter from Drs. John Malcolm and Sydney L. Churchward (February 28, p. 508) on acute labyrinthitis. During the recent influenza epidemic I had about a dozen cases, mostly also with gastro-intestinal symptoms, who had, I believe, acute labyrinthitis—one very severe—which would point to the influenza virus responsible for this epidemic being a common cause. I should be interested to know whether symptoms of acute labyrinthitis were noticeable in other areas.—I am, etc.,

Borough Green, Kent.

K. D. PINSON.

Unusual Cause of Delay in Delivery of After-coming Head

SIR,—A multipara aged 29 years was admitted to hospital in labour as an emergency because it was suspected that delivery was complicated by a carcinoma of cervix. During delivery the after-coming head was held up at the perineum. It was impossible to deliver the baby until a rubber disk 3 in. (7.6 cm.) in diameter had been removed from the vagina. Delivery was then easily completed. On further examination the disk was found to have a central hole $\frac{1}{2}$ in. (1.3 cm.) in diameter and its periphery had a fungating appearance.

The patient was subsequently questioned and offered this story in explanation. Five years previously she had received advice on the use of, and was fitted with, a diaphragm contraceptive cap. She stated that she burnt this cap, being uncertain how to use it. The patient would not admit to the knowledge that a rubber disk had been inserted and left in place. On questioning she maintained, furthermore, that the disk must have been present during a normal delivery three years ago. Unlikely as her story seemed, there was no particular reason to doubt it. This case history is published by kind permission of Mr. W. H. Peek.—I am, etc.,

Walsall.

E. R. BLAY.

Television and the Patient

SIR,—Who is responsible for sponsoring the talks on medico-scientific subjects televised from time to time? I am unable to afford television myself, so I have to rely on two of my patients for my information. The first had seen some recent advances in bone surgery, in which were discussed the plating of fractures, the use of Smith-Petersen's nail, and the prosthesis used for arthritis of the hip. In the latter my patient gathered that the present material (this would probably be acrylic resin) was shortly to be superseded by some form of compressed nylon.

The second patient had witnessed "Matters of Medicine—Pain," in which were demonstrated various methods of alle-

viating pain. Modern methods of inhalation were contrasted with the older open ether or open chloroform method, which incidentally was referred to as the "out-of-date rag and bottle method." The picture was cut short with the patient struggling during induction by an open anaesthetic. The lecturer took great pains to describe in detail how a spinal needle should be introduced into the theca. One can imagine the feelings of a patient who has seen this latter feature when asked to submit to operation under "rag and bottle anaesthesia." Won't he regard the anaesthetist as being incompetent and out of date?

Apart from ethical considerations, I doubt whether the best interests of the consumers—the public—are served by making available information which many medical men of long standing have not been privileged to gain and which can only lead to an increase in allegations of malpraxis and incompetence.—I am, etc.,

Ruthin.

TREVOR HUGHES.

Trichlorethylene in Labour

SIR,—I was interested in Dr. G. C. Steel's letter (March 14, p. 615) since his routine of pethidine, followed by gas and air, followed by trichlorethylene when the head is on the perineum, is just that which the nurse and I have used routinely for the last four years as a result of a process of evolution from the chloral and chloroform with which I started seven years ago. No doubt many general practitioners have followed instinctively the same path. I believe it combines humanity with the paramount safety of the child.

I agree that it is sometimes necessary to withdraw the inhaler to enable a hitherto normal labour to proceed because of the occasional but obvious inhibitory effect of trichlorethylene on the uterine contractions. Routines based on time and the degree of dilatation without consideration for the woman's willingness to tolerate discomfort are hardly necessary in, or worthy of, domiciliary practice, where alone can the patient be under the close and continuous observation of one midwife and, if necessary, one doctor.

If the doctor himself administers the terminal trichlorethylene analgesia he will also be immediately available to deal with, or anticipate, post-partum haemorrhage.—I am, etc.,

Amble, Northumberland.

R. P. ROBERTSON.

Overdose of Pyrimethamine

SIR,—To those of us who live in the Tropics and who have experienced the trials of administering bitter-tasting malaria prophylactics regularly to small children, the property of pyrimethamine ("daraprim") which commends itself most is its tastelessness. This very property gives rise to the hazard that, finding the bottle of pills, a child may, in play, consume more than its weekly ration. The following story demonstrates another valuable property of the drug—relative lack of toxicity.

A British female child, aged 3 years and 2 months and weighing 35 lb. (15.75 kg.), had been taking weekly doses of a half tablet (12.5 mg.) of pyrimethamine for nine weeks and thoroughly enjoyed the Sunday morning ritual. On February 28, between 10 and 11 a.m., she found the bottle and consumed 15 tablets (375 mg.)—30 times the prophylactic dose. At midday she complained of stomach-ache, but continued to play actively. At 1 p.m. she vomited after eating two spoonfuls of her lunch, but no pills were found in the vomitus. It was only at 4.30 p.m. that she confessed to having eaten the pills, and 15 were found to be missing. She continued to vomit at 30-minute intervals from 1 p.m. to 6 p.m., when she fell into an apparently normal sleep. At 1 a.m. she awoke complaining of thirst and stomach-ache and again vomited. She continued crying for water and retching and vomiting bile-stained fluid at hourly intervals until 10 a.m., but slept for short periods between the bouts. She was then given citrated milk and sodium bicarbonate, and slept until midday, when she again started vomiting. At 2 p.m. the vomiting ceased and she slept until 4 p.m., when she awoke and demanded food, which she ate. Apart from being pale and tired she appeared

to be her normal self. For the following week she was irritable, but ate and slept normally, and now, with no evidence of anaemia or other cellular damage, she seems to have suffered little from her escapade.

This case ably illustrates the remarkably wide range between a prophylactic and a fatal dose of pyrimethamine.—We are, etc.,

P. H. ABBOTT.

MAHMOUD ALI HAMDI.

Wad Medani, Sudan.

Sensitization to Antihistamines

SIR,—I have been interested in the recent correspondence in the *Journal* concerning cutaneous hypersensitivity to antihistamine creams. Whilst the condition undoubtedly exists, it should be stressed that in many cases the cream base and not the antihistamine content is the sensitizing factor.

Recently I have seen two cases, both female, who had been treated with "teevex" cream. Both complained of a burning sensation following applications, and patch tests were strongly positive. However, further testing with the constituents of the cream gave the following results: crotonyl-N-ethyl-o-toluidine, negative; N-dimethylamino-ethyl-N-p-chlorobenzyl- α -aminopyridine hydrochloride, negative; cream base, positive.

Antihistamine creams, used with care, are useful adjuncts to treatment of various itching dermatoses, particularly pruritus ani, pruritus vulvae, lichen simplex (circumscribed neurodermatitis), and lichenified eczema. In cases where sensitivity to one antihistamine cream is discovered, a change to another (in a non-sensitizing base) preceded by a simple patch test is indicated, rather than abandoning a very useful form of therapy.—I am, etc.,

London, W.1.

BENTLEY PHILLIPS.

Nikethamide by Mouth

SIR,—Many G.P.s must have been surprised at the conclusions arrived at by Dr. J. G. Macarthur in his article on "The Effect of Nikethamide by Mouth in Man" (March 7, p. 547). If it is intended we should accept his findings as conclusive, a singularly inopportune moment has been chosen for publication.

Debility, particularly cardiac debility, has been a frequent and prominent feature particularly in the elderly patient following an attack of influenza in the recent epidemic. Nikethamide by mouth I, and no doubt many other G.P.s, have found to be the drug above all others to aid a return to normal circulation and respiration.

The type of case that benefits by nikethamide by mouth is entirely different from the case that calls for the hypodermic syringe. In doses of 1–1.5 ml. by mouth three times a day absorption appears to be slow, but the action, though it may not be great, is a continuous one, beneficial both to cardiac output and to respiration. I have little doubt the stomach would rebel against massive doses, and absorption would be little or none.

Textbooks on cardiology do not mention its use by mouth. The explanation of this is, I feel, that the cardiologist only sees the more severe cases of cardiac failure, and not the lesser cases which the G.P. himself treats. I would be interested to know if many other G.P.s feel similarly to myself, and also feel that its administration by mouth should not be so condemned.—I am, etc.,

Ewell.

J. V. COPE.

The College of General Practitioners

SIR,—One of the purposes of our original letter (February 7, p. 333) was to stimulate comment on the subject of the College of General Practitioners. In this we appear to have failed, and there still appear to be continued apathy, little new comment, and no organized discussion groups. Two correspondents only made reference to our letter. It was a pleasure to read Mr. A. Wilfrid Adams's second communication (February 28, p. 508), but we still find ourselves in disagreement with Dr. H. H. Pilling (p. 507).

He considers that we have not been presented with a *fait accompli*, and that there was ample opportunity for comment. In an article by Dr. J. H. Hunt (*Supplement*, June 28, 1952, p. 335) we were informed that the steering committee would produce a report on what should be done, and we, doubtless with others, waited for their recommendations so that we could submit comments after due consideration. The committee in its report (*Journal*, December 20, 1952, p. 1321) appears to have considered that its recommendations were too good to be improved on, and proceeded to put them into operation before even publishing them. So much for the opportunity for comment, so much for democratic procedure. This surely must be considered a *fait accompli par excellence*. There is one point to which we would like to draw attention. It seems to be widely assumed that all founder members will be presented with whatever diploma may be eventually decided on. This would clearly be a catastrophe, and would for at least 20 years take away any value such a diploma might have. We know of no basis for this assumption and trust it will turn out to be incorrect, but the rumour should be scotched at once by those at present in charge.

Finally, Dr. Pilling states that he believes that the B.M.A. welcomes the venture. It seemed to us most noticeable that the leading article (December 20, 1952, p. 1344) was a plain statement of what had been done—without comment. We believe that many G.P.s feel the college to be unnecessary, its mode of formation peremptory, and its motives unknown. It is indeed high time for the B.M.A. to give us guidance, and advise members as to their attitude to this venture.—We are, etc.,

J. P. DENNY.

C. H. HIGHFIELD.

D. L. ISAAC.

A. MURPHY.

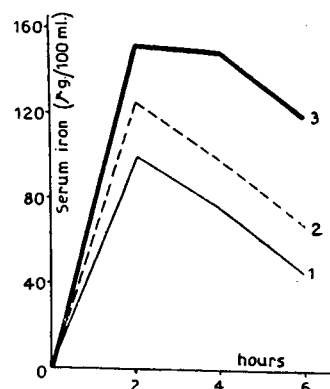
Long Eaton, Notts.

Iron Therapy

SIR,—Dr. David Haler's answer (February 7, p. 332) to Dr. R. S. Saxton's letter (January 10, p. 97) raises two points. First, with regard to his positive reply that "ferrous gluconate by itself is a more efficient haematinic than ferrous sulphate"—in our opinion the question is not yet settled, as may be seen from the literature. Jasinski^{1,2,3,4} in his papers deals only with the absorption of ferrous gluconate when introduced by mouth and with the good results obtained by the administration of ferrous gluconate to anaemic patients. According to experiments by Lüdin,⁵ the iron utilization coefficient after the administration of ferrous gluconate to anaemic patients is 22%; this value may be interesting if related to the coefficient of 14% obtained by Witts⁶ some years before, using ferrous sulphate. But we think that the comparison of the results obtained by the two different authors in such a complex field is to be regarded with caution. Gram and Leverton⁷ state that the administration of different iron compounds to women showed a daily absorption of 9 mg. with ferrous gluconate and 11 mg. with ferrous sulphate. Finally, Haler,⁸ after a study of the haematinic action of different iron salts, concludes that a ferrous gluconate solution containing aneurin, nicotinamide, riboflavin, and vitamin C is more highly haematinic than ferrous sulphate by itself. It therefore seems to us to be incautious to infer that ferrous gluconate used by itself is a more efficient haematinic than ferrous sulphate.

Secondly, with regard to the interference of vitamins with the absorption of iron compounds, we all know that the haematinic property of an iron compound administered by mouth is directly related to the quantity which enters the body. Whatever the compound used, when iron ions have passed the duodeno-jejunal wall they all behave in the same manner, and, fixed in the plasma, are transported to the various centres of consumption or to the storage organs (Ventura⁹). According to this, the haematinic capacity of an iron preparation is chiefly related to its ability to set free iron ions when subjected to the action of gastro-

duodenal secretions, and so is also related to the quantity of the ions which reach the blood. Consequently, if one iron compound is absorbed better than another it probably has a higher haematinic action. The question arises whether all the vitamins have only a general action on the haematopoietic system, or whether some of them allow a better iron absorption when administered together with iron. Many researches, including papers by Monasterio and



Increase of "serum iron" after the administration of (1) ferrous sulphate, (2) ferrous sulphate plus vitamin C, and (3) "hormo-hemina with iron."

vitamin C and of a particular compound ("hormo-hemina with iron") in which liver extract, gastric mucosa, and yeast are added to the same quantity of ferrous sulphate plus vitamin C, we find that the addition of such substances is able to increase again the iron absorption. This proves the point that a comparison of two iron compounds can be made only when the pure substances are examined. As soon as we can we will report whether ferrous gluconate is absorbed better than ferrous sulphate.—We are, etc.,

P. LARIZZA,
S. VENTURA.

Pavia, Italy.

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Neonatal Myasthenia Gravis

SIR,—The report of still another case of neonatal myasthenia gravis by Drs. B. Gans and D. H. Forsdick (*Journal*, February 7, p. 314) indicates an increasing awareness of the possible occurrence of this condition in offspring of myasthenic mothers. I am presenting three further cases of this syndrome as well as three probable cases in a review, "Myasthenia in the Newborn," to appear in *Pediatrics* in the near future. A patient with congenital myasthenia is also included. It is of interest that, while only three infants with neonatal myasthenia were reported up to 1948, there have been 12 additional cases reported (or in press) in the past few years. Of these 15 cases, nine, including the case by Gans and Forsdick, received adequate treatment with neostigmine, and all recovered. These cases varied in severity, and some might well have recovered without treatment. Of the remaining six who received little or no neostigmine, three recovered but three died, a mortality of 50%. In view of this high mortality in untreated and inadequately treated cases, all newborn infants of myasthenic mothers should be closely observed with the possibility of neonatal myasthenia in mind, despite the fact that many normal infants have been born to myasthenic mothers. Any such newborn infant with unexplained limpness, inability to suck or handle secretions, and a feeble cry should be given a

diagnostic test with 0.125 mg. neostigmine subcutaneously or 3.75 mg. by mouth. It is important that an adequate test dose be given, for otherwise a detectable response may not be elicited in all cases. A syringe containing 0.1–0.2 mg. atropine should be available to counteract any undesirable side-reactions due to the muscarinic actions of this drug. Once the diagnosis is established, the infant should immediately be placed on maintenance therapy, the severity of symptoms determining the size and frequency of the maintenance dose. The average duration of treatment in reported cases was about three weeks. Treatment, once instituted, should be continuous and terminated only gradually to avoid the sudden occurrence of relapse.

Three mothers, after giving birth to infants with myasthenic signs, again became pregnant. In each instance the infant born of the latter pregnancy also showed evidence of the same condition, indicating that this syndrome is prone to recur. Once noted, therefore, infants born in succeeding pregnancies should be particularly suspect and followed especially closely at term.—I am, etc.,

Boston, Mass.

SIDNEY KIBRICK.

Aphosphorosis

SIR,—At a recent combined meeting of the Midland Medical Society and the Midland Counties Veterinary Association, I learned that one of the earliest symptoms of aphosphorosis in cattle is a reduction in fertility. This disease is widespread throughout the world, and is due to a low phosphorus content of the soil, which is, of course, lower in some areas than others, the deficiency being most marked where the soil is peaty.

It seems likely that this fundamental lack of phosphorus will be reflected in the diet of humans, and may be a factor in human infertility. The threshold for phosphorus deficiency is probably different in humans, and aphosphorosis may only occur under conditions of extreme deprivation, faulty metabolism, or faddism. However, it would seem a simple matter and probably well worth while to carry out some controlled experiments in which the blood phosphorus levels of fertile and infertile women were compared, and to assess the value of supplementing the diet of infertile women with suitable phosphorus-containing foods or medicaments.

It is true that there are many factors involved in infertility, and it is unlikely that any one factor would be all-important, but if we excluded only the cases with an organic cause, and disregarded the many nebulous factors that have been postulated, we would be left with the great majority of infertile couples who would be suitable for the investigation.—I am, etc.,

Birmingham.

EDWARD COPE.

Incidence of Leukaemia

SIR,—The survey carried out by Drs. W. R. Gauld, James Innes, and H. N. Robson on the incidence of leukaemia (*Journal*, March 14, p. 585) is extremely interesting, particularly since their findings tend to show a real increase in the incidence of the disease, more particularly the chronic lymphatic form. I would like to point out that contemporaneously there has been an increase in the extent to which x-radiation has been used in the diagnosis of disease. It is, of course, common knowledge that x rays in large doses are capable of producing acute blood changes, and I think there is some evidence that continued small dosage, even at levels below that which is usually regarded as safe, are capable of producing chronic changes.

May I suggest through your columns that some group or body of research workers with suitable facilities at their disposal should investigate the question of a possible causal relationship between these simultaneous increases in the number of x-ray investigations and the number of cases of leukaemia? As a preliminary investigation it might perhaps be possible to take a large number of cases of leukaemia, more particularly the lymphatic form, and find out whether they had at any time been subjected to x-ray investigations.

and then to compare the figures so obtained with a cross-section of the general population. There is, I think, a faint suspicion in the minds of one or two radiologists that indiscriminate radiological investigation is not without attendant dangers.—I am, etc.,

Chislehurst, Kent.

H. GLYN JONES.

Epidemic Nausea and Vomiting

SIR,—Your leading article on this subject (March 7, p. 552) draws attention to a condition increasingly common, which in its acute form constitutes a public health problem, and in its subacute and chronic variants furnishes an appreciable amount of work to the general practitioner. In this practice the condition was first encountered as a mild outbreak in September, 1950. Clinically it was confused with Sonne dysentery by virtue of the combination of respiratory and intestinal symptoms. Stool cultures and blood agglutinations, however, were consistently negative. Since September, 1950, the disease has steadily entrenched itself in the community, with always one or two cases present and periodic mild outbreaks. When the outbreak is at its height (although it is never explosive) and several cases are being seen daily with acute sickness and diarrhoea, the subacute and chronic varieties begin to show themselves.

The subacute variety, peculiar to children, manifests itself as a febrile flatulent constipation with acute nausea, thirst, nasal catarrh, and brassy cough and a reversal of the ordinary sleep habit, so that the child is somnolent by day but sleeps only fitfully by night with a tendency to muscular twitchings and nightmares. On occasion the temperature may go up to 104° F. (40° C.), and there may be conjunctivitis and a blotchy rash on the face which may be mistaken for measles. In the recovery phase there is a tendency to tedious remissions.

The chronic variety, seen in adults, is characterized by a most pronounced weariness and nervous depression, flatulent indigestion, constipation, and headache. Other common symptoms include vertigo, diurnal torpor and nocturnal insomnia, increased cold sensitivity, perversions of taste and smell, thirst, polyuria, and bloodshot eyes. The signs in this chronic type are few—some upper respiratory catarrh, abdominal tympanites, a normal or rather slow pulse, and a very offensive stool. Vertigo, when present, may be so severe as to overshadow other symptoms. These cases may be the foundation of reports of epidemic vertigo. When the vertigo is accompanied by severe frontal or occipital headache and nausea it may be confused with Ménière's syndrome.

In the absence of treatment the chronic case drags on for three to four weeks, the course being punctuated by periods of well-being. This symptomatic seesaw is a prominent feature.

Treatment with succinylsulphathiazole or phthalylsulphathiazole reduces the duration to seven to ten days, while chloramphenicol may resolve the condition in one to three days. When dealing with large numbers this in itself creates a therapeutic dilemma, in view of the difference in cost.

Throughout the three-year period in which this problem has been studied three outbreaks of Sonne dysentery were also noted in this practice, in each of which positive stool cultures were readily obtained.—I am, etc.,

Uffculme, Devon.

FRANK MURRAY.

Cord Traction

SIR,—Without taking sides for or against the routine use of intravenous ergometrine in labour, may I be allowed a few comments on the subject of cord traction which Drs. J. D. Martin and J. G. Dumoulin (*Journal*, March 21, p. 643) raise, since they refer to a paper of mine?

They mention that active contraction of the uterus makes cord traction relatively safe, but do not mention a second safeguard which, in my opinion, is just as important—namely, that the fundus should be maintained as high as possible in the abdomen. In fact, they appear to advocate the use of fundal pressure and cord traction, which I consider to be a most unsafe and undesirable combination. If the placenta is in the vagina or lower uterine segment, suprapubic pressure with the minimum of cord traction is usually very satisfactory. Furthermore, while agreeing with the authors on the desirability of terminating the third stage quickly after the use of intravenous ergometrine, I would like to point out that in this case many of the placentae, though

separated, would still be in the upper segment and a few will not be completely separated. Are the authors happy to allow midwives to pull on the cord in such circumstances?

I believe suprapubic pressure and cord traction to remove the separated placenta to be safe in almost any hands provided that a test for separation has been made. I also believe that, with certain safeguards, cord traction and counter fundal pressure is a valuable procedure in certain abnormal cases in the obstetrician's hands, but would hesitate to go further than this without more experience. Finally, may I ask what happens if the shoulders become impacted and intravenous ergometrine has already been given? Many prefer to wait until the birth of the anterior shoulder is imminent in order to avoid this risk.—I am, etc.,

Borcham Wood.

REFERENCE

- J. Obstet. Gynaec. Brit. Emp.*, 1951, 58, 764.

The Metric System

SIR,—With reference to the recent correspondence on this subject, it seems to me that anything would be better than the present position of using the two systems in a horrid mixture. Thus, believe it or not, I anaesthetize rabbits with a mixture containing 1 grain per "mil." of solution. And even the nasty word "mil." is still only half-way there. For who is there who says that his patients have 5 million red cells per "millilil" ("What a word!" as A. P. H. would say). What is sauce for the goose is sauce for the gander, and if Mr. A. L. Bacharach (March 14, p. 619) is right in saying that we are wickedly inaccurate in talking about "ccs.", we are surely no better for talking about cubic millimetres. Perhaps he will tell us what is the exact difference between a "cc." and a "mil.", and whether the difference is enough to be of the slightest significance. I am afraid he will find that there is still a lot of glassware and syringes about unashamedly graduated in ccs., and no one seems a penny the worse.

For the mixture of measures there is surely nothing whatever to be said—see how easy it is for my horrid handwriting to make "grain" look exactly like "gram," while by far the strongest argument against the metric system is the fatal ease with which one can kill one's best friend by putting a "damned dot" one place too far to the right. It is just for this sort of reason that the lawyers omit from their documents any sort of dots whatever.—I am, etc.,

London, W.1.

J. W. SHACKLE.

Polypharmacy

SIR,—I agree with Dr. George Discombe (*Journal*, April 11, p. 836) that the introduction of unnecessary, highly priced polypharmaceutical mixtures encourages waste of public money, but I do not agree that the proper use of the preparation he mentions, which contains the principal known haemopoietic substances, is either unnecessary or wasteful. Ideally, a specific nutritional deficiency should be treated with a specific nutriment, but it is rare to meet with a deficiency of one factor without depletion of others. This is particularly true in the common anaemias, since foods low in iron are, for the most part, low in folic acid and vitamin B₁₂. For example, Litwins and Greenwald¹ have obtained a more rapid response in hypochromic anaemia when liver extract was added to iron therapy. Smith² has also presented evidence of the existence in liver of still other factors than folic acid and vitamin B₁₂ which account in part for its efficacy, which makes desirable the inclusion of liver fraction in therapeutic preparations.

As Dr. Discombe says, "No one can exaggerate the importance of diagnosis in anaemia," nor can one underestimate its treatment. The use of a preparation that combines the principal substances known to be involved in haemopoiesis would seem to be a reasonable therapeutic measure.—I am, etc.,

London, W.C.2.

A. T. MENNIE,
Medical Director, Lederle Laboratories Division,
Cyanamid Products, Ltd.

REFERENCES

- Bull. N.Y. med. Coll.*, 1950, 13, 116.
- J. Pharm. Pharmacol.*, 1950, 2, 409.

Plant Seed Haemagglutinins

SIR,—Your annotation "Plant Seed Haemagglutinins" (March 21, p. 664) rightly ended with the caution that "it is too early yet to assess whether this [method] will be practicable or advantageous."

Recent work in these laboratories, shortly to be published,¹ has shown that fresh saline extracts of *Dolichos biflorus* and *Phaseolus lunatus*, while strongly agglutinating A₁ and A₂ cells, fail to react with A₄ bloods.² However, they can be used to distinguish the subgroup A₂, as *Dolichos biflorus* extracts do not agglutinate A₂ but *Phaseolus lunatus* does—a fact which we have already applied in the investigation of the subgroups of A. Plant haemagglutinins may be a useful research tool for probing the mosaic of the group A antigen, but much further work on many varieties of seeds will be necessary before human grouping sera can be displaced.—I am, etc.,

Regional Transfusion Laboratory,
Sheffield.

C. C. BOWLEY.

REFERENCES

- ¹ Dunsford, J., and Hut-hinson, A. M. (1953). *Bull. Cent. Lab. Ned. Red. Cross*. In press.
² — and Aspinall, P. (1952). *Ann. Eugen. (Camb.)*, 17, 30.

Venepuncture

SIR,—I agree with Dr. John Hendrie (March 7, p. 562) that the technique of venepuncture could be much advanced, but not by condemning the routine use of the antecubital site. In techniques which are mechanically straightforward, the importance of maintaining the safety of simplicity is often overshadowed by the apparent advantages of advanced equipment and the requirements of advanced anaesthetic techniques. While I cannot subscribe anything on prolonged or intermittent injection technique, a series of almost 22,000 single-dosage intravenous injections with but one sore arm recorded (this did not slough) encourages me to mention my own routine.

The site is unimportant so long as an adequate vein is selected and confirmed. The antecubital site is normally chosen. The simplest equipment is used, and adhered to, to enable a finer "feel" of the intravenous position. The syringes are all-glass with eccentric nozzle, Luer fitting, of desired capacity. The needles are fine gauge 26, with long bevel (this is still shorter than the short bevel of larger needles commonly used). The needle is inserted with the bevel down, as it is desired that the bevel, rather than the needle, shall be parallel with the vein. A length of $\frac{1}{2}$ in. is adequate for routine work.

A constant visual safety check is maintained. By using simple equipment, a fine needle, and glass nozzle, venous blood can be momentarily withdrawn to the nozzle only for inspection at the outset and at any time during injection. The check occupies three seconds, so can be repeated every millilitre if ever in doubt, and still allow a rate of injection of one millilitre per six seconds. With a metal nozzle syringe, such a simple safety check is impossible. Even the brightest lighting does not enable the blood colour to be recognized at once, because blood must be withdrawn to, and cloud, the main reservoir of solution, so that each subsequent check is increasingly difficult.

During training, none but palpable veins must be attempted. Later, if the above simple precautions are respected, the correct intravenous position can be determined throughout any injection in any vein.—I am, etc.,

London, W.1.

S. L. DRUMMOND-JACKSON.

Mental Health Research Fund

SIR,—The Mental Health Research Fund was founded in July, 1949. Last year you were good enough to draw attention to it in a leading article and by your report of the inaugural conference at Oxford (*Journal*, 1952, 1, 699). Many of your readers will have seen in *The Times* of March 10 a letter making the Fund known to the public and inviting contributions. In launching this public campaign it seems appropriate also to recall our purposes and hopes to the minds of doctors.

That research in mental health is needed is abundantly clear from the high incidence of mental illness in the com-

munity and from the growing population of our mental hospitals. Fortunately research methods are full of promise and yearly become more accurate and delicate. We hope the Fund will be able to offer grants to approved research projects, and wish to remind your readers that its outlook is catholic: as we stated in *The Times*, it is not wedded to any particular approach to this many-sided subject. The governing body is composed mainly of people who are already active in fields bearing on the mind, and the Fund works in close touch with the National Association for Mental Health.

If, as we hope, there are those among your readers who would wish to give this Fund their support, we are in a position to assure them that any contributions which they can secure for the Fund would be used to good advantage. We shall be glad to send further particulars of the Fund to any doctors or laymen who may be interested.—We are, etc.,

IAN T. HENDERSON,
Chairman, Executive Committee.

GEOFFREY VICKERS,
Chairman, Research Committee.
London, W.C.1.

PRISCILLA NORMAN.
DAVID HENDERSON.
W. E. LE GROS CLARK.
D. R. MACCALMAN.
DEREK R. RICHTER.

POINTS FROM LETTERS

Freemartins and Siamese Twins

Dr. J. I. MEIKLE (Lilliesleaf, Roxburghshire) writes: As a doctor-farmer I must challenge the statement contained in the first sentence of your annotation "Parabiosis" (March 14, p. 608). Is the calf known to cattle breeders as a "freemartin" truly analogous to a Siamese twin as stated? I do not think so if the expression "Siamese twin" is used in the customarily accepted sense. As I understand the term, "Siamese twins" refers to a viable double monster (classified as a double autosome), the twins being anatomically united and incapable of separate existence short of surgical separation. On the other hand, a "freemartin" in the customary farming sense simply implies a heifer calf of a twin pregnancy, where the other twin is a bull calf. Such twins are born and exist as quite separate individuals, although in foetal life, through a fusion of foetal membranes, they shared a common blood supply. The result of this is that a varying amount of male sex hormone circulated through the female twin effecting masculinization of varying degrees.

Smoking and Lung Cancer

Dr. E. GALLOP (London, S.W.1) writes: In their letter (February 28, p. 505) replying to some criticisms of their views on the possible effects of smoking Dr. Richard Doll and Professor A. Bradford Hill write: "The time correlation was, of course, our starting point. . . . But having applied that stimulus it ceased to have any interest whatever for us until our epidemiological inquiry was over and had alone led us to the conclusion we have quoted above" (that is, "tobacco smoking is a factor in the production of carcinoma of the lung"). This concern for objectivity is wholly admirable, for it is by no means easy to achieve. I do not think that they have done so. For example, in the discussion of the effects of inhaling (*Journal*, December 13, 1952, p. 1271) they write: "On the other hand, the observation that patients who recognize that they inhale are found no more frequently in the lung-carcinoma group than in the control group appears somewhat paradoxical." But, unless there had been an expectation that the figures would turn out differently, why should it seem paradoxical? It does not seem so to me, but then I do not think there is a causal "association between smoking and carcinoma of the lung."

The Medical Practitioner and the Law

Mr. C. R. PORTEOUS (Liverpool) writes: I was interested to read Dr. G. A. Craig's letter (March 14, p. 618) and I am sure that most people thoroughly agree with him. In a recent case, which I am glad to say did not succeed, the cost of the proceedings, which lasted over a week, amounted to many thousands of pounds. Such costs are ultimately defrayed by the taxpayer, whether through "legal aid" or a hospital board. Would it not be possible to establish a fund, or a method of national compensation, for the purpose of alleviating accidental misfortunes? An unbiased board could allocate amounts, and costly court actions would be reserved for cases of criminal negligence where the Crown would prosecute and there would be no question of damages.

Obituary

Dr. G. J. JONES died at his home at Smethwick on March 8 at the age of 76. Born at Warrenpoint, Northern Ireland, on November 24, 1876, George James Jones received his medical education at the old Queen's College, Belfast, graduating M.B., B.Ch. from the former Royal University of Ireland in 1904. After graduation he practised in Northern Ireland until 1915, when he entered the R.A.M.C. and served in France. He was invalided out of the Army in 1918, and in the same year he obtained the M.D. of Queen's University, Belfast. In 1919 he settled in general practice at Smethwick, where he quickly gained the respect and affection of his medical colleagues, for he was a man who gave careful thought to all problems affecting the profession. There was no compromise or deviation once he had made up his mind on what was right. Always ready to help, he was often asked for advice, and, if unpleasant, this was given with a sugared pill of dry, pawky humour. He served on many committees, and was chairman of the West Bromwich and Smethwick Division of the British Medical Association from 1942 to 1944. He was medical officer to various organizations, and during the last war was in charge of a first-aid post, a position which he filled admirably by reason of his strength of character and imperturbability. A doctor of the old school, his hobbies, which he always shared with his wife, were golf, pottery, and reading, and he was a keen alpine gardener. His colleagues and patients in Smethwick mourn his passing with deep sincerity, and sympathize with his wife and son and daughter.—J. S.

Another practitioner of the old school, in the person of Dr. F. C. WETHERELL, died at his home at Ipswich on March 11, within a few days of his 78th birthday. Frank Cordeux Wetherell was born on March 19, 1875, and received his professional training at Guy's Hospital, graduating M.B. from the University of London in 1901. While at Guy's he was captain of the Rugby fifteen which won the inter-hospitals cup in 1897-8. He also played tennis for the hospital and for Suffolk, and Rugby for Kent. In addition he was a good club cricketer. After holding the appointments of house-surgeon at Guy's Hospital and resident medical officer at the Ascot and Bracknell Smallpox Hospital, he settled at Ipswich, where he practised for nearly half a century. During the war of 1914-18 he helped the staff at the East Suffolk and Ipswich Hospital, and in 1919 he was appointed a physician to the hospital, continuing in that capacity until 1936, when he was accorded consultant status. Dr. Wetherell had an unassuming nature, but his patients soon realized that he had a sincere desire for their welfare and they valued his services accordingly. He had a strong sense of humour, and was held in great affection by his colleagues, who elected him chairman of the South Suffolk Division of the British Medical Association in 1935. For many years he was president of the Ipswich Male Voice Choir, in which he took a keen interest, and he was also a vice-president of the Ipswich Choral Society and of the former Ipswich Players. A widower, he is survived by one son and one daughter.

Dr. JAMES B. HANNAH sends the following appreciation: I had the privilege of working under Dr. Wetherell between 1946 and 1948. He had been in practice in Ipswich for some 50 years. In my own experience of physicians, he was the greatest of them all. I shall carry with me always the memory of his courage, his wit, and the way he practised the art of medicine—and to him it was an art indeed, into which he poured his soul as well as his science. Medicine to him was never just an application of scientific principles, even though he excelled in them, and he taught his students to respect patients rather than their diseases.

"Peace of mind," he used to say, "is what they chiefly need. Give it to them." Some of the things he taught took courage to accept, aiming at honesty rather than expedience. "Never be afraid of admitting you've made a mistake. Your patients will think all the more of you and come back to you again." He had great courage. Nearly crippled with arthritis, he used slowly to struggle out of his chair with grunts and a laugh, force his creaking joints through the first few steps and then, with his two sticks, walk jerkily along saying, "That's better." Often he would let himself painfully down on his knees on the hard ward floors so that he could better palpate an abdomen. It was his ambition to work to the end, and when he wrote this year to tell me that he had a hemianopsia the only regret he expressed was that he was "finished as a workman." In his early days he was a great sportsman. He loved music, painting, all that grew in field and garden, animals, his work, and people. In short, he loved life and understood it better than most of us ever will.

The Clan MacDougall, prominent in Scottish history since the twelfth century, has lost its 29th hereditary chief by the death of Colonel A. J. MACDOUGALL of MacDougall and Dunollie at his home at Oban on March 13 at the age of 81. Alexander James MacDougall was born at Poona, India, on January 7, 1872, the eldest son of Surgeon-General H. R. L. MacDougall, and was educated at Clifton College and at the University of Edinburgh, where he graduated M.B., C.M. in 1894. Two years later he entered the Army Medical Department and served first in India and later in Ceylon. During the war of 1914-18 he saw service in France, Egypt, Macedonia, and Palestine. From 1915 to 1917 he was in command of the 35th Casualty Clearing Hospital, and was then appointed A.D.M.S. of the 52nd Division, with the rank of temporary colonel. His war services were recognized by two mentions in dispatches, and in 1919 he was appointed C.M.G. He retired to his home at Oban shortly after the end of the war. In 1932 he was appointed a Deputy Lieutenant for Argyllshire, and he was an Honorary Sheriff Substitute for the county. Colonel MacDougall married Miss Colina Edith MacDougall, third daughter of Mr. Alexander W. MacDougall, in 1901, and she survives him, together with the three daughters of the marriage, the eldest of whom, Mrs. Leslie Grahame-Thomson—the holder of the traditional title Maid of Lorn—now becomes the chief of the Clan.

Dr. H. N. CROSSLEY died at his home in Rochdale on March 13 at the age of 62. For many years he was principal medical officer at Birch Hill Hospital. Harry Newbold Crossley was born at Burnley on November 26, 1890, and received his medical education at the University of Manchester, where he graduated M.B., Ch.B. in 1913, taking the D.P.H. three years later. After qualifying he held the posts of house-surgeon at the Manchester Royal Infirmary and resident medical officer at Withington Hospital. During the first world war he served first as medical officer at the military hospital at Nell Lane, West Didsbury, and later in France with the 61st and 50th casualty clearing stations and the base hospital at Etaples. On demobilization he spent a few months in general practice before being appointed to Birch Hill Hospital in 1920. At that time the hospital was a Poor Law institution and he was the sole resident. Those who have followed the progress of this and similar institutions can look back with great satisfaction, as he did, on the steady progress that took place during the following years. If ever dead bones came to life they did in these hospitals. Changes came fast after the local authorities took over in 1930. At Birch Hill a maternity block was built, a modern pavilion for children was added, the nurses' home was extended, and in 1940 a new operating theatre was opened, which had not only air conditioning but also the first Rothwell sterile water system in Britain. For the inventor was engineer to the hospital at the time.

In all these improvements Dr. Crossley played an important part. Lancastrian by birth and character, he was not one to rush headlong into change for change's sake, but, once convinced that a suggested alteration was a good one, he gave it his unqualified support. Though blessed with a keen sense of humour, he was more sensitive than appeared on the surface, being essentially a shy man. But to those who knew him well he was a staunch and generous friend. He had no interests outside the hospital, and as its superintendent he was shrewd and vigilant, taking pride in the fact that all went well while he was in control. He was a loyal member of the British Medical Association and served on numerous committees, being chairman of the Rochdale Division from 1941 to 1944. His last two years were shadowed by ill-health, and that he lived through them was largely due to the devoted attention of his wife, who survives him.—J. C. J.

We record with regret the death of Dr. CHARLOTTE SHIELDS at her home at Lound, near Lowestoft, on March 17 at the age of 81. Charlotte Annie Warren was born at Derby on July 4, 1871, and was educated at Derby Grammar School. At the end of her school years she decided to take up teaching as a career and was trained for that purpose at Stockwell, in London. After completing her training she held a teaching post in Derby for a time and later taught in Douglas, in the Isle of Man. She married Mr. R. H. Shields in 1900 and went to live at St. Albans, where her husband was a chemist. A year later their only child, a son, was born. In 1907 they moved to Rochford, in Essex. After a few years Dr. Shields realized that her husband's health was failing, and she knew that if their son was to have the education they wished for him she would have to take up some work herself. Medicine had for a long time appealed to her, and bravely she embarked on the necessary training at the late age of 40, entering the London School of Medicine for Women. She travelled daily from Rochford to London, and continued to do so after war broke out in 1914. Despite all, she took the M.R.C.S., L.R.C.P. in 1917, and graduated M.B., B.S. from the University of London in the following year. After qualifying, she decided to start in practice at Westcliff-on-Sea, and was the first woman general practitioner in the borough of Southend. Because of her sound clinical sense and ability, she steadily built up a flourishing practice and endeared herself to many by her patience, skill, and understanding. She also became a medical officer to the antenatal and infant welfare clinics of the borough and took a keen interest in the meetings and other activities of the British Medical Association, becoming chairman of the South-east Essex Division in 1937-8, the first woman to be thus honoured. Outside her medical activities Dr. Shields found time to interest herself in art and music, natural history, the theatre, and the cinema. She retired from practice in 1939 and went to live first at Torquay and later with her son, now rector of Lound. Dr. Shields was a remarkable personality. Only those privileged to know her intimately and work with her could realize her amazing quickness of mind and versatility and the readiness with which she absorbed and utilized new knowledge. With all this she combined patience and humility, a very real love of her fellows, and a desire to help them.—J. L. L.

Dr. W. K. CALWELL, who practised in Kensington for many years, died at his home in London on March 28 at the age of 66. Born at Holywood, Co. Down, on February 27, 1887, William Kirkwood Calwell was educated at the Upper Sullivan School, Holywood, and at Queen's University, Belfast. While at the Queen's Street Hospital he won a scholarship in medicine and the gold medal in diseases of children. After graduating M.B., B.Ch. in 1911, he took the D.P.H. two years later, and proceeded M.D. in 1920, winning a gold medal for his thesis. Having been a house-surgeon and house-physician at the Royal Victoria Hospital, and a house-surgeon at the Belfast Maternity Hospital, Dr.

Calwell joined the R.A.M.C. at the beginning of the war of 1914-18, and went to France with the first 100,000 of the British Expeditionary Force. He was with the 47th London Regiment before being wounded in 1916, and after a short time at home he went out to the Middle East and saw service in Egypt, the Sudan, and Palestine. After being demobilized he entered general practice in Kensington, where he remained for 32 years. During the last war he again served his country nobly by continuing in practice without a break, showing a wonderful example of unselfishness and devotion to duty throughout the numerous heavy air raids on London. In addition to conducting a busy practice he held several clinical assistantships at London hospitals, and was surgeon to F Division of the Metropolitan Police, chairman of a medical board at Willesden, and for a short period part-time assistant medical officer of health for Hammer-smith. Dr. "Billy" Calwell was a lovable man with a heart of gold. His generosity and kindnesses to others were unending, and yet were always quietly and unobtrusively rendered. Trusted and beloved both by patients and colleagues alike, he was the ideal family physician—sound in judgment, modest in manner, ever ready to help, and always gentle and sympathetic. His medical colleagues and patients will sadly miss him. To his wife and two sons we offer our sincere sympathy.—W. B. S.

Mr. LIONEL LOGUE, one of the best-known speech therapists in this country, died in London on April 12, aged 73. He was born at Adelaide in 1880 and educated at the Prince Alfred College there. During and after the first world war he greatly added to his reputation as a specialist in speech disorders by his work among shell-shocked Australian soldiers. In 1924 he left Australia and settled in London, where he built up a big practice. He did much to improve the status of speech therapists, being one of the original founders of the British Society of Speech Therapists and a founder fellow of the College of Speech Therapists. It is now well known that King George VI was one of Mr. Logue's patients. Some ten years before he came to the throne the Duke of York was called on to represent his father at the opening of the new Australian Parliament at Canberra. For a man with a speech impediment this was likely to prove a trying ordeal, and Mr. Logue's advice was sought. On this occasion the Duke was able to deliver his speech successfully, and thereafter Logue continued to help him overcome his difficulty. It was largely owing to Logue's ability and the trust which the Duke of York had in him that the latter was able, when he became King, to speak to the nation with confidence on important occasions, such as his own coronation, and to continue the Christmas broadcasts which his father had initiated. Logue's services were officially recognized by his appointment as M.V.O. in 1937. He was promoted C.V.O. in 1944. His wife died in 1945, and he is survived by three sons.

A general practitioner well known in Devon, Dr. W. H. BUSH died at his home at Chulmleigh on February 8 at the age of 74. Born at Huntingdon on June 21, 1878, William Henry Bush was educated at Brighton College, and then went on to Guy's Hospital, where he was ward clerk to the late Sir Charters Symonds in the days when a carbolic spray was used at operations. After qualifying L.S.A. in 1903 he held the post of house-surgeon at the Brighton and Hove Dispensary for two years, and in 1908 he obtained the diploma of L.M.S.S.A. Dr. Bush was in practice first in Yorkshire and then in Berkshire before entering the R.A.M.C. for service in the war of 1914-18, during which he was in command of the 41st British Stationary Hospital of the North-West Frontier Force in India. After the war he went into practice at Chulmleigh, where he worked for 33 years. Always busy, he was never so preoccupied as to be unable to give sympathetic aid to those who suffered, and his strong personality acted as a tonic to those in pain. He will be sadly missed both by his patients and by his

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Dr. Frank Howarth has been reappointed University Lecturer in Pharmacology from October 1 to the retiring age, and Dr. F. H. Grundy has been appointed University Demonstrator in Pharmacology from January 1 for three years.

In Congregation on January 24 the following medical degrees were conferred:

M.D.—K. B. Dickson, A. C. C. Hughes, P. F. Lucas, T. A. Kemp, D. G. James.

UNIVERSITY OF BIRMINGHAM

In Congregation on December 19, 1952, the following medical degrees were conferred:

Ch.M.—M. J. Roper-Hall.

M.B., Ch.B.—Monica A. Axson, A. G. Clews, Anthea M. S. Connell, Sylvia J. Darke, J. A. H. Davies, G. F. Devey, J. Edgington, J. E. Evans, C. R. B. Hooper, T. H. Howells, R. C. B. Ngaronye, A. C. Pelides, A. G. Pitchford, E. C. Raybould, M. B. Skirrow, J. Wassell.

The title of University Research Fellow has been conferred on Dr. J. C. Howell, a cancer research worker.

UNIVERSITY OF SHEFFIELD

At a Special Degree Congregation to be held on June 26 a number of honorary degrees will be conferred, including that of D.Sc. on Sir Ernest Finch, Professor of Surgery in the University from 1934 to 1944.

NATIONAL UNIVERSITY OF IRELAND

The following candidates have been approved at the examinations indicated:

DIPLOMA IN CHILD HEALTH.—G. H. Cussen, Livinia H. M. Donnelly, Irene B. Finnegan, Mary G. Larnihan, Deirdre M. F. MacHale, A. Waldron.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—D. M. Brady, Alice M. Creamer, Mary B. Furlong, B. S. Kale, P. J. O'Connor.

CERTIFICATE IN PUBLIC HEALTH.—J. J. Ambrose, W. J. Bushe, D. N. Connolly, J. G. Cooney, L. F. B. Delany, E. Desmond, Carmel P. Dooley, M. J. Doyle, Margaret M. Farrell, T. M. Fitzgerald, T. Fleming, Hanora H. Forde, J. V. Gallagher, J. K. Heagney, Malachy Heenan, M. E. Kennedy, R. P. King, E. Lacy, A. Loftus, J. B. H. Lusk, E. J. McArdle, D. M. McCarthy, B. St. J. McCartie, Frances M. McCauley, T. C. McGrath, Ita McMahon, D. J. McNamara, B. Maguire, S. P. Maurer, D. E. Mellon, J. J. Molony, Madeline E. Moran, Mary I. Murphy, B. T. A. Murray, O. P. M. Murray, J. J. O'Brien, E. O'Connor, T. J. O'Dea, M. O'Dwyer, P. K. O'Flynn, J. P. O'Sullivan, A. C. O'Toole, M. J. Reilly, Eva Roith, M. T. Rynne, T. E. Scully, T. Simpson, Clare M. H. Smith, T. J. Timmons, J. H. Walsh.

UNIVERSITY OF BRISTOL

Arthur Oliver Chick and Ephraim Joshua Field, M.D., M.S., Lecturer in Anatomy in the University, have been approved at the examination for the degree of Ph.D. in the Faculty of Medicine.

ROYAL COLLEGE OF SURGEONS IN IRELAND

The following candidates were conferred with the Fellowship of the College on November 21, 1952: J. T. Carroll, D. L. T. G. Finn, S. J. Heffernan, I. C. Modebe, J. P. McMullin, O. M. O'Malley, R. D. H. Parker.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council of the College held on November 29, 1952, it was reported that a grant of £3,000 had been received from the British Empire Cancer Campaign for research purposes.

Professor Lutherus Johannes te Groen (University of Pretoria) was elected to the Fellowship and Diaa Seif-Eldin was admitted to the Membership of the College.

Mr. Henry Roberts (Liverpool) and Mr. James Walker (Aberdeen) were appointed William Blair-Bell Memorial Lecturers for 1953.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Faculty held on February 2, with the President, Dr. Andrew Allison, in the chair, A. H. Edwards was admitted a Fellow of Faculty *qua* Surgeon.

Medico-Legal

MEDICAL PRACTICE A "BUSINESS"?

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Mr. J. H. Williams, being anxious to provide for the future of his son, made a will in which, in addition to giving him a determinable life interest in nine-tenths of his residuary estate, he empowered the trustees to advance up to a quarter of that share to the son, after he had attained the age of 35, for the purpose of starting him in business or for the advancement of any business with which he might be concerned.

Mr. Williams died in 1937. In 1942 the son qualified as a doctor. In 1943 he reached the age of 35. He was now anxious to buy a house partly to live in and partly as a base for his medical practice, and wanted the trustees to advance the purchase price under the power in the will.

The trustees applied to the Chancery Division of the High Court to determine whether under the will they had the power to do so, and the matter was heard by Mr. Justice Danckwerts on February 6, 1953.¹

In his judgment Mr. Justice Danckwerts said that the clause in the will should not be narrowly construed and that its object was to help the son to maintain himself in a gainful occupation. From the authorities and the dictionaries the word "business" seemed to be capable of including a profession, and plainly included the profession of doctor. Referring to the B.M.A.'s *Medical Practitioners' Handbook*, he said that the evidence showed that it was often a condition of success that a doctor should be able to take over a house where he could have a surgery and where he could be available. Therefore it would be a proper thing for the trustees to buy a house for the son to reside in, provided it was bought not only for him to live in with his family but with a view to advancing his prospects in medicine.

He made a declaration accordingly.

¹ *The Times*, February 7.

The Services

A *Supplement* to the *London Gazette* has announced the following appointments in recognition of gallant and distinguished services in Korea during the period July 1 to December 31, 1952:

O.B.E. (Military Division).—Lieutenant-Colonel C. B. Caswell, M.C., 37 Field Ambulance, R.C.A.M.C.

M.B.E. (Military Division).—Major B. D. Jaffey, 37 Field Ambulance, R.C.A.M.C.

NAVAL MEDICAL COMPASSIONATE FUND

A meeting of the subscribers of the above fund will be held on May 4 at 3 p.m., at the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W.1, to elect six directors of the fund.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 28 (No. 12) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	20	1	13	3		33	2	13	0	
Dysentery ..	463	79	120	5		516	49	49	1	1
Encephalitis, acute	6	0	0	0		8	1	1	0	2
Enteric fever:										
Typhoid ..	2	0	0	0	2	1	0	0	0	
Paratyphoid ..	5	0	0	0	0	6	0	2(B)	0	
Food-poisoning ..	60	7		0		127	13		0	
Infective enteritis or diarrhoea under 2 years ..					13					6
Measles*	25,791	1,133	479	176	254	6,885	201	554	229	377
Meningococcal infection ..	44	5	25	4	1	48	3	20	2	2
Ophthalmia neonatorum ..	39	5	6	0		54	6	7	0	
Pneumonia†	1,067	64	365	27	5	848	38	396	20	4
Poliomyelitis, acute:										
Paralytic ..	42	9				12	0		0	0
Non-paralytic ..	4	0		1	2	8	1		0	0
Puerperal fever‡	241	15	16	0		266	33	14	1	
Scarlet fever ..	1,739	111	207	42	50	1,486	100	175	21	56
Tuberculosis:										
Respiratory ..			201	25				138	37	
Non-respiratory ..			28	2				29	4	
Whooping-cough ..	3,202	260	372	59	158	3,133	131	264	130	83

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	1	0	0
Dysentery ..	0	0	1	0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	19	2	3	4	1	12		3	0	2
Influenza ..	100	6	7	3	2	35	2	17	1	1
Measles ..		0	0	0	0		0		0	1
Meningococcal infection ..		0	1				1	1		
Pneumonia ..	369	59	28	23	15	275	35		7	8
Poliomyelitis, acute	7	2			0	1	0		0	
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis:										
Respiratory ..	137	20	16	5	9	157	19	24	2	12
Non-respiratory ..		3	2	0	2		3	4	0	4
Whooping-cough ..	7	1	0	0	0	2	0	1	0	0
Deaths 0-1 year ..	301	35	30	13	22	240	24	28	3	23
Deaths (excluding stillbirths) ..	6,489	943	651	146	213	5,798	800	694	109	184
LIVE BIRTHS ..	8,163	1,223	990	249	484	8,345	1,285	950	240	351
STILLBIRTHS ..	218	26	26			197	29	20		

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

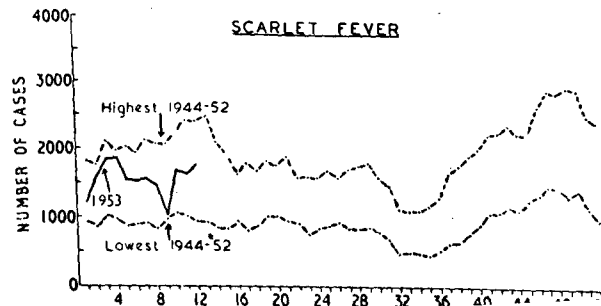
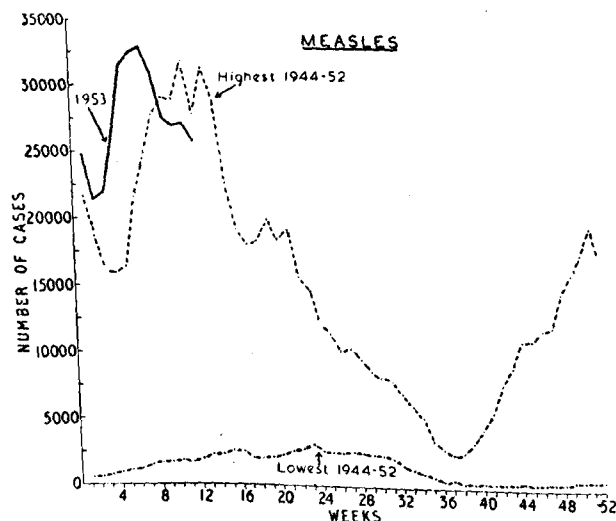
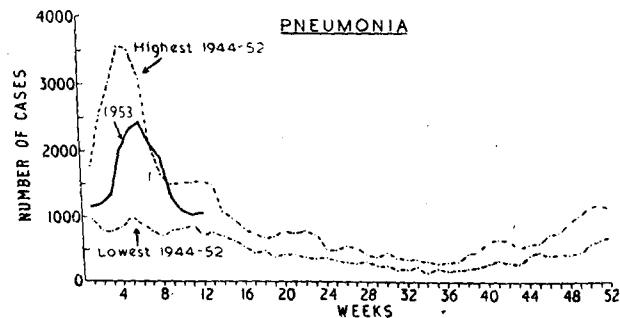
Vital Statistics

Smallpox in the North Country

Up to noon on April 14 there had been 22 confirmed cases of smallpox, including 4 deaths. The districts in which contacts remained under surveillance at that date were Oldham C.B. and Leeds C.B. At Oldham there was a fresh case since the previous week's report, in a girl already in quarantine. Aged 17, she had never been vaccinated. At Leeds an unvaccinated boy aged 8 died on April 14. The confident diagnosis of haemorrhagic smallpox awaited laboratory confirmation.

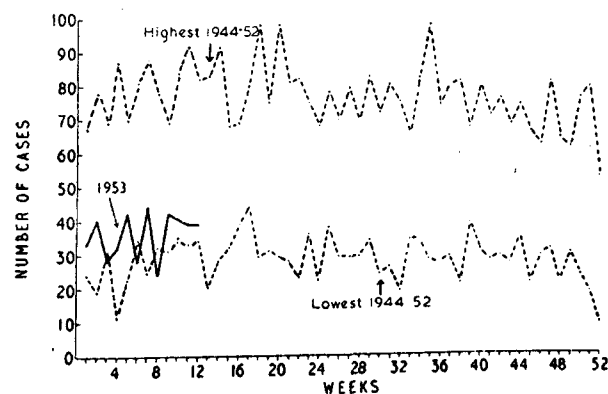
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Medical News

OPHTHALMIA NEONATORUM



Infectious Diseases

In England and Wales during the week ending March 28 a decrease of 1,435 was reported in the number of notifications of measles, from 27,226 to 25,791, while the largest increases were 114 for scarlet fever, from 1,625 to 1,739, and 98 for whooping-cough, from 3,104 to 3,202.

The fall in the incidence of measles was confined to the southern section of the country; in the northern section there was a small rise. The largest decreases in the number of notifications of measles were 400 in Surrey, from 1,805 to 1,405; 394 in Hertfordshire, from 1,109 to 715; 306 in London, from 1,439 to 1,133; and 239 in Middlesex, from 1,337 to 1,098; the largest rise was 177 in Yorkshire West Riding, from 1,821 to 1,998. The largest increase in the number of notifications of whooping-cough was 58 in London, from 202 to 260. The only large rise in scarlet fever was 50 in Lancashire, from 196 to 246. 20 cases of diphtheria were notified, the same number as in the preceding week. The chief feature of the local returns of diphtheria was a rise in Lancashire from 5 to 10.

46 cases of acute poliomyelitis were notified during the week, 20 more than in the preceding week. These cases were 22 more for paralytic and 2 fewer for non-paralytic cases. The largest returns were London 9 (Fulham 2, Battersea 2, Kensington 2), Lancaster 5 (Liverpool C.B. 2), Sussex 4, and Middlesex 4.

463 cases of dysentery were notified, 30 more than in the preceding week. The chief centres of infection were Leicestershire 89 (Leicester C.B. 87), London 79 (Stoke Newington 18, Islington 10), Lancashire 60 (Liverpool C.B. 30; Manchester C.B. 14), Yorkshire West Riding 59 (Leeds C.B. 24, Bradford C.B. 19), Middlesex 38 (Edmonton M.B. 25), and Lincolnshire 25 (Boston M.B. 12, Boston R.D. 8).

Influenza deaths in the great towns numbered 100; these were 33 fewer than in the preceding week.

Week Ending April 4

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,403, whooping-cough 2,508, diphtheria 11, measles 21,166, acute poliomyelitis 38, dysentery 423, paratyphoid fever 7, typhoid fever 6.

The Industrial Spectroscopy Group, Institute of Physics, has formed a panel of members interested in direct reading equipment for spectrochemical analysis. These devices combine spectrographs with electronic equipment in such a way that the intensities of characteristic spectral lines give a direct reading of the percentage of the elements present in the specimen. The panel is to organize meetings serving the interests of users and potential users of this equipment. Readers who would like notices of the meetings on this subject are invited to join the Group. Further particulars may be obtained from the secretary, Institute of Physics, 47, Belgrave Square, London, S.W.1.

W.H.O. Regional Health Education Conference.—This week delegates from 18 European countries have been meeting at B.M.A. House to discuss health education of the public. The Conference, sponsored by the European Regional Office of W.H.O., is under the joint chairmanship of Professor J. M. Mackintosh, of the London School of Hygiene and Tropical Medicine, and Dr. Eugene Aujaleu, of the French Ministry of Public Health and Population. The principal speakers have been Dr. John Burton (London), medical director of the Central Council for Health Education, whose subject was "Health Education of the Public—Present Scope and Future Growth," and Professor Pierre Delore (Lyons), who spoke on "The Role and Possibilities of Health Workers in Health Education of the Public." Other subjects discussed have been "Planning for Health Education of the Public" and "Methods and Techniques in Health Education." The conference was opened on April 11 by Sir John Charles, Chief Medical Officer of the Ministry of Health, and ends on April 18.

Medical Team for Indonesia.—The World Health Organization has recently sent several international teams of medical specialists to countries in the Near and Far East. Each team has comprised about a dozen or so members, all of whom are acknowledged experts in their subjects. The teams remain for two or three months, and the members work alongside their opposite numbers, sharing their experience. One of these teams went to India at the beginning of the year (see *Journal*, February 7, p. 345). Another has just gone to Indonesia for seven weeks. The latter includes four British professors among its thirteen members—Dr. E. W. H. Cruickshank (professor of physiology, Aberdeen), Dr. M. L. Rosenheim (professor of medicine, London), Dr. R. R. Macintosh (professor of anaesthetics, Oxford), and Dr. A. C. Stevenson (professor of social and preventive medicine, Belfast).

Association of Clinical Biochemists.—The inaugural general meeting of the Association of Clinical Biochemists was held at the Postgraduate Medical School of London last month. The formation of the Association goes back to May, 1952, when regional societies of clinical biochemists in Glasgow, the Midlands, North-Western and Southern England set up an interim committee under the chairmanship of Professor E. J. King. The association now formed will be both scientific and professional in the scope of its activities. On the professional side it will concern itself with the status of scientifically qualified biochemists working in hospitals or allied laboratories, who have not hitherto been specifically provided for by professional associations. On the scientific side it will work in the rapidly expanding field of clinical biochemistry, where pathology, clinical medicine, and biochemistry overlap. The association will hold regional and national meetings, at which papers will be read and demonstrations given. Anyone wishing for further information about the association should write to the Secretary, Dr. A. L. Tárnoky, Royal Berkshire Hospital, Reading.

Hunterian Society's Gold Medal Essay Competition.—The subject for this year's essay is "The Management of Peptic Ulceration in General Practice." The competition is open to all general practitioners, and further details may be obtained from the hon. secretary of the Hunterian Society, Mr. A. W. Badenoch, 110, Harley Street, London, W.1. The Society's gold medal for last year's essay competition has been awarded to Dr. D. G. French, of Kidsgrove, for his essay on "The Management of Hypertension in General Practice." A *proxime accessit* award was made to Dr. A. E. de la T. Mallett, of Wimborne.

Missing Harveian Oration.—The library of the Royal College of Physicians of London possesses copies of all the published Harveian Orations with the exception of one—

that delivered in 1849 by Dr. J. C. Badeley. The particulars of this oration, as taken from the Surgeon-General's catalogue, are:

BADELEY (Joh. Carr.) Oratio ex Harveii Instituto in ædibus Collegii Regalis Medicorum habita pridie calend. Julii, A.D. 1849. 20 pp. 8°. London, J. Churchill, 1849.

Anyone who has a copy of this oration for disposal is asked to communicate with Professor E. C. Dodds, F.R.S., Harveian Librarian, Royal College of Physicians, Pall Mall East, London, S.W.1.

Scientific Instruments and the Customs.—Delicate scientific instruments have sometimes to be sent from country to country, and unless very carefully packed they are liable to breakage in transit. In order to avoid their unpacking at frontier customs stations Unesco has recommended the adoption of a special label. Countries participating in the scheme designate the laboratories entitled to use the labels. When one of these laboratories wishes to export an instrument it is packed in the presence of a customs officer, and the label affixed. This will ensure that the package is not opened until it reaches its final destination, where it will be unpacked in the presence of another customs officer. The scheme was originally proposed to Unesco by Britain, and considerable interest is being shown in it. The only British laboratory so far chosen as a participant is the National Physical Laboratory, Teddington.

Medical Photography.—An exhibition celebrating 100 years of medical photography is being held until the end of April at the Royal Photographic Society, 16, Prince's Gate, London, S.W.7 (Mondays to Fridays 9.30 a.m. to 5.30 p.m., Saturdays 9.30 a.m. to 5 p.m.). An unusual collection of old photographs is on view, many of them being of historical interest. A few of the modern ones are in colour, though they hardly display the full possibilities of colour photography in medicine. The modern black-and-white photographs show, as might be expected, a high degree of excellence.

La Presse Médicale's Film Competition.—The results of the second competition for medical films, organized by *La Presse Médicale*, were decided by a jury of expert assessors in Paris last month. The first prize (50,000 francs) and two second prizes (25,000 francs each) went to French exhibitors. Mr. J. T. R. Edwards, a consulting surgeon from Newport, Monmouthshire, was one of four to receive an award of 10,000 francs. His film was called "Resection of the Oesophagus."

Medical Symposium in the Lebanon.—Four British delegates are attending the third Middle East Medical Symposium at the American University, Beirut, thanks to the British Council. They are Dr. C. H. Andrewes, F.R.S., who is speaking on the virus theory of cancer and on poliomyelitis, Professor J. W. Cook, F.R.S., whose subject is "The Chemical Aetiology of Cancer," Professor L. P. Garrod, who is to review antibiotic therapy, and Professor Robert Cruickshank, who is discussing controlled chemotherapeutic trials. After the conference Professor Cruickshank will visit Turkey, and Professor Garrod Syria.

Air Marshal Sir Harold Whittingham has, for the fourth year in succession, been elected chairman of the Standing Medical Committee of the International Air Transport Association, whose recent meeting in Portugal was referred to in the *Journal* of April 11 (p. 843).

COMING EVENTS

Hastings Lecture, 1953.—Professor F. A. E. Crew, F.R.S., professor of public health and social medicine in the University of Edinburgh, is to give this year's Hastings Lecture of the British Medical Association, on May 6 at 6.30 p.m. in the Great Hall of B.M.A. House. His subject is "Medicine and Social Policy." Mr. Walter Elliot, C.H., F.R.S., will be in the chair. The Hastings Lecture is expressly intended for the lay public, and it is hoped that doctors will bring this function to the notice of lay people

who might be able to attend. Admission is free by ticket obtained in advance on application to the Public Relations Department, B.M.A. House, Tavistock Square, London, W.C.1.

Cambridge Medical Society.—A dinner of the Cambridge Medical Society will be held at the University Arms Hotel, Cambridge, on April 22 at 7.30 p.m. Members may bring wives and friends, and tickets (price 21s. per head) are obtainable from the secretary, 22, Parkside, Cambridge.

Medical Art Exhibition.—The annual exhibition of the Medical Art Society, which opened on April 13 at Walker's Galleries, 118, New Bond Street, London, W.1, will remain open daily from 10 a.m. to 5 p.m. (Saturday 10 a.m. to 1 p.m.) until April 25. Admission is free.

Postgraduate Course at Cambridge.—The next symposium arranged for postgraduate students by the Cambridge University Medical School will be on cardiovascular diseases, and will take place at Addenbrooke's Hospital, Cambridge, on April 25 at 10.30 a.m. Those wishing to attend are asked to notify the secretary, Cambridge University Medical School, Tennis Court Road, Cambridge.

Spanish-American Odontology Congress.—The first Spanish-American Congress of Odontology is to be held in Seville from May 1 to 7. The main subjects for discussion will be dental caries, total prosthesis, periodontal disease, and social services. Further details may be obtained from the secretary of the Congress, Villanueva 5, Madrid, Spain.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, April 20

- HUNTERIAN SOCIETY.—At Talbot Restaurant, 7 for 7.30 p.m., annual general (dinner) meeting. Mr. C. Robert Rudolf: Hunteriana—Part III. LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—5.15 p.m., Professor Philip Drinker (Harvard): The Engineer and the Physician in Industrial Hygiene.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. H. J. Seddon: Periphereal Nerve Injuries; 6.30 p.m., Mr. A. J. Gardham: Tumours of the Pharynx.

Tuesday, April 21

- CAERNARVONSHIRE AND ANGLESEY PAEDIATRIC CLUB.—At Clinic, Sackville Road, Bangor, 4.30 p.m., Miss Isabella Forshall: Surgery of the Newborn.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Erasmus Wilson: Demonstration by Dr. B. E. Heard: Structure of Tumour Cells.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. R. Guy Pulvertaft: Care of the Injured Hand; 6.30 p.m., Sir Stanford Cade: Bone Sarcoma.
- SOCIETY FOR THE STUDY OF ADDICTION.—At Medical Society of London, 8 p.m., annual meeting. Dr. W. R. Bett: Vincent Van Gogh (March 30, 1853-90): Artist and Addict.

Wednesday, April 22

- HARVEIAN SOCIETY OF LONDON.—8.15 p.m., discussion to be introduced by Dr. John Hawksley and Professor M. Maizels: P.U.O.
- NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Aintree Hospital, Liverpool, 5.30 p.m., Dr. W. S. Sutton: Bronchiectasis.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Urology Lecture by Mr. Arthur Jacobs: Uretero-colic Anastomosis. The Indications, Methods and Results.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.30 p.m., Professor W. V. Mayneord: Some Clinical Applications of Radioactive Isotopes.
- ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Mr. W. B. Purchase: Experiences at the Bar and as a London Coroner.
- SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP—NUTRITION PANEL.—At Burlington House, 6.15 p.m., papers on synthetic food potentialities. Speakers, Dr. W. F. J. Cuthbertson, F.R.I.C., and Mr. P. N. Williams, F.R.I.C.

Thursday, April 23

- HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. A. Rae Gilchrist: Coronary Sclerosis.
- ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Sir Francis Fraser: Privileges of a Learned Profession.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. F. W. Holdsworth: Management of Paraplegia; 6.30 p.m., Professor C. Wells: Transplantation of the Ureter.
- ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Mr. R. Mailer: Treatment of Peptic Ulceration.
- ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. D. Curran: post-graduate demonstration in psychiatry.

Friday, April 24

- INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., discussion for general practitioners. Mr. S. E. Birdsall: Otitis Externa.
- MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—7.30 p.m., general meeting. Dr. C. S. Nicol and Dr. D. G. ff. Edward: Role of the Pleuropneumonia Organisms in Genital Infection.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6 p.m., Professor F. A. R. Stammers: Use and Abuse of Antibiotics.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Thyroid Adenoma and Malignancy

Q.—What is the magnitude of the risk of simple adenoma of the thyroid becoming malignant? How should the adenoma be treated?

A.—True simple adenoma of the thyroid is a rare condition and can be correctly diagnosed only after removal and histological examination; malignant change in such a tumour is exceedingly uncommon. Nodules (of one sort or another) are, however, a common finding on palpation of the thyroid, and the important thing is to decide whether they are multiple or solitary. Multiple nodules in the thyroid are typically seen in adults living in an area of endemic goitre, but they not infrequently appear sporadically in non-goitrous areas, being particularly common, for example, in London. It is unlikely that a malignant change occurs more often in such glands than in apparently normal ones. Even allowing for the fact that suspicion of a malignant change in a multinodular goitre will lead to its removal, the incidence of cancer in such glands removed by operation is rarely over 5%.

Solitary nodules, however, especially if seen in young patients, should always suggest the possibility of malignancy, and should therefore be removed with a margin of healthy thyroid tissue. If malignant, they are usually of a papillary type of carcinoma which is slow growing, spreads typically by the lymphatics, and even local removal frequently leads to apparent cure. The criteria for deciding to excise such nodules naturally vary according to the views of the individual clinician, but the incidence of malignancy in solitary nodules removed from younger people has been found to be somewhere around 15%. It must be added that, even after removal of the nodule from the patient's thyroid, the pathologist may have great difficulty in deciding whether it is malignant or not. Perhaps it is for this very reason that the reported incidence of malignancy in thyroid nodules has varied greatly in different clinics.

Overdose of Adrenaline

Q.—What is the explanation of extreme pallor, thready pulse, and a severe throbbing headache following the injection of 15 minims (0.9 ml.) of adrenaline for an attack of asthma? Does the reaction contraindicate further adrenaline for the patient concerned, and, if so, what alternative treatment is advised for his asthma?

A.—The amount of adrenaline required in an attack of asthma varies according to the severity of the attack. The symptoms and signs described indicate that too much adrenaline was given for that attack. Further immediate adrenaline would be contraindicated, and, if the asthmatic attack was persisting, intravenous aminophylline (0.5 g. per 20 ml.) given slowly would be advisable. There would be no contraindication to adrenaline being used in subsequent attacks, but much smaller dosage (3 to 6 minims—0.18 to 0.36 ml.) might be tried and repeated if the initial dose was ineffective. It is usually possible to find a suitable dose for the individual patient which will relieve the majority of attacks with little side-effect. It is assumed that the patient is an adult and measures such as ephedrine, aminophylline, neb. adrenal. et atrop. co., and isopropyl-noradrenaline have been tried and found ineffective.

"Butazolidin"

Q.—What are the indications for butazolidin? How should it be given, in what dosage, and for how long? What side-effects must be watched for?

A.—Butazolidin (phenylbutazone) has been used to treat arthritis and related conditions, including typical progressive rheumatoid arthritis, osteoarthritis, gout, ankylosing spondylitis, degenerative joint disease of the spine, and Paget's disease. Symptomatic relief has been reported in a high proportion of cases, many of which had failed to respond to physiotherapy, rest, or gold treatment. Pain and tenderness were lessened and grip improved, but there is little evidence that swelling was reduced or that the E.S.R. was lowered, or that the drug had any effect other than that of a good analgesic and antipyretic agent.

Butazolidin has been administered intramuscularly, 0.6–1 g. daily for 10 days, then every second day for 10 more days, and every third day for three further injections. Prolonged pain and inflammation often occurred at the site of injection. It has also been given orally, 1 g. daily in divided doses for three days, then 1 g. on alternate days for two to four weeks, after which the dose was reduced to the lowest effective level, usually three to four 200-mg. tablets two or three times a week. Relief began 24 to 36 hours after starting oral treatment. Symptoms returned in a few days or weeks after treatment ended.

Toxic effects are considerable, especially with doses above 600 mg. daily. Nausea, diarrhoea, and drug rash are frequent, but usually mild. Fluid retention occurs commonly, and the drug should therefore not be given to older patients or to those with diminished cardiac reserve. It is also contraindicated when peptic ulcer is present or suspected, as it has caused severe gastric haemorrhage. Fatal agranulocytosis has been reported. Frequent counts of white blood corpuscles and platelets must be made (see *Journal*, 1952, 2, 1401).

A Rabbit's Blood Pressure

Q.—How can I take a rabbit's blood pressure? Is it possible to use the tail as in rats?

A.—The length and hairlessness of a rat's tail positively invite the plethysmographic method used for measuring a rat's blood pressure, but it could not be applied to the fluffy brevity of a rabbit's scut. A simple method exists, however, in the Grant capsule,¹ by which that pressure is measured which, when applied directly to one ear, just obliterates the central artery (to direct inspection). The results agree well with the mean femoral arterial pressure measured directly (provided certain simple precautions are taken), and are about 10–15 mm. mercury below carotid arterial pressure.

REFERENCE

- ¹ *J. Physiol.*, 1934, 81, 265.

Recurrent Unilateral Conjunctivitis

Q.—What is the aetiology of recurrent attacks of unilateral conjunctivitis without discharge, most marked on the palpebral conjunctiva, accompanied by some oedema of the lids and provoked by cold winds? The condition is rapidly controlled by mild silver proteinate, but how can it be prevented?

A.—The findings suggest that these attacks have a vasomotor rather than an infective basis in spite of the favourable response to silver proteinate. Exposure to cold probably acts as a trigger, setting off attacks to which the patient is already predisposed. A search should be made for sources of irritation or infection in the nasal sinuses and teeth; if found, these would probably be on the same side as the affected eye and their elimination should relieve the condition. As the condition is unilateral, allergy to exogenous agents appears unlikely, but conjunctivitis due

to endogenous allergens, usually bacterial, is not infrequent. Of these the commonest is perhaps the *Staphylococcus aureus*, infection with which may be found in the patient's lids, anterior nares, or nasopharynx, swabs from which should be taken. If this organism is found, chemotherapy, even with agents to which it is sensitive, is unlikely to be of more than ephemeral benefit. The indiscriminate use of vaccines has quite deservedly fallen into disrepute, but bacterial or allergic inflammation of the lids and conjunctiva caused by *Staphylococcus aureus* appears to be one of the probably few conditions in which a three-months course of vaccine injections helps to a considerable extent, and investigation along these lines might well form the second line of attack.

Suffocation in a Fire

Q.—When a person is suffocated in a fire, are unconsciousness and death due to lack of oxygen or to the effect of poisonous gases? If the latter, which gases are principally concerned? What is the correct treatment?

A.—Although, in the past, it was thought that accumulation of carbon monoxide and carbon dioxide was the principal menace to life in fire fumes, it has become increasingly clear that shortage of oxygen (partly owing to its being used in burning and partly owing to its displacement by fire fumes and smoke) is by far the more sinister factor. Measurement of the carbon monoxide saturation of the blood in fire deaths seldom gives readings of over 30–35%, and in the presence of adequate oxygen (even at atmospheric partial pressure) this would not in itself menace life. In many cases, in fact, the carbon monoxide reading is a mere 12–20%, and it is quite plain from the profound cyanosis and many anoxal petechiae which are present that shortage of oxygen is the significant factor.

Oxygen—without carbon dioxide—is plainly urgently required, and, provided the air passages are not choked with sooty mucus and that there is an effective circulation, assisted respiration (with oxygen if possible) is all that is immediately desirable: the air passages must be cleared of mucus. It is no longer thought that methylene blue or other dye injection improves the oxygen-carrying capacity of the blood, or assists the action of cell oxidases. Some hours must elapse before the stable compound of haemoglobin with carbon monoxide (it is 300 times as stable as that with oxygen) is dispersed by the new oxygen made available. Treatment must not be considered adequate because immediate improvement ensues, and hospitalization is desirable wherever unconsciousness has occurred, however short-lived it may have been.

Thrombosis and Intravenous Infusion

Q.—What factors predispose to thrombosis during and after intravenous infusions? What preventive measures are worth taking?

A.—It is probable that the duration of the infusion is the most important factor in determining the onset of thrombosis when relatively bland fluids are injected into veins. It follows that one important preventive measure is not to allow an infusion to run into any particular vein for more than eight hours. When patients have to receive intravenous infusions for longer periods than this a fresh needle or cannula must be inserted into a vein at a new site.

Another factor which is known to predispose to thrombosis is the injection of solutions which are strongly hypertonic—e.g., 50% glucose. If such solutions have to be given to a patient over a long period it is best to pass a polythene tube up an arm vein until the tip reaches a very large vessel such as the superior vena cava. In such a site the infused fluid will be so rapidly diluted that damage to the vein is very unlikely and the tube can be left in position for many days.

NOTES AND COMMENTS

Pregnancy after Subarachnoid Haemorrhage.—Dr. W. GRIFFITH LOVE (Burton-on-Trent) writes: With reference to the question on this subject ("Any Questions?" April 4, p. 793) the following notes may be of interest. Mrs. M. W., aged 26. August, 1947, normal confinement, male child, healthy. Puerperium normal. February, 1949, admitted to Burton General Infirmary with severe subarachnoid haemorrhage. April, 1949, discharged from hospital with "very guarded prognosis." This patient became pregnant again in 1952. Apart from slight hyperemesis which was easily controlled by "avomine," the pregnancy was uneventful. She was confined on March 18, 1952. Duration of labour was eight hours. Trichlorethylene was administered during the second stage. The puerperium was quite uneventful.

Troublesome Cough in a Child.—Dr. MARGARET EGAN (Manchester) writes: The answer about troublesome night cough in a child ("Any Questions?" February 14, p. 413) suggested a post-nasal drip stimulating the cough reflex. Sinus and antrum infection is much commoner in children than is generally known, and if successfully treated usually clears up the discharge and obviates the cough.

Dr. MORRIS WITKIN (Johannesburg) writes: With reference to the "Any Question?" on this subject (February 14, p. 413) I would suggest the following approach. As this girl of 5 does not cough much during the day the cause of the trouble may be found in her bedroom. Place the bed preferably between two inside walls. Discard woollen or fluffy blankets; use cotton ones instead. Try a new pillow and use two pillow-slips. Replace old curtains and carpets with washable rugs and light curtains. There must be nothing underneath the bed or on top of the wardrobe. Ensure scrupulous cleanliness and minimum of furniture. Taboo embrocations and liniments. Forbid strong perfumes and pungent floor polish in the room. Keep pets out. Bedding must be aired daily. Give light supper and try daily bath in morning. Ventilate the room freely when not in use and see there is sufficient aeration at night.

OUR EXPERT writes: Dr. Egan's comment that "sinus and antrum infection is much commoner in children than is generally known" is certainly correct. The trouble is that the condition is so difficult to treat. I believe that the best policy is to give the ephedrine drops recommended in my answer, and quite often they work. Surgical treatment on the nose of a child, even just an antral washout, is most unpleasant and is not to be recommended unless really thorough treatment with ephedrine drops has failed and unless the child is suffering in health.

With regard to Dr. Witkin's letter, asthma may in early childhood present as a nocturnal cough, but the one in question followed colds, and seems much more probably to be the sequel of upper respiratory infection: this is, after all, very common in infancy during the winter. Dr. Witkin suggests a regime which is going to cause an upheaval in the home and which will be both difficult and costly to carry out. If an asthmatic element were thought to be present, some steps on the lines he has suggested would be worth taking; his emphasis on good ventilation of the bedroom is certainly of value.

Spontaneous Combustion of Alcoholics.—Dr. H. H. MACWILLIAM (Liverpool) writes: With regard to the question on this subject ("Any Questions?" April 4, p. 793) I remember a case in which death was rapidly followed by the development of an extreme degree of generalized oedema. When the skin was punctured gas escaped with a loud hissing noise. I ignited the gas, and it went on burning like an old-fashioned gas jet until tired of the spectacle.

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THE HAZARDS OF PREGNANCY IN WOMEN WITH HEART DISEASE*

BY

CRIGHTON BRAMWELL, M.D., F.R.C.P.

Professor of Cardiology in the University of Manchester

It is a terrible disappointment to a young woman to be told that, because she has a bad heart, it would be unwise for her ever to have children. Fortunately, in the great majority of cases, heart disease is no contraindication to pregnancy. The risk has in the past been grossly exaggerated, because writers on the subject have based their opinions on general impressions, which are notoriously fallacious.

In my clinic at the Manchester Royal Infirmary, during the last twenty-five years, my colleagues and I have followed through pregnancy, labour, and the puerperium more than 1,600 patients with organic heart disease. Many of these patients have been followed through more than one pregnancy, and others have been kept under observation for a year or more after delivery. Two samples from this group have been carefully analysed. In 1938 Edith Longson and I reported our findings in the first 350 cases (Bramwell and Longson, 1938), and an analysis of 500 of the more recent cases, studied by my colleagues Morgan Jones (1952) and Samuel Oleesky, has now been completed. It is interesting to compare these two series of cases and to see how our views regarding the management of this condition have changed during this period.

Assessment of the Risk

In attempting to assess the probable risk of pregnancy in patients with heart disease, it is convenient to classify cases in three groups:

I. In the first group are those patients in whom the heart disease is so trivial that it does not add appreciably to the risk of childbirth. Provided they are kept under medical supervision, these patients rarely cause any anxiety.

II. The second is the largest group. It consists of patients in whom the heart disease is such that it does add appreciably to the risk, but the risk is not regarded as prohibitive. The more severe cases in this group call for much discrimination and judgment on the part of the physician. Many factors other than the severity of the heart disease, such as the age of the patient, the facilities for antenatal and post-natal care, and the number of children in the family, must be taken into account in arriving at an assessment.

III. The third and smallest group consists of those patients in whom the risk is obviously so great that it

*A lecture to the Dundee Branch of the British Medical Association delivered on December 16, 1952.

would be unwise to sanction pregnancy, or if pregnancy is already established termination should be advised. Unfortunately some patients in this group are not seen until pregnancy is far advanced, and the risk of termination may then be greater than the risk of allowing pregnancy to continue. When termination of pregnancy is refused on religious grounds the decision is clearly no longer in the hands of the physician.

In assigning patients to their respective groups we have relied, in the first instance, on an estimate of the functional efficiency of the heart, based on the patient's exercise tolerance prior to pregnancy. I emphasize the words "prior to pregnancy," for as pregnancy proceeds the tolerance for exercise diminishes, and if a patient is not seen till late in pregnancy a false impression may be formed of her cardiac disability.

Roughly speaking, Group I consists of patients who had been able to undertake their household duties and other normal activities without breathlessness or other symptoms, while Group III consists of those who had experienced one or more episodes of congestive heart failure prior to pregnancy and also those in whom the rheumatic process appeared to be still active, or the cardiac condition showed evidence of rapidly progressive deterioration. Patients whose mobility had been limited to a greater or lesser extent, but who had not actually been in failure and whose heart disease appeared to be quiescent, are placed in Group II.

We must, however, consider not only the risk to the mother but also the prospect of a successful pregnancy which makes that risk worth taking. In our later series, four out of five pregnancies yielded living children, but of 53 patients with severe heart disease, who either refused termination or were first seen too late to terminate pregnancy, only one in four had a living child.

The Hazards of Pregnancy

(1) Congestive Heart Failure

Clearly the most important consideration in these patients is the risk of death from heart failure. There were 15 deaths from this cause in our earlier series, and these cases may be divided into two groups.

Four were women aged 39 or over (Table I), three of whom were in their seventh or later pregnancy, and three had established auricular fibrillation. In these four cases the patients' expectation of life was already very limited owing to the advanced state of the disease. Any additional strain, whether physical or due to intercurrent infection,

TABLE I.—Deaths from Heart Failure

Age	Parity	Time after Confinement	Remarks
40	7	5 months	A.F. A.C. A.F. A.C. A.F. A.C.
43	7	3 "	
39	14	2 "	
39	5	3 weeks	

A.F.—Auricular fibrillation. A.C.—Attended antenatal clinic.

might have proved fatal. In their case the strain happened to be pregnancy. They were, in fact, all cases in which we should regard pregnancy as contraindicated, and would have advised termination had they been seen earlier in pregnancy.

The other 11 cases (Table II) were of quite a different type. They were younger women, seven of them primigravidae, their heart disease was less advanced, and all but

TABLE II.—Deaths from Heart Failure

Age	Parity	Time After Confinement	Remarks
29	1	Undelivered	A.F. A.C.
25	1	Same day	
27	3	1 day	
32	2	3 days	
30	1	3 "	
24	1	3 "	
27	2	3 "	
33	1	6 "	
36	2	4 weeks	
25	1	5 "	
24	1	6 "	
		9 "	

two had normal rhythm. There was another common factor in this group—only one of these patients had attended the antenatal clinic, the other 10 had been admitted to hospital in the later months of pregnancy as "urgencies" on account of heart failure. This we regard as most significant, for it is our experience that, in women who are pregnant, congestive heart failure, if recognized early, responds well to treatment, and it is only when the condition is allowed to run on unchecked that it becomes irreversible. Adequate antenatal supervision is, we believe, the most important single measure in limiting the risk to which these patients are subject.

Intercurrent complications, especially bronchial infection and anaemia, are apt to precipitate heart failure in patients with rheumatic heart disease. Bronchitis, influenza, and even the common cold must be treated with great respect in these patients. In foggy weather they should be confined to the house, crowds and places of public entertainment should be avoided, and in the event of infection they should be put to bed and kept there until they are fully convalescent. In our experience anaemia is often overlooked. This is particularly unfortunate, since adequate treatment of the anaemia will usually relieve the heart failure.

The common sequence of events in the later stages of mitral stenosis is the development of auricular fibrillation followed by congestive heart failure. The onset of heart failure is usually insidious, with gradually increasing oedema of the dependent parts of the body, enlargement of the liver, and engorgement in the veins of the neck. These signs are easily recognized. A few weeks' treatment in hospital will generally suffice to restore the normal balance, and the cardiac function may be satisfactorily controlled throughout the remainder of pregnancy, provided the patient is kept under supervision. If this were the only danger we had to face, assessment of the risk would be easy, but occasionally things take quite a different course.

(2) Acute Pulmonary Oedema

When congestion affects the pulmonary instead of the systemic circuit, heart failure manifests itself by paroxysmal dyspnoea (cardiac asthma) and acute pulmonary oedema. The suddenness with which these symptoms may develop contrasts strikingly with the more insidious onset of congestive heart failure in the systemic circuit. They constitute a grave emergency, which may prove rapidly fatal. In our

later series, 7 of the 11 deaths from heart failure which occurred during pregnancy or within eight months thereafter were due to this cause, a very heavy mortality considering that only 16 patients in the whole series developed acute pulmonary oedema.

Acute pulmonary oedema used to be regarded as a rare complication of mitral stenosis, and its greater frequency in association with pregnancy was attributed to the increased blood volume and the increased retention of salt and water in the body. The successful surgical treatment of mitral stenosis, however, has led to a more intensive study of this valvular lesion and has shown that acute pulmonary oedema is not nearly such a rare complication as we used to believe. It is, in fact, one of the most urgent indications for mitral valvotomy.

In the earlier years of investigation we did not fully appreciate the importance of acute pulmonary oedema, and regarded it merely as a type of heart failure. In 1941, however, our attention was urgently directed to the matter by two cases under my care, both of which proved fatal. The post-mortem findings in these two patients (reported by Bramwell and Jones, 1944) were illuminating. During life both had normal rhythm with a very loud crescendo presystolic murmur, and at necropsy were found to have a buttonhole mitral stenosis with great hypertrophy of the wall of the left auricle. This combination suggested that the rheumatic process had hit the valve hard, but spared the muscle. In spite of the extreme degree of stenosis the hypertrophied auricle had for many years been able to maintain ventricular filling, when suddenly, under the strain of pregnancy, it failed, the lungs were flushed with blood, and pulmonary oedema developed, rapidly proving fatal.

It is in cases such as these, with normal rhythm and a loud presystolic murmur, that pulmonary oedema is most likely to develop. Whereas in children the murmur of mitral stenosis is generally heard in mid-diastole, in older patients the most striking feature is the crescendo murmur in presystole. This difference can be accounted for by the fact that in young subjects the blood flow from auricle to ventricle is most rapid when the mitral valve first opens, whereas in older people the auricle, having had time to hypertrophy, expels its contents much more forcibly, and consequently the rate of blood flow through the mitral orifice attains its maximum during auricular systole. In patients with a loud crescendo presystolic murmur during life, an extreme degree of narrowing of the mitral orifice is often found at necropsy. The high degree of mitral obstruction having called forth a compensatory work-hypertrophy in the auricle, which manifests itself clinically by a loud crescendo presystolic murmur. Such hypertrophy occurs only when the heart muscle is healthy; a damaged auricle, when subjected to strain, fibrillates.

The grave nature of acute pulmonary oedema makes it vitally important to be on the look-out for any signs which give warning that it may develop, for if these are manifest during the early months of pregnancy therapeutic abortion is indicated. Unfortunately, acute pulmonary oedema usually first makes its appearance in mid-pregnancy, by which time emptying the uterus has become a much more serious matter on account of the dangers of embolism, shock, and haemorrhage. An isolated attack of acute pulmonary oedema should always be regarded as a warning that further trouble of a similar nature must be expected in the future. Although systemic and pulmonary congestion often occur together, pulmonary congestion may lead to fatal acute pulmonary oedema before any systemic oedema or other signs of right heart failure are evident, and it is then that it is most likely to take us by surprise.

The importance of the early recognition of pulmonary congestion cannot be over-emphasized. Its clinical manifestations are paroxysmal dyspnoea and repeated haemoptysis; later, persistent moist rales appear at the lung bases. A rapid increase in weight during mid-pregnancy should lead one to suspect excessive water retention in the body. There is a progressive diminution in vital capacity, but the most

convincing evidence is derived from radioscopic examination of the chest, which yields direct visual proof of the congested state of the lungs. In any clinic devoted to heart disease in pregnancy, facilities for x-ray screening are an absolute essential. The electrocardiogram, on the other hand, gives us little help in these cases.

Before the introduction of mitral valvotomy we used to advise termination of pregnancy in all such cases, but within the last few months Baker, Brock, Campbell, and Wood (1952), in London, and Logan and Turner (1952), in Edinburgh, have reported cases in which valvotomy has been successfully performed during pregnancy, and the pregnancy allowed to proceed to a normal termination. In patients with pulmonary congestion, valvotomy should be undertaken before they become pregnant.

Brock also suggests, on theoretical grounds, that patients with coarctation of the aorta who are pregnant should be submitted to operation. With this suggestion I cannot agree. This is a very serious operation which carries a high mortality, and the only risk these patients run is rupture of the aorta at the time of delivery, a risk which can be avoided by caesarean section.

(3) Auricular Fibrillation

This is a common precursor of heart failure. It is a milestone well down the road of rheumatic heart disease and a warning that heart failure is not far ahead. As such, it merits especially careful consideration in assessing the risk of pregnancy.

In the early days of this investigation we were unduly afraid of this complication, having been impressed by the high mortality reported by some earlier workers (Table III).

TABLE III.—Auricular Fibrillation

	Cases	Deaths
Carr and Hamilton (1933) ..	14.	6
Robinson (1927) ..	18	13
Hunt (1926) ..	22	8

Further experience, however, has led us to believe that under favourable circumstances it is not incompatible with successful pregnancy.

In our earlier series of cases, 24 patients developed auricular fibrillation either before or within six months of delivery. Of these, seven died. This is a heavy mortality, but careful scrutiny (Table IV) of our fatal cases suggests that the picture is not quite so gloomy as it appears at first sight.

TABLE IV.—Fibrillators who Died

Fibrillation Developed	Parity	Age	Remarks
Before pregnancy	14	39	Cerebral embolism. C.S.
	1	35	
	1	30	
During pregnancy	2	32	"Urgency" Induced 36 weeks. "Urgency"
	1	26	
	7	43	
After delivery ..	5	39	

C.S.—Caesarean section.

In three cases pregnancy was clearly contraindicated, and termination would have been advised had they come under observation earlier in pregnancy. Two were women who developed fibrillation after delivery in their fifth and seventh pregnancies respectively. They were aged 39 and 43. In both of these patients the strain of labour undoubtedly precipitated a final breakdown in a heart which was nearing the end of its tether in the normal course of the disease. The third was a woman of 39 in her fourteenth pregnancy who had fibrillation when first seen. Of the remaining four fatal cases in this group, two died of intercurrent post-operative complications and one other had not received adequate antenatal care. Thus it is conceivable that under the most favourable circumstances we might have lost only one of these seven patients.

These considerations led us to modify our previous opinion and to believe that, although auricular fibrillation does undoubtedly add to the risk of pregnancy, it does not constitute a bar to pregnancy, provided the patient can be kept under observation and receive adequate treatment. In our later series 19 patients had auricular fibrillation, and only two died.

(4) Other Considerations

In patients in Group II, who have never actually been in failure but whose tolerance for exercise is limited to a greater or lesser extent, the strain on the heart adds in varying degree to the risk of pregnancy. Those in whom there is considerable limitation of activity are the most difficult to assess, and various factors other than the severity of the heart disease must be taken into account in framing the prognosis.

Clearly a previous trouble-free pregnancy affords the surest ground for optimism, provided the patient's cardiac condition has not deteriorated since her last confinement. The first pregnancy eliminates most of those likely to succumb. Women under 35 are better risks than those over that age. Consequently the risk is smallest in young women who have already had one or more children.

Some workers have attached more weight than others to the size of the heart in assessing the risk of pregnancy. Our own experience leads us to believe that it is much less important than the functional efficiency of the heart as estimated by the exercise tolerance, and in this connexion it is especially significant that many patients who develop acute pulmonary oedema have but little cardiac enlargement.

When we embarked on this investigation we expected to find that patients whose only valvular lesion was mitral stenosis would do better than those who had both a mitral and an aortic lesion. This forecast has not proved to be correct. Whereas, in our earlier series, amongst 260 patients with uncomplicated mitral stenosis there were 20 deaths (8%), there was only one death (3%) amongst the 31 patients with both mitral stenosis and a lesion of the aortic valve. Our experience is similar to that of most other workers in this country.

Aetiology

Let me refer very briefly to the question of aetiology. About 90% of cases of heart disease in pregnant women are rheumatic, and most of the remaining 10% congenital.

In rheumatic heart disease the orthodox teaching was that the more attacks of rheumatic fever or chorea from which a patient had suffered, the more severe was the heart lesion likely to be. This seemed a reasonable assumption, since each attack was likely to add to the previous damage. It therefore came as somewhat of a surprise to us to find that the mortality was highest in those cases in which there was no history of rheumatic infection, and in which heart disease, previously unsuspected, had been discovered either at a routine medical examination or when the doctor had been called in to attend the patient for some minor ailment.

Out of 293 cases of mitral stenosis, admittedly a rheumatic lesion (Table V), 173 gave a history of rheumatic fever or chorea, and, of these, nine died before or within six months

TABLE V.—Mortality in Patients with Mitral Stenosis

History	No. of Cases	No. of Deaths
Rheumatic fever or chorea ..	173	9 (5%)
No previous illness ..	32	9 (28%)

of confinement. Of the remaining 120, 88 dated their symptoms from an attack of muscular rheumatism, tonsillitis, or some other acute infection, while in 32 there was no history of any antecedent disease, their first manifestation of ill-health having been cardiac. Of these 32, 9 died before or within six months of confinement. Thus the mortality in patients with a rheumatic history was 5%,

whereas the percentage of those with no previous history of illness was 28%. I think the explanation of this is that children with acute articular rheumatism or chorea are put to bed and kept there to prevent cardiac damage, whereas in those whose joint and nervous manifestations are minimal the true nature of the illness is apt to be overlooked, and consequently no such precautions are taken.

There were 19 cases of congenital heart disease in our earlier series, and in 13 of these the lesion was of a relatively trivial nature. The only patient who died was a 3-para of 27 with cyanotic heart disease and great cardiac enlargement, first seen at the eighth month of pregnancy.

Subacute bacterial endocarditis is an important complication of pregnancy. In 1946-7 my department participated in the investigation, planned by the Medical Research Council, on the treatment of this condition with penicillin (Bramwell, 1948). Of the first 33 cases in our series 22 were women, 7 of whom were pregnant. Of these seven, two were moribund when first seen, the true nature of the condition having escaped recognition, and the infection having been present for many weeks before treatment was started. Both these patients died, but their babies survived. The other five patients came under our care much earlier in the course of the disease and all survived, the infection having been satisfactorily controlled. In these seven cases we lost only one child—a macerated foetus.

Unexplained fever in any patient with valvular or congenital heart disease who is pregnant calls for immediate blood culture, since the duration of infection is one of the most important considerations in prognosis in subacute bacterial endocarditis.

Remote Prognosis

Now what about the ultimate prognosis in these patients? Most earlier workers believed that pregnancy always produced a permanent aggravation of the cardiac disability. We now know that is not true. As patients grow older the disability resulting from rheumatic heart disease tends to increase, and if deterioration is observed it is often difficult to say whether this is attributable to pregnancy or merely to the normal course of the disease.

Gilchrist and Murray-Lyon (1933) made some interesting observations on this point. They studied the age at death in 109 cases of mitral stenosis that came to necropsy, in all of which death was directly attributable to heart disease. Forty of these cases were males and 69 were females—28 nulliparous and 41 parous. The average age at death was 39.3, 42.1, and 42.0 respectively. I think we can hardly blame pregnancy for the earlier death in the male group, though Mr. Punch, in one of his most famous cartoons, did suggest that childbirth was a great strain on the father! In the case of the females there is no appreciable difference between the parous and nulliparous women as regards the average age of death, but one must take into consideration the fact that only the fitter women marry, and, of those who do marry, the fitter are more likely to have children.

In these three groups there was little difference in the number of survivors at different ages, and had pregnancy exerted a detrimental influence one would have expected a higher mortality amongst the parous women during the child-bearing period.

Our own observations have convinced us that, in young patients at any rate, pregnancy is rarely detrimental. Morgan Jones followed up his cases after delivery until the cardiac condition had either shown deterioration or been stabilized at its previous level. Twenty-five patients died, and it was found that, of the 475 who survived, 427 (90%) showed no obvious deterioration as the result of pregnancy.

Treatment

If I were asked what I regarded as the most important consideration in the treatment of patients with heart disease who were pregnant, I should have no hesitation in saying that it is never, under any circumstances, to interfere with

pregnancy in a patient with heart failure until all has been done that can be done—and that is often a great deal—to relieve the heart failure. When a woman is admitted to hospital as an “urgency,” desperately ill with a failing heart, it is tempting to think that, to save life, the termination of pregnancy is indicated. It is not. In these circumstances surgical intervention is an unjustifiable risk. It is surprising how well many of these patients respond to treatment. A few days’ rest in bed, with skilled nursing, digitalis, and sedatives, will often convert what was a hopeless case into a reasonable surgical risk. When the heart condition has been stabilized, and not before, is the time to consider whether pregnancy should be terminated.

In such cases, when the heart failure had been relieved, we used to recommend caesarean section; but further experience has convinced us that normal delivery carries less risk, and, with the single exception of coarctation of the aorta, in which condition there is danger of rupture of the aorta at the time of labour, we always advise that, in the absence of obstetric indications, pregnancy should be allowed to pursue its normal course. Workers in other centres have come to the same conclusion (Haigh and Gilchrist, 1949).

The more we have studied this problem the more reluctant have we become to interfere with pregnancy. This change in policy is, we believe, partly responsible for the improvement in our results, seven deaths in our earlier series having been due to post-operative complications following termination of pregnancy.

When we first embarked on this investigation it was generally thought that the strain on the heart increased progressively as pregnancy advanced, and on this account the induction of premature labour (or caesarean section) before full term was often advised in women with heart disease to avoid the strain of the final month of pregnancy. We now know that the blood volume and cardiac output do not increase, but actually diminish, during the last few weeks of pregnancy. These facts have led us to modify our views regarding the management of such cases. There is little danger of heart failure developing during the last month of pregnancy if it had not been present previously, and there is therefore no purely cardiac indication for terminating pregnancy at this stage, since the strain on the heart will not be increasing but diminishing. Admittedly the presence of a cardiac lesion would justify operative intervention in those borderline cases in which there is some obstetric complication that by itself alone might not have done so.

Finally, let me remind you once again of the importance of adequate antenatal supervision. When Edith Longson and I came to analyse the first 350 cases in our series we found that 325 had attended the antenatal clinic and only 25 had been admitted as “urgencies.” Fourteen of the urgencies and 11 of the quiet cases proved fatal, so that the death rate among urgencies was 56%, as compared with 3% among quiet cases.

Similar results had been reported elsewhere (Table VI).

TABLE VI.—“Urgency” Death Rate

	No. of Cases	Total Deaths	“Urgency” Deaths
Bramwell and Longson (Manchester)	350	25	14 (56%)
Carr and Hamilton (Boston)	500	32	16 (50%)
B. P. Watson (1933) (New York)	240	17	8 (47%)

But we can go a step further, for in 10 of our 25 fatal cases death was due not to heart failure but to other causes. In the 15 patients who died of heart failure the figures are even more striking. Of these, 11 were urgencies and only 4 quiet cases. Thus the death rate from heart failure in our quiet cases was 1% as compared with 44% amongst urgencies. These figures convinced us of the importance of adequate antenatal supervision.

In our pregnancy cardiac clinic at the Manchester Royal Infirmary the almoner plays an important part. Her experience enables her to resolve many of the patients’ difficulties and to arrange home help, to tide over the emergency, in case of need. From the psychological aspect, also, we believe this special clinic has proved useful. The newcomers get talking with the old hands, who have been through the mill before, and begin to realize that heart disease is not nearly such a terrible thing as they had been led to believe.

James Mackenzie

I cannot conclude my lecture without reference to the work of a very remarkable man—a man who was keenly interested in this problem and who wrote a book on heart disease in pregnancy (Mackenzie, 1921). He must have been a familiar figure to the older members of my audience, for he spent the Indian summer of his life in St. Andrews.

James Mackenzie was a Highlander. He was educated at Perth Academy and Edinburgh University. The next twenty-five years—the most productive years of his life—were devoted to general practice in Burnley. His work there is commemorated by a tablet on the wall of the house in which he practised. During the war this tablet was removed, for the powers that be considered that the word “Burnley,” which appeared in the inscription, might prove helpful to the enemy in the event of invasion.

As an undergraduate Mackenzie won no special academic distinction. Later, however, he proved himself to be an investigator of outstanding merit and a man who made the fullest possible use of his opportunities. Mackenzie will probably go down to history as the man who solved the riddle of the cardiac irregularities. This he did by means of his clinical polygraph; all the earlier models of this instrument were made for him by Mr. Shaw, a local watchmaker.

But far more important was his work on prognosis, based on his own clinical observations. I have never ceased to marvel that such a popular and busy family doctor could find the time, and have the energy, to keep such wonderful records of his cases. The hours for research were literally snatched from the rush of general practice. It was these records of his cases in Burnley which enabled Mackenzie finally to overthrow the dictatorship of the stethoscope, which had dominated cardiology for nearly a hundred years.

Summary

The chief dangers to be faced in patients with heart disease who are pregnant are acute pulmonary oedema and congestive heart failure. The former calls for special vigilance on account of the suddenness with which it may develop, and in every case of mitral stenosis clinical or radiological evidence of pulmonary congestion must be regarded with grave apprehension. Congestive heart failure with oedema, if recognized early, usually responds well to treatment.

Auricular fibrillation, though a recognized precursor of heart failure, is not necessarily a bar to pregnancy, provided adequate antenatal and post-natal care can be assured. In assessing the risk, the previous obstetric history, age, economic conditions, and temperament of the patient must all be taken into account.

In patients with heart failure, surgical intervention should never be contemplated until the heart failure has been treated. Patients with heart disease tolerate pelvic delivery better than caesarean section.

In patients with advanced heart disease pregnancy is contraindicated. If, however, pregnancy is already established and the patient is seen within the first three months, it should be terminated, but, if she is not seen until later, it should be allowed to run its normal course. Alternatively, mitral valvotomy may be considered.

There is no purely cardiac indication for anticipating normal delivery.

All patients, however trivial their heart disease, should be kept under observation throughout pregnancy, and intercurrent infection and anaemia promptly treated.

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TREATMENT OF GENITO-URINARY TUBERCULOSIS FURTHER REPORT

BY

J. COSBIE ROSS, Ch.M., F.R.C.S.

J. G. GOW, F.R.C.S.

AND

C. A. ST. HILL, M.B.

(From the Royal Southern Hospital, Liverpool)

In 1951 we published a preliminary report on the treatment of 51 cases of genito-urinary tuberculosis (Ross *et al.*, 1951). The present communication includes a record of a further 47 patients similarly treated, and a follow-up of the earlier series. It is necessary to emphasize once more that a long-term view must be taken of this disease, as it is possible to encounter patients who have survived for many years after a bilateral renal lesion has been confirmed and in spite of the absence of treatment of any kind.

Classification.—No patient was accepted for treatment until a positive guinea-pig inoculation test put the diagnosis beyond all reasonable doubt. At the same time no case, however serious, was refused treatment. The patients were divided in five groups: (1) minor unilateral lesion or subclinical focus; (2) lesion of one kidney with cystitis and nephrectomy; (3) bilateral disease and nephrectomy of the worse kidney; (4) infection of the remaining kidney; and (5) severe bilateral disease. We realize that this is not a perfect classification, but for the purpose of uniformity in assessing the results we have not altered it on this occasion.

Method of Treatment

In addition to the regime described below, the ordinary surgical measures, such as nephrectomy and epididymectomy, were carried out when required, with the proviso that the optimum time was selected for the operation. For example, nephrectomy was often performed during the second or third course of streptomycin.

The whole course of treatment lasted six months, during which time the patient received the usual sanatorium regime at Wrightington Hospital. The three drugs used were: (a) “Ethizone” (*para*-ethylsulphonylbenzaldehyde thiosemicarbazone, or T.B.3), beginning at 50 mg. daily and gradually increasing by weekly increments of 200 mg. daily. Ethizone was given continuously for the six-months course of treat-

ment. (b) *Para*-aminosalicylic acid (P.A.S.), 18 g. daily, given at three-hourly intervals for periods of 25 days, alternating with (c) dihydrostreptomycin, 1 g. twice a day for a period of 35 days. A mixture containing 30 gr. (2 g.) of potassium citrate and 5 gr. (0.32 g.) of potassium iodide was given thrice daily throughout the streptomycin periods.

Originally it was a difficult matter to render and maintain the urine alkaline, but as a result of recent extended tests we have found the following mixture both palatable and effective:

Potassium citrate	..	..	30 gr. (2 g.)
Sodium citrate	..	..	30 gr. (2 g.)
Potassium acetate	..	..	20 gr. (1.3 g.)
Syrup of lemon	..	..	7½ min. (0.45 ml.)
Extract of liquorice	..	..	7 min. (0.42 ml.)
Aqua	..	..	ad ½ oz. (14 ml.)
½ oz. (14 ml.) four times a day			

We have already given our reasons for this method of treatment (Ross *et al.*, 1951), which has been gradually evolved as a result of experience. Briefly these reasons are:

(1) Each of the three drugs probably exerts a different effect on the tubercle bacillus, and it seems logical to use all three in the hope of achieving the maximum effect.

(2) Lattimer *et al.* (1950) have shown that in order to maintain an adequate concentration of streptomycin in the blood it is desirable to give 1 g. every twelve hours. The concentration in the blood following intramuscular injection of 1 g. of streptomycin is as follows:

1 hour	..	14-31 u./ml.	6 hours	..	8-15 u./ml.
2 hours	..	22-38 "	7 "	..	6-10 "
3 "	..	18-22 "	10 "	..	5-9 "
4 "	..	14-18 "	12 "	..	3-4.5 "
5 "	..	10-13 "			

(3) Lattimer *et al.* also pointed out that the incidence of toxicity rapidly increased after 60 days and was invariably present at 120 days, using 2 g. of streptomycin daily. We have therefore adopted the intermittent method of administering streptomycin to counteract this tendency.

(4) By using the alternating technique we hoped not only to prevent the emergence of resistant strains of tubercle bacilli, but also to diminish the intolerance of patients to the larger doses of P.A.S.

(5) Ethizone was given continuously, as it has been shown by Domagk *et al.* (1946) that the best results were obtained after prolonged administration. Ethizone seems to be the most active and least toxic of the thiosemicarbazones (Hoggarth *et al.*, 1949; Hoggarth and Martin, 1950). There is evidence to show by the "corneal screening" test that the effects of both P.A.S. and streptomycin are enhanced by ethizone (Rees and Robson, 1950, 1951).

Surgical Measures

During the course of treatment nephrectomy was performed on 13 patients, the ureter being excised only as far as the pelvic brim. The wound was invariably closed without drainage, and in every case healed by first intention. With the introduction of antibiotics it would seem that partial or polar nephrectomy may prove of value. Partial nephrectomy has not been carried out in the present series, but has been performed on several occasions in the third group of cases, to be published at a later date.

Epididymectomy was found to be necessary in 12 patients, and was carried out by the Ross (1948) technique. Healing was satisfactory, and in no instance did atrophy of the testicular body occur.

Three patients required transplantation of the ureter of the remaining kidney into the colon. All three were advanced cases (type 4), and two patients died some months after the operation. The third patient has remained well. We believe that the two deaths were due to acidosis and uraemia, and hope to eliminate these tragedies in future by maintaining a close watch on the blood chemistry for a prolonged period. As routine measures we insist on a low-salt diet, a strong alkaline mixture, and three-hourly evacuation of the bowels day and night.

Toxicity

In view of the fact that potent drugs were being used over an extended period of six months it seemed important that signs of toxicity should be recognized and dealt with at the earliest possible moment.

P.A.S.—This has been extensively employed in the treatment of all forms of tuberculosis, and many workers experienced in its use have testified to its low toxicity (Nagley, 1949; McAnally and Seymour, 1948). In spite of this we have found some minor toxic symptoms in 35% of our patients, especially nausea, vomiting, anorexia, and mental depression. In a further 25% the drug had to be discontinued because of severe vomiting, despite the fact that all varieties and forms, such as the calcium salt, cachets, and enteric-coated granules, were given a trial. We have not encountered haematuria or albuminuria (Nagley and Logg, 1949), nor have we seen any skin eruptions. Two patients developed toxic hepatitis (Gow, 1951) similar to those previously reported (Cuthbert, 1950; McKendrick, 1951). There was no clinical evidence of potassium depletion (Heard *et al.*, 1950; Cayley, 1950) in this series. Thus it can be seen that until a less toxic form of P.A.S. is available the full value of the drug cannot be achieved in an appreciable number of patients. For this reason we are now using the calcium salt of B.P.A.S. (N-benzoyl *para*-aminosalicylic acid) (Gow, 1953).

Dihydrostreptomycin.—In spite of using the intermittent method of administration outlined above, we have encountered an appreciable number of toxic manifestations. In the present series of 47 patients deafness has occurred in six, dizziness in eight, and both symptoms in two. Skin rashes were found in three cases. The dizziness and skin rashes were transient and disappeared quickly when the drug was stopped. Desensitization was often effective, and was carried out by beginning with a daily injection of 0.1 g. of streptomycin, gradually increasing up to 1 g., the course lasting a fortnight. The administration of "avomine," one of the antihistaminic drugs, was also helpful. Deafness was a more serious symptom, and appears to be permanent. These figures correspond with those quoted from a smaller series (Cathie and Garrow, 1951; Don and Gregory, 1952; etc.). It would seem that the percentage of patients becoming deaf with dihydrostreptomycin is much higher than with streptomycin sulphate, although the activity of the two preparations is the same. In future, therefore, we intend to use the latter.

Ethizone.—We have not seen any of the more severe complications described, such as liver or renal damage, but as a precautionary measure we have carried out at regular intervals the thymol turbidity test on patients' sera. All findings were below 4 units, which, at the very least, indicates that there has been no gross liver damage. In a few instances, in which toxæmia from the disease was severe, there has been a progressive anaemia, which improved, irrespective of the ethizone, when the tuberculous focus producing the toxæmia was removed. In no case was the ethizone stopped. All patients were able to tolerate 150 mg. daily, but 30% were not able to take 200 mg. for prolonged periods. Intolerance of the higher dose was manifested by anorexia, depression, and mental apathy. Patients under treatment with thiosemicarbazone, and ethizone in particular, should abstain from alcohol on account of its reaction. The symptoms of this are palpitation, flushing of the skin, and a full bounding pulse. If the effect is severe, collapse may occur. These symptoms may last two to three hours. They can also be experienced in a minor degree for about seven to ten days after the ethizone has been discontinued.

Results

As in our previous communication, we have attempted to assess the results in the following way: (a) sterilization of the urine; (b) radiographic changes; (c) cystoscopic improvement, including an increase in bladder capacity and

an improvement in the appearance of the mucous membrane or ureters; and (d) clinical improvement—for example, frequency of micturition, dysuria, gain in weight.

(a) Sterilization of the Urine

We have always believed that the sterilization of the urine is the absolute criterion of the efficacy of any particular method of treatment. We have therefore taken special care to ensure that the technique employed should eliminate as many sources of error as possible.

During the period of treatment the urines were investigated for the presence of tubercle bacilli at approximately six-weekly intervals. Every effort was made to isolate the bacillus, and the methods used for this were modified from time to time in order to improve the results.

In the early stages of the investigation the six-weekly search for tubercle bacilli was carried out on the total quantity of urine passed by the patient over a period of 40 hours. The collection of this urine was carried out as follows: (a) A 24-hour pooled specimen. (b) The "first morning" specimen passed by the patient after the end of the 24-hour period. (c) A catheter specimen obtained from the patient four to five hours after the first morning specimen had been passed.

The 24-hour specimens were allowed to stand for 48 hours, and 150 ml. of the deposit was removed and centrifuged. The centrifuged deposit was treated for a minimum time with 3% sodium hydroxide to destroy contaminating organisms. After neutralization it was inoculated on two Löwenstein-Jensen slopes and, except in some of the earlier cases, into two guinea-pigs.

From the first morning specimen 100 ml. was centrifuged and the deposit, after treatment with 3% sodium hydroxide, was inoculated on two Löwenstein-Jensen slopes.

The catheter specimens were used in an effort to overcome the possibility that the sodium hydroxide needed to destroy contaminating organisms might reduce the number of positive results by its lethal action on the tubercle bacilli. Each specimen was collected with the utmost aseptic precautions, using a no-touch technique. The whole specimen was centrifuged and a small part of the deposit inoculated on to a blood-agar plate. If no growth appeared on overnight culture the specimen was regarded as free of contaminants and inoculated without further treatment on two Löwenstein-Jensen slopes. If contaminating organisms grew on the blood-agar plate the deposit was treated with sodium hydroxide before inoculation.

Thus each investigation entailed the inoculation of six Löwenstein-Jensen slopes and two guinea-pigs. The results obtained from these specimens are given in Table I. These

TABLE I

Type of Specimen	No. of Specimens	Positive	
		No.	% (Approx.)
24-hour: culture	99	8	8
guinea-pig	48	13	27
First morning: culture	97	7	7
Catheter, no contaminants (no sodium hydroxide used)	39	1	2.5
Catheter, contaminated (treated with sodium hydroxide)	47	1	2

results revealed a number of facts: (a) That early morning specimens were giving results equally as good as those obtained from the 24-hour specimens. (b) That, in spite of the greatest possible care, more than half the catheter specimens were bacteriologically contaminated. (c) That the results of culture of catheter specimens compared unfavourably with those obtained from early morning and 24-hour specimens. This applied whether the catheter specimens were treated or untreated with sodium hydroxide. (d) That guinea-pig inoculation of the deposits was giving better results than cultural methods.

For these reasons both the methods of collecting specimens and their examination were changed. The specimens were limited to 24-hour pooled urines and first morning specimens.

The 24-hour specimens were allowed to stand for 48 hours. At the end of this period the whole of the thick deposit ("sludge") was withdrawn. An equal volume of the urine lying immediately above it (supernatant) was also withdrawn into a separate container. These two specimens, each about 50-100 ml. in volume, were centrifuged, and the deposits treated with sodium hydroxide and neutralized. The resultant mixtures were divided into two. One-half of each was inoculated on two Löwenstein-Jensen slopes. The other half of one of them was inoculated into two guinea-pigs.

The first morning urine was treated in the same manner as in the early cases, except that the deposit was inoculated on two Löwenstein-Jensen slopes and also into two guinea-pigs. By this means, on each six-weekly investigation the deposits from 36 hours' urine were inoculated on six Löwenstein-Jensen slopes and into four guinea-pigs. The results are given in Table II.

TABLE II

Specimen	No.	Positive	
		No.	% (Approx.)
Early morning: culture	102	6	6
guinea-pig	102	18	18
24-hour "sludge": culture	108	5	4.5
guinea-pig	62	7	11
"Supernatant": culture	99	7	7
guinea-pig	47	4	8.5

Examination of results at this stage led us to draw certain inferences: (a) That once again the results from the early morning specimens were at least as good as those from the 24-hour pooled specimens. (b) That guinea-pig inoculation was still giving better results than cultural methods. (c) That the distribution of tubercle bacilli in the "sludge" and the urine layer immediately above it was more or less uniform. (d) That the use of smaller volumes of deposit from the 24-hour specimens was apparently leading to somewhat poorer results.

A further change was therefore made in the technique. The 24-hour specimens were allowed to stand for 48 hours and a minimum of 200-300 ml. was centrifuged, the resultant deposit being treated with sodium hydroxide and inoculated on two Löwenstein-Jensen slopes and into two guinea-pigs. The whole of the early morning specimens were centrifuged and the deposit was inoculated on two Löwenstein-Jensen slopes and into two guinea-pigs. The results obtained by this method are given in Table III.

By this means we obtained the greatest proportion of positive results both in the early morning specimens and in the 24-hour specimens. Once again guinea-pig inoculation

TABLE III

Specimen	No.	Positive	
		No.	%
Early morning: culture	93	12	13
guinea-pig	93	26	28
24-hour: culture	135	13	8
guinea-pig	135	42	31

TABLE IV

Specimen	No.	Positive	
		No.	%
Early morning: culture	292	26	8.9
guinea-pig	193	46	24
24-hour: culture	441	22	5
guinea-pig	284	68	24

gave better results than artificial culture, and the results from the early morning specimens were at least as good as those from the 24-hour specimens.

The total figures for the whole period are given in Table IV.

Table V reveals that out of the total of 47 patients investigated the urines of 36 (76.5%) were sterile at the end of the six-months course of treatment. Of the 11 (23.5%) who were

(b) Radiographic Changes

In no case was there any convincing improvement in the pyelographic appearances during treatment (Table VI). Intravenous pyelography has been carried out in every patient and a bilateral retrograde pyelogram whenever possible. We do not agree with Ericsson and Lindbom (1950) that retrograde pyelography is dangerous, and we have seen no complications in many hundreds of such examinations.

TABLE V.—Sterilization of Urine and Sensitivity of Organisms to Streptomycin

Group	Initially Guinea-pig Positive	After 2-3 Months' Treatment		After 3-4 Months' Treatment		After 5-6 Months' Treatment		Remarks
		Guinea-pig Positive	Sensitive to Streptomycin	Guinea-pig Positive	Sensitive to Streptomycin	Guinea-pig Positive	Sensitive to Streptomycin	
1	16	No. 4 25	All sensitive to 0.25 u./ml.	No. 6 37	5 sensitive to 0.25 u./ml., 1 resistant to 32 u./ml.	No. 5 32	4 sensitive to 0.25 u./ml., 1 resistant to 64 u./ml.	Of 4 patients who were guinea-pig positive after 2 months, 3 remained positive and 1 became negative. After 4 months' treatment, 3 patients who were guinea-pig negative reverted after 4 months' treatment. Two of these remained positive after 6 months.
2	8	5 62	" "	5 62	4 sensitive to 0.25 u./ml., 1 resistant to 64 u./ml.	3 37	2 sensitive to 0.25 u./ml., 1 resistant to 64 u./ml.	No new guinea-pig positives were noted during the course of treatment.
3	10	5 50	4 sensitive to 0.25 u./ml., 1 resistant to 32 u./ml.	3 30	1 sensitive to 0.25 u./ml., 2 resistant to 32 u./ml.	3 30	1 sensitive to 0.25 u./ml., 2 resistant to 32 u./ml.	One patient who was guinea-pig positive at the fourth month became negative at the sixth month of treatment and 1 who was guinea-pig negative reverted to positive at the end of the sixth month.
4	9	5 55	All sensitive to 0.25 u./ml.	2 22	Both sensitive to 0.25 u./ml.	—	—	The 2 patients who were positive at 4 months had transplantation of the ureter into the colon.
5	4	1 20	Sensitive to 0.25 u./ml.	—	—	—	—	The patient who was positive died during the fourth month of treatment with silicosis and acute bronchopneumonic spread.
Total	47	20 42	19 sensitive to 0.25 u./ml., 1 resistant to 32 u./ml.	16 34	12 sensitive to 0.25 u./ml., 4 resistant to 32 u./ml.	11 23	7 sensitive to 0.25 u./ml., 4 resistant to 32 u./ml.	

positive four were resistant to streptomycin, two of whom had had over 150 g. of streptomycin elsewhere, before beginning our course of treatment. Occasionally tubercle bacilli have reappeared (after previous negative guinea-pig tests) in the urine of a patient during the latter half of the course of treatment. It is probable that the excretion of tubercle bacilli is intermittent except when the lesion is large and has a free communication with a calix. Again, the kidney may be reinfected from an active focus elsewhere, such as the spine or lung. It must be remembered that sometimes a secondary infection with other organisms, usually *Bact. coli*, may complicate matters and require treatment by the appropriate antibiotic. It is unfortunate that, owing to the somewhat indiscriminate and widespread use of antibiotics without bacteriological control, so many resistant strains of organisms were encountered.

It is desirable to carry out the retrograde pyelogram under direct vision in order to obtain an accurate picture of the pelvi-caliceal system. Recent experience with partial or polar nephrectomy has, however, made it clear to us that relatively extensive lesions may lie alongside a calix showing minimal deformity.

(c) Cystoscopic Improvement

In the course of this investigation over 200 cystoscopies and 150 ureteric catheterizations were carried out in the period January 1 to December 21, 1951. All cystoscopic examinations were done by two of us (J. C. R. and J. G. G.), and in each case a careful description of the bladder mucosa and the ureteric orifices was written without reference to previous cystoscopic notes. Definite improvement was found in all cases in the present series (in which the bladder

TABLE VI

Group	No. of Cases	Clinical Improvement				Cystoscopic Changes				Pyelographic Changes			
		Frequency of Micturition		Pain on Micturition		Bladder Appearance		Bladder Capacity		Normal		Deteriorated	
		Normal	Unchanged	Improved	Deteriorated	Normal	Unchanged	Improved	Deteriorated	Normal	Unchanged	Improved	Deteriorated
1	16	10	—	6	—	14	—	2	—	11	gained, average 10 lb.; 5 lost, average 3 lb.	—	—
2	7	—	1	6	—	6	—	1	—	7	gained, average 14 lb.	—	—
3	10	—	2	8	—	2	2	6	—	6	gained, average 8 lb.; 4 lost, average 2 lb.	—	—
4	10	—	6	3	1	—	10	—	—	7	gained, average 6 lb.; 3 lost, average 4 lb.	—	—
5	4	—	—	4	—	—	1	3	—	2	gained 12 lb.; 2 lost, 14 lb., 16 lb.	—	—

was diseased) except for three (Table VI). The improvement consisted in the healing of granulations and ulceration and replacement of these by scar tissue, in addition to an increase in bladder capacity.

(d) Clinical Improvement

We have noticed that clinical improvement usually occurs at an early stage of the course, but in some patients it appears later, sometimes after three months' treatment. In almost every patient a clinical improvement was achieved and was assessed in terms of degree of frequency, nocturia, dysuria, etc. It is customary to denigrate in scientific communications all references to symptoms, but the symptomatic

The follow-up included a three-monthly cystoscopy and an inoculation of guinea-pigs with the deposit of both 24-hour and ureteric specimens of urine. It must be pointed out that the six patients given all three drugs were advanced cases falling into either type 4 or type 5. On the whole, the alternating method of treatment described here seems to be standing up to the test of time.

Two patients appeared to merit special mention, as they illustrated the fact that no case should be regarded as hopeless. The first man was admitted with active pulmonary and vertebral lesions, a tuberculous kidney, cystitis, and epididymitis. During his six months' treatment his extra-renal lesions healed and we were able to remove the non-functioning right kidney. Incidentally, this was the only patient in the series in whom complete healing of the epididymal lesion took place without operation.

In a second patient with a disorganized kidney operation revealed the presence also of a large solitary cyst. This is only the third case of tuberculous nephritis in which a solitary cyst has been recorded. It is interesting that the amount of streptomycin in the cyst was 250 u./ml. fluid, whilst the greatest amount in any ulcero-cavernous lesion was 8 u./ml.

Summary

An investigation begun two years ago has been carried a step forward by treating a further 47 patients.

The six-months course consists in a sanatorium regime, the usual surgical measures, and a combination of streptomycin, P.A.S., and ethizone. Our view still remains that the three drugs are not a substitute for surgery or sanatorium treatment, but that each is a complement to the other.

Assessment of the results has been carried out not only for the present series of patients but also for the original group of 51 reported a year ago. The most important single factor is the elimination of tubercle bacilli from the urine. To be certain of this, most exhaustive and searching tests were found to be necessary. Of the original group 62% of urines were sterile at the end of eighteen months, while 77% of urines of the present series were sterile at the end of a year.

While it is necessary to keep in mind the chronicity of the disease, the course of treatment suggested by us seems to achieve satisfactory results and to hold out a promise for the future.

We are grateful to Mr. J. Dobson, surgeon-superintendent, Wrightington Hospital, for his assistance and constant encouragement, to Herts Pharmaceuticals Ltd. for their interest,

TABLE VII.—Effect of the Regime on the Extrarenal Lesion

Chest lesions	No. of Cases	Improved	Deteriorated	Unchanged	Remarks
12	3	1	1	8	4 quiescent before treatment began
Bone and joint lesions	No. of Cases	Improved	Deteriorated	Unchanged	Remarks
3	2	1	1	—	2 quiescent before treatment began
Bone and joint and chest lesions	No. of Cases	Improved	Deteriorated	Unchanged	Remarks
3	1	1	—	—	1 quiescent before treatment began
3	2	1	1	—	2 quiescent before treatment began

improvement is vitally important from two points of view. The improvement is important to the patient not only because he is able to obtain more comfort and sleep, but also because he is encouraged to continue and complete his six-months course. The results are shown in Table VI.

Table VII shows the results in patients having combined lesions affecting also lungs, bones, joints, etc. In combined cases there is no significant improvement of the extrarenal lesion when compared with cases treated with streptomycin alone, or, as in the case of the lungs, with streptomycin and P.A.S. One important fact which should be mentioned, however, is that the seven patients whose sputa remained positive for tubercle bacilli at the end of the six-months period were all sensitive to 0.25 u./ml. of streptomycin.

Follow-up of Previous Series (Table VIII)

The group of 51 patients discussed in a previous article (Ross *et al.*, 1951) have been followed up on the lines indicated above. With few exceptions symptomatic and cystoscopic improvement has been maintained up to the present time, eighteen months since the completion of treatment. Of the remaining 43 patients of the original series still alive, the urine of 27 was sterile at 18 months.

TABLE VIII

Treatment	No. of Cases	6 Months	12 Months	18 Months
Streptomycin alone	18	13 remained sterile 3 positive 2 sterile, reverted to positive	9 sterile 3 reverted 1 given other course 3 died after transplantation of ureter 2 sterile	9 sterile 2 reverted 1 not traced
Streptomycin and P.A.S. together	7	4 sterile 1 positive 2 sterile, reverted to positive	4 sterile Died after ureterocolic transplant 1 died after ureterocolic transplant 1 given latest course	2 sterile 4 sterile
Streptomycin and P.A.S. alternately	20	19 sterile	1 not traced 2 given latest course 12 sterile 1 died after thoracoplasty 1 died after ureterocolic transplant	10 sterile, 2 reverted, 1 died 2 still positive
Streptomycin, P.A.S., and thiazetazone (T.B.1)	6	1 positive 6 sterile	4 sterile 2 reverted	2 sterile, 2 reverted 2 still positive
Total	51	Sterile 42 (82%)	1 not traced; 7 died after ureterocolic transplant; 4 given latest course No. followed up, 39 Sterile 29 (74%)	1 not traced 1 died Total followed up, 37 Sterile 23 (62%)

technical help, and supplies of ethizone and calcium B.P.A.S.; and we are especially indebted to Miss A. Osborne, who has undertaken all the urine analyses, for allowing us the use of her notes. A fuller report will be published by her at a later date.

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THE SIGNIFICANCE OF THE THYROID IN PSYCHIATRIC ILLNESS AND TREATMENT

ROUTINE EXAMINATION WITH A RADIOACTIVE TRACER METHOD

BY

M. REISS, M.D., D.Sc.

R. E. HEMPHILL, M.A., M.D., D.P.M.

R. MAGGS, M.B., Ch.B., D.P.M.

C. P. HAIGH, Ph.D., A.Inst.P.

AND

JEAN M. REISS

(From the Research Department, Bristol Mental Hospitals)

In previous communications we reported that abnormal indices of thyroid activity occur in a fair proportion of psychiatric patients (Reiss *et al.*, 1951b). Changes in the thyroid activity of such patients after E.C.T. and treatment with pituitary anterior lobe hormones were described (Reiss *et al.*, 1951a).

The thyroid activity is now investigated as a routine in the majority of patients admitted to our hospital, so that we have extended the studies further, and here report on some of the results of this work in more than 1,000 patients in 1949-50 and 1950-1. The question of whether there is a real causal interrelationship between ascertained thyroid disturbance and mental illness is examined in the light of these research results.

Methods.—The radioactive tracer methods used have already been described (Haigh and Reiss, 1950; Reiss *et al.*, 1952). The normal ranges are seen in Fig. 3. For the determination of the basal metabolism rate the usual spirometric method was used. Where complete relaxation of the patient could not be obtained the investigation was carried out under thiopentone. Methods of treatment are referred to in the description of each case.

Results

Distribution of Thyroid Indices

Figs. 1 and 2 are histograms of the distribution of the I_t values in 302 male and 244 female psychiatric patients in 1949-50, and of 222 male and 271 female similar cases in 1950-1. Fig. 3 shows the histograms of the patients in

1949-50 superimposed on the histograms of 1950-1. The distribution of thyroid indices in about 1,000 unselected psychiatric patients in two successive years is seen to be almost exactly the same. For comparison, the limits for normal controls are plotted above the histograms of Fig. 3, and the arithmetic mean values are in good agreement for the corresponding values of the normal controls. These normal control values never overlapped the values recorded in patients who had clinical evidence of hypothyroidism or hyperthyroidism. It is clear that the spread of the patient material is much wider than the spread of the normals, and that among the patients there are a number in whom thyroid function lies outside the normal range but in whom clinical evidence of thyroid abnormality is lacking. The number of these borderline cases is appreciable, amounting to about 20%. The mean values of the thyroid indices in males are lower than in females, both in patients and in normal controls. In male borderline cases thyroid function tends towards hypothyroidism, and in females to hyperthyroidism.

Distribution of Thyroid Indices According to Certain Psychiatric Disease Categories

The cases were classified in a number of fairly well defined psychiatric categories, and the relation between these psychiatric disorders and their associated thyroid values is shown in Fig. 4. For this purpose the thyroid values were classified in four standards, as follows: the normal range was divided equally into upper and lower normal; outside these limits are the regions of underfunction and overfunction, which comprise mainly borderline cases.

In most groups there seems to be no significant relationship between the disease and the standard of thyroid function. There are, however, the following exceptions. In the female anxiety group there is a tendency to thyroid hyperfunction, more than 60% of the cases being in the upper normal or overfunctional range. In contrast, in the male anxiety group there is a tendency to thyroid underfunction, about 36% being lower normal and 38% underfunctional.

In 40% of female patients with recent schizophrenia the thyroid index was above the upper range of normality, but in female chronic schizophrenia this was seldom observed. In male recent schizophrenia, by contrast, underfunction of the thyroid was more usual.

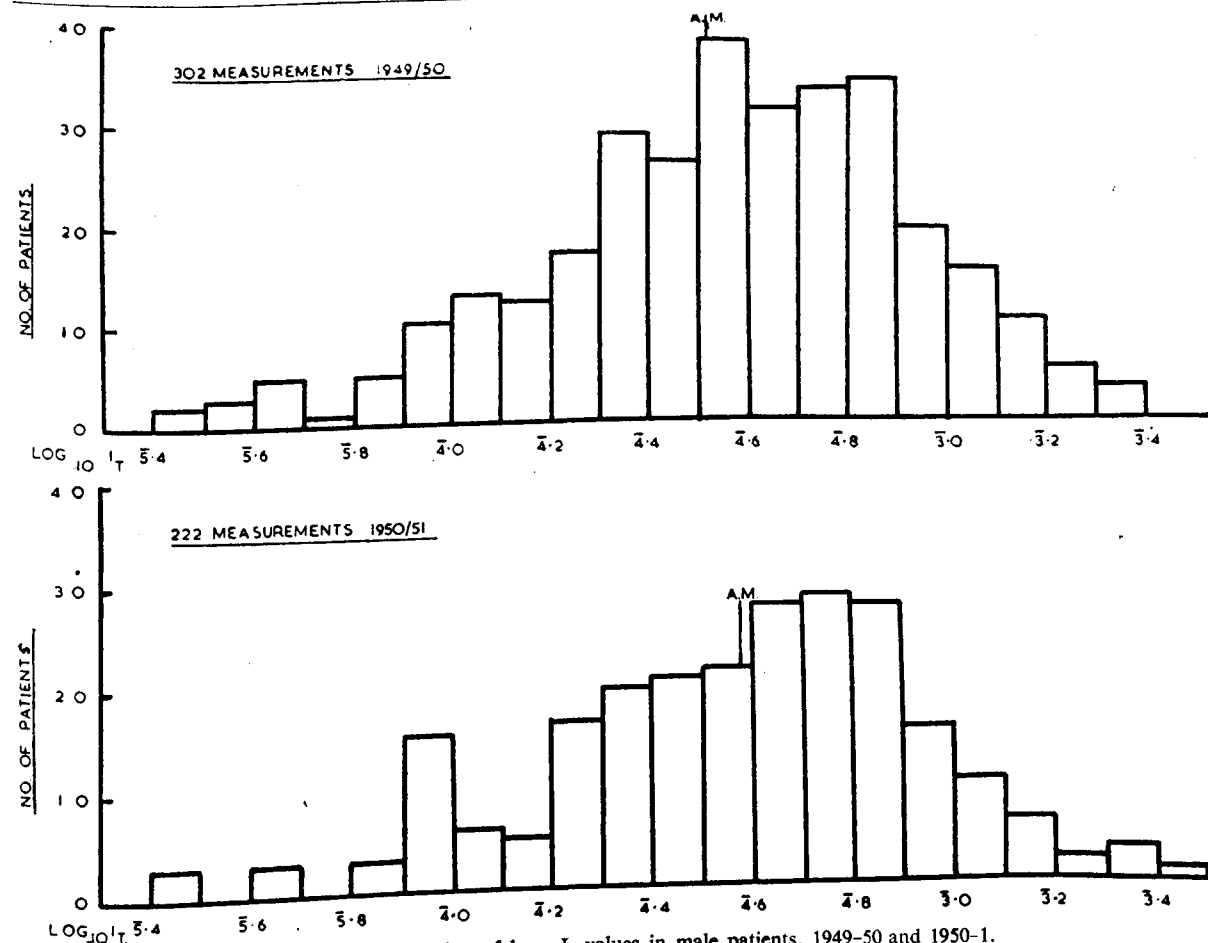
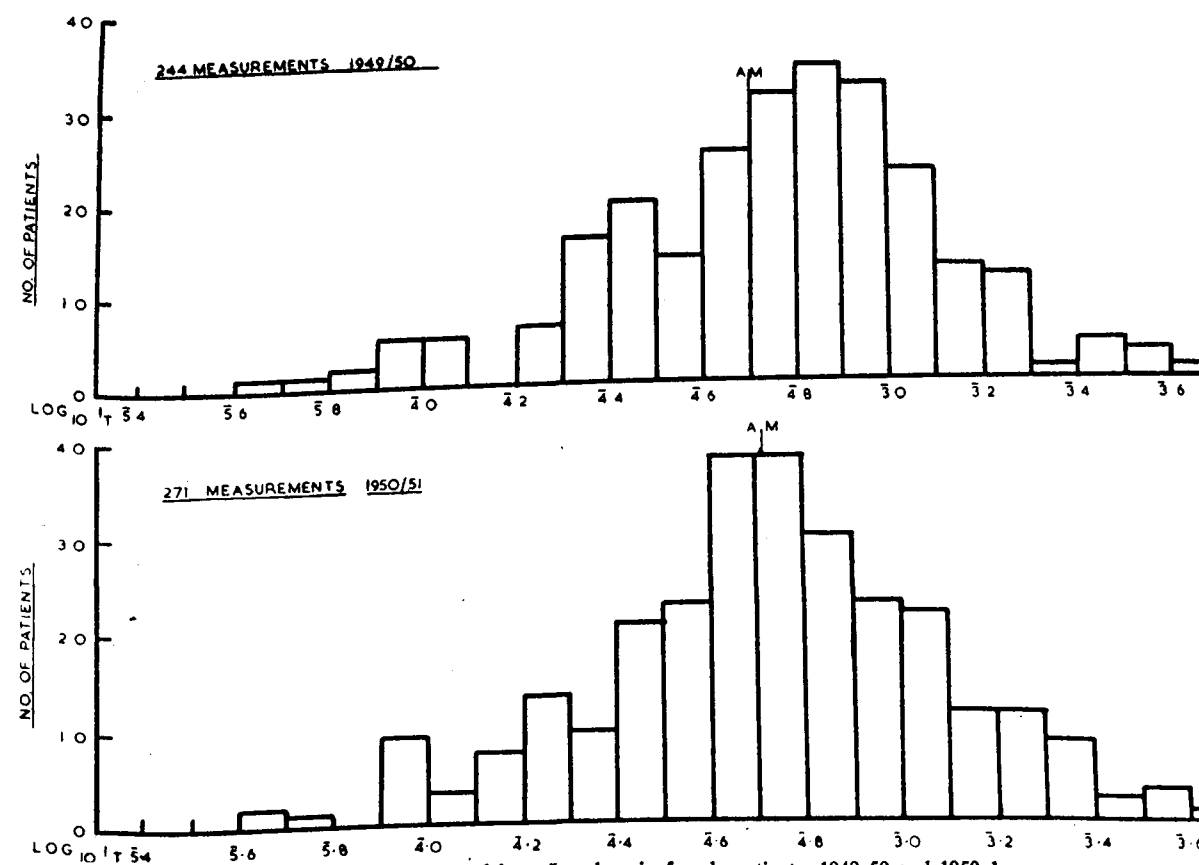
Changes in Thyroid Function Accompanying Changes in the Psychiatric Illness Occurring Spontaneously or after Treatment

We have previously reported (Reiss *et al.*, 1951a) the effect of E.C.T. on thyroid function. The cases investigated were mainly depressives, which usually recover with E.C.T., and the series was small (34 cases). We have extended the investigation to include a more representative group of 183 cases of most common forms of psychiatric disorder treated in various ways or remitting spontaneously. Thyroid function was assessed before and after treatment, and compared with the clinical result. The forms of treatment included E.C.T., modified insulin, coma insulin, carbon dioxide, leucotomy, psychotherapy, and various combinations. A number of cases in which there was a spontaneous remission were also investigated.

In 76 of these patients there was evidence of disturbed thyroid function before treatment, and normal values in 107. Changes in the thyroid values of all the patients after treatment are shown in Tables I-III. In 82 of the 107 euthyroid cases (Table I) treatment produced no change or

TABLE I.—Changes in the Thyroid Activity During Treatment of Euthyroid Patients

Direction of Change	Changes in Mentation	
	Improved	Not Improved
No change	7	3
Changes inside the normal range	57	15
Change to hypofunctional range	12	7
Change to hyperfunctional range	5	1

FIG. 1.—Distribution of $\log_{10} I_t$ values in male patients, 1949-50 and 1950-1.FIG. 2.—Distribution of $\log_{10} I_t$ values in female patients, 1949-50 and 1950-1.

changes only within the normal range; there was some slight change beyond the normal limits in the remaining 25 cases, 17 of whom made a clinical recovery. It is interesting that of the 82 patients who showed no change or change within the normal range only 22% failed to improve after treatment; while 39% of the patients whose thyroid levels became subnormal did not improve. Although suggestive, this difference is not statistically significant ($\chi^2 = 1.124$, with a corresponding P value of >0.20).

TABLE II

Thyroid Activity		Psychiatric Changes	
State Before Therapy	Change During Therapy	Improved	Not Improved
Underfunction	Normalized	20	0
	Not normalized	12*	5
Overfunction	Normalized	25	3
	Not normalized	7*	4

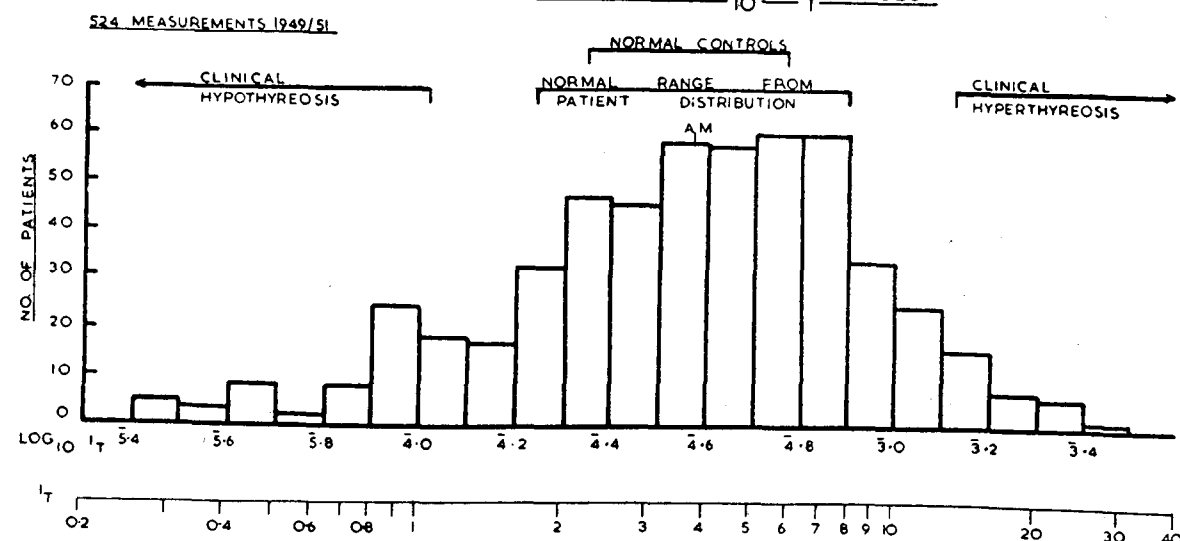
* The I_t in 12 of these 19 cases was improving, but the normal range was not yet reached at the time the mental improvement was detected. In one of the hyperthyroid patients of this group the I_t was also decreased but below the normal range, and only 6 of the cases showed no change of the I_t in the right direction.

From inspection of the results in Tables II and III it is clear that there is no significant difference in the proportions of "normalized thyroid" improved and not-improved patients in the underfunction and overfunction categories.

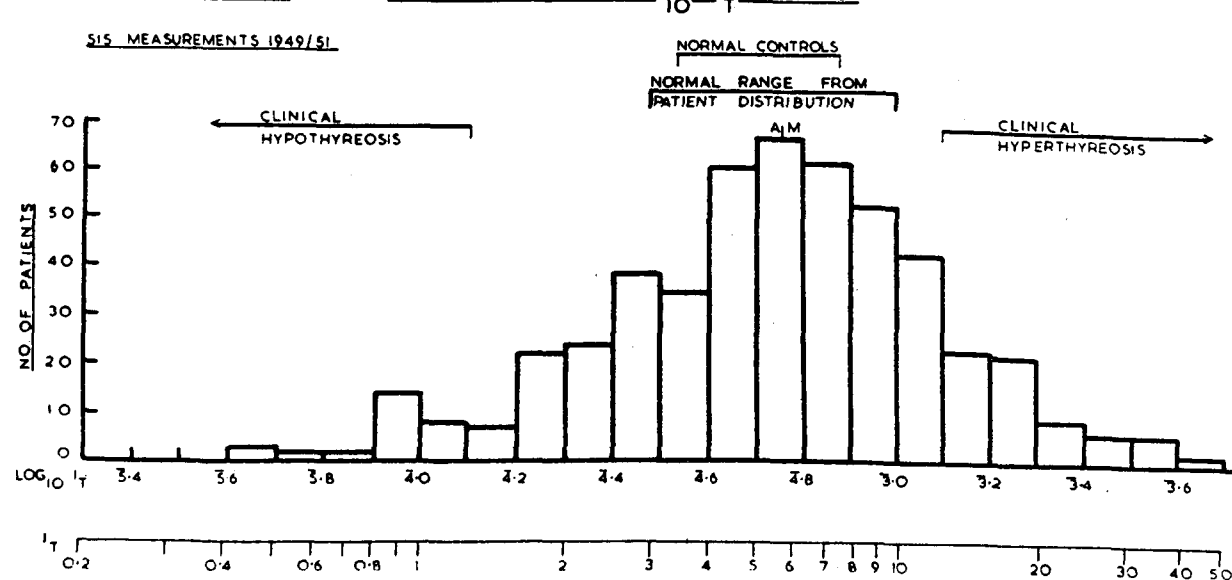
TABLE III

Treatment	No.	Psychiatric Change		Thyroid Activity		Correlation Between Change in Thyroid and Psychiatric Change	
		Im-proved	Not Im-proved	Normal-ized	Not Normal-ized		
E.C.T.	43	38	5	27	16	31	12
Psychotherapy	11	7	4	6	5	6	5
Spontaneous remission	9	9	—	7	2	7	2
Coma insulin therapy	3	3	—	3	—	3	—
Mod. insulin therapy	5	3	2	2	3	4	1
Other (CO ₂ , leucotomy)	5	4	1	3	2	4	1
Total	76	64	12	48	28	55	21

MALE PATIENTS

DISTRIBUTION OF $\log_{10} I_t$ VALUES

FEMALE PATIENTS

DISTRIBUTION OF $\log_{10} I_t$ VALUESFIG. 3.—Distribution of $\log_{10} I_t$ values in male and female patients, 1949–51.

and that the proportions of "not normalized thyroid" improved and not-improved patients in these categories are also very similar. For statistical purposes, therefore, the underfunction and overfunction categories are combined, the proportion of "normalized thyroid" improved to not improved being compared with the proportion of "not normalized thyroid" improved to not improved, regardless of whether thyroid activity had shown underfunction or overfunction before treatment. This comparison indicates that there is a highly significant relationship between psychiatric improvement (as opposed to no change or deterioration) and normalization of thyroid activity. (The value of χ^2 is 7.076, using Yates's correction for continuity. This corresponds to a P value of <0.01 , thus indicating that this relationship could occur by chance only once in 100 times.)

Treatment According to Thyroid Indications

It appeared reasonable to treat ascertained thyroid disturbances and observe the effects on the mental state. A number of patients suffering from various psychiatric illnesses were therefore given specific treatment on thyroid indications only.

We are well aware how controversial and sometimes conflicting have been the results of endocrine therapy in psychiatry reported by various authors, and how difficult it is to allow for the usual degree of apparent improvement after patients have settled down in hospital environment. We have therefore endeavoured to relate treatment and its results to suitable laboratory investigations and to have all patients followed up after discharge by doctors or social workers. We are still checking and revising our results in the light of what we know about the subsequent history of our patients. The thyroid disturbances were usually treated as follows.

Thyroid Underfunction.—Most patients were treated initially with thyrotrophic hormone for two weeks. If thyroid activity had been increased on reassessment with I_t at the end of this period it was assumed that the thyroid underfunction was secondary to primary pituitary underfunction, and treatment with thyrotrophic hormone was continued until the thyroid index became normal. If thyrotrophic hormone was ineffective primary thyroid underfunction was assumed, and the patients were then treated with dry thyroid tablets, or thyroxine or "thyranon" injections, until the B.M.R. became normal, as the tracer method cannot be reliably used during administration of thyroid hormones.

Thyroid Overfunction.—It may be assumed that in many cases hyperfunction of the thyroid is due to increased production of thyrotrophic hormone by the pituitary anterior lobe. Attempts to determine thyrotrophic hormone in blood to settle this question are being made in our department, but the method is not yet in clinical use. Nevertheless, in thyroid hyperfunction the direction of treatment at first is to suppress the production of thyrotrophic hormone with oestrone or A.C.T.H. Generally, 50,000 units of oestradiol were administered daily. In some cases the thyroid level fell to normal or below normal in the course of ten days. If there was no result treat-

ment was continued with methylthiouracil (0.2 g. thrice daily) and 100 mg. of sodium iodide daily.

In some cases the thyroid value measured by I_t may be normal or subnormal, but the B.M.R. increased. Measured under strictly controlled conditions this seems to be due to hypersensitivity to thyroid hormone (see Reiss *et al.*, 1952), and these cases have been treated with ergotamine tartrate.

Although, for reasons mentioned before, we are not prepared at present to give statistics of the results of treatment, the following four cases are reported in some detail by way of illustration of the methods of treatment.

Case 1

A female university student aged 18 was admitted on November 26, 1950. Diagnosis: hebephrenic schizophrenia of gradual onset; duration about a year. There was considerable thought disorder, with hallucinations. She was deteriorating. November 28: thyroid index, $I_t=18.8$ (considerably increased); B.M.R. (under thiopentone) +27%; no clinical signs of hyperthyroidism. Treatment: methylthiouracil, 0.2 g. t.d.s., combined after a week with 100 mg. NaI daily. The B.M.R. (under thiopentone) on January 8, 1951, was -5% and on February 2 was -1%. The B.M.R. (without thiopentone) was +0% on February 13, +3% on February 28, and -3% on March 20.

Clinical Progress.—January 8, 1951: marked improvement in thinking; disappearance of hallucinations; good insight; gained 12 lb. (5.4 kg.) in weight. March 10: discharged symptom-free. June 15: social worker reported that patient was teaching at a small school; mentally normal. October 27: normal; had resumed work at the university. February 1, 1952: attending regularly as an out-patient; began to relapse; much thought disorder with delusions and completely incongruous emotion. February 16: readmitted; I_t at time of admission 15.0 (again increased); psychiatric state as before. March 6: "oestron," 3,000 units daily, with NaI, 100 mg. daily. March 20: state unchanged; B.M.R. now reduced to -13%. April 7: thought disorder as before. June 9: much improved and mentally clear; rational but a little dull; B.M.R. -3%. July 9: remained improved; $I_t=0.4$, B.M.R. -8%. August 26: remission; awaiting discharge; contemplating taking up a teaching post.

Case 2

A married woman aged 31 was admitted on December 8, 1950. Diagnosis: anxiety state, moderately severe, with

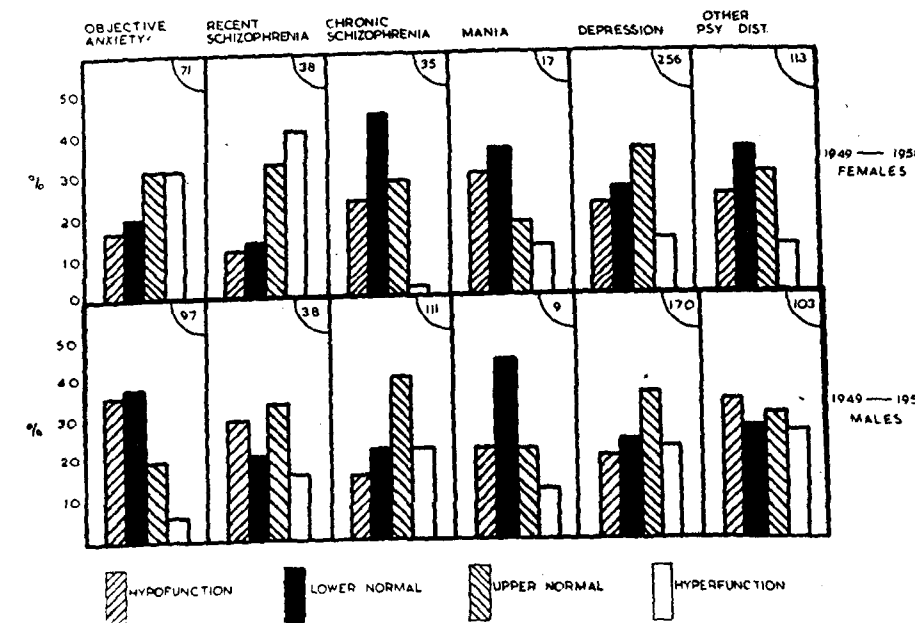


FIG. 4.—Thyroid values in psychiatric disorders.

panic attacks, palpitations, much somatic discomfort, and disturbance of sleep. Immature personality. Acute onset five months before admission. December 1: $I_t=16.8$ (increased value). December 20: B.M.R. +25%. Treatment: patient showed positive prolan I reaction, and general hyperfunction of the pituitary anterior lobe was assumed. Treatment was therefore with oestrone instead of thiouracil. January 4, 1951: 50,000 units oestroform and 100 mg. NaI daily. January 29: oestrone dose reduced to 9,000 units daily. February 1: $I_t=0.3$.

Clinical Progress.—She began to improve more quickly than is usual with thiouracil treatment, and ten days after treatment started she was eating and sleeping well and the panic attacks had disappeared. February 18: discharged, recovered; still remains well.

Case 3

A labourer aged 20 was admitted on February 10, 1949. Diagnosis: chronic hebephrenic schizophrenia; duration two years; marked thought disorder, with delusions and hallucinations. Unemployable. May 9: $K=0.37 \times 10^{-2}$ (very reduced value); 17-ketosteroid excretion, 12.2 (normal); cortin excretion, 2.6 (normal). Treatment with thyroid, 1 gr. (65 mg.) twice daily, for hypothyroidism. May 23: if anything, worse. May 30: marked subjective and objective improvement. Discharged on July 2. Although symptom-free, probably a little slow. Instructed to continue taking thyroid, 1 gr. (65 mg.) twice daily. Remained so well that in February, 1950, he stopped taking tablets, and two weeks later he relapsed and was readmitted in much the same state as previously.

March 24, 1950: $I_t=1.3$ (subnormal); treated with thyrotrophic hormone. April 12: $I_t=2.9$ (normal range); rapid improvement. Discharged on May 6. Thyroid, 1 gr. (65 mg.) twice daily, continued. Remained well while continuing treatment for the next 10 months. Relapsed on July 4, 1951, and readmitted as before. July 5: $I_t=0.5$ (very subnormal); treatment as before with thyrotrophic hormone. August 17: $I_t=2.1$ (normal). Considerable psychiatric improvement. Maintenance therapy begun by replacing thyrotrophic hormone by thyroid sicc. twice daily. Discharged on November 12. At this time there was still some flattening of effect and dullness, but no florid symptoms. He has remained symptom-free and at work, and is still taking thyroid, 1 gr. (65 mg.) twice daily. August 26, 1952: patient has remained well on thyroid, 1 gr. (65 mg.) twice daily.

Case 4

A male clerk aged 46 was admitted on April 18, 1951. Diagnosis: chronic anxiety neurosis of 17 years' duration, with panic states, various phobias, lack of confidence, and inability to sleep, most pronounced for six months before admission. He had given up work. April 26: $K=0.52$; $I_t=0.8$ (very subnormal). May 17: condition rather worse; treatment begun with 400 units thyrotrophic hormone daily. May 22: $K=1.05$; $I_t=1.7$ (still subnormal). June 14: $K=2.2$ (lower normal range).

Clinical Progress.—From about May 31 some improvement. A fortnight later, more confidence and less anxiety. Discharged on June 29. Still mildly anxious, but phobias had disappeared. More confident and capable of handling business.

Discussion

The distribution of values of thyroid activity in the psychiatric hospital population presented here agrees in general with our previous reports dealing with much smaller numbers of patients.

It seems fairly clear, as we have discussed before, that there are a great many intermediate states and borderline cases of thyroid disturbance in psychiatric patients as compared with normals. This might be regarded as a reflection of a general constitutional abnormality or weakness in some psychiatric subjects and not of aetiological importance. We think this is not the case, for when the case material

is broken down into groups it will be seen that hypofunction and hyperfunction are more commonly found in some disorders than in others; and, further, that thyroid function is usually corrected in patients who recover, and in some cases it corrects itself as psychiatric recovery takes place.

On the basis that there is a neuro-endocrine interrelationship, the disturbances of the thyroid may be a consequence or a cause, primary or contributory, of mental disorder. However, in most cases the whole disorder has progressed so far that there is a vicious circle, so that we can only speculate on the primary pathological factor.

The statistical evaluation of a large group of patients in whom there was disturbed thyroid activity before treatment, and who showed mental improvement parallel with normalization of the thyroid function, points significantly to a close correlation between the processes of mental and thyroid restoration. We do not think it likely that the changes in the thyroid and mental disorder could have occurred independently without causal interrelationship. It is obvious that in some cases mental improvement may have been responsible for the thyroid normalization, but in others—especially where the improvement in thyroid state preceded mental improvement—it is possible that the thyroid disorder was primary, or was part of a complex endocrine disturbance responsible for mental abnormality.

The most convincing proof that abnormal thyroid activity in some cases is responsible for mental disturbance is the remission of symptoms in patients treated for the thyroid disorder alone. Although we have reported here in some detail four satisfactory cases, a very large series would have to be produced to prove this point and to provide case material for further research in causation.

The purely empirical treatment of psychiatric disorders with hormones and drugs alike is rightly in discredit. We are of the opinion that reporting small numbers of cases who have improved, apparently as the result of hormone treatment, only adds to the confusion unless in each case there have been systematic and continued laboratory investigations. With the methods at present at our disposal this is an ideal very hard to achieve, but—in the case of the thyroid—not outside the possibilities of many of the larger psychiatric research units.

Summary

The indices of thyroid activity in 1,000 psychiatric patients, using the I^{131} tracer method, have been studied in two successive years.

About 20% were outside normal limits.

The histograms of the distribution of indices in 1949–50 and in 1950–1 are almost identical.

Thyroid function in relationship to various psychiatric disorders, treatments, and spontaneous remissions have been studied and discussed.

In a significant number of cases in which the thyroid indices were abnormal before treatment normalization of the thyroid accompanied mental improvement.

Our thanks are due to Dr. K. R. L. Hall and his staff for the statistical evaluation of the results.

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Last year the Pharmaceutical Society initiated legal proceedings in 43 cases under the Pharmacy Acts (1852–1941), the Penicillin Act (1947), and the Summary Jurisdiction Act (1848); only five of these cases proved unsuccessful. This fact is among information contained in the Registrar's Report of the Pharmaceutical Society for 1952, which was published recently.

ANTICOAGULANTS IN MYOCARDIAL INFARCTION

BY

I. S. L. LOUDON, B.M., B.Ch.

House-physician, Radcliffe Infirmary, Oxford

J. C. PEASE, D.M., M.R.C.P.

Senior Registrar, Radcliffe Infirmary, Oxford

AND

A. M. COOKE, D.M., F.R.C.P.

Physician, Radcliffe Infirmary, Oxford

The treatment of myocardial infarction with anticoagulants is generally accepted in the United States of America. In Great Britain a number of physicians do not treat their patients in this way, although most papers published here support the American view. The decision to use anticoagulants impels most physicians to admit their patients to hospital for a stay of several weeks, a matter of economic as well as medical importance. The present paper attempts to provide further evidence on the efficacy or otherwise of anticoagulant therapy and the suitability of certain types of patient for this treatment.

The problem was approached by a study of the effects of anticoagulant therapy on the prognosis of patients admitted to hospital with myocardial infarction, by determining if anticoagulant therapy was of equal benefit to all patients of all ages and with different degrees of shock, and by the analysis of notes and post-mortem reports to find how anticoagulant therapy affected the mortality.

Material

Two hundred patients admitted to the Radcliffe Infirmary as emergencies between January, 1945, and May, 1952, were suitable for the investigation; 125 of them were controls and 75 received anticoagulant therapy. In this hospital the duty of admitting medical emergencies is shared between four physicians. There is no selection of the type of case admitted under each physician; one physician admits medical emergencies on Mondays, and the other three in turn for periods of three days in succession.

The notes of all patients admitted between January, 1945, and May, 1952, with a diagnosis of myocardial infarction have been reviewed. Cases were rejected if the diagnosis was in doubt, if the notes were inadequate, or if the use of anticoagulant therapy was contraindicated,—for example, by an accompanying cerebrovascular accident or by a recent history of melaena. The diagnosis was based on the clinical history and positive electrocardiographic evidence in 179 cases, the clinical history and post-mortem evidence in 18 cases, and the clinical history alone in three cases. Of the 70 patients who died, 52 were submitted to a post-mortem examination.

The patients in the control group fell into two categories—75 admitted before 1950, in which year anticoagulant therapy was coming into general use in the Radcliffe Infirmary, and 50 admitted in and after that year. As the death rates in the two categories were 39% and 44% respectively it was felt that all the patients were suitable for inclusion in the control group. In fact, the use and choice of anticoagulants was determined by the views of the physician under whose care the patient was admitted, and there was no obvious medical reason why the patients in the second category did not have anticoagulant treatment.

The case notes of both series have been analysed to show the following facts:—(1) Age. (2) Sex. (3) Time from the onset of infarction to admission and to discharge or death.

(4) Cardiac function before the onset of infarction; four categories being used: (I) no cardiac symptoms, (II) mild angina pectoris or a reduction in exercise tolerance, (III) severe angina pectoris or a great reduction in exercise tolerance, and (IV) frank heart failure. (5) Signs of previous cardiovascular disease before admission: this was judged to be present, absent, or not recorded; if present, one or more of the following signs of cardiovascular disease had been recorded—abnormal rhythm, hypertension, enlarged heart, or evidence of previous infarction. (6) The degree of shock at onset and on admission was assessed as "none or mild," "moderate," "severe," or "not recorded" by consideration of the severity of the pain and its duration and response to opiates, blood pressure, pulse rate, and appearance of the patient. (7) The electrocardiogram. (8) Further thrombo-embolic accidents. (9) The post-mortem report. (10) Cause of death.

In the treated group the following facts were also recorded: type of anticoagulant used, whether heparin, dicoumarol, or ethyl biscoumacetate ("tromexan"); time from the onset of infarction to the beginning of effective anticoagulant therapy, which was taken as the giving of 10,000 i.u. of heparin intravenously or a fall in prothrombin efficiency to under 20% of normal; the duration of effective anticoagulant therapy; and the occurrence of complications resulting from treatment.

Control of Anticoagulant Therapy

Heparin was used in some cases, but only to initiate treatment, and no laboratory tests were necessary, because the dosage used was not large enough to cause lengthening of the clotting-time for a whole 24-hour period. Dicoumarol and ethyl biscoumacetate therapy were controlled by the one-stage prothrombin test as described by Biggs and Macfarlane (1949). When dicoumarol was used the aim of treatment was to maintain the clotting-time between one and a half and two times that of the normal control. This change in clotting-time interpreted from the dilution curve given by Biggs and Macfarlane represents a range of prothrombin efficiency between 10 and 20% of normal. With ethyl biscoumacetate a slightly smaller margin of safety was allowed because it was found that the level of clotting-time could be adjusted more rapidly. With this drug the therapeutic range of clotting-time was taken to be one and a half to two and a half times the control clotting-time, or 7.5 to 20% of prothrombin efficiency, a range similar to that used by Tulloch and Gilchrist (1950).

Results

The mortality in the two groups of cases is shown in Table I.

TABLE I.—Mortality

Group	No. of Cases	No. that Survived	No. that Died
Control	125	74 (59%)	51 (41%)
Treated	75	56 (75%)	19 (25%)

The calculation of χ^2 gives a value of 4.27, corresponding to a probability of about 0.04.

As the mortality rate might have been influenced by factors other than anticoagulant drugs, the two groups were further analysed to try to find out if there were any patients for whom the prognosis was strikingly good or bad in either the control or the treated group. The time from onset to admission was similar in the two groups (Table II). The importance of taking this into considera-

TABLE II.—Cases Admitted in First 48 Hours and in First Seven Days

Group	Admitted in	
	First 48 Hours	First 7 Days
Control	68%	83%
Treated	59%	82%

tion when comparing methods of treatment has been demonstrated by Tulloch and Gilchrist (1950) and by Yater *et al.* (1948).

Cassidy's (1946) series of 1,000 cases had a male-to-female ratio of 3.5 to 1. In the present series the ratio was approximately 2 to 1, the figures in the control group being 82:43 and in the treated group 50:25.

Other factors which might influence the prognosis are age, degree of shock, and cardiac function before the infarction. In Tables III, IV, and V the two groups are compared for each of these factors and shown to be similar, except in degree of shock at onset, where the number of severely shocked patients was larger in the treated group.

The notes of the two groups were examined for evidence of objective signs of previous cardiovascular disease, but it was found that in about half of the cases no information was available. In the remaining half there was a record of some kind of cardiovascular disease in all but four of the control group and all but two of the treated group. This means that the state of the myocardium before the infarction had to be assessed on the subjective evidence of cardiac function, since objective evidence was lacking in a large number of cases.

The cases were then divided up into those mildly, moderately, and severely shocked, and the mortality in each section was considered separately. The results are shown in Table VI, which brings out the influence of the severity of shock on the prognosis of patients not treated with anticoagulants, and suggests that anticoagulants are of value in patients who are moderately and severely shocked. This point is clearly emphasized by Gilchrist (1952), whose article appeared after the present paper had been prepared.

The state of the myocardium before the infarction naturally affects the prognosis, and the figures in Table VII

TABLE III.—Number of Patients in Each Decade from 40 to 90

Group	Age in Years				
	40-49	50-59	60-69	70-79	80-89
Control	19 (15%)	27 (22%)	45 (36%)	28 (22%)	6 (5%)
Treated	15 (20%)	23 (30%)	24 (33%)	13 (17%)	0

TABLE IV.—Number of Patients in Each Category of Shock

Group	Degree of Shock at Onset			
	None or Mild	Moderate	Severe	Not Recorded
Control	42 (33%)	48 (39%)	31 (25%)	4 (3%)
Treated	13 (18%)	37 (49%)	25 (33%)	0

TABLE V.—Number of Patients in Each Category of Cardiac Function Before the Infarction

Group	Cardiac Function				Not Recorded
	Category				
	I	II	III	IV	
Control	33 (26%)	60 (49%)	20 (16%)	4 (3%)	8 (6%)
Treated	18 (24%)	39 (52%)	15 (20%)	0	3 (4%)

TABLE VI.—Influence on Death Rate of Degree of Shock Due to Infarction

	Degree of Shock			
	None/Mild	Moderate	Severe	Not Recorded
Deaths and death rates in control group	10 (24%)	19 (40%)	21 (68%)	1 (2%)
Deaths and death rates in treated group	3 (23%)	7 (19%)	9 (36%)	0

The numbers in the treated group are too small for the result to be statistically significant.

TABLE VII.—Influence of Cardiac Function Before Infarction on Death Rate

	Cardiac Function Before Onset		
	Categories I and II	Categories III and IV	Not Recorded
Deaths and death rates in control group	37 (41%)	9 (38%)	5
Deaths and death rates in treated group	12 (21%)	7 (46%)	0

TABLE VIII.—Death Rate of Patients Over and Under 60

	Under 60	Over 60
Deaths and death rates in control group	16 out of 46 (35%)	35 out of 79 (44%)
Deaths and death rates in treated group	11 out of 38 (29%)	8 out of 37 (21.5%)

TABLE IX.—Number of Patients Over and Under 60 in Each Category of Shock and in Each Category of Cardiac Function

	Under 60	Over 60
Shock:		
Mild	18 (21%)	37 (32%)
Moderate	40 (48%)	45 (39%)
Severe	23 (31%)	33 (29%)
Cardiac function:		
Categories I and II	65 (81%)	84 (77%)
Categories III and IV	15 (19%)	25 (23%)

TABLE X.—Degree of Shock Resulting from Infarction in Relation to the Cardiac Function Before the Infarction

	Cardiac Function	
	Categories I and II	Categories III and IV
Mild shock	42 (29%)	13 (32.5%)
Moderate shock	67 (46%)	14 (35%)
Severe shock	37 (25%)	13 (32.5%)

TABLE XI.—Death Rate in Men and Women

Group	Male		Female	
	Survived	Died	Survived	Died
Control	49	33 (40%)	25	18 (42%)
Treated	35	15 (30%)	21	4 (16%)

suggest that only those patients with a good cardiac function before infarction receive benefit from anticoagulant treatment. In Table VIII the influence of age on mortality in the control and treated groups is considered.

The results in the present series suggest that older patients have a worse prognosis if untreated, but a more striking reduction in mortality when anticoagulants are used. Thus age, degree of shock, and cardiac function are shown to influence the mortality from myocardial infarction and the benefit received from anticoagulants. Tables IX and X show that these three factors are independent of one another and are not, as might be expected, due only to the influence of age. In 11 cases it was impossible to decide from the notes what the cardiac function was before the infarction.

It is generally accepted that the prognosis is better for older patients and better for women than for men. In Table XI the greater reduction in mortality for women as a result of the use of anticoagulant therapy may be due to the fact that the women were on the whole older, 70% being over 60, whereas only 50% of the men were over 60.

Discussion

The prognosis of so common a disease as myocardial infarction is uncertain because it is difficult to ascertain the incidence and death rate. In the present paper we

have necessarily had to confine ourselves to a study of those patients who survived long enough to reach hospital. We found that the mortality rate was reduced by anticoagulant therapy from 41 to 25%, a difference that is statistically significant and comparable with the figures of Tulloch and Gilchrist (1950).

The groups of patients who appeared to receive most benefit from anticoagulants were those over 60 years of age, those who were moderately and severely shocked, and those whose cardiac function immediately before the myocardial infarction was impaired slightly or not at all.

It is not merely a question of academic interest to decide what type of patient is most likely to benefit from anticoagulants, because most physicians find treatment practicable only in hospital, and many more cases of myocardial infarction are admitted now than formerly. Table XII

TABLE XII.—Number of Patients Admitted with Myocardial Infarction each Year from 1945 to May, 1952, and the Proportion Receiving Anticoagulant Therapy (Only the Cases Included in the Present Series are Recorded)

Year	No.	No. Treated with Anticoagulants
1945	4	0
1946	20	0
1947	14	0
1948	4	4 (17%)
1949	24	2 (11%)
1950	18	15 (83%)
1951	32	36 (55%)
1952	66	18 (27%)
Jan.-May, 1952	22	18 (82%)

shows that more patients were admitted to the Radcliffe Infirmary in 1951 (66) than in the four years 1945-8 (62). Unless there is a change in the management of patients with myocardial infarction which allows satisfactory treatment in the home, the number of patients admitted to hospital will increase. This is an important economic fact, because anticoagulant therapy does not shorten the period in hospital. In the control group the average stay was 39 days and in the treated group 45 days. The number of persons in the age groups with the highest incidence is increasing, and the cost of a hospital bed in the Radcliffe Infirmary reached the figure of £17 12s. 3d. a week in 1951.

The death rate in the series of 800 cases reported by the American Heart Association was 24% in the controls and 15% in the treated group. The difference was thought to be due chiefly to a reduced incidence of thrombo-embolic deaths. One of our chief difficulties in making a retrospective survey was that vital information about the patient's mode of death is so often lacking, and even with very comprehensive post-mortem notes the exact cause cannot be found, although contributory causes may be evident, and in many cases no more precise diagnoses than those listed in Table XIII could be made. It is for this reason that the admittedly vague terms "sudden death," "continued shock," and "heart failure" had to be used.

TABLE XIII.—Causes of Death

Cause	Control Group	Treated Group
Sudden death	25	11
Continued shock	10	2
Heart failure	12	6
Ruptured ventricle	2	0
Haematemesis	2	0

An attempt is made to answer the question posed in a leading article in the *British Medical Journal* of October 28, 1950 (p. 991), of how many of the deaths were inevitable. By inevitable we mean, for instance, a severely shocked patient dying within an hour of admission or a patient found after death to have a ruptured ventricle.

Table XIV shows the numbers in each category after the inevitable deaths have been subtracted, and has been

TABLE XIV.—Causes of Death After Subtraction of Inevitable Deaths

Cause	Control Group	Treated Group
Sudden death	25	9
Continued shock	4	1
Heart failure	10	1

included although we realize that the word inevitable as used here has no absolute value but is a retrospective assessment. For the same reason no deduction of inevitable deaths has been made throughout the paper.

Thrombo-embolic accidents other than myocardial infarction which developed while the patients were in hospital numbered 27 (21%) in the control group and 11 (15%) in the treated group. The incidence is low because adequate records of suspicious incidents were sometimes lacking.

Thus in the present paper there is no definite indication how anticoagulant therapy lowers the mortality rate from myocardial infarction, although it is quite clear that there is a significant reduction.

While we do not feel that it is yet justifiable to withhold anticoagulant therapy from any patient suffering from myocardial infarction, provided no contraindication exists and proper laboratory facilities are available, our results suggest that certain types of patient may be specially suitable for that treatment.

Summary

The case histories of 200 patients admitted to the Radcliffe Infirmary with myocardial infarction between January, 1948, and May, 1952, have been reviewed.

The death rate in hospital was 41% in the control group of 125 cases and 25% in the treated group of 75 cases, a difference which is statistically significant.

Anticoagulant therapy seemed to be of most value to patients over 60 years of age, moderately or severely shocked, and with little or no previous impairment of cardiac function.

No complications resulted from anticoagulant therapy.

We wish to thank the physicians of the Radcliffe Infirmary for permission to use the case reports of their patients; Dr. A. H. T. Robb-Smith, Dr. R. G. Macfarlane, and Dr. Rosemary Biggs for the pathological and haematological data; Dr. I. Sutherland and Dr. D. J. Finney for advice and the statistical calculations; and Miss Betty Merry, of the Records Department, Radcliffe Infirmary.

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The Sixth Laboratory Animals Bureau Congress was held at the Royal Veterinary College, London, on March 27 and 28. Some 250 technicians from all parts of the country attended. The congress was opened by the secretary of the Medical Research Council, Sir Harold Himsworth. Six shop papers were read by technicians, and one long one, on reproduction in mammals, by Dr. I. W. Rowlands, of the Agricultural Research Council Institute of Animal Physiology, Babraham. Visits were paid to the National Institute for Medical Research, Mill Hill, and to the Lister Institute at Elstree, and a programme of films of zoological interest was shown at the College. The final session was "Questions." Chairmen at the four sessions were Professor S. Bedson, F.R.S., Dr. L. Harrison Matthews, Dr. R. Love and Professor R. E. Glover. The proceedings of the Congress will be published in full in the journal of the Animal Technicians Association.

RUPTURE OF THE HEART AS A RESULT OF BR. ABORTUS ENDOCARDITIS

BY

G. H. GRANT, B.M., B.Sc

Pathologist, Royal Salop Infirmary, Shrewsbury

AND

C. L. STOTE, M.D., M.R.C.P.

Physician, Royal Salop Infirmary, Shrewsbury

Undulant fever is not a rare disease in this country; yet endocarditis due to *Brucella* organisms has only twice been recorded here (Rennie and Young, 1936; Hart *et al.*, 1951), and only in the latter case was it confirmed bacteriologically at necropsy. Dalrymple-Champneys (1950), in his series of 983 cases of undulant fever, does not record a single example. In the foreign literature we have found accounts of a further 21 cases confirmed bacteriologically at necropsy; most of these have been reviewed by Hart *et al.*

There seems to have been no previous example of a sudden fatal termination by massive haemorrhage into the pericardium.

Case History

A 51-year-old forestry nurseryman had had no previous severe illness. In July, 1950, he complained of sudden partial loss of vision in the right eye. An ophthalmologist found pale patches below and to the nasal side of the disk, with a complete central scotoma. The blood pressure was 75/50.

When admitted to hospital on September 25 he was a thin ill-looking man with pigmented patches on the forehead. The blood pressure was 95/60; Hb 78% (11.5 g. %), and the white blood cells numbered 4,500 per c.mm. (76% polymorphs). The Wassermann reaction and Kahn test were negative. The urine contained a trace of protein and scanty hyaline casts.

A rigor occurred the day after admission, but following this his temperature showed only an occasional rise to 99° F. (37.2° C.). On October 17 his serum agglutinated a standard suspension of *Br. abortus* in a dilution of 1/3,200. His general condition improved steadily, the sight in the affected eye gradually returned, and his temperature settled. In view of this no specific treatment for the abortus infection was given. He seemed well in himself on discharge on October 26, but his E.S.R. remained high—54 mm. in one hour (Wintrobe).

A month later his ankles began to swell and he became breathless on exertion. During the following week, early in December, he was readmitted with nocturnal dyspnoea and a temperature of 100–101° F. (37.8–38.3° C.). This pyrexia settled after four days, and was assumed to be due to an associated bronchitis.

Examination showed oedema of the ankles and sacral region, and some clubbing of the fingers. The pulse rate was about 100, with frequent extrasystoles, and a systolic murmur could be heard over the whole praecordium. A chest x-ray film showed moderate enlargement of the heart, chiefly left ventricular; the blood pressure was 95/60. The symptoms of congestive failure improved with treatment and the oedema practically disappeared, but a temperature of 99–100° F. (37.2–38.8° C.) recurred during the week before he was allowed to return home on December 23, for Christmas.

When readmitted on January 6, 1951, the signs of congestive failure had returned more severely, the legs were grossly oedematous and the breathing was distressed. The pulse rate was 100 and regular, and the blood pressure 105/75. No cardiac murmur could now be heard. The

only electrocardiographic findings were slurring of the P-R interval with a depressed T wave in all leads except CF 4; both auricular and ventricular extrasystoles were occurring. A blood count showed Hb, 11.1 g. % (75%); white cells, 5,500 per c.mm. (banded polymorph neutrophils 3%, segmented polymorph neutrophils 88%, lymphocytes 5%, monocytes 4%). He remained afebrile and a single blood culture at this time was sterile. Yet he steadily became worse and died suddenly on January 14, eight days after his readmission and six months after his first symptoms.

Thus the clinical course of the illness was that of a mild *Br. abortus* infection with apparent spontaneous recovery, followed by rapid congestive heart failure. He had had comparatively few of the usual signs and symptoms associated with bacterial endocarditis. The original blindness may have been due to an embolus, but none other was observed. The spleen was never palpable and the patient was afebrile during most of his illness.

Necropsy Findings

A post-mortem examination was carried out 50 hours after death. The heart (275 g.) was not enlarged. The left ventricle was 17 mm. thick, the right ventricle 6 mm. The coronary arteries were healthy. The tricuspid, pulmonary, and mitral valves were normal. The aortic valve was bicuspid, a single large cusp replacing the usual right and non-coronary cusps (see Figs. 1 and 2). This combined cusp was smaller than two normal ones but larger than a single one: it measured 40 mm., while the other (left) cusp measured 33 mm.

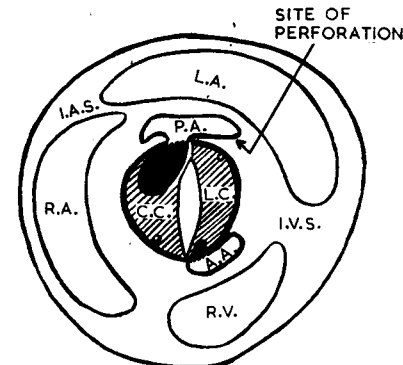


FIG. 1.—Diagram of transverse section of heart at level of aortic valve. L.A.=left auricle. R.A.=right auricle. R.V.=right ventricle. I.A.S.=interauricular septum. I.V.S.=interventricular septum. P.A.=posterior aortic cusp. A.A.=anterior aortic cusp. L.C.=left cusp. C.C.=combined cusp. Black areas show perforations in cusps. O represents coronary orifices.

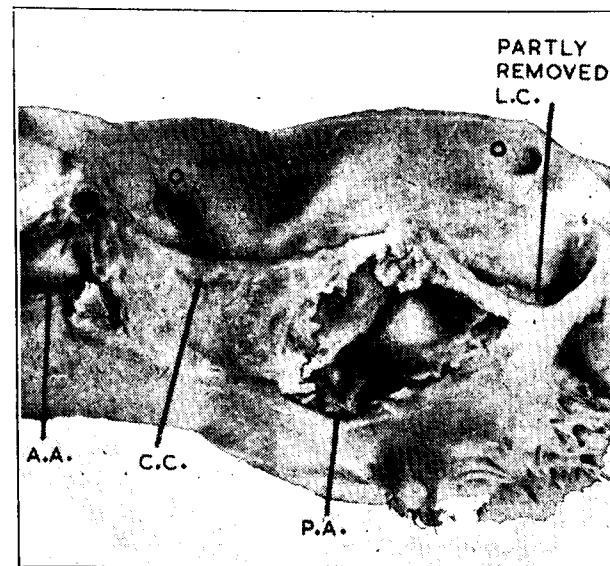


FIG. 2.—Part of aortic valve, opened out after cutting through the left cusp. The top of this cusp with attached vegetations has been removed to show opening into posterior aneurysm. Lettering as in Fig. 1.

Opposite the centre of the combined cusp a low ridge ran along the wall of the aortic sinus in the long axis of the aorta. It was 3 mm. wide and less than 1 mm. high, with a rounded outer surface and parallel borders—an appearance almost pathognomonic of a congenital lesion (Koletsky, 1941). Microscopical examination of serial longitudinal sections through the ridge confirmed this. They showed a thickening of the elastic-containing media only and no evidence of an inflammatory reaction. If the lesion had been acquired, such a central ridge should have contained fibrous tissue from the annulus fibrosus on the lumen side of the elastic tissue of the aortic media (Lewis and Grant, 1923).

There were large friable vegetations on both cusps, especially posteriorly, where their margins were fused together for a distance of 1.5 cm. Microscopically these vegetations consisted of fibroblasts with a few lymphocytes and histiocytes, covered by blood clot, fibrin, hyaline necrotic material, and masses of Gram-negative coccobacilli. The posterior third of the combined (right) cusp had been almost completely destroyed by ulceration; only a narrow band at the free margin remained attached to the aorta posteriorly; beneath this was a ragged hole about 2 cm. in diameter. There was also a smaller hole in the other (left) cusp near its attachment anteriorly. Both cusps were slightly thickened. Microscopically the larger cusp showed fibrosis (maximum thickness 3 mm.), and at its junction with the aorta some small deposits of calcium were identified by von Kossa's method. Such changes are common in congenital bicuspid valves in the absence of infection (Lewis and Grant, 1923).

The myocardium, although its cut surface appeared normal to the naked eye, was under the microscope diffusely inflamed, especially just beneath the endocardium. Numerous small foci of necrosis scantily infiltrated with mononuclear and occasional polymorph cells were seen, and also collections of similar cells unassociated with muscle necrosis and having a very occasional central foreign body giant cell. Near the aortic valve there was an occasional acute abscess full of polymorph leucocytes. No fibrosis of acute muscle was seen apart from a patchy area in the intermuscle. Since none of these lesions resembled an Aschoff nodule, and since the mitral valve and the endocardium of the left auricle appeared healthy, old rheumatic infection seemed unlikely.

The aortic sinuses opposite the two holes in the cusps were greatly dilated to form localized smooth-walled aneurysms. The smaller (anterior) aneurysm had a narrow orifice opposite the perforation in the left cusp—that is, in the extreme anterior part of the sinus; it extended for about 1.5 cm. to the left beneath the undilated part of the sinus. The larger (posterior) aneurysm involved an area about 1.5 cm. in diameter, and was situated in the most posterior cm. of the sinus; it extended posteriorly, upwards, and quarter to right and left for about 1 cm. Externally its bulging to right and left could be seen between the aorta and the left upper dome could be seen between the aorta and the left auricle. The smooth walls of these aneurysms and the presence of the congenital bicuspid valve suggested at first that they might be congenital in origin. There is, however, no recorded case of a congenital aneurysm of the left aortic sinus, presumably because its formation is not affected by the aorto-pulmonary septum. Furthermore, when the posterior aneurysm was investigated microscopically by studying serial horizontal sections at 1-mm. intervals, it was found to have a smooth uninfamed fibrous wall 2 to 3 mm. thick, containing peripherally numerous histiocytes filled with iron pigment. It was continuous below with the fibrous tissue of the annulus fibrosus; at the sides and above the elastic tissue of the aortic media was bent outwards before abruptly giving place to the fibrous tissue of the aneurysm wall. If the aneurysms were congenital, one would expect at least the upper part to be lined by elastic-containing media, even if the lower part were lined by fibrous tissue from the annulus fibrosus.

The blood reaching the pericardial cavity had burst through a small hole in the left wall of the posterior aneurysm and emerged between the left auricular appendage and the aorta, tracking for about 0.5 cm. beneath the visceral pericardium. Microscopically this hole was an acute inflammatory sinus, but serial sections taken above and below it showed a closed cavity filled with pus cells in the wall of the aneurysm (see Fig. 3). This suggests that

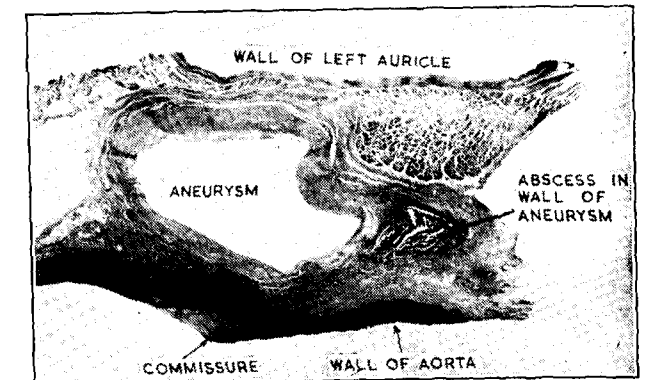


FIG. 3.—Transverse section through posterior wall of aorta and upper part of posterior aneurysm at level of top of aortic valve. (×24. Verhoeff's elastica.)

the perforation was not due to inflammation of the inner surface of the aneurysm but to an abscess in the wall, which may have been embolic in origin or, more probably, arose by direct spread from the vegetations near the attachment of the left cusp.

Other Organs.—The lungs were oedematous (right 800 g., left 550 g.), and there were bilateral pleural effusions, each about 200 ml. The spleen (500 g.), liver (1,800 g.) and lymph nodes were all congested. Microscopically they contained scattered collections of inflammatory cells and small granulomata consisting of epithelioid cells with a varying amount of collagen and an occasional foreign body giant cell but no central caseation. The kidneys, normal in size, had microscopically a non-specific interstitial inflammatory reaction. The remaining organs showed no unusual features.

Bacteriological Findings.—*Br. abortus* was isolated from the patient's bone marrow, and also by guinea-pig inoculation from part of an aortic-valve vegetation which had been washed repeatedly in sterile saline and 70% alcohol and ground before injection into the animal. (The guinea-pig's serum agglutinin titre to *Br. abortus* rose to 1 in 320 in five weeks.) The cultures of *Br. abortus* were identified by their nutritional requirements, and by biochemical tests, dye inhibition tests, and serology. This confirmed the diagnosis of *Br. abortus* carditis and septicaemia.

Comment

Of the 22 cases of *Brucella* endocarditis confirmed at necropsy, 14 were due to *Br. abortus*, the organism causing undulant fever in Great Britain. In addition to the case described by Hart *et al.* in this country, 10 cases have been recorded in America (Scott and Saphir, 1928; Spink and Nelson, 1939; Smith and Curtis, 1939; Spink *et al.*, 1942, 1948; Wechsler and Gustafson, 1942; Call *et al.*, 1944; Quintin and Stalker, 1946; Voth, 1949), and three in Central Europe (Matzdorff, 1933; Steyrer, 1934; Rothman, 1935). All were males, reflecting the curiously high incidence of brucellosis in men (Stableforth, 1952), and all died after an illness lasting 3 to 11 months. One case of recovery has been described (Spink *et al.*, 1948).

Although in at least two cases (Rothman, 1935; Spink and Nelson, 1939) the heart valves attacked were apparently normal, the infection resembles *Streptococcus viridans*

endocarditis in usually seeking out valves which have been previously damaged by rheumatism or which are congenitally deformed. In nearly all the recorded cases, including the two previously described in England, old rheumatic valvulitis has been found. Our case is the fourth example of infection superimposed upon a congenital bicuspid aortic valve (Wechsler and Gustafson, 1942; Voth, 1949; Spink *et al.*, 1948).

Cases of bacterial endocarditis due to *Brucella* organisms have certain distinctive characteristics. These are well illustrated by our case, and may be summarized as follows:

1. The aortic valve is usually attacked. Occasionally the mitral valve is also involved, but in only two cases was the disease confined to it (Rennie and Young, 1936; Spink *et al.*, 1942).

2. There is a great tendency to produce ulceration. The valve cusps become perforated and there are often haematomata in the myocardium or in the auricular or ventricular septa. In the first case described by Call *et al.* (1944) the inflammatory process had ulcerated through the root of the aorta as far as the epicardium, but, unlike our case, rupture into the pericardium had evidently not occurred.

3. Aneurysmal dilatation of the aortic sinuses is common. Probably (see Jones and Langley, 1949) inflammation of the sinus wall causes separation of the annulus fibrosus from the aortic media, so that blood passes through the wall of the aorta and stretches the exposed muscle of atrium or septum. It then clots and eventually becomes organized, so giving rise to an aneurysm lined by fibrous tissue. That this is the correct explanation in our case is supported by the presence of the surrounding histiocytes filled with iron pigment.

4. A persistent leucopenia is common, but, unlike uncomplicated brucellosis, there is a relative neutrophilia rather than a lymphocytosis, apart from one exception (Steyrer, 1934).

5. Extremely low blood pressure, which was a prominent feature in this case—the systolic pressure being only once recorded as above 100 mm.—has also been found in other cases. In one of these (Gounelle and Warter, 1935) a pressure of 60/45 was recorded, and five others had pressures of 105 mm. systolic or less at one time or another. Furthermore, evidence of alteration in conduction of the heart muscle has been demonstrated in several cases, although not in ours. Both these factors may well be due to the severe myocarditis commonly present.

6. The accompanying bacteraemia often gives rise to a variety of focal lesions in the viscera, such as the granulomata, suppurative lesions, and focal necroses seen in our case (compare Matzdorff, 1933; Sprunt and McBryde, 1936; Rabson, 1939; Call *et al.*, 1944) as well as embolic lesions.

7. There may be improvement in symptoms and cessation of pyrexia for a period, even when infection remains active (Call *et al.*, 1944; Voth, 1949; Hart *et al.*, 1951), so that a patient with *Brucella* endocarditis may appear deceptively well—an important practical point, well illustrated by our case. There was little evidence of septicaemia, only slight pyrexia, no definite embolic manifestations, and no clinical enlargement of the spleen, at a time when the histological evidence suggests that the endocarditis was progressing.

The possibility of such rare complications reinforces the need for the early diagnosis of all cases of undulant fever and their treatment with full courses of antibiotics.

Summary

A case of *Brucella* endocarditis is reported. It was superimposed on a congenital bicuspid aortic valve and gave rise to aneurysms of the aortic sinuses. Terminal rupture of the heart resulted from a small abscess in the wall of one of these aneurysms.

The characteristics of this type of endocarditis are described in the light of this and previous cases.

The possibility of such a serious latent complication emphasizes the need for early diagnosis and treatment of all cases of brucellosis.

We wish to thank Dr. A. C. Jones and Mr. P. Everall for the bacteriological work in this case, and Mr. R. T. Ross for technical assistance.

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OBSERVATIONS ON GOLD THERAPY IN RHEUMATOID ARTHRITIS

BY

R. A. PEEBLES BROWN, M.B., Ch.B., F.R.F.P.S.
M.R.C.P.

Senior Registrar

AND

J. P. CURRIE, M.D., F.R.F.P.S., M.R.C.P.

Physician

Rheumatism Unit, Glasgow Royal Infirmary

Gold salts have been widely used for the treatment of rheumatoid arthritis for about 20 years, and during that time many reports of the results have been published. Although some of these reports have been of small numbers of cases, others have been extensive; for example, Forestier (1935) reported on over 550 treated patients, and Hartfall *et al.* (1937) on 690. The general impression from these reports is that a favourable response may be expected in about 80% of cases. Thus Short *et al.* (1946) analysed the results of gold treatment in cases collected from 35 published reports. Making allowance for the different criteria adopted, they found that it was claimed that 84% of 1,943 cases showed definite improvement of any degree, 59.3% of 2,924 showed noteworthy improvement, and 22.6% of 1,825 were arrested. It is probably true to say that on this basis gold has become the most widely accepted single therapeutic weapon in the treatment of rheumatoid arthritis.

Need for Controlled Trials

Unfortunately, none of the results in the early series were controlled in any way, and even now the number of reports of controlled series is strikingly few. Control of results in rheumatoid arthritis is essential for two reasons. The first is that spontaneous improvement and arrest can occur at any time; it seems to occur more often in patients who have developed the disease at an earlier age and in earlier stages of the disease, and it is notable that it is for such patients that gold is said to give the best results. The exact course and the natural history of untreated rheumatoid arthritis are difficult to assess, as with such a prolonged and disabling condition it is impossible to keep patients entirely without treatment, either from their doctor or from friends. Few figures are available even for the results of simple and non-specific treatment, but Short *et al.* (1946)

assessed such results for 274 patients in 1937, after a period of six months to seven years. They found 52.9% with noteworthy improvement and 16.4% in which the condition was arrested. In a later paper (Short and Bauer, 1948), covering 250 cases followed for a further 10 years, 53.2% were found to be improved and 15.9% in remission, with 9% arrested for five years or longer. They did not consider that their own results for gold treatment in 35 patients were any better than this. They quote Furlong (1942) for the opinion that 60–70% of patients receiving general measures show improvement. Thompson *et al.* (1938) also claimed that various measures other than gold resulted in marked or moderate improvement in 76.5% of 274 patients, with 6% classified as being well.

The second difficulty in assessing results lies in the determination of objective improvement. In 1937 Hartfall *et al.* stated that they had been unable to eliminate the psychological effect of injection therapy, but thought that "most observers will no doubt agree that psychogenic factors do not play an important role in the majority of patients." In recent years the effect of the emotional state of the patient and of the emotional atmosphere on subjective tests of improvement has been increasingly noted. Clark (1951) has stressed the effect of placebo treatment, and Bedford (1951) has shown that the response to subjective tests may vary from hour to hour even in the absence of any therapy. There is as yet, however, no agreement on which tests may be considered objective. Quin *et al.* (1950) accept tenderness, power of grip, and speed of movement as suitable tests, and Janus (1950) accepts tenderness and grip. As Clark has pointed out, these tests depend on the co-operation of the patient, and changes in the emotional tone may, by varying the threshold of sensitivity to pain, cause variations in the results obtained. Strictly objective tests that may be used include the measurement of joint size, temperature, and blood flow; estimation of the E.S.R. and degree of anaemia; and estimation of plasma viscosity and C-reactive globulin. The difficulty of using many of these tests in routine assessment of improvement is obvious.

Results in the Literature

The first report of a controlled trial of gold salts was by Ellman *et al.* (1940). They treated 30 patients with large doses of gold salts and 30 with small doses; 30 patients were observed as controls. They claimed that in 14 of those on large doses, 8 on small doses, and 1 of the controls became inactive, and that 14, 20, and 22 respectively showed some improvement. These findings were supported by E.S.R. estimation and measurement of joint swelling. After one year the results in the treated cases remained better than in the controls.

Fraser (1945) carried out a carefully controlled investigation on 110 patients, 61 being treated with sodium aurothiomalate ("myocrisin") and 49 with control injections. The results were assessed after one year. He found that 82% of those on gold improved clinically, compared with 45% of the controls, although 75% of the latter claimed subjective improvement. He did not claim arrest in any cases, but 56% of those on gold were considered to show great improvement, compared with 33% of the controls. Fraser believed that, although gold was the best single form of treatment available at the time, the good results claimed by the majority of observers were unjustifiably high owing to the lack of adequate controls.

Waine *et al.* (1947) are quoted by Egellius *et al.* (1952) as having treated 58 of 120 patients with gold. After an average of 2.9 years they found 56.9% of the treated cases symptom-free or greatly improved, compared with 29.1% of those treated physically.

Adams and Cecil (1950) treated 106 of 189 patients with gold. After one year they claimed complete remission in 78.7% of cases on gold and in 29.8% of controls for cases of less than six months' duration, while in those in which the disease was present for a longer period remissions oc-

curred in 48.9% and 16.7% respectively. After an average of four years, 55.7% of gold cases and 36.1% of controls remained in remission. These figures are high for cases showing complete inactivation; by using the strict "therapeutic criteria" of the New York Rheumatism Association (Steinbrocker *et al.*, 1949) they are lowered to 44.8% for gold and 27.7% for controls; such figures indicate how varying criteria may affect the results obtained in uncontrolled series.

Merliss *et al.* (1951) treated 28 patients with aurothioglycoanilide ("lauron") and 44 controls with saline, serum, or antireticulocytotoxic serum. They found no essential difference in the results of the two groups, and again stressed the great variation of results with a varying emotional atmosphere.

The introduction of cortisone has shown what effect can be achieved by a really potent remedy in suitable cases of rheumatoid arthritis, and has given a standard against which the results of gold therapy can be set. Since it is widely agreed that gold may produce dangerous toxic effects, it is essential to be sure that any benefit obtained is great enough to warrant its continued use. Gold treatment will not necessarily be discarded completely through the introduction of cortisone, and indeed its use to potentiate or prolong the action of cortisone is under investigation. In these circumstances, and considering the varying results reported, it seems essential that further controlled studies of the results of treatment should be carried out.

Present Investigation

A course of treatment lasting 13 weeks was given to 220 patients. All were treated in the out-patient department of the Glasgow Royal Infirmary and were seen once weekly for treatment and observation. The diagnosis of rheumatoid arthritis was based on the following criteria: polyarthritides; radiological confirmation or lack of evidence of other joint pathology; normal blood uric acid; negative Wassermann reaction; negative gonococcal complement-fixation test; negative serum agglutination test for abortus fever; acceptable clinical history and picture; and raised E.S.R. and raised plasma viscosity. The patients were assessed for improvement at the end of the course, again three months later, and, finally, one year after treatment had ceased. Assessment of subjective improvement was by pain, performance, well-being, and appetite; objective improvement by joint measurements, E.S.R., plasma viscosity, and degree of anaemia.

Treatment was as follows:—(1) Gold: weekly intramuscular injections of sodium aurothiomalate (total dose 0.8–1 g., divided over 13 doses). (2) Copper: weekly intravenous injection of "cuprelone" (1st dose, 10 mg.; 2nd and 3rd doses, 25 mg.; 4th and 5th doses, 50 mg.; 6th and 7th doses, 75 mg.; 8th and 9th doses, 100 mg.; 10th and 11th doses, 150 mg.; 12th and 13th doses, 200 mg.). (3) Saline: weekly intramuscular injections of 3 ml. of sterile normal saline. (4) Physiotherapy: weekly treatments of various forms of heat therapy and gentle massage. (5) Arsenic: weekly intravenous injections of neoarsphenamine (1st dose, 0.15 g.; 2nd to 13th doses, 0.3 g.). (6) Aspirin: 10 gr. (0.6 g.) acetylsalicylic acid powder three times a day for 13 weeks; inter-viewed weekly.

The results at the end of the course for all patients are set out in Table I. These results are not, however, strictly comparable one with another, as the cases treated by gold and

TABLE I.—Results at End of Course; All Cases

Treatment	No. of Cases	% Symptomatically Improved	% Objectively Improved
Gold	38	75	50
Copper	60	50	33
Saline	60	42	33
Arsenic	21	70	50
Physiotherapy	22	50	33
Aspirin	19	50	25

arsenic had been selected in that they were all early and frankly active cases with an E.S.R. of over 40 mm. in one hour. The remaining groups included patients over 50 years of age and with advanced disease.

Table II shows the results adjusted by the removal of such patients from each group. The figures in this small series indicate that the results of a single course of treatment with gold salts are no better than those obtained by the other methods described.

TABLE II.—Results Adjusted to Exclude Elderly and Inactive Cases

Treatment	No. of Cases	At End of Course		At 3 Months		At 1 Year	
		A	B	A	B	A	B
Gold	38 (0)	75	50	62	28	53	30
Copper	40 (20)	77	52	66	32	50	33
Saline	38 (22)	74	53	60	36	55	30
Arsenic	21 (0)	70	50	60	30	50	29
Physiotherapy	16 (6)	70	43	58	29	48	30
Aspirin	13 (6)	77	38	59	25	60	25

A=Percentage symptomatically improved. B=Percentage objectively improved.

Figures in parentheses show the number of cases eliminated from each group to make the basis for selection comparable to that for gold therapy.

Summary

Attention is drawn once more to the small number of reports of controlled trials of gold therapy and to the variation in the results obtained.

A series of 220 patients have been treated by a variety of measures, 38 of them receiving gold. No appreciable difference in the results has been found, either immediately or after one year.

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Miss Patricia Hornsby-Smith, M.P., Parliamentary Secretary to the Ministry of Health, was the guest speaker at the annual general meeting of the Central Council for the Care of Cripples, which took place on April 10. She said she sympathized very much with the point of view of the council on the edict of the General Nursing Council preventing nurses from starting their training until they are 18, and thus eliminating the year of orthopaedic pre-nursing which many girls of 17 had been doing, but she hoped that some compromise might yet be reached in this matter. The Ministry of Health readily acknowledged and appreciated the voluntary work which the council was doing, and was glad to support the project being launched for the sale of goods made by cripples. A committee was being set up by the Ministry to inquire into the rehabilitation and training of all those physically handicapped. Miss Hornsby-Smith said that, following a circular to 129 local authorities asking them to submit schemes for the care of their physically disabled, 65 had already submitted schemes to the Minister. She thought local authorities had a difficult task in deciding which service to expand and which to create without increasing the rates.

DISSEMINATED ASPERGILLOSIS AND MONILIASIS ASSOCIATED WITH AGRANULOCYTOSIS AND ANTIBIOTIC THERAPY

BY

N. E. RANKIN, M.B., B.S.

(From the Department of Pathology, the Royal Infirmary, Gloucester)

Pulmonary aspergillosis and local infections with monilia are not rare, but the disseminated forms are much less common. The use of antibiotics in the presence of these fungous infections is dangerous. The following case is of interest because both fungi were present in the lesions.

Case Report

A window cleaner aged 45 was seen on April 3, 1951, with an abscess of the thigh. He was treated with sulphonamides, and was admitted on April 18 for evacuation of the pus (culture, *Staphylococcus aureus*). He later developed consolidation of the right lung. This was treated with penicillin, 14 million units, and resolved slowly. Albuminuria developed on May 28 and persisted. The white-cell counts on April 26 and July 26 were 4,600 and 4,300 per c.mm., respectively. He was discharged on August 31, and shortly afterwards developed ulceration of the throat, which responded to chloramphenicol. He was readmitted on October 5 and agranulocytosis was found (white cells 1,800, polymorphonuclears 108 per c.mm.), and this persisted. Chloramphenicol was continued (total dose, 30 g.), with oral and intramuscular penicillin. Pyridoxine, 250 mg., "livadex" 20 ml., and three blood transfusions of 1 pint (570 ml.) were given. Consolidation of both lungs developed on November 1 (sputum culture, *Ps. pyocyanea*) and he died on November 7.

At necropsy on November 8 fibrinous pleurisy was present on both sides. A large infarct was found in the right upper lobe and a smaller infarct in the middle lobe; the pulmonary arteries to these areas showed thrombosis. In the left upper lobe was a pale area of consolidation 6 cm. in diameter, but no cavitation. A typical red infarct was present in the left kidney, and both kidneys showed several smaller dark-red areas in the cortex. The liver was enlarged (3,500 g.), pale, and firm, with numerous firm white nodules up to 1.5 cm. in diameter with some hyperaemia at the edges. There were a few similar areas in the spleen. The oesophagus was covered throughout with a ragged soft membranous exudate covering shallow ulcers. There was one small acute ulcer in the stomach. In the duodenum and jejunum there were numerous ulcers up to 1 cm. in diameter with a yellowish base and raised haemorrhagic border. A few ulcers were found in the ileum and one in the caecum. Red marrow was present in the sternum and vertebral bodies. Exploration of the left thigh showed fibrosis at the site of the abscess, but no pus or involvement of the femur.

Sections of the lesion in the left lung showed a central area of necrosis, in which only the outlines of the blood vessels could be distinguished. Surrounding this was a zone of inflammatory infiltration in which plasma cells and macrophages predominated. No polymorphonuclears or eosinophils could be seen. Branching mycelium was present throughout the necrotic zone, invading the inflammatory zone and large and small vessels at the edge. The left lung showed a typical infarct with mycelium in the thrombi. The kidney contained an infarct with mycelium in the lumen of the artery. Sections of liver and spleen revealed areas of necrosis similar to that in the lung, but with a very dense network of mycelium, which extended on to the peritoneal surface of the liver. The ulcers in the alimentary tract showed necrotic centres surrounded by the inflammatory reaction, and invasion of the muscularis and blood vessels by mycelium.

Dr. J. T. Duncan kindly examined the sections and made the following comments on the morphology of the fungi. "The tissue sections showed infection by two different fungi, neither of which can be identified specifically without a culture. One of the fungi shows a coarse septate mycelium bearing tufts of stunted terminal branches, indistinguishable from the vegetative mycelium of *Aspergillus fumigatus* in parasitic life, yet not sufficiently distinctive to be identified with this species in the absence of conidial apparatus. This was the only fungus seen in the lung and kidney sections, but it was present also in other tissues, often within the blood vessels. In fact, like *A. fumigatus*, it seemed to have a marked predilection for the blood vessels, and this accounts for the renal infarct. I would judge that this mould infection originated in the lung and was carried to other organs by the blood stream. The other fungus, which was seen in all of the tissues except the lung and kidney, showed general morphology of *Candida*, which is particularly well shown in the sections of liver and spleen. In many of the tissues both fungi are present, and in some areas they are intimately mixed. However, the *Candida* infection is chiefly associated with the mucosa of the alimentary tract."

Discussion

Disseminated aspergillosis is often associated with infarcts, especially in the kidney (Wahl and Erickson, 1928; Abbott *et al.*, 1952; Dr. H. G. Close, personal communication). Very widespread dissemination has been described (Cawley, 1947; Grekin *et al.*, 1950), as have two cases of (Cawley, 1947; Grekin *et al.*, 1950), as have two cases of the mouth endocarditis (Zimmerman, 1950). Infection of the mouth and alimentary tract with monilia is a common complication and agranulocytosis. Several cases of disseminated infection of agranulocytosis. The portal of entry may be the alimentary tract, as in the present case and in those of Lederer and Todd (1949). Duhig and Mead (1951) discussed the possibility of introduction into the blood stream during intravenous therapy. This probably occurred in the cases described by Joachim and Polayes (1940) and Wikler *et al.* (1942) in drug addicts, and by Geiger *et al.* (1945). The bacterial flora of the alimentary tract is known to change during antibiotic therapy, and fungi often appear (Tomaszewski, 1951) owing to suppression of the normal flora and other factors. It is probable that in the present case dissemination of the fungi was promoted by chloramphenicol therapy. The association of agranulocytosis with chloramphenicol was not well known at the time this patient was treated.

Summary

A case of fatal generalized aspergillosis and moniliasis is described. The patient's illness started with a staphylococcal abscess in the thigh, followed by pyaemia with lung lesions. He later developed agranulocytosis and was treated with chloramphenicol. Recent reports indicate the danger of this drug in agranulocytosis. Aspergillosis and moniliasis were found at necropsy. Reference is made to other cases of generalized fungous infections in the literature.

I wish to thank Mr. P. M. Birks and Dr. R. F. Jarrett for permission to publish this case; Dr. E. N. Davey for his advice in preparing this paper; and Dr. H. G. Close, of Dartford, for allowing me to examine material from his case. Dr. J. T. Duncan's help and advice on the mycology have been invaluable. I am grateful to Miss B. Summers for the histological preparations.

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Medical Memoranda

Monilia Peritonitis

Powerful wide-spectrum antibiotics will suppress the growth of susceptible bacteria, and these may be replaced by monilia or other yeast-like organisms which can in certain situations become pathogenic. Oral and intestinal lesions are well recognized (Woods *et al.*, 1951), and cases of monilia pneumonia (Ormerod and Friedmann, 1951; Wolff, 1952) and moniliasis of the urinary tract (Taylor and Rundle, 1952) have been reported in patients treated with aureomycin or chloramphenicol. So far as we know monilia peritonitis has not hitherto been reported.

CASE REPORT

A man aged 49 was admitted to hospital with foot-drop, fever, and abdominal pain. While in hospital the fever continued, wrist-drop developed, and signs of active carditis appeared. The usual investigations of a pyrexia of unknown origin were negative, and in spite of parenteral penicillin the patient deteriorated and developed bronchopneumonia. He was thought to be suffering from polyarteritis nodosa, and, although he was known to have a duodenal ulcer, it was decided that he should be treated with 100 mg. of A.C.T.H. and 2 g. of aureomycin daily. After three days on this regimen he complained of severe abdominal pain and his abdomen became distended with fluid. He was judged unfit for surgical intervention and 60 oz. (1.7 litres) of brownish viscid fluid was aspirated from the peritoneal cavity. The A.C.T.H. was stopped, the stomach aspirated, and an intravenous drip of glucose-saline begun together with intravenous terramycin. Three days later a further paracentesis was necessary and 100 oz. (2.8 litres) of very viscous fluid was withdrawn.

Large numbers of monilia were found on direct examination of the fluid, with pus cells but no other organisms, and a pure growth of *Candida albicans* was obtained on culture. Gentian violet, 1 g., was given daily by intraperitoneal injection, but fluid continued to reaccumulate and the patient went downhill and died after a further four days. At necropsy 3 litres of fluid was found in the peritoneal cavity, the viscera were coated with fibrino-purulent material, and there was a large perforated ulcer in the first part of the duodenum.

COMMENT

The aureomycin must have altered the patient's intestinal flora until *C. albicans* was the dominant organism, and when the ulcer perforated as a complication of treatment with A.C.T.H. it was this organism which obtained access to the peritoneal cavity and set up infection. Powerful new remedies of necessity bring with them new complications, and it is important that these should be recorded, as, with the increasing use of these agents, similar cases are to be expected in the future.

We are grateful to Dr. R. L. Vollum for the bacteriological findings and to Professor L. J. Witts for permission to publish this report.

P. C. REYNELL, D.M., M.R.C.P.
E. A. MARTIN, M.B., M.R.C.P.I.
A. W. BEARD, B.M., B.Sc.

Nuffield Department of Clinical Medicine,
Radcliffe Infirmary, Oxford.

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Congenital Hypertrophic Pyloric Stenosis in Twins

When a disease process of uncertain cause affects one or both of twins speculation is immediately aroused whether hereditary influences, maternal toxins, placental abnormalities, and the like may have some bearing on the causation. The present paper records the occurrence of congenital hypertrophic pyloric stenosis in both members of a pair of identical twins.

CASE REPORT

Richard and Joseph were born on September 16, 1950, in hospital. There was another child, aged 7, alive and well. The mother's age was 25; her general health was good, her diet was satisfactory, and she had had no miscarriages. There was no history of infection during pregnancy nor a family history of twinning or congenital abnormality. She was admitted to hospital two weeks before delivery because her blood pressure was raised, and she was stated to have toxæmia. Both babies were born spontaneously, both at full term. Joseph was born first, and weighed 6 lb. 11 oz. (3,033 g.); Richard weighed 6 lb. 10 oz. (3,005 g.). The placenta weighed 2 lb. 13 oz. (1,276 g.), and was uniovular.

Both twins were breast-fed, but they needed occasional complementary feeds. They took feeds quite well until October 6 (3 weeks old), when they both began to vomit. This vomiting was at first slight, but it soon became projectile in character. The feeding was changed to mainly a half-cream proprietary milk food, but after some relief the vomiting became projectile again. Breast-feeding was not completely stopped, however. The babies were constipated and always hungry. Visible peristalsis was observed in a child welfare clinic, and the babies were admitted to hospital on October 10.

On admission Joseph weighed 7 lb. 12 oz. (3,515 g.). He was well developed and showed no signs of dehydration. Visible gastric peristalsis was observed, and a typical pyloric tumour was palpated on October 11. He had been given treatment with glucose-saline and an antispasmodic. There was some relief from vomiting, but this recommenced early on October 12. Richard weighed 6 lb. 4 oz. (2,835 g.), and was a little dehydrated. As with Joseph, visible gastric peristalsis was seen and a tumour palpated. Under treatment he gained 6 oz. (170 g.). On October 12 he started to vomit again. It was therefore decided to submit both twins to operation. Joseph was operated on first. Typical pyloric tumours were found in each case, and Fredet-Ramstedt operations were performed.

Joseph had occasional vomits post-operatively, and on the third day after operation he had three large vomits. The stomach was washed out with saline and a large quantity of mucus was removed. His vomiting ceased, his bowels functioned normally, and he began to gain weight. Richard's convalescence was complicated by incessant vomiting. Stomach wash-outs relieved him only a little. Both babies were being fed with expressed breast milk with complementary feeds of half-cream dried milk. It was noted that Richard's vomits were associated with the dried-milk feeds. He was therefore fed wholly on "bank" breast milk. He then ceased to vomit and began to put on weight. Joseph was discharged on October 17 and weighed 7 lb. 10 oz. (3,460 g.). Richard weighed 6 lb. 12 oz. (3,060 g.) when he was discharged on October 23. After discharge the mother fed Richard mainly on the breast, but within a few weeks both were having breast milk and complementary feeds. They were last seen on April 19, 1951, and were then being fed on breast milk and solids. Each weighed 16 lb. 9 oz. (7,510 g.). They looked very alike, having the same features, and hair and eyes of the same colour.

COMMENT

The occurrence of the same disease in twins at the same time is always an interesting phenomenon. When the disease is one such as congenital hypertrophic pyloric stenosis this interest is heightened. Moore (1924) seems to have been the first to report pyloric stenosis affecting both

members of uniovular twins. Since then the number of reported cases has not been large. Laubscher and Smith (1947) collected 13 such reports. Wagner and Baratz (1951) and Lamy and his co-authors (1949) have since added one case each.

The suspicion that a genetic factor plays an important part in the aetiology of congenital hypertrophic pyloric stenosis is substantiated by the increasing number of reports of its occurrence in twins, siblings, and near and distant relatives. Cockayne (1934) has propounded the view that the disease has a genetic basis, but adds that "the way in which the condition is inherited is still uncertain, and an environmental factor may be necessary for its production, in addition to the genetic one." Sheldon's (1938) thoughts on the subject, that "when pyloric stenosis affects uniovular twins both twins show the condition," and "when pyloric stenosis affects binovular twins the disease is likely to occur only in one twin," are in the main true, and reports such as this and those of Ward-McQuaid and Porritt (1950) and of Cockayne and Penrose (1943) add further support to his views. There are, however, exceptions to this, as amply shown by Lasch (1925), O'Donnell and Klein (1941), Laubscher and Smith (1947), Hughes, Small, and Macky (1949), Garrison (1949), Powell and Carter (1951), and Sheldon himself. All these writers have given instances of pyloric stenosis affecting both members of binovular twins. Conversely, Sheldon, Powell and Carter, and Lasch have reported only one member of uniovular twins being affected.

In this report the type of twinning has not been so completely elucidated as were the cases reported by Ford, Brown, and McCreary (1941). The evidence available points to the twinning being uniovular. The fact that there was one placenta, the obstetrician's opinion that the placenta was uniovular, the similarity in sex, the striking likeness in features, colour of hair, eyes, and complexion, and their general progress are strong pointers to the conclusion that these babies are monozygotic twins. Thus the occurrence of congenital hypertrophic pyloric stenosis in them affords further evidence to substantiate Sheldon's assertion. However, there are so many exceptions, and the number of cases involved is so small, that the truth of the matter cannot yet be correctly assessed.

My thanks are due to Mr. W. A. Thompson for his kind permission to treat these patients and to publish this case report. The babies were admitted under his care to the Royal Liverpool Children's Hospital.

T. A. SALE, M.B., Ch.B., F.R.C.S.Ed.

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The Court of the University of Edinburgh has appointed Miss G. B. Carter, B.Sc., S.C.M., S.R.N., to the Boots Research Fellowship in Nursing tenable in the Department of Social Medicine. Miss Carter, during her tenure of the Fellowship, is to undertake (a) a review of the educational needs of the sister tutor in relation to her responsibilities; (b) an examination of the courses of instruction offered in Great Britain to the candidates for the sister tutor's certificate; and (c) an examination of the desirability and of the possibility of instituting in this country an academic degree in nursing which would be of advantage to such as hold senior positions within the nursing profession.

Reviews**SYMPATHETIC CONTROL OF BLOOD VESSELS**

Sympathetic Control of Human Blood Vessels. By Professor H. Barcroft, M.D., M.R.C.P., and H. J. C. Swan, M.B., B.S., M.R.C.P. Monographs of the Physiological Society, No. 1. (Pp. 165; illustrated. 18s.) London: Edward Arnold and Co. 1953.

This monograph is the first of a series started by the Physiological Society under the editorship of Drs. Bayliss, Feldberg, and Hodgkin, whose names guarantee a high standard of quality. It is an excellent opening number and a good omen for its successors.

There are two types of monograph, each distinctive, each useful to the reader, and each, according to its content and authorship, authoritative within its field. The first is a survey of the whole ground embraced by the title, the second is the record of a voyage indicating the problems seen, the thoughts, experiments, failures, and successes; it carries the reader in the spirit of adventure and, when well written, holds him with radar eyes even though viewing through a sea mist or a Celtic twilight. This is of the second type. Of the monograph writers in this class, among the best was the father of the senior author of this work. It is with nostalgic pleasure one is taken into the author's confidence, one sees the design of the experiment being built up, one watches colleague-collaborator achieve his answer, and, that problem disposed of, one follows through to the next step, sharing the experimenters' *joie de vivre*.

This method has the virtue of joining with the authors in their Odyssey, but it has the weakness that one only visits the islands Ulysses visited. One would have liked to know the position of the work of Paton and Zaimis and the hexamethonium drugs in this picture—especially as Fig 10.2 tantalizingly refers to this group, but in the text of the book they are not mentioned. In many respects the most useful and also the most interesting portions are the accounts of the experimental methods designed and followed in settling the relative functions of neural and humoral factors. The logical processes pursued hold the interest. The appendix on plethysmography is a useful account of the history of the subject, and the authors discuss the technique and the methods in a way invaluable for the non-physiologist or the honours student. Two clinical conditions are most illuminatingly considered—phaeochromocytoma and fainting—and well illustrate the value of the experimental method in and well illustrate the value of the experimental method in clinical problems. The illustrations are plentiful and useful though compact. So far as the reviewer knows, the answer to Professor Barcroft and Dr. Swan's question on p. 143-4 ("Where did Brodie and Russell do their experiments?") is, In Professor Barcroft's own laboratory, where Brodie was head and Russell demonstrator.

A. ST. G. HUGGETT.

VISCERAL CIRCULATION

Visceral Circulation. A Ciba Foundation Symposium. Edited for the Ciba Foundation by G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., assisted by Margaret P. Cameron, M.A., A.B.L.S., and Jessie S. Freeman, M.B., B.S., D.P.H. (Pp. 278; 72 illustrations. £1 10s.) London: J. and A. Churchill. 1952.

This is the text of a symposium on the visceral circulation which was held at the Ciba Foundation in London in July, 1951. The first part is on the architecture of the visceral circulation, of which so many beautiful pictures have been produced in recent years, and where arterio-venous shunts and pre-capillary sphincters are the topics of the day. The second part is on general factors in blood-flow regulation, with particular reference to the actions of adrenaline and noradrenaline. The third part is on regional blood-flow regulation, the investigation of which requires complex and arduous techniques, and the fourth and final part is on the interaction and integration of the general and visceral circulations.

As has happened in other fields, the study of the circulation has become not less but more complicated as more data have been collected, but it is in disorders of the visceral circulation that we may have to look for an explanation of the mechanism of some unsolved diseases, more especially diseases of the skin and the alimentary tract. The symposium is well edited and contains some excellent photographs; it will be a useful work of reference, not only for those attending the conference but for the large number of other workers in this field.

L. J. WITTS.

THORACIC SURGICAL MANAGEMENT

Thoracic Surgical Management. By J. R. Belcher, M.S., F.R.C.S., and I. W. B. Grant, M.D., M.R.C.P.Ed. Foreword by Sir Clement Price Thomas, K.C.V.O., F.R.C.S. (Pp. 196; 65 figures. 16s.) London: Baillière, Tindall and Cox. 1953.

The authors of this book, both men well versed and skilled in their subject, have set out to place their knowledge and experience at the disposal of others. They have achieved their purpose with commendable directness and economy of words, realizing that real insight and understanding on the part of the resident staff is imperative in the working of any successful thoracic team. The book will be no less valuable to the team's nurses and physiotherapists.

Because of the mechanics of the chest and heart, operative success or failure depends largely on scrupulous pre- and post-operative care. In no other branch of surgery is the strict training of resident medical and nursing staffs more important. An occluded bronchus, an uncontrolled thoracic-cage deficiency, a leaking bronchus after pulmonary resection, a sudden intrathoracic haemorrhage, or the appearance of cardiac irregularity, or other serious post-operative incident, may mean death to the patient unless correctly diagnosed and remedied at once.

In relating the cost of the book to the pockets of its readers, the authors have perhaps limited its practical value by the exclusion of x-ray pictures. This could be remedied in subsequent editions. Then too, since ideas on many procedures, especially in relation to tuberculosis, are changing, an indication of relative values would have been helpful. For instance, the minor operation of phrenic crush, so lightly undertaken perhaps with the expectation of recovery of function in six to twelve months' time, may so cripple a patient with already impaired respiratory function that, in the absence of regeneration, future major surgery may be made difficult or impossible.

The book is clearly printed and well illustrated. It is full of fundamental information and will prove invaluable to a large number of men and women both at home and abroad. Mr. Belcher and Dr. Grant deserve the warmest congratulations on having analysed in a small space knowledge hitherto handed on only by word of mouth and precept. They have pointed out many pitfalls into which the unwary may stumble only too easily. This compact volume is strongly recommended to all those interested in thoracic medicine and surgery.

DONALD BARLOW.

PSYCHIATRIC RESEARCH

Prospects in Psychiatric Research: Proceedings of the Oxford Conference of the Mental Health Research Fund, March, 1952. Edited by J. M. Tanner, M.D. (Pp. 197. £1 1s.) Oxford: Blackwell Scientific Publications. 1953.

This book is one of the most stimulating psychiatric publications in recent years. The newly formed Mental Health Research Fund collected together 50 research workers and clinicians, eminent in various fields of psychiatry, sociology, neuroanatomy, biochemistry, pharmacology, and the like, to discuss ignorance hampering advances in the treatment of mental illness and the most profitable lines of future research. We now have available the full transcript of their two days' discussion at Oxford, which was at the time the subject of a leading article in this *Journal* (March 29, 1952, p. 699).

Parts of such a book are bound to be better than others, but an extremely high standard is maintained throughout.

Professor Le Gros Clark's contribution is outstanding on the possibilities of research into various regions of the brain whose function is little understood. As the cutting of a few tracts in the prefrontal lobes has resulted in the discharge of so many incurable patients from mental hospitals, other tracts in the brain must soon be explored. Dr. Eliot Slater is refreshingly outspoken on genetic research, and diagnoses some of our present troubles as "too many people who know all the answers (and) have found the key to the universe." The need for more psychological and physiological work in animals is repeatedly emphasized. This book also contains a host of other problems for those trained in all branches of medicine.

Future generations are bound to be bewildered about why, in the presence of so much mental disorder and psychopathic crime, so little is now being done to finance and organize research to combat it. The book's introduction stresses the incalculable cost in terms of human suffering. This, however, may be partly due to suspicion about the amount of supposed "trick cycling" prevalent in this specialty. Anyhow, those having such abilities might still be useful if they learn from this book how to produce more genuine rabbits out of the ridiculously small financial research hat provided at the present time.

WILLIAM SARGANT.

NUTRITION AND HEALTH

Nutrition and Health. By Sir Robert McCarrison, C.I.E., M.A., M.D., D.Sc., LL.D., F.R.C.P., with a postscript by H. M. Sinclair, M.A., D.M., B.Sc. Being the Cantor Lectures to the Royal Society of Arts in 1936, together with two earlier Essays. (Pp. 125. 12s. 6d.) London: Faber and Faber, 1953.

Sir Robert McCarrison went to India at the age of 23 and spent 30 years in working on nutritional problems. He attained the rank of major-general in the Indian Medical Service, and founded the well-known Nutrition Research Laboratories at Coonoor. In 1936, some years after retiring from his duties in India, he gave a series of Cantor lectures on the influence of diet upon health before the Royal Society of Arts. From his vast experience in both clinical and laboratory work he concluded that perfectly constituted food is the greatest single factor in the acquisition and maintenance of good health. In support of this view he correlated the fine physique of the northern Indian races—Sikhs, Pathans, Mahrattas, and Hunza and Nepalese hillmen—with their good diet based on wheat, milk, and vegetables. In contrast the more southern Indian races, including the Bengali and Madrassi, who subsist mainly on rice, were greatly inferior both in their physique and in their resistance to disease.

Proof that diet was the deciding factor was obtained by feeding seven groups of rats on the foods of selected races. The animals given the diet eaten by Sikhs became large and healthy, and those given the other diets were graded in their growth and resistance to disease in the same order as had been found in their human counterparts. Thus the rats given the Madrassi diet came at the bottom of the list, with a growth rate of only about one-third that observed in the rats given the Sikh diet. From these investigations McCarrison concluded that in India faulty diet not only increases the liability to infections, such as tuberculosis, but also gives rise to minor manifestations of ill-health which cannot be given a diagnostic label. These less obvious manifestations of deficiency disease, in his opinion, may have vastly greater practical importance than more obvious but less common diseases such as scurvy, beriberi, and rickets.

The present book, which is well produced and illustrated, will serve a useful purpose in bringing home to the rising generation the lessons taught in the Cantor lectures. During the last 20 years, as Dr. Sinclair emphasizes, our knowledge of the science of nutrition has greatly expanded. We have even learnt some hard lessons in its practical application: during the relief of starving Holland expensive protein hydrolysates were eaten willingly only by

lunatics. It still remains difficult, however, to disentangle the effects of nutrition from those of other factors which affect public health. When we attempt to decide how far imperfect food is responsible for ill-health in Britain and other European countries, the pioneer work of McCarrison at least indicates that all is not necessarily well because frank signs of deficiency are not immediately evident.

T. MOORE.

CARDIOVASCULAR DISEASES

Lehrbuch der Krankheiten des Herzens und der Blutstrombahn. By Professor Fritz Lange. (Pp. 631; 192 figures. M. 71.) Stuttgart: Ferdinand Enke, 1953.

It is interesting to see a textbook of the diseases of the heart and circulatory system by Professor Lange, for it is based on Romberg's book, the third edition of which the reviewer studied over thirty years ago. The present volume is probably a good indication of thought and practice in this subject in Germany to-day. One finds remarkable differences from the ideas fashionable in Britain. In the general section the part on the metabolism of the heart is very well done indeed and most interesting. It follows a good section on the dynamics of the heart. In the section on physical examination it is curious to learn that a percussion hammer and pleximeter are still used: this must surely shock some for whom the art of percussing the heart at all is almost extinct. It is curious to associate the anacrotic pulse with hypertension. Pulses, by the way, are given Latin names, but sometimes the Latin is wrong. Gallop rhythm, however, is hardly mentioned. In the chapter on infective endocarditis there are some very complicated diagrams which do not illuminate the subject. It is interesting to gather that there seems to have been a considerable increase in the incidence of this disease in Germany much in the same way as it increased in Britain in 1918. In the chapter on congenital heart disease the operation advised by Brock in this country is not mentioned.

In discussing infarction the author claims that one can distinguish the anterior infarct from the posterior by the type of symptoms produced, noting that a posterior infarct produces pain referred to the abdomen, whereas anterior ones are likely to cause acute oedema of the lungs or sudden death. In treatment one is surprised to see that leeches receive more space than venesection and that the vogue for bathing, once so popular in Germany, is still maintained. One wonders whether one should really consider "diuretin" before the mercurial diuretics in these times: these are recommended for administration either intramuscularly or intravenously, but no preference is suggested. There is a considerable section on disease of the arteries and of the veins, so that anatomically, at any rate, the whole of the circulation is fully discussed.

Some of the illustrations seem to be familiar, coming from a source in this and another country which is not acknowledged. The print is good and the variety of type helpful. The x-ray photographs are clear and the cardiograms satisfactory. Emphasis is laid on the effort-cardiogram in diagnosing angina pectoris.

In general this book seems somewhat old-fashioned and hardly emphasizes what in Britain would be considered important. It is, however, interesting to read the opinions of those with a different point of view.

TERENCE EAST.

Garrod, Batten, and Thursfield's *Diseases of Children*, the fifth edition of which is edited by Professor Alan Moncrieff and Dr. Philip Evans, includes a number of new sections on the causes of congenital malformation, endocrine disorders, the alimentary tract, congenital heart disease, and other subjects. The text has also been extensively revised. The illustrations have been as thoroughly revised as the text, and there are many new ones. The two volumes are paginated continuously, with an index at the end. They are published by Edward Arnold and Co. for £7. The 19th edition of B. N. Ghosh's *Pharmacology, Materia Medica and Therapeutics*, which incorporates new material, is published by Hilton and Co., Calcutta, for 30s. (London agents, H. K. Lewis and Co.).

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THE REPRESENTATIVE BODY

A series of articles on the constitution of the B.M.A. is brought to a close in this week's *Supplement* with an article by Dr. Alfred Cox on "The Jubilee of the Representative Meeting," the first of which was held in Swansea on July 28, 1903. Dr. Cox is the only surviving member of the Constitution Committee of 1900, and we are much indebted to one to whom the Association is so much indebted for this lively and interesting account, written with undiminished mental vigour at the age of 87 years. At the beginning of this century, Dr. Cox tells us, there was despair, resentment, and "even desperation," because of the abuses of contract medical practice and of the inertia of the ruling body of the B.M.A.—the Council. The reason for the inactivity of the Association was "that it was unable to do anything effective because under its constitution it had no means of voicing either the opinion of the profession as a whole or even of its own members, and no machinery by which it could have organized effective resistance." The stimulus to reform came in the shape of a letter to the *Journal* of September 16, 1899, in which Dr. Samuel Crawshaw, on behalf of the Manchester Medical Guild, announced the holding of a conference of "delegates from all associations of general practitioners in England and Wales."

The dominating force at this conference was Mr. (later Sir) Victor Horsley. Dr. (later Sir James) Smith Whitaker was its principal draughtsman and subsequently the first Medical Secretary of the Association. The third force was Dr. Alfred Cox, of Gateshead, who years later succeeded Smith Whitaker as the B.M.A.'s Medical Secretary. It was Dr. Cox's proposals that the conference embodied in the following epoch-making resolutions¹:

"(1) That the present need in medical organization is concentration;

"(2) That the multiplication of associations other than those purely local is to be deprecated;

"(3) That the size, position, and wealth of the British Medical Association make it the most suitable national medical organization; and

¹ *History of the British Medical Association, 1832-1932.* Compiled by Ernest Muirhead Little, F.R.C.S. Published by the British Medical Association, 1932.

"(4) That the efforts of all medico-ethical and similar associations and of the conference should be directed to the conversion of the British Medical Association into an energetic body really representative of the majority of the members of the profession."

Victor Horsley led the deputation from this conference which met the Council of the B.M.A. in Ipswich in the same year, the outcome being the Council's appointment of a Constitution Committee, whose crowning triumph was the first Representative Meeting in Swansea in July, 1903. Dr. Cox believes that, besides himself, there are only two or three other surviving members of this meeting. As the B.M.A. is meeting at Cardiff this year it is apposite to recall that Mr. (now Sir) Ewen Maclean was Chairman of the Representative Body during the struggle over the National Health Insurance Act in 1911, and was elected President of the Association in 1928. To these and many other notable figures in our history the Association owes a debt of deep gratitude, but in this Jubilee Year of constitution-making we hail in particular the work of Dr. Alfred Cox, Sir Victor Horsley, and Sir James Smith Whitaker.

A jubilee year is a time for commemoration and also for taking stock. Much has happened since 1903. There have been two medical revolutions—in 1911 with the passing of the National Health Insurance Act and in 1946 with the passing of the N.H.S. Act. With the first there appeared the first autonomous body within the B.M.A.—the Insurance Acts Committee and its associated Panel Conference. Since 1946 the autonomy of the I.A.C. has become vested in the General Medical Services Committee and its associated Conference of Local Medical Committees. The consultants followed suit in obtaining autonomy for the Central Consultants and Specialists Committee of the Association. Restlessness about the autonomous position of these two important bodies has found expression in a resolution of the Representative Body that their autonomous powers should be renewed each year. And anxiety about this position has been voiced in articles and correspondence on the constitution of the B.M.A. in recent issues of the *Supplement*. In his letter of March 21 Dr. Cox says, "The idea of autonomy inside a parliament is unusual and seems to me potentially dangerous." Dr. F. B. Winfield (*Supplement*, April 18, p. 139) believes that the power and efficiency of the Representative Body have been impaired by the autonomous bodies. Dr. Metcalfe Brown (*Supplement*, March 28, p. 81) considers that the dangers of autonomy are less than might appear, that "autonomy is incompatible with

true unity," but that it should disappear gradually and by agreement and not by any revolutionary measure. What is fundamental is that the power of the two autonomous bodies should not lead to sectionalism within the profession, with a consequent conflict of interests. What is needed is integration of interests and efforts, and so unity in a profession whose real aims and objects should be, and indeed are, one. It was, no doubt, with this in mind that the Winchester Division in its important memorandum on the Representative Body (*Supplement*, February 28) advocates election to it of four members of the Central Consultants and Specialists Committee, four of the General Medical Services Committee, and four of the Public Health Committee. The R.B. is the Parliament of the profession and the policy-making body of the Association. Its powers in this respect must be maintained and not weakened, and there can be little doubt that in general the R.B. feels that its position in the constitution of the B.M.A. is not what it was.

The other big change in the B.M.A. since 1903 is its great increase in membership, an increase which has paralleled the increase in registration of doctors, and now more closely approximating to it. In 1903 there were about 36,000 doctors on the *Medical Register*, and membership of the B.M.A. was 18,000. At the beginning of 1952 the number of persons on the *Register* was 82,256 (including 2,036 foreign doctors); membership of the Association was just over 66,000. In an article commenting on the Winchester Memorandum (*Supplement*, March 7) figures were given showing the corresponding increase in the size of the R.B. The numbers appointed by the home constituencies were 210 in 1920, 278 in 1938, 360 in 1947, 425 in 1951: the possible number for this year is 448. If to this are added the overseas members (31), the public health members (4), Council members, the secretariat, and the Press the Winchester Division estimates that a hall is needed large enough to allow for 600 people to "move about comfortably." Such a great increase in size must affect the quality of the work done in the four days allotted to the R.B. at the Annual Meeting. Complaints about this have been made at the meeting itself and in the *Journal*. The matter has been debated in Council and in the R.B., and at Dublin last year the R.B. accepted the Council's recommendation that its numbers should not be reduced. In general it was felt that the educational value to those present outweighed disadvantages. But the Winchester proposals for a reduction in the size of the R.B. to 329 members is strongly supported by one of its founders, Dr. Cox,

in a letter to the *Supplement* of March 21. "At present," he writes, "it seems more like a public meeting than a legislative body." It must be difficult for a Representative Body of its present size to have any feeling of unity and concentration of purpose. It might, too, be argued that the place for education in the work of the Association is at the periphery, in the meetings of the Branches and Divisions that go on throughout the year.

Increase in numbers must lead to diffuseness of debate and to what the Winchester memorandum calls "a lack of balance in the conduct of business." The memorandum also makes a criticism which is of great importance—namely, "The Representative Body is not *truly representative of the profession* in that the majority of its members are general practitioners, so that the view expressed by the Representative Body on any subject tends to be the general practitioners' view, and is *unfortunately so regarded by other sections of the profession*. Consequently the decisions of the Representative Body are not always implemented by the Standing Committees of the Association." As the Chairman of the Winchester Division, Dr. R. Gibson, is a general practitioner and the first signatory of the memorandum this criticism has added force. The memorandum calls for reduction in membership of the R.B., a balanced representation of all sections of the profession, and a system which allows for adequate time for discussion of matters of first importance. The profession is now faced with medico-political problems of quite a different order from those which faced it 50 years ago, problems which affect all sections and not predominantly general practitioners. In dealing with these many and complex matters it needs now, more than ever, unity of purpose, integration of effort, the avoidance of sectionalism, and a concentration on objectives that would appear to many to be difficult to obtain in a body the present size of the R.B. The Winchester Division has done well to keep the debate open. Perhaps the outcome of this might be the formation of still another Constitution Committee.

ENDOCRINES IN TREATMENT OF CANCER

Recent experimental and clinical work suggests that endocrine therapy will eventually play an important part in the treatment of certain types of malignant growth. Thus neoplasms induced by hormonal stimulation may in the future be prevented or held in check by medical or surgical modification of the host's endocrine system.¹ Dr. Charles Huggins and his

colleagues in Chicago, working initially on experimental animals and later clinically, have confirmed the importance of endocrine therapy for certain types of cancer of the breast and prostate gland. Huggins's approach to this problem has been scientific rather than empirical, and has arisen from experiments on hormone-dependent tumours in animals. According to these experiments not all endocrine secretions, or substances with similar action to that of the recognized hormones, possess carcinogenic properties. The oestrogens and gonadotrophins are the only ones at present known to have them, and Huggins states that "when an oestrogen is a carcinogen its neoplasm-inducing properties are eliminated by testosterone; when a gonadotrophin is a carcinogen tumours are eliminated by gonadal steroids." Suppression or elimination of steroid hormones from the testes, ovary, or adrenal cortex causes regression of both mammary and prostatic growths, provided they are hormone-dependent neoplasms.

For more than a generation the ovaries have been regarded as an important factor in the causation of mammary cancer. Yet only rarely has complete regression of mammary growth been attained by ovariectomy in the human subject. An apparently successful case has recently been reported by Raven.² According to Huggins, the reason why ovariectomy influences occasional cases of human mammary cancer is that these particular neoplasms are independent of adrenal cortical function, whereas most mammary tumours are dependent for sustained growth upon adrenal steroids. This has been shown experimentally by Shimkin and Wyman,³ who found that adrenalectomy reduced the incidence of mammary cancer in mice. Other experimental data⁴ also support the contention that the adrenal cortex plays some part in the genesis of certain mammary tumours in animals. Such evidence, together with Huggins's own work, led him to believe that certain hormone-dependent growths of the mammary and prostate glands would regress when the adrenal factor had been eliminated by surgical removal.

Bilateral adrenalectomy in man was first successfully performed by Huggins and Scott in 1945. The initial results on patients suffering from cancer were not entirely successful, because at that time the post-operative hormonal maintenance of the patients was unsatisfactory owing to inadequate supplies of 11-

oxygenated steroids. But some regression of prostatic growths was observed. Now that cortisone is available, bilateral adrenalectomy should no longer be regarded, according to Huggins, as a risky procedure. Total adrenalectomy for patients suffering from reactivated prostatic carcinoma, followed by the appropriate post-operative therapy, has also been recently advocated by Harrison, Thorn, and Jenkins,⁵ who confirm the results previously obtained by Huggins.

In collaboration with Ling-Yuan Dao, Huggins⁶ has recently reported that adrenalectomy also causes remission in both male and female human breast cancer. Bilateral adrenalectomy, performed at one operation on 42 patients suffering from either breast or prostatic cancer, has resulted in only two deaths, the last group of consecutive cases all surviving. One post-operative death occurred among eight patients with advanced mammary cancer. Four of the survivors showed very satisfactory remission of the disease, while in the remaining three the response was considered to be poor. The four patients in good condition seven to eleven months after adrenalectomy were considered by Huggins to have suffered from "adrenal-dependent mammary cancers." He lays great stress on the form of anaesthesia and on the post-operative hormonal maintenance with cortisone acetate, the details of which have been published separately in collaboration with Bergenstal.⁷ Local or spinal analgesia is inadequate and details are given of the surgical technique for one-stage adrenalectomy under nitrous-oxide-oxygen-ether anaesthesia after sodium pentothal induction. The posterolateral approach is preferred through an incision 20–25 cm. long made directly over the twelfth rib, which is resected. It is claimed that the operation can be completed in 60–90 minutes even with little experience.

Certain breast cancers in women may be ovary-dependent rather than adrenal-dependent. For these Huggins advises ovariectomy before, or simultaneously with, adrenalectomy. He recommends a two-stage operation in which the right adrenal and ovary are removed on one occasion, followed in about two weeks by removal of the left adrenal and ovary.

The difficulty still remains that it is impossible to determine before operation whether a mammary neoplasm is adrenal-dependent. Dependence seems to be a physiological phenomenon not necessarily accompanied by any distinctive morphological characters. The most favourable prognostic sign of the adrenal-dependent mammary tumour, in Huggins's

¹ Huggins, C., *J. Urol.*, 1952, **68**, 875.

² *British Medical Journal*, 1950, **1**, 1343.

³ *J. Nat. Cancer Inst.*, 1945, **6**, 187.

⁴ Wooley, G., et al., *Proc. Nat. Acad. Sci. (Wash.)*, 1939, **25**, 277.

⁵ *New Engl. J. Med.*, 1953, **248**, 86.

⁶ *Ann. Surg.*, 1952, **136**, 595.

⁷ *J. Amer. med. Ass.*, 1951, **147**, 101.

view, is the presence of enlarged adrenal glands with hypertrophy of the zona glomerulosa. Experience has also shown that well-differentiated mammary tumours give the best response to adrenalectomy.

In a more recent and detailed review of this problem Huggins¹ admits that many questions relating to the treatment of appropriate neoplasms by adrenalectomy remain unsolved. He does not attempt to predict what percentage of patients with advanced mammary or prostatic cancer will respond or what the duration of remission will be. There seems to be little danger of adrenalectomized patients developing the Addisonian syndrome provided they are given the correct substitution therapy. In fact most of them seem to be maintained in excellent health, and many after a short time in hospital can resume their ordinary occupations.

GOLD UNDER SCRUTINY

It is only in recent years that the technique of the therapeutic trial has come to be studied with some degree of precision. New drugs are now born into a more rigorous climate than that which greeted their parents and grandparents, and their survival has been made far more difficult. They must undergo strict examination to decide whether they should reach maturity or oblivion. It may be salutary to speculate from time to time on the fate which would overtake some drugs now in regular use if they were to appear for the first time to-day unhallowed by tradition. But it is not necessary to assume that, because a treatment is empirical, therefore it would automatically be discarded under these circumstances. If a paper were to be published in this issue announcing the discovery of the potent effects of colchicine in acute gout, there is little doubt but that adequate evidence could be brought forward in support; yet no account of its mode of action could be given in our present state of knowledge.

In this issue we publish an investigation by Dr. Peebles Brown and Dr. J. P. Currie into the effects of gold therapy in rheumatoid arthritis. They failed to find any evidence that gold, when administered in the accepted manner, had any beneficial effect in 38 cases of rheumatoid arthritis. The cases were assessed after 3 months and at one year. Forestier¹ originally used gold salts in this disease because of claims that they were beneficial in tuberculosis and with the idea that rheumatoid arthritis might be a similar chronic infective condition. Despite the lack of evidence in favour of his original premises, gold has continued, almost alone, to hold its place in the treatment of this condition for nearly 25 years. Yet Short, Beckman, and Bauer² as recently as 1946 wrote, "The burden of proof is still on the proponents of gold therapy to demonstrate that a

significant effect is exerted on the course of rheumatoid arthritis."

Peebles Brown and Currie do not claim that their failure to demonstrate any beneficial effect thereby establishes the fact that gold is of no value, and they draw attention to the fact that there is a good deal of contrary evidence already published—evidence which is not, however, entirely satisfactory. Moreover, most (though not all) clinicians of wide experience in the treatment of rheumatoid arthritis still believe that gold therapy is beneficial, and this cannot be ignored. What is certainly important is that this paper provides a sharp reminder that gold, in common with all other drugs, affords no short cut to the treatment of rheumatoid arthritis and that it is no substitute for the proper management of these patients. Treatment must include, in particular, the prevention of deformity and the maintenance of muscle power and joint range. Gold therapy must not divert our attention from these fundamental principles. Whatever the final outcome of this problem, the role of gold therapy in rheumatoid arthritis can be no more than a subsidiary one at present.

LIFE AND HEALTH OF DOCTORS

What became of them all, our student contemporaries at school and hospital, after they qualified and went out into the world? Did the wild boys settle down, the clever ones become professors, the literary ones forsake medicine? Did all the predicted futures come true? For ancient friendship or for curiosity, for the chance to see which of our prognoses were right, the biographies of all those now lost to sight would be interesting; and, taken as a group for planned study, they have a sociological value and can guide administration, for they represent a kind of follow-up to show whether a medical school's initial selection of students had the right results and whether its training has fitted doctors for all branches of medicine. In a different direction they show the nurse's chances of marrying a doctor, and the doctor's chance of practising on his native heath—and whether these chances are changing. They can reflect the evolving customs and structure of our whole society and the professional man's shifting place in it.

Dr. A. Meiklejohn and his colleagues at Glasgow took the opportunity of the University's quincentenary celebrations there in 1951 to ask all their Glaswegian fellow students of 1923–6 twenty-five searching questions on their life and opinions. The results are published on p. 930, and represent replies from almost half of the 800 still alive, and information about the 99 who were dead. If it be assumed that the replies are representative for the whole 800, they throw light on two subjects—the doctor's health and the Scots doctors' contribution to medical practice. Three-fifths of the doctors were in general practice and another fifth had become consultants. In the years 1923–6 two out of every five new doctors put on the *Medical Register* were Scots.

¹ *Bull. Soc. méd. Hôp. Paris*, 1929, **53**, 323.

² *New Engl. J. Med.*, 1946, **235**, 362.

³ Hood, W. D., *Hlth Bull. (Edinb.)*, 1953, **11**, 19.

Scotland has long been known as a country producing doctors for export, and in 1926, with a population of about 4.8 million—representing only one-ninth of all the people in Britain—she was contributing nearly half the doctors. Nor has this position greatly changed. A recent analysis¹ shows that at present she produces about 550 new doctors annually, over half of whom must cross the border to find employment. In proportion to population this is a production three times that of England and Wales. Why this should be so requires further fact-finding, though the tradition maintained by the large and highly esteemed Scottish medical schools since the eighteenth century may provide a partial explanation.

Dr. Meiklejohn's paper has some interesting sidelights on the health of his group. Half the doctors who replied said they had never been seriously ill since they graduated. Among the 99 deaths were the expected excess due to coronary thrombosis, and also a surprisingly large number of drownings and poisonings, which seems to point to a suicide rate above that of the general population. Again it is surprising that one-quarter of all graduates were still unmarried ten years after qualification, though it must be remembered that, partly because of the 1931 economic slump, it was the custom to marry later than it is to-day. After twenty-five years 90% of the graduates had married. It would be interesting if other medical schools made similar investigations among their old students, for in this way there could gradually be built up a real picture, both sociological and psychological, of the doctor as a man and as a member of the community.

INTRINSIC FACTOR IN THE TREATMENT OF PERNICIOUS ANAEMIA

Despite the fact that the blood counts of patients suffering from pernicious anaemia can be restored to normal by the parenteral administration of vitamin B₁₂, the precise pathogenesis of the disease is still not entirely clear. It is generally believed that the fundamental defect is simply a failure of the upper alimentary tract to absorb vitamin B₁₂ (extrinsic factor), and that this is due to lack of a substance (intrinsic factor) which is normally present in gastric juice.¹ Some progress in the identification of intrinsic factor has been made in recent years. Evidence put forward by Glass^{2,3} in the U.S.A. and by Latner and Ungley⁴ in this country shows that a gastric mucoprotein or mucopolysaccharide has great intrinsic-factor activity, but whether the mucoprotein is intrinsic factor itself or is merely a carrier of it has not yet been established.⁵ Gastric juice from normal subjects or gastric extracts containing intrinsic factor unquestionably facilitate in some way the absorption of small amounts of B₁₂ when given by mouth.

Exactly how intrinsic factor brings about this absorption remains to be discovered. It is a conceivable but unproved hypothesis that combination with intrinsic factor may assist the passage of B₁₂ through the cell

membranes of the intestinal epithelium.⁶ A quite different explanation was indicated by the work of Ternberg and Eakin,⁷ who showed that certain bacteria which required B₁₂ for growth failed to grow if gastric preparations were added to the medium—a possible reason for this being that the B₁₂ was "bound" and in some way made unavailable to the bacteria. It was therefore suggested that in a healthy man the binding of vitamin B₁₂ by some component of gastric juice might prevent the utilization or destruction of B₁₂ by bacteria within the upper intestine. But it was later shown that bacteria which could not grow in the absence of the vitamin constituted only a very small part of the intestinal flora, and also that proteins other than intrinsic-factor-containing material had the property of making B₁₂ unavailable.

On the other hand, it is now known that certain bacteria, including some strains of *Bact. coli*, take up large amounts of B₁₂, although not actually requiring it for growth.⁸ The presence of bacteria in the upper intestine in patients with pernicious anaemia may therefore still be of importance. Moreover, it has been claimed^{9,10} that the very large uptake of B₁₂ by *Bact. coli* could be prevented by giving small amounts of gastric preparations, and that this did not happen with other protein and organ extracts.¹¹ Hoff-Jørgensen, Skouby, and Andresen¹² concluded that the "coli factor" and intrinsic factor were probably identical. Following up this idea, they have carried out some preliminary clinical trials with gastric extracts previously assayed for their ability to inhibit the adsorption of B₁₂ by *Bact. coli*.

This work is clearly of importance, since a convenient method of assaying intrinsic factor is badly needed, not only as an aid to the purification of intrinsic factor itself but also as an essential step in the preparation of gastric preparations intended to be used therapeutically in pernicious anaemia. Whether or not oral treatment with gastric extracts combined with vitamin B₁₂ can compete in effectiveness with parenteral treatment with the vitamin alone would seem to depend upon the reliability of the preparations intended for oral administration, the regularity with which patients absorb and respond to oral preparations, and their cheapness. It is hoped that oral preparations will not be used in the routine treatment of pernicious anaemia until they have been thoroughly tested under carefully controlled conditions. In any case it would be regrettable if their use led to a lessening of the personal supervision of the patient that the use of parenteral preparations at present entails.

¹ Berk, L., Castle, W. B., Welch, A. D., Heinle, R. W., Anker, R., and Epstein, M., *New Engl. J. Med.*, 1948, **239**, 911.

² *Fed. Proc.*, 1951, **10**, 50.

³ *Science*, 1952, **115**, 101.

⁴ *British Medical Journal*, 1953, **1**, 467.

⁵ Glass, G. B. J., *Gastroenterology*, 1953, **23**, 219.

⁶ Welch, A. D., and Heinle, R. W., *Pharm. Rev.*, 1951, **3**, 345.

⁷ *J. Amer. chem. Soc.*, 1949, **71**, 3858.

⁸ Davis, B. D., and Mingioli, E. S., *J. Bact.*, 1950, **60**, 17.

⁹ Burkholder, P. R., *Arch. Biochem.*, 1952, **39**, 322.

¹⁰ Hoff-Jørgensen, E., *ibid.*, 1952, **39**, 235.

¹¹ — and Lanboe-Christensen, E., quoted in footnote 10 below.

¹² *Nord. Med.*, 1952, **48**, 1754, 1760.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

INJURIES TO THE BACK—II

BY

E. A. NICOLL, C.B.E., M.D., F.R.C.S.Ed.

Surgical Director of Orthopaedic and Accident Services, Chesterfield Royal Hospital and Mansfield General Hospital; Surgeon, Harlow Wood Orthopaedic Hospital

Simple compression fractures are produced by hyperflexion of the spine, which may be caused by direct violence such as a weight falling on the back or by indirect violence such as falling on the feet from a height. The former is by far the more common, and two-thirds of the resulting fractures are in the dorso-lumbar region. They are often called "wedge fractures," because they produce a characteristic wedge-shaped deformity of the vertebral body. The deformity is never great, however, and in many cases cannot be recognized clinically. If the vertebral body is crushed by more than one-third of its height anteriorly, the ligaments posterior to the fulcrum (see Part I of this article, printed in our last issue) are almost certainly ruptured. Subluxation then occurs with separation of the spinous processes and the condition is no longer a simple compression fracture but a fracture-dislocation. The differentiation is very important, because, whereas a simple compression fracture is stable and relatively innocuous, a fracture-dislocation is extremely dangerous and associated with a high incidence of damage to the spinal cord or nerve roots.

Management of Simple Compression Fractures

It used to be taught that all compression fractures, however slight the deformity, should be corrected by hyperextending the spine and immobilizing it in plaster-of-Paris for three to four months. There are still many adherents of this view, but it is becoming increasingly accepted that most of these fractures can be treated as soft-tissue injuries with much less trouble to the patient, a quicker return to work, and a better functional result. This view is based on the fact that if the fracture is stable—that is, if the fulcrum and the ligaments posterior to it have remained intact—the deformity is necessarily slight and will not increase even if the spine is not immobilized. The fracture is a crushing of the cancellous bone and will therefore heal readily and rapidly even without fixation.

It has also been established that in a series of functionally perfect results there is the same proportion of patients with residual deformity as in a series of poor results. Deformity in itself is therefore not the crucial factor, nor can it be prevented in certain cases, even if the fracture is reduced and immobilized for a prolonged period. In many of these cases the intervertebral disk has been irretrievably damaged, and, since it is a structure devoid of blood supply, it is incapable of repair and will inevitably collapse once the supporting plaster is removed. It is such considerations as these that have led to a modification of our views about the treatment of simple compression fractures, though it cannot be stressed too strongly that the decision rests on an appreciation of the stability of the fracture and its differentiation from fracture-dislocation or fracture-subluxation. This calls for considerable experience in the interpretation of x-ray films and the films must be of very high quality.

Fig. 1 illustrates a stable compression fracture which was treated on these lines. The patient was kept at rest in bed for three weeks. He was then transferred to a rehabilitation centre, where he proceeded through the normal course of progressive remedial exercises for spine cases. Treatment was completed in eight weeks and he returned to light work.

In three months he was back at his ordinary work as a miner and x-ray films at that time showed that the fracture had consolidated without any increase in the amount of wedging. In other words, he was back at full work at a time when under the older method of treatment he would still have been in plaster.

However, the above regime may seem to be such a departure from orthodoxy that it is permissible to digress for a moment and consider the basic principles underlying the use of plaster or other immobilizing agents in the treatment of fractures, lest it become a ritual rather than a scientific procedure. There are only two reasons for immobilizing a fracture: one is to place it at complete rest in order to promote union, the other is to maintain reduction until union has occurred. There are many fractures, however, that will unite whether immobilized or not (fractures of the ribs, for example, which cannot be immobilized). There are other fractures—for example, of the clavicle—in which deformity within certain limits does not affect function. Simple compression fractures of the spine fall into both categories, so there is no scientific basis for reduction and prolonged immobilization. If plaster is used in such fractures it should be recognized for what it is—namely, a method of resting damaged soft tissues during the initial stages of healing—and as such it may be entirely justified. While I subscribe to these views, however, it must be stressed that there are still many authorities who adhere to the methods advocated by Böhler and Watson-Jones that all compression fractures of the spine should be immobilized in hyperextension for three to four months.

Fractures of the Laminae

These injuries are comparatively rare, but their importance lies in the fact that they are difficult to detect, yet because of their instability they may result in the condition known as spondylolisthesis. The lesion occurs in the lowest part of the lumbar spine and is caused by a combination of flexion and rotation. It is often associated with fractures of the transverse processes. The laminae fracture near their junction with the pedicles and this allows the upper vertebra to slide forwards on the lower one, particularly at the lumbo-sacral junction, where the force of gravity alone will produce progressive displacement if the fracture is undetected and the patient is allowed to walk about. High-



FIG. 1.—Radiograph of simple compression fracture.

quality x-ray pictures, including lateral and oblique views, are needed to reveal these fractures. If they are detected before forward displacement has occurred they should be immobilized in a full plaster-jacket, including both thighs so as to fix the lumbo-sacral junction. Once displacement has occurred, reduction by manipulative methods is impossible and fusion of the affected spinal segment should be carried out to prevent further displacement.

Spondylolisthesis also occurs as the result of a congenital defect in the laminae. It is a gradual process which often does not produce symptoms until adult life. These symptoms may be precipitated by an injury to the lower part of the spine, so that the congenital variety may be revealed for the first time following trauma. There is no doubt, however, that traumatic spondylolisthesis resulting from actual fracture of the laminae is a real entity. The spinal cord is not endangered to the same extent as in fracture-dislocations, because the neural arch posterior to the fracture or congenital defect is not displaced forwards. The nerve roots can, however, be involved in this displacement, causing a radiating type of pain. The roots affected are usually the fifth lumbar or first sacral, so that spondylolisthesis is one of the conditions apt to be confused with a prolapsed intervertebral disk.

Fracture-dislocations

Fracture-dislocations are the result of direct violence causing hyperflexion, and they are the most dangerous of all spinal injuries because of their tendency to cause damage to the spinal cord or cauda equina. The supraspinous, interspinous, and capsular ligaments, which stabilize the spine in flexion, are all ruptured, allowing the spinous processes to separate and the posterior intervertebral joints to dislocate. The flexion force causes a forward displacement of the upper vertebra and a compression fracture of the lower one (Fig. 2). At least 50% of these fracture-dislocations are associated with damage to the spinal cord or cauda equina, causing varying degrees of paraplegia or quadriplegia according to the level of the injury. They are among the most difficult of all first-aid problems, particularly as most of them occur in mining accidents and the patient may have to be extricated from a very confined space. Any movement of the patient which increases the

flexion deformity may damage the cord irretrievably, therefore the handling and transport of these men is of the utmost importance. The angular deformity can always be felt, as can the large gap between the spinous processes.

Some years ago it was advocated that all back injuries should be transported in the prone position to avoid any possible flexion of the spine, and this is no doubt the safest procedure if it is practicable. There are often circumstances, however,



FIG. 2.—Radiograph of fracture dislocation.

which make it impracticable, and then the main concern of the first-aid worker should be to ensure that at all times the spine is supported and not allowed to flex. The same precautions must be observed during the reception of the case into hospital and during the x-ray examination.

Some fracture-dislocations can be reduced by manipulative means, but in others the dislocated facets become locked and reduction cannot be achieved except by operation. Locked facets can usually be demonstrated on x-ray examination, although once again it must be stressed that high quality x-ray films are needed to disclose these details.

All fracture-dislocations are highly unstable and a great danger to the spinal cord. They should always be reduced at the earliest possible moment either by manipulative or by operative methods, depending on whether the facets are locked or not. If manipulative reduction is possible and there is no paraplegia, fixation in plaster should be carried out for four months with frequent x-ray checks to ensure that reduction is maintained. If operative reduction has to be carried out, it is usual to supplement it by applying a bone graft to the spinous processes as an additional safeguard against late redisplacement. In either case a period of four months' fixation in plaster is necessary, but during most of this time the patient may be ambulant. On removing the plaster, progressive remedial exercises are carried out, together with other forms of rehabilitation such as recreational and occupational therapy. It may be eight months before the patient is fit to resume work, but if sound union is obtained and the injured segments of the spine are securely stabilized there is no reason why these cases should not eventually achieve the same degree of fitness as those with simple compression fractures.

Traumatic Paraplegia

The system of treatment outlined above for fracture-dislocations of the spine does not apply to cases complicated by paraplegia. In these the use of plaster inevitably leads to pressure sores and thence to a vicious circle of complications ending in renal failure. The treatment of traumatic paraplegia would demand an article in itself, so the present review must necessarily be confined to a brief survey in very general terms.

Paraplegia following spinal injuries was first described about 5,000 years ago in the Edwin Smith Papyrus, and the author of that remarkable document summed up treatment in the words "an ailment not to be treated." His view, no doubt, was that the physician should not try to prolong a state of misery which he was powerless to alleviate, and any doctor who has worked long enough in a mining community to become familiar with the distressing spectacle presented by these unfortunate patients might well be forgiven for agreeing with him. Unable to move, incontinent of urine and faeces, with large stinking pressure sores getting larger as the patient becomes more emaciated, painful involuntary spasms, contractures, urinary sepsis, renal calculi, and finally uraemia—this is the distressing sequence of events that is often dragged out for four or even five years.

The change that has been brought about in the past 10 years is almost unbelievable, and the story of its accomplishment is one of the most remarkable "combined operations" of surgery and social medicine. It demands a degree of special knowledge, skill, nursing attention, and social welfare that can be achieved only in special units, but that it can be done has been proved beyond all doubt by the work of such centres as Stoke Mandeville and Wharncliffe in this country and by many others in America. There can surely be no middle course with a condition capable of causing such prolonged misery and suffering: it must be treated either superbly well or not at all. The worst thing that can happen to these unfortunate patients—and there is no doubt it is still happening—is that they should be treated well enough to prevent them from dying but not well enough to make life worth living.

Next Refresher Course Article.—"Anticoagulant Therapy," by Dr. H. Payling Wright.

TWENTY-FIVE YEARS IN MEDICINE

A RETROSPECT

BY

A. MEIKLEJOHN, M.D., F.R.F.P.S., M.R.C.P.

Senior Lecturer in Industrial Health, University of Glasgow

"Dear Fellow-Student,—Nearly 25 years or more have passed since we graduated in the years 1923, 1924, 1925, and 1926. In the intervening period we have become dispersed all over the globe and into every branch of the profession. Some, no doubt, have been more fortunate than others; not a few have died long ere their prime. The experience of the goodly company must form a most interesting and not insignificant chapter in medical annals."

These were the opening lines of a letter which a group of doctors* addressed in 1950 to their companions of undergraduate days.

Origin of the Inquiry

In June, 1951, the University of Glasgow was due to celebrate the quinqucentenary of its foundation. Many graduates, it was anticipated, would make the pilgrimage to join in the ceremonies and to pay tribute to their Alma Mater. A small group of medical graduates foresaw in this occasion a unique opportunity for a reunion with their fellow students, in which it might be possible to discover something of the collective story of the years between.

The men involved were the graduates in medicine in the four years 1923–6, which means that by 1951 each had achieved at least 25 years of practice. In the course of their lifetime they had endured two world wars and the economic slump of the early 'thirties; they had lived in a golden age of advance in medicine and had been involved in the inception of the National Health Service on July 5, 1948. As undergraduates they had studied under such renowned teachers as Macewen, Muir, Cathcart, and Carl Browning, and from these teachers they had shared in the continuing glory and inspiration of Lister, Hector Cameron, and Gairdner. As medical men, over a quarter of a century as rich and varied as any in the medical and social history of Great Britain, they had experience of three generations of practice and teaching, as exemplified by their teachers, their contemporaries, and their assistants, who in some instances were their own sons and daughters.

Method of Inquiry

The only means of contacting each individual was by a questionnaire distributed by post. All the names were available in the graduation lists. Information enabling us to trace those still alive was available in the current *Medical Register*. In the case of those deceased the Registrar of the University was able to provide certain particulars.

The committee was fully aware of the defects of this type of survey, and that the response might not exceed 30%. The purpose of the inquiry was explained in a covering letter, of which the opening lines have been quoted, and it is worthy of record that not only did 48% complete the form but many expressed their gratitude for this link with the past. There were 25 questions, occupying four foolscap pages, and these required much time and thought. The questions were divisible into two main groups: (a) facts and (b) opinions. The nature of these appears from what follows.

Population at Issue

The graduates numbered 899, and at June 30, 1951—a minimum interval of 25 years since graduation—800 were alive and 99 dead (Table I). Of the 800 survivors, 385 (48.1%) completed and returned the questionnaire.

The Registrar of the Medical Council has provided the details, shown in Table II, of new medical registrations

for the same years. Scotland therefore provided 40.8% of the total new medical registrations in Great Britain, while the present group represented no less than 11.9%.

In the relative number of replies and in the analysis of the data which follows there emerged a remarkable identity in the individual years. While this is not proof that the respondents constitute a fair sample of the total population, it is at least suggestive that the findings may be representative of the whole group.

TABLE I.—Follow-up of Graduates, 1923–6, as at June 30, 1951 (899 Graduates)

Year of Graduation	No. of Graduates	Replies		Deceased	
		No.	%	No.	%
1923	263	109	41.4	31	11.8
1924	290	130	44.8	29	10.0
1925	195	80	41.0	22	11.3
1926	151	66	43.7	17	11.3
1923–6	899	385	42.8	99	11.0

TABLE II.—Medical Registrations (Male and Female) 1923–6

Year	Great Britain	Scotland
1923	1,853	878
1924	2,125	935
1925	1,982	736
1926	1,586	527
1923–6	7,546	3,076

Present Practice

Dr. Johnson's dictum that the fairest prospect for a Scot is the broad highway to England (single ticket) is not altogether supported by the present location of these 800 doctors: 52% are in England and Wales, 40% in Scotland, mainly in the south-west, and 8% abroad. Rather more than half held house appointments, and they are now distributed as follows: general practice, 59%; consultant practice, 18%; appointments, 21%; others, 2%. Many of the consultants of this period graduated through general practice, and almost unanimously they commend the benefit of this experience. Indeed, it is generally urged that all doctors should spend some time in general practice. The period need not be long; many thought it should be one year.

Marriage (385 Replies)

Only three were already married before graduation, but by the date of the inquiry 91% had married. The marriage state in relation to graduation year of the 385 graduates was as follows:

Married at end of 5 years	..	42.7%
" " " " 10 "	..	75.5%
" " " " 15 "	..	86.7%
" " " " 20 "	..	89.3%
" " " " 25 "	..	90.9%
Unmarried	..	9.1%

General practitioners married early; consultants and others were more tardy: immunity seems to increase with the years, but it is doubtful if it ever becomes complete. Remarriages were rare.

The occupation of the spouse is of some interest; thus 7% of the 385 graduates married doctors, 19% nurses, and the remainder "other occupations." If this pattern of marriage selection is general to the profession, then, having regard to the relative proportion of male to female graduates, an interesting deduction follows—namely, that between 30 and 40% of women graduates marry doctors.

The 350 marriages resulted in 295 (84%) families, numbering 703 children, of whom all but 32 (4.6%) survive. The number of children in family ranged from 1 to 10, with an average of 2.4. According to "Census 1951, Great Britain, One Per Cent. Sample Tables" (H.M.S.O., 1952) at April, 1951, the average size of families in Scotland was 2.03, compared with 1.69 in England and Wales and 1.72 over the whole of Great Britain. The most appropri-

ate comparative figure, however, may be that for Scots-women aged 45–49 years and married for 15–19 years, whose average size of family (including children who have since died) is 1.87. In the professional classes the figure was 1.41 (18% below the figure for all classes combined).

Analysis according to the occupation of the spouse revealed no difference between the groups—doctor, nurse, and "other occupations."

Social Pattern of Marriage and Family

The preceding facts raise certain serious considerations for the profession under present-day circumstances. It seems reasonable to assert that this social pattern of marriage and the family is unlikely to change radically in the near future, if indeed ever.

Medical studies now begin at the age of 18 years and extend over a minimum period of six years. Thereafter one year must be spent in hospital appointments and a further two years in National Service. This means that the young doctor will have attained the minimum age of 27 years before he is free to begin his career. During the next 10 years the prospect is marriage and a family of two or three children. Other considerations apart, this represents a heavy financial load for a further 20 years—indeed, until the parents are approaching ages between 50 and 55 years. This involves serious implications concerning the remuneration and social status of all future doctors and their families. Distant prospects and rewards of hard practice thus assume relatively less importance than the assurance of an adequate income in the early and middle years. The satisfaction of vocation, no matter how complete, will not suffice; indeed, it is not likely to be attained unless supported by a reasonable freedom from economic pressure. These are not insignificant matters, because from them must derive the whole quality of the National Health Service.

In recent controversies it has often been asserted that in future medical men will not enter their children for medicine. This would seem to ignore the well-founded observation of a family trend in certain occupations, and it is not altogether supported by recent applications to the medical schools. From the present group 136 (20%) among 671 children have already graduated or are studying for a medical degree. Moreover, these 136 children derived from 295 families, signifying that approximately one family in every two maintains continuity in the profession. Many of the girls have entered nursing and associated professions in hospitals. Furthermore, many are still at school and too young to have chosen their future career.

As a supplement to the foregoing, inquiry has been made into the broad occupational groups which provide new entrants to the study of medicine (Table III). This is of interest in so far that educational grants for study at a university are now more generally available than heretofore. There are many factors which could influence this pattern, and it is not possible from the figures to make any precise deduction. This notwithstanding, it does not seem that as yet in the West of Scotland there is any alteration in the number of students from the artisan and labouring groups. Scholarships and grants, however, may be of real assistance to all classes where the father is deceased.

TABLE III.—Pattern of Applicants (Male Students) to Faculty of Medicine According to Occupation of Father (University of Glasgow)

Category	1918–22		1950–3	
	No.	%	No.	%
Medical practitioners	65	7.2	136	14.2
Other professions	221	24.7	213	22.2
Business	378	42.2	303	31.6
Artisans and others	203	22.7	201	21.0
Not stated or Deceased	29	3.2	29	3.0
Total	896	100.0	958	100.0

Health and Sickness

A specific question was asked about major illnesses since graduation, with special reference to dates, duration, and residual disability. No less than one-half of the total, all now aged about 50 years, stated with gratitude that they had not suffered any serious sickness.

An analysis of the illnesses recorded revealed the pre-dominance of gastro-intestinal affections, appendicitis, cholecystitis, peptic ulcer, and dysentery. In relation to these the interesting fact emerged that almost invariably these conditions were treated surgically, and that cholecystectomy was usually supplemented by appendicectomy. Respiratory diseases, pneumonia, and tuberculosis were next in order of frequency. Altogether nine cases of coronary thrombosis were recorded. The acute infectious diseases usually associated with childhood were not infrequent, and there were several cases of acute poliomyelitis.

A matter of vital concern to the profession arises from these answers—one which, so far, has received all too little emphasis. It concerns those doctors who, through chronic disabling sickness or accident, become handicapped for their work, particularly general practice in industrial areas. Hitherto such persons could seek alternative work in appointments in the public health service, in laboratory work, in some specialty, or in transfer to a less arduous general practice. Nowadays, under the National Health Service, there is neither freedom of entry nor of transfer in the various branches of the profession. Medical boards would appear to be their only refuge, and a place on these is not easy of attainment. Meanwhile the profession is continually being enjoined to increase its concern with the rehabilitation and resettlement of disabled and aged workmen. This is right, but at the same time there is urgent need to ensure adequate arrangements for disabled and aged members of our own profession.

It may also not be without relevance to remark that this observation has an important bearing on the health of students. Each year a number of students with a history of tuberculous disease, at the time regarded as closed or quiescent, and other disabling conditions are admitted—and rightly so—to medical schools. For these there is a need for regular medical supervision and vocational guidance. Such interest should not be opposed or be regarded as an infringement of individual freedom.

Deaths

Of the original 899 graduates, 99 died during the intervening period, and the detailed certified cause of death was obtained in 90 cases; this information was not available in the others, who died abroad.

The incidence of deaths in individual years varied between one and eight, and no fewer than four deaths occurred within one year of graduation. The principal causes of death are shown in Table IV.

TABLE IV.—Causes of Death

Cause	No.	Remarks
Unnatural (violence, 12; drowning, 5; poisoning, 8)	25	5, war
Pulmonary tuberculosis	10	
Pneumonia	10	
Bronchiectasis	2	
Cancer	9	5, lung
Coronary thrombosis	3	
Other heart disease	4	
Nephritis	4	
Furuncle of nose	4	
Miscellaneous	14	Of each 1 case
All causes	90	

Mortality in Glasgow Medical Graduates

By courtesy of Dr. W. P. D. Logan, of the General Register Office, Mr. B. Benjamin examined these causes of death. Assuming—quite reasonably—that the graduates were all aged 20–24 and uniformly distributed over that

*J. Black, A. M. Campbell, A. S. Henderson, J. A. Imrie, A. G. Mearns, and A. Meiklejohn.

age group, he found it was possible to apply life-table factors to calculate the expected deaths in successive periods of time. Thereby he was enabled to compare the expected number of deaths with those actually experienced and to determine whether or not the mortality among the graduates was greater or less than that of the body of lives from which the table was derived. For this comparison the Scottish Life Table, 1931, was most appropriate.

It emerged that the mortality experienced by the graduates was a good deal lighter than the mortality of the Scottish population as a whole (urban and rural mixed).

When the distribution of causes of death was compared with that expected it was found that deaths from tuberculosis were much fewer than would be expected on a general-population basis. Deaths from heart disease in total were not significantly greater than expected, but the number certified as from coronary thrombosis was excessive.

The four deaths from "furuncle of the nose," which at first sight seemed unusual, were found to conform to previous experience of mortality of doctors from septicaemia, carbuncles, and boils.

The only significant excess of deaths was from violence. Excluding the five war injuries, 20 graduate deaths resulted from violence. On the basis of statistics for England and Wales the expected number from drowning should have been one, and from poisoning two—the actual figures were five and eight respectively, greatly in excess of expectation. Mr. Benjamin summed up: "The general impression (and the data do not justify more than an impression) is that the mortality of these Glasgow graduates differed from that of the general population in so far as there was (a) an excessive incidence of violent deaths (drowning and poisoning), and (b) an excess mortality at ages 30–34 followed by lighter than average mortality. Whether (a) and (b) are the same depends on the provision of data of age and cause together. It looks as though, but for excessive violent deaths, the graduates' mortality might have been below average." (Note the ages at death by drowning were 24, 25, 32, 42, and 45; and by poisoning 36, 37, 39, 39, 42, 45, 48, and 61.)

Activities and Outlook

The remaining questions were directed to discovering something of the general activities and outlook, and the impressions formed in 25 years of practice. Higher qualifications obtained by examination were very common, but the M.D. degree, which at Glasgow University requires the presentation of a written thesis based on original work, had been conferred on only 14% of the group (800). A few had engaged in local government, but activities outside professional work were almost entirely confined to meetings of medical organizations and societies.

Almost all had found medicine a satisfying way of life, but there was much condemnation of conditions of practice following the introduction of the Health Service. In this matter, however, it was rather disappointing to note that the criticisms were expressed in the trite phrases of the medical press—frustration, loss of status, excessive demands of the public, too much work and too little time, book-keeping and form-filling, and the wife the unpaid drudge of the Health Service.

Medical Education

There was a very consistent demand for a general course comparable to the old *studium generale*, as an introduction and background to the subjects of professional study. While it was recognized that new discoveries and developments in all branches of medicine had greatly increased the amount of knowledge to be acquired, the need for the extension of the period of undergraduate study to six years was not generally acknowledged. On the contrary, many submitted that a five-year period was adequate if teachers made more effective use of the time. Thus there was ample scope for the diminution in the number and length of systematic lectures, particularly of those which were largely a recapitulation of textbook material. Similar criticisms were directed against ward rounds and demonstrations of patients suffering from advanced and rare diseases. More of the avail-

able time, it was urged, should be devoted to clinics, with the focus on everyday ailments and the beginnings of disease.

As to individual class subjects, a demand appeared for the co-ordination of the primary scientific studies in a course on biology. While many condemned the emphasis on the minute details of anatomical dissection, they recommended a more continuous and thorough teaching of anatomy and physiology as part of clinical instruction. Materia medica and therapeutics attracted adverse comment, in which there was a demand for more intensive instruction in the proper use of medicaments, particularly those which had established their worth.

As to what they recognized as recent advances in medicine, individual opinions were obviously influenced by the sphere of practice. It was, however, abundantly clear that the general practitioners attached chief importance to those measures which assisted in the management of chronic disease—for example, insulin and liver therapy. Diphtheria immunization was generally acclaimed.

Finally, what present as the challenges of our age? The answer is, the care of the aged and infirm and the chronic sick, the control and management of tuberculosis, and the need to link general and hospital practice more effectively towards the fulfilment of the Health Service.

This story, and it pretends to be nothing more, was made possible only by the co-operation and encouragement of our fellow-students, and to them the members of the team wish to convey their sincere gratitude and greetings for the future. They also wish to record their thanks to Dr. W. P. D. Logan and Mr. B. Benjamin, of the General Register Office; to Mr. C. Weston, Registrar of the General Medical Council; to Mr. T. H. Graham, of the Branch Medical Council Office for Scotland; to Dr. R. T. Hutcheson, Registrar of Glasgow University; to Dr. R. A. Robb; and to Miss Meikle, who undertook the secretarial work. We are also indebted to the University Court, who defrayed the cost of the inquiry.

THE PROBLEMS OF CONVALESCENCE

A two-day conference in London, attended chiefly by almoners, matrons, and superintendents of convalescent homes, was held, under the auspices of King Edward's Hospital Fund, on April 10 and 11. The questions of quicker turnover of hospital beds, the needs of the early convalescent, and the psychology of recovery were discussed. Professor Alan Moncrieff said that one unfortunate circumstance, elicited by a King's Fund survey not long ago, was that over a quarter of the patients recommended for convalescent homes had to wait in hospital an average of eight days before transfer—a sheer waste of hospital bed-time. One reason for delay was that the placing of convalescent homes had no strict relation to the regional organization of the National Health Service or even to the situation of the hospital. Convalescent homes had also various restrictions and regulations which tended to prevent early transfer. It would not be a great exaggeration to say that some of them took patients only when the patients had so far recovered that they could go home. Some of them, for example, would not take a child who had had chorea until all choreic movements had ceased; they feared that other children might catch the movements by imitation. Professor Moncrieff thought that convalescent homes should be prepared to undertake simple nursing duties, such as the giving of enemas, syringing of cavities, application of strappings and dressings and the like, and they should make provision for physiotherapy and occupational therapy.

The point of view of the convalescent home was put forward by Dr. J. O. Reid, of Princess Mary's Hospital (Rehabilitation), Margate. He envisaged a convalescent hospital in every region which should take and treat all kinds of patients. Every convalescent home, he said, should have a doctor of wide clinical experience and a "restoration minded" nursing staff. Treatment, especially simple physiotherapy, must come first, but as much freedom should be allowed as possible, for freedom restored the sense of self-reliance and responsibility. The patient must,

however, be controlled and guided throughout the whole period. Given proper facilities at the convalescent home, patients should be sent there earlier; application for admission should be made earlier by the general hospital, not on the day of the patient's discharge.

He had letters from almoners saying that the transfer must be postponed because the wound had not healed, but in convalescent homes they should welcome wounds that were not healed. In his own hospital they carried out 5,000–6,000 major dressings a year. Not all patients would fully recover, and these must be taught in the convalescent home to live with their disabilities. Dr. Reid also referred to the amount of drugs which patients brought with them from hospital—"whole winchesters of medicines." It seemed to be thought that convalescent homes had no doctor who could prescribe for patients.

Finally, Dr. J. S. Richardson, of St. Thomas's, considered the psychology of convalescence under the three heads of childishness, anxiety, and depression. He felt that a point to be remembered in dealing with convalescents was that the majority of them were gregarious and resented too much solitude. But there was also the quiet person, to whom mixing with a crowd was an ordeal. He quoted a psychiatrist colleague as saying that people with depression of the endogenous type should not be sent to convalescent homes at all, and that not a few cases of suicide had resulted from sending them. The physical expressions of depression were severe headaches, possibly constipation, slow movement, and aches and pains of the "dragging" type. Dr. Richardson was insistent that patients should not be kept too long in a convalescent home. There was an optimum period when they should be discharged, and in this last statement he was supported by Sir Henry Tidy, from his experience of Red Cross convalescent hospitals during the war, who said that, while it could not be laid down as an invariable rule that patients should be discharged at the end of two or three weeks, it was important to keep in mind some general limit of that kind.

Nova et Vetera

JOHN ABERNETHY

John Abernethy: A Biography. By John L. Thornton, A.L.A. Librarian of St. Bartholomew's Hospital Medical School. (Pp. 184. £1 5s.) London: Simpkin Marshall. 1953.

Of such as Abernethy it has been said that "they enjoyed their immortality in their lifetimes" and, by implication, not after. Abernethy takes no important place in the history of surgery, but he was an extremely popular teacher, a remarkably successful practitioner, and, above all, the effective founder of St. Bartholomew's Hospital Medical College. Locally, at the school that he founded, his reputation remains immense. The matter is well summed up by Sir Arthur Keith, whom Mr. Thornton quotes: "There is one side of a man's nature which can never grow old—never pass out of date or fashion. That is his character. Abernethy as a man will never be out of date."

John Abernethy (1764–1831) was born in London, well educated, and early attracted to surgery. He was apprenticed to a surgeon, as the manner then was. His master was a surgeon at St. Bartholomew's, and there he learned much of his art from the lectures on the subject by that admirable exponent, Percivall Pott (1714–89). Meanwhile he attended anatomical lectures at the London Hospital. In 1787 he was elected assistant surgeon to Bartholomew's, but had to wait 28 years before reaching the full staff. As assistant surgeon he began to teach anatomy at his private house until in 1791 he succeeded in persuading the governors to build a lecture theatre. There he lectured for many years to very large audiences on anatomy, physiology, and surgery. He was a devoted admirer of John Hunter (1728–93) and a supporter of William Clift, Hunter's secretary, in his gallant, devoted, and successful stand to keep his great

master's collection intact. Thus Abernethy should be remembered for his share in developing the scientific idea of a museum.

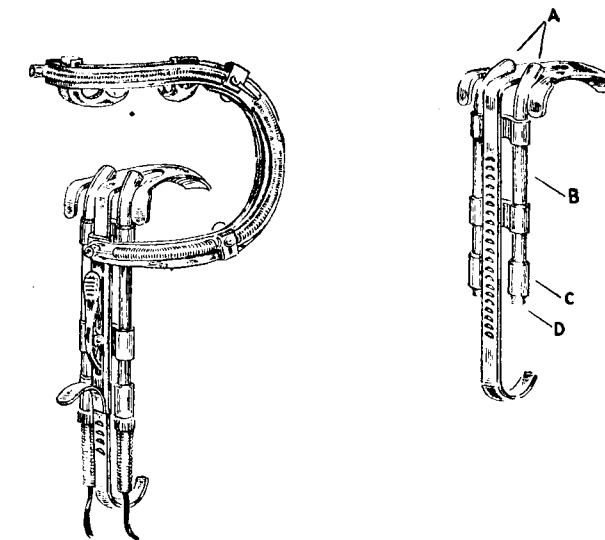
But when it is asked what were Abernethy's positive achievements, no adequate answer can be given. His contributions to anatomy and physiology are insignificant. True he was the first to ligate the external iliac artery successfully for aneurysm, but he disliked operating, and his best professional claim is that in those days of heroic surgery he adopted and constantly inculcated reasonably conservative and expectant tactics, combined with cleanliness which, however, could not in those days be aseptic. But he was a judge of men, and his greatest discovery was Richard Owen (1804–92), the most eminent comparative anatomist that Britain has produced. He promoted the student Owen to be his prosector and later recommended him for the museum of the College of Surgeons. Thus the spirit of Abernethy stands as that of a sort of elder statesman at the back of much of modern medical and scientific education. His life was well worthy of the pleasant and beautifully illustrated account which Mr. Thornton here provides, for it was a good life, well and fully lived.

CHARLES SINGER.

Preparations and Appliances

LIGHT ATTACHMENT FOR DOTT'S GAG

Mr. W. G. HOLDSWORTH, F.R.C.S., of the Plastic and Jaw Unit, Rooksdown House, Basingstoke, writes: Two methods of illumination are available for palate surgery. One is a headlight and the other a scialytic lamp near the surgeon's head. Neither of these is altogether satisfactory, and with the idea of having the light actually within the mouth the device illustrated was made. This is a tongue-piece



carrying two lamps, the rays of which are directed on to the palate (A) through columns of "perspex" (B) bent as required and sheathed in metal. The danger of sparking is virtually eliminated by having the lights at a distance from the mouth (D) and enclosed by screw attachments (C) to the metal sheaths. Even with prolonged use there is no rise in temperature of any part. Illumination is by a 4½-volt battery. The whole appliance, including the flexible leads, can be boiled. The lighting system was devised by Messrs. Vann Brothers, Ltd., after prolonged and persistent experiments, and the tongue-piece was constructed by Chas. F. Thackray, Ltd. As shown, the appliance fits on to the Dott's gag, which is used by most British surgeons when operating on the palate.

Correspondence

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

Neonatal Intestinal Obstruction

SIR,—Dr. W. P. Sweetnam and his colleagues (*Journal*, April 4, p. 765) are to be congratulated on their successful case of intestinal atresia in the newborn. In their discussion they refer to an article published by one of us (Rickham)¹ in which the development of regional neonatal surgical centres was strongly advocated. They mention that the delay and disturbance involved in transferring these babies to a centre would be harmful, and they also argue that operations for intestinal obstruction in the newborn should remain within the province of the general surgeon. These statements prompt us to reply.

Neonatal surgery has made great strides during the last dozen years; so rapid has been the advance that many recent developments and figures have, as yet, not been reported in the literature. The figures published by Ladd and Gross² (quoted by Dr. Sweetnam) were collected in the 'twenties and 'thirties and are completely out of date. One of us has recently visited Boston and learnt that the operative mortality in intestinal obstruction of the newborn (excluding meconium ileus) is now in the neighbourhood of 10% in the Children's Hospital. Even in this country, where we have been backward in recognizing the value of paediatric surgical centres, the results have improved considerably. In the previously mentioned article (Rickham¹), 23 cases of neonatal intestinal obstruction were reviewed; the mortality was 78.3%. These cases occurred in the Liverpool region during 1949, and a large proportion were operated upon in peripheral hospitals. This contrasts sharply with the mortality rate of 26.1% in 23 similar cases operated upon during 1952 in our neonatal surgical centre. Our last seven consecutive cases of ileal and colonic atresia have survived operation.

There is no doubt that occasional successes will occur in general surgical clinics, but, unless these cases are concentrated, the operative mortality of neonatal intestinal obstruction will remain high throughout the country as a whole. The improvement in the mortality has been mainly brought about by advances in the pre- and post-operative care and a better understanding of the biochemical changes which are involved. Improvement in the actual surgical technique has been of less importance. Continuously high recovery rates are impossible without the work of a team of surgeons, anaesthetists, pathologists, biochemists, and nurses specialized in this type of surgery. Such a team can only be formed in a centre. The general surgeon, unless he is trained to undertake the pre- and post-operative treatment, will always work at a disadvantage, he will have to depend on paediatricians who are inexperienced in these special surgical problems. If we are to improve the mortality associated with these conditions we will have to establish more regional centres in this country. This has long been recognized in those North American and Scandinavian countries which have left us behind in this type of surgery. Luckily, our distances are comparatively small, and three to four hours' travel would take a child from the remotest area to a regional centre, a delay which is insignificant. Babies are sent to us from distances up to 100 miles. These children travel well, provided an experienced nurse is sent with them. Delay in treatment due to distance is, in our experience, insignificant compared with the delay due to late diagnosis.

In our view the greatest advance in this type of work has been the appointment of paediatricians to outlying hospitals. This has resulted in early diagnosis and rapid transit to the appropriate centre.—We are, etc.,

ISABELLA FORSHALL.
P. P. RICKHAM.

Liverpool, 12.

REFERENCES

- ¹ *Lancet*, 1952, 1, 332.
- ² *Abdominal Surgery of Infancy and Childhood*, 1941. Saunders, Philadelphia.

SIR,—Dr. W. P. Sweetnam, Mr. F. W. Shepherd, and Dr. E. F. Murphy (*Journal*, April 4, p. 765) advocate that cases of congenital deformity of the digestive tract occurring in

the abdomen should be treated by general surgeons: in other words that the system which now obtains in most parts of this country should persist. They recommend, however, that similar deformities occurring in the thoracic part of the tract should be treated in special centres; and they do not mention the very varied and difficult ones occurring in the lowest part, the rectum and anus.

In support of their argument the authors present a series of two cases, neither of which I find very convincing. The case of intestinal anastomosis survives with the grave handicap of a blind length of bowel leading off the caecum, and, as congenital defects of the bowel are often multiple, many authorities would not agree with the omission to examine the whole digestive tract. The other case was allowed to develop obstruction under the eye of the surgeon. In their references they quote Wangenstein,¹ who has been preaching for many years against delays of this kind. They also quote Ladd and Gross,² whose classical and most valuable work would have been impossible under the system they recommend. If the authors of the paper would investigate precisely what has happened to all the cases of deformities of the digestive tract in a definite district surrounding them over a definite space of time we should have some really valuable information, of the kind gathered by P. P. Rickham.³ It would then be possible to compare these results with those gained in centres of paediatric surgery in Boston and Stockholm, not to mention Liverpool and London.

This is, of course, not to suggest that the authors of this paper are wrong to treat such cases; but I do think they are wrong in encouraging the average general surgeon to take on their care, and in discouraging the formation of those units of paediatric surgery which have brought the treatment of all congenital deformities to an efficiency that is far from realized by the profession at large. What I would like to see would be purely paediatric surgical units set up in centres such as Huddersfield, with young surgeons in charge of them who would take the work of these difficult and fascinating cases to a higher pitch of efficiency than is to be found anywhere at present. They would find plenty to do, and it is only by concentrating such relatively rare conditions in large numbers that a real body of knowledge of pathology, diagnosis, and treatment can be built up.—I am, etc.,

London, W.1.

DENIS BROWNE.

REFERENCES

- ¹ *Intestinal Obstruction*, 1942. Thomas, Springfield, Ill.
- ² *Abdominal Surgery of Infancy and Childhood*, 1941. Saunders, Philadelphia.
- ³ *Lancet*, 1952, 1, 332.

SIR,—Dr. W. P. Sweetnam, Mr. F. W. Shepherd, and Dr. E. F. Murphy (*Journal*, April 4, p. 765) with the anaesthetist and nurses concerned must be congratulated on the successful surgical treatment of two premature infants with intestinal obstruction. They raise the question of who should operate on the newborn, and take a proper view that much neonatal abdominal surgery is within the competence of the general surgeon. The thoracic, the plastic, and the neurosurgeon can also play their appropriate parts, provided that the particular surgeon, anaesthetist, and staff (like the paediatrician) will acquaint themselves with the latest developments in the special field.

Clearly there is room for one or two units for intensive study of surgery of the newborn as such, even though they may not have the monopoly of valuable results. The modern trend is to demand the complete range of "extra-specialists" everywhere, on the principle that everyone must have the best. This leads to rather elaborate and possibly wasteful staffing. There is still a limit to the number of outstanding men. Let us give them full opportunity when we recognize them and learn from them what we can. And let us remember that multiplication of departments does not automatically multiply talents.—I am, etc.,

London, W.1.

ALFRED WHITE FRANKLIN.

The Judet Operation

SIR.—The Judet operation is probably at the height of its popularity at the moment. Furthermore, the stimulus which it seems to have given to the marketing of newer and even more formidable prostheses may have exceeded the bounds of reason. At this stage, then, it may be fruitful to record some impressions arising from a personal series of about 50 cases. These are qualified by the fact that there must be few indeed in the country with sufficient long-term experience of the operation to draw precise conclusions about its lasting efficacy. Indeed, the only worth-while follow-up yet published is that of Judet himself, and naturally he is enthusiastic about his own operation.

The results of some 25 cases of subcapital fracture of the femoral neck treated by acrylic replacement have been at least encouraging. Apart from one death in the sixth post-operative week from bronchopneumonia, all the patients have been able to walk well (albeit with one stick), have regained full, or nearly full, movement, and have been free from pain—this in substantially less time than one usually considers a "nailing" fit to bear weight. The osteoarthritis, however, have given less cause for satisfaction. In some 28 cases, four have had a return of hip-joint pain within two years of their operation. Return of symptoms has recurred in cases where a technically satisfactory operation has been performed, and one has been at a loss for an explanation. Certain facts, however, appear to become more significant when meditating upon these indifferent results. No prosthesis can ever accurately match the head which is removed, and, as a sequel, where two bearing surfaces are not exactly congruous mechanical wear is absolutely inevitable.

With these figures and deductions in mind I now find myself, perhaps unconsciously, leaning towards the older established procedures such as arthrodesis and displacement operations of the MacMurray type. Space forbids discussion of the merits of each. Suffice it to say that, apart from its own intrinsic merits (and these are considerable), a MacMurray's osteotomy has never yet given me an ungrateful patient, and it may even become a standard method of dealing with the "failed" acrylic head. In conclusion, let us become a little less prosthetically minded and indulge in some critical thinking about this widespread joint "re-bushing."—I am, etc.,

West Hartlepool.

A. WEBB-JONES.

Nicotinic-acid Deficiency

SIR,—I am very interested in the case note published by Dr. G. H. Collins in his letter (March 28, p. 731), for it corroborates observations of my own¹ regarding the importance of high blood concentrations of vitamins in various clinical conditions. In such instances vitamins are no longer used as dietary supplements, nor can they be adequately regarded as catalysts. It is tempting to consider them as metabolic reagents having metabolic cycles of their own which, however, have not so far been described.

There is a further comment I would wish to make regarding the use of nicotinic acid in the dose of 1,500 mg. mentioned by Dr. Collins. In my experience, even as little as 50 mg. intravenously may produce intense abdominal pains, and furthermore subjective discomfort may be most severe owing to vasodilatation. Quite marked blood pressure alterations and other signs of autonomic disturbance may occur if large doses of any single vitamin are given directly into the blood stream. In so far as Dr. Collins's case showed a syndrome highly suggestive of nicotinic-acid deficiency, it is almost certain that the other members of the "B-complex" were insufficiently present. My own experience has led me to prefer a mixed barrage of vitamins, and always to use nicotinamide rather than nicotinic acid where possible. Although I have not treated a case exactly comparable to Dr. Collins's, results obtained by a colleague and myself in the treatment of acute alcoholic and toxic-infective psychoses are in preparation for publication. We have successfully used variations of the mixture of vitamins mentioned in the paper quoted—namely, dextrose, 10 g. (10% solution):

aneurin hydrochloride, 1,000 mg.; nicotinamide, 200 mg.; pyridoxin, 200 mg.; and ascorbic acid, 1,500 mg.

Of course, in the presence of clinical signs suggestive of a marked single vitamin deficiency, the corresponding agents should be given in greater amounts.—I am, etc.,

London, W.1.

JONATHAN GOULD.

REFERENCE

- ¹ *Lancet*, 1953, 1, 570.

Intravenous Detoxication of Drunkenness

SIR,—Dr. Peter Nobes (*Journal*, April 11, p. 836) is of course quite right in stating that the quelling of a drunken patient by intravenous barbiturates (as recommended by Dr. A. H. Bartley (*Journal*, January 17, p. 163)) is potentially dangerous, but, where intravenous injection is feasible, why not detoxicate instead of appease? It is not generally known that high-dosage multiple-vitamin intravenous injection not only gets rid of the excitement but of every other symptom of intoxication, and will even dispose of delirium tremens in a matter of hours. This method, which also applies to other "toxic" psychoses, was first used in 1942, and (like convulsive treatment) gradually improved. It is fully described and documented in Dr. J. Gould's recent article.¹

Detoxication does not of course cure the alcoholic, but helps to bring it home to him that subsequent curative treatment is possible.—I am, etc.,

Isleworth, Middlesex.

H. PULLAR-STRECKER.

REFERENCE

- ¹ *Lancet*, 1953, 1, 570.

SIR,—When a casualty officer I was not infrequently faced with the problem of the acute alcoholic. I had heard that those of my colleagues who prescribed vitamin B₆ for post-radiation sickness swore to its effectiveness as an antidote to the alcoholic hangover. I therefore tried an intravenous injection of 50–100 mg. The results were far more dramatic than I had anticipated, and of the same order as the giving of intravenous glucose to a patient in the aggressive phase of hypoglycaemia. A typical case was a woman of 45 brought in singing, swearing, and staggering. Three minutes after an intravenous injection of 100 mg. of vitamin B₆ ("benadon") she became quiet, apologized for the trouble she had caused us, and asserted she felt quite sober. She was able to walk across the room perfectly steadily.

My series was only about six cases in all, but the results were uniform, and it does appear to me that vitamin B₆ is a specific antidote to alcohol. As an anaesthetic to general anaesthetics, at any rate in the dose of 100 mg., it appears to have little effect. I feel that this treatment is more physiological than the use of sedatives, and may possibly be of some use in making the diagnosis between drunkenness and head injury. I should be interested to hear if others have had experience of this method of treatment.—I am, etc.,

Thornton Heath, Surrey.

V. P. WORDSWORTH.

Banishment of Bromides

SIR,—I feel that those doctors who have had years of experience of the great value of bromides should not let the banishers have things all their own way just because of lack of time, or lethargy in putting pen to paper. I refer especially to the article (*Journal*, March 28, p. 694) in which Professor D. M. Dunlop and his colleagues give a survey of prescribing in Scotland in 1951 and state: (1) "Bromides seldom prove more effective than phenobarbitone either as sedatives or as anticonvulsants. Their frequent side-effects and the undesirable cumulative toxic effects which result from their prolonged administration relegate bromides to the group of drugs which should largely be discarded in modern therapeutics," and (2) "Bromides are sedatives which have to be administered frequently before there is a sufficient replacement of chloride by bromide ion to exert a depressant effect on the central nervous system, and their occasional administration with a hypnotic such as chloral has no more effect than a dose of salt water."

There is undoubtedly truth in the first part of the first statement, but the conclusion is hardly justified. The effect of sedatives is extraordinarily individualized, as one realizes more and more the longer one has experience of them. One patient of nervous type with disseminated sclerosis went through seas of trouble on various daytime sedatives until I went back to a bromide and chloral mixture, of which a small or medium dose was taken as required. The patient had previously been doing reasonably well on it, but an exacerbation of the disease occurred, and in deference to modern views I decided to try without the mixture. We persevered for a long time with various barbiturates, etc., during and after the exacerbation, but a return to the bromide and chloral mixture made it quite clear that it was the best daytime sedative for the case. The second statement I can only regard as incorrect. Doubtless some neglected factor in the experiments will be found, as happened with the contention that ergot by the mouth was ineffective. I can cite other patients who get exactly the mild daytime sedation they may require from a small dose of bromide alone, either occasionally or repeated for a few days; it has always worked so well that there has been no justification for change.

The late Dr. Alfred Parsons, a well-known Dublin teacher, gave outstanding credit to the value of small doses of sodium bromide in many, if not most, of the ills that flesh is heir to. The late Sir Maurice Craig, of London, held, I believe, a similar opinion. It would seem a pity for young doctors to fight shy of old and most helpful remedies because of modern pronouncements perhaps not based on a thorough personal experience with the drugs condemned. It is relevant to recall that quite a number of patients are intolerant to phenobarbitone, and that it is slowly excreted and can also accumulate in the system.—I am, etc.,

Portadown, Co. Armagh.

ROBERT E. HADDEN.

The Backward Child

SIR,—Having worked in the Fountain Hospital in 1948, and at that time having been impressed by Dr. B. H. Kirman's open-minded approach to the problem of mental deficiency, I greatly enjoyed his letter (*Journal*, February 7, p. 334).

Like Dr. D. Jackson (*Journal*, March 7, p. 559), I agree with Dr. Kirman that a final diagnosis regarding educability should be postponed as long as possible. To Dr. Jackson's statement that educability will largely depend on "advances in psychology and education" I want to add "and on advances in medicine." By this I mean on new findings in brain pathology which have to be combined and synthesized with findings of brain anatomy and of brain physiology to bear upon the concept of mind. Medical research should lead the way in demonstrating what different integrative actions of the brain are involved in solving various intelligence tests. Analysing a great number of such tests, I found every single one resting basically on integrations of the visual or the auditory sense with either proprioceptive or interoceptive impulses.

It is a well-known fact that visual and auditory nerve fibres are integrated with proprioceptive fibres in the superior and inferior corpus quadrigeminum. It is at present only a well-founded hypothesis that visual and auditory impulses are integrated with interoceptive impulses from the hypothalamus in the corpus geniculata laterale and mediale.

In a report for the Ministry of Health, published in 1922 by H.M. Stationery Office, Eardley Holland described his findings in the brains of almost 100 stillborn children. He found in every case a massive haemorrhage, which "could be pinned down within narrow limits . . . and corresponds to the course of the vein of Galen." The blood coagulum pressed on the lamina quadrigemina and against the caudal end of the thalamus—that is, against the corpora geniculata and the pulvinar. A number of other researchers have since confirmed the correctness of Holland's findings and the enormous frequency of these haemorrhages in stillborn children and in young infants who died from intercurrent diseases during the first year of life. Holland posed the question: "As these injuries are so frequent and probably in most cases not fatal, what happens to the children who survive?" Strangely enough, nobody has tried to answer this

question by investigating the brain stem in diseased aments. The explanation is probably that nobody considered the likelihood of an intellectual defect originating in the lowest brain region, a region which is almost identical in all vertebrates from fish to man.

Clinical and brain pathological studies in the field of mental deficiency during the last eight years have enabled me to collect a large amount of clinical data and a lesser amount of pathological data which might help to answer Holland's question. My findings and observations strongly support the theory that pathological changes in the above-mentioned ganglia and in their afferent and efferent tracts may play one of the most important roles in the causation of mental defect. Organic disturbances in one or several of these structures will—according to their severity—disturb more or less severely a child's visual or auditory reflex activity, either somatic or autonomic. At the same time, these disturbances will deprive the cortex of necessary sensory-somatic or sensory-autonomic impulses. This loss will create more or less distorted concepts of reality in the mind of an afflicted child.

Analysis of the individual scoring patterns in intelligence tests makes it possible to gain a fairly good impression of the special functional disabilities of a mentally handicapped individual. Neurological examination designed to reveal disturbed visual and auditory reflexes have to supplement the diagnosis of visuo-somatic, auditory-somatic, visuo-autonomic, and auditory-autonomic impairment. We often find a combination of two, sometimes even of three or four, disorders. On the basis of such a diagnosis educational treatment can be instituted. Following the example set by the development of blind and deaf teaching, new educational procedures and new educational tools have to be devised. These have to be designed to make use of intact pathways into the cortex so as to supply the mind with undistorted information. Adequate stimulation, mentioned by Dr. Jackson, originates in this undistorted information.

At Columbus State School in Ohio we are presently engaged in a research project based on the above considerations and designed to develop the dormant intellectual potentialities of 20 ineducable children, aged 6 to 8 years, with I.Q.s between 30 and 50. In contrast to English usage, Americans regard an institution for backward children as— to use Dr. Jackson's words again—"an educational establishment, that is, school."—I am, etc.,

Columbus, Ohio.

LISE GELLNER.

Pilonidal Sinus of the Suprapubic Region

SIR,—We have read with interest the medical memorandum by Mr. Roderick G. MacLeod (*Journal*, March 28, p. 710) entitled "Pilonidal Sinus of the Suprapubic Region." In this he states that pilonidal sinuses have been previously described in the axilla, the sacro-coccygeal region, the perineum, barbers' hands, the sole of the foot, and the umbilicus, and adds a seventh site, the suprapubic region.

As we have seen several cases of sinuses in barbers' hands within recent months and intend to publish a review of this condition shortly, we are interested not only in hair-bearing sinuses in any situation but also in the nomenclature presently in use. The term pilonidal sinus, which is descriptive only and has no histiogenetic or aetiological basis, was used first by Hodges¹ and applied by him to the post-sacral type. It is of interest that he was aware of the lesions occurring in barbers' hands and did not apply the term pilonidal to these. Patey and Scarff² have recently drawn attention to this occupational disease of barbers, and have suggested that the mechanism of formation of the post-anal pilonidal sinus may be similar to that of the barbers' lesion. Although we feel that there is much to be said in favour of the congenital theory in the production of the post-anal sinus, it is suggested that the purely descriptive term of post-anal pilonidal sinus be used and not that of post-sacral dermoid, as its real nature is still in doubt. In cases where a sinus has arisen as a result of rupture of an infected dermoid cyst—one of us has recently seen one on the nose—it is surely unnecessary and wrong to give it a name which is only descriptive, when the true pathology is known.

Finally, in the case of the sinuses of barbers' hands, it is well established that the lesion is produced by the tissue reaction to extraneous hairs and not to the hairs of the

host. There are no hair follicles in the sinus wall, and the lesion arises as a result of penetration of the epidermis by short sharp hairs from the heads of males, the setting up of a foreign-body reaction to them, and secondary infection. It is therefore again preferable to name such lesions "interdigital sinuses of barbers' hands," rather than use the confusing term "pilonidal sinuses."—We are, etc.,

A. R. CURRIE.

THOMAS GIBSON.

ARCHD. L. GOODALL.

Glasgow.

REFERENCES

- ¹ *Boston med. surg. J.*, 1880, 103, 485.
- ² *Lancet*, 1946, 2, 484.
- ³ *Ibid.*, 1948, 2, 13.

SIR,—Neither history nor histology supports Mr. R. G. MacLeod (*Journal*, March 28, p. 710) in applying the term pilonidal sinus to a suppurating and discharging dermoid cyst. The term pilonidal sinus was coined by R. M. Hodges¹ in 1880, and he described the condition in the following words: "On exposing its interior by an incision, a certain quantity of pus is evacuated, and a lock of loose hair is found occupying the space, more or less matted and curled, and of varying size and amount. The hairs of which it is made up are always short, without bulbs, and correspond in colour to those of the patient. The cavity containing them has no cyst or lining membrane, or other characteristic suggestive of a congenital dermoid wen; merely the granulating walls of an ordinary suppurating sinus, with no trace or suspicion of hairs growing from its surface, or of isolated spots of cuticle from which they might have been shed."

It is remarkable that in the face of such evidence as this the developmental or endogenous theory of a pilonidal sinus should have become widespread. The champions of this theory have been hard put to it to explain the conspicuous absence of an epithelial lining from the main cavity of a pilonidal sinus and have had to fall back on the argument that the epithelium is destroyed by the suppuration. Mr. MacLeod's interesting case has spiked this gun by showing that when there really is an epithelial lining it can withstand the repeated suppuration for as long as two years. It is time the endogenists surrendered.—I am, etc.,

B. H. PAGE.

Enfield, Middlesex.

REFERENCE

- ¹ Hodges, R. M. (1880). *Boston med. surg. J.*, 103, 485.

Myxomatosis in Control of Rabbits

SIR,—I was interested to see in the *Journal* (March 21, p. 639) the brief note about the satisfactory effects of myxomatosis in the destruction of rabbits in Australia. I think there should have been included some reference to Dr. H. de B. Aragão, of the Instituto Oswaldo Cruz in Rio de Janeiro, who first suggested its use for rabbit control in 1928. His work and the parts played by American and British workers are briefly summarized in an article by Liversidge in *Discovery*.—I am, etc.,

C. J. HACKETT.

London, N.W.1.

REFERENCE

- ¹ *Discovery*, 1952, 13, 191.

Cancer and Organic Content of Soil

SIR,—Dr. E. H. Eason (October 25, 1952, p. 941) considered it misleading to mention organic manure in relation to plant copper deficiency. I can find no substantiation for this, since it appears from the literature that the factor involved is simply the power of organic matter to fix copper in a form unavailable to plants. The other soil conditions mentioned by Dr. Eason are not relevant here, important though they are in agriculture. On the other hand, Dr. E. D. Allen-Price (October 11, 1952, p. 831) finds excessive gastric cancer mortality in an area of intensive cultivation in his region.

I have therefore examined data¹ for one area where exceptionally heavy organic manuring has long been practised—the Biggleswade and Sandy area of Bedfordshire. It has been observed that this area "seemed conspicuous for

the malignancy of cancers of all sorts."² Total cancer mortality, standardized for the experience of all Bedfordshire (age, sex, type of district), is given below.

District	Expected	Actual	Ratio %
Biggleswade R.D.	175	199	113
U.D.	64	63	99
Sandy U.D.	31	43	139
Aggregate	270	305	113

Soil samples from cultivated land in the area gave an ignition-loss figure of 8.2% ; from heaths and woods, 6.0%. From this it would seem that heavy organic manuring does induce the "total cancer factor," despite rapid humus turnover. From other evidence too lengthy to give here I suspect that a protective factor exists in normal vegetables, which is depressed by copper deficiency. It may be a product of tyrosine oxidation, though this is problematic. If this deduction is correct, then a simple agricultural operation can increase human resistance to carcinogenesis. Indeed, in areas where micronutrient fertilization is essential for adequate crops, farmers may now be preventing cancer. How true to historical form!

So long as the malignant mutation remains irreversible, active prevention is the best hope.—I am, etc.,

London, S.W.17.

C. D. LEGON.

REFERENCES

- ¹ Harvey, C. A. (1953). Personal communication.
- ² Gordon-Taylor, G. (1939). *The Practitioner*, 143, 21.

Agriculture (Poisonous Substances) Regulations

SIR,—I would refer to your annotation in the *Journal* of March 28 (p. 717) on Agriculture (Poisonous Substances) Regulations, S.I. 1953, No. 358. The last paragraph of the annotation contained the following comment. "They [the regulations] are open to criticism for the reliance they place on the wearing of face-shields rather than full face respirators. The main route of absorption is through the lungs, and face-shields do not prevent absorption by this route during spraying operations. They are likely to be particularly ineffectual when organo-phosphorus compounds are used in an enclosed space such as a greenhouse."

This criticism is hardly justified, and suggests misinterpretation of the regulations. The regulations rightly distinguish between the dangers from the specified substances when they are suspended in the atmosphere in an enclosed space and likely to be absorbed in the lungs, and when in the form of coarser droplets which are rapidly deposited. In the former case the use of a full-face respirator is specified in the regulations (see First Schedule, Part II, item 7, and Regulations 4 (2)), in the latter a face-shield only is required.—I am, etc.,

W. A. WILLIAMS,

Secretary.

London, W.1.

Association of British Insecticide Manufacturers.

Attempted Suicide by Burning

SIR,—Mr. R. J. V. Battle and Dr. H. E. S. Marshall's case record of an attempted suicide by burning (*Journal*, December 27, 1952, p. 1397) recalls a patient who is at present undergoing treatment for a like condition.

Two years ago a 15-year-old girl poured paraffin over her clothes and set them alight. She suffered severe burns of the right side of face, neck, front and back of chest, axillae, right forearm, and hand. On healing, severe contractures were formed on the neck and axillae. She is one of eight daughters; and, according to a local attitude to which her family adheres, this is considered a misfortune. She was denied any parental affection, and besides the scolding by her father she was often beaten. She has had limited schooling. Following the healing of the burns, she has attended a psychiatric centre in Jerusalem, but at all times, according to their records, she maintained a reticence about her deeds.

While under plastic surgical treatment, which is of necessity a lengthy one, she is proving very co-operative. The abdominal flap is already in position on the neck, and the favourable result

thereof seems to have produced a marked psychological improvement in the patient. Suicide by burning among the peoples of the Middle East is apparently not infrequent.

I wish to thank Mr. Jack Penn for his advice in planning the plastic procedures on this patient.—I am, etc.,

Haifa.

B. HIRSHOWITZ.

Liver Injury by Antibiotics

SIR,—Attention has been drawn in your annotation (*Journal*, April 4, p. 777) to reports of changes seen in liver tissue associated with a large dosage of antibiotics. The comment has been made that "this evidence from human and animal studies shows that aureomycin, and probably terramycin, are mildly injurious to the liver when given in large doses, especially parenterally."

Among the references given, as regards terramycin, Lepper *et al.*¹ reported the effects of large doses of antibiotics on the livers of mice. They found that "the effect of terramycin was similar to that of aureomycin, although less marked." They also emphasized that the dosages of both antibiotics were much higher than those which are recommended for the treatment of human infections. Nevertheless, the very mildness of the possible liver injury subsequent to excessive antibiotic therapy is summed up in the first article quoted in the annotation²: "Excessive amounts administered therapeutically, for instance, may act in a manner analogous to that of excessive amounts of dextrose given by the intravenous route." Again, in the same article, the authors considered that the liver damage would seem to be reversible if administration of the drug was stopped soon enough. The seven patients in this article are reported as having shown definite clinical signs of liver damage after aureomycin, but the authors emphasize that six of them, from whom they had obtained liver tissue for examination, had evidence of potential or demonstrable liver damage prior to any treatment.

Lastly, the discovery of the structural formula of terramycin has shown it to be both unique and devoid of dangerous chemical radicals which are known to provoke serious toxic reactions. This new knowledge helps to explain the high degree of safety of the drug, an experience which has been amply confirmed by many thousands of clinical trials in which terramycin is shown to be free of toxic effects in blood and blood-forming organs, liver, heart, and other vital organs.—I am, etc.,

R. K. PHILLIPS,

Folkestone.

Director of Medical Services, Pfizer Ltd.

REFERENCES

- ¹ *Arch. Intern. Med.*, 1951, **88**, 284.
- ² *Ibid.*, 1951, **88**, 271.

SIR,—In your annotation on "Liver Injury by Antibiotics" (April 4, p. 777) you state that the evidence from human and animal studies shows that aureomycin and probably terramycin are mildly injurious to the liver when given in large doses parenterally, and that there is a remarkable absence of such toxicity when given orally in the usual dosage.

Lepper and his associates in the paper which you quote¹ mention that the dosages of aureomycin which produced evidence of liver dysfunction in patients were excessive. Lepper further states that intravenous doses of aureomycin totalling less than 2 g. a day were not accompanied by evidence of liver dysfunction or injury. In more than 1,300 patients to whom they administered aureomycin orally, no evidence of liver injury was noted.

Kalz and his co-workers² and Knight *et al.*³ have found aureomycin useful in chronic liver diseases and particularly in the chronic residua of acute hepatitis. It appears also to be of definite value in hepatic failure and in the fulminating type of acute hepatitis (Kimbrough⁴).

Long⁵ states that every year since its introduction the dosage requirements of aureomycin have been decreased and are now about 50% less than those suggested two years ago. The present recommended dosage of aureomycin of

12 mg. per kilo of body weight, or 1 g. daily for the average adult, does not produce injury to the liver.

However, your annotation emphasizes the possible ill-effects of administering doses of antibiotics parenterally in excess of therapeutic requirements, and is a timely warning on the misuse of these substances.—I am, etc.,

A. T. MENNIE,

London, W.C.2.

Medical Director, Lederle Laboratories Division,
Cyanamid Products, Ltd.

REFERENCES

- ¹ *Arch. intern. Med.*, 1951, **88**, 271.
- ² *Canad. med. Ass. J.*, 1949, **61**, 171.
- ³ *J. clin. Invest.*, 1949, **28**, 1052.
- ⁴ *J. Tenn. med. Ass.*, 1951, **44**, 412.
- ⁵ *Trans. Amer. Acad. Ophthalm. Otolaryng.*, 1951, 524.

"Efocaine" and the Relief of Pain

SIR,—Referring to Dr. T. H. Howell's note (*Journal*, April 4, p. 785) giving his results with "efocaine" for the relief of pain in fibrositis, my personal experience is that the chemical constitution of the solution injected is quite immaterial, provided that all the myalgic spots where the pain originates are successfully located. The relief then given should last for months.

In a recently published series¹ I described a carefully controlled experiment in which the objective effect of injecting normal saline was the same as that of injecting procaine. The advantage that normal saline has over any of the anaesthetic solutions of which procaine is the prototype lies in the fact that there is never any reaction. For the last two years I have used nothing else.—I am, etc.,

London, W.1.

H. WARREN CROWE.

REFERENCE

- ¹ *Lancet*, 1952, **2**, 1133.

The Metric System

SIR,—I have read with great interest the correspondence on the metric system. I have been working in Zurich for two years, and therefore have had ample experience of the practical side of this question. I can wholeheartedly agree with the opinions expressed by Dr. C. Langton Hewer in his letters (*Journal*, February 21, p. 450, and April 4, p. 782), and Dr. John Primrose (*Journal*, April 4, p. 782) seems to have arrived at the happy compromise. My personal experience is that in practice it is by no means the excellent system that theory would lead one to expect.

When the dosage is in grammes the metric system works well, but when it is in milligrams or fractions of milligrams then it is often corrupted and becomes confusing. For example, when I wish to order 1/150 gr. I must say to the sister the equivalent of: "Please give nought comma nought nought five" (this is an approximation, 1/150 gr. = 0.00044 g.). For some reason of habitual usage I cannot say the equivalent of, "Please give half, or 0.5 mg.," or confusion might be worse confused. 1/100 gr. is 0.0006 g., but who would argue that the mental picture of the difference between 1/150 gr. and 1/100 gr. is not more quickly appreciated than the metric 0.00044 g. and 0.0006 g.?

The difficulty is largely overcome here by the simple but very undesirable system of ordering drugs in "whole ampoule" or "half ampoule." Apparently this is a local expedient to overcome the practical difficulties, adopted by those who have been brought up on the metric system all their educational lives. The disadvantages and, indeed, dangers of such an expedient are self-evident.

Touches of the magic wand of mathematical nicety cannot change human mental processes. Ever since the days when we were little boys and girls and gave our playmate half an apple (and gave or kept the "bigger half" for ourselves) fractions will have a clearer mental picture for the average adult than a metric system. So far I have never heard my small son come in and say: "Daddy, Hans gave me 0.5 of his apple." And in our hospitals we must work with the average practical individual who gets on with the work, rather than the adherents of a beautifully correct mathematical system.—I am, etc.,

Zurich.

R. A. C. HERRON.

The Medical Practitioner and the Law

SIR,—The time has come for the medical profession to recognize the double threat inherent in the growing tendency for dissatisfied patients to bring an accusation of negligence against a doctor and/or his hospital. The present tendency is due partly to the impersonal element introduced by the National Health Service, and partly to the financial immunity of certain claimants because of the legal aid system.

The first part of the threat is against the faith of the public in their doctor. Obviously the more often doctors are declared to have been negligent the less faith the public may reasonably put in them. The second threat challenges to some extent the freedom of the practice of medicine. It is again obvious that, if the doctor is gradually forced to give only such treatment as can be defended safely in a court of law should any unforeseen or unavoidable complication arise, then progress in medicine will be deterred.

Although it is the public who ultimately stand to lose by these processes, it is nevertheless our duty to counter them. It seems to me that it is desirable for members of our profession to take particular care that they do not yield to the temptation to support slender grounds a claim of negligence against a fellow practitioner. Where a medical man finds himself faced with the invidious duty of saying whether a colleague has been negligent, he should not shrink from that duty. He may feel that he has a responsibility to assist the course of justice and he must discharge it. The medical profession does not wish, even were it possible, to set itself above judicial criticism or beyond reproach. But the doctor who has to give his opinion as to negligence should be satisfied that there are facts on which he can base his opinion. He must remember that medicine is not an exact science, that assumption and conjecture about patients whom he has not seen and about whom the facts are uncertain are completely unreliable. Conjectures, assumptions, and hypotheses are not sufficient grounds on which to give a responsible and honest opinion that a colleague has been negligent.

One hears that a doctor giving evidence as an expert witness in one of these cases said "there must have been" such and such a sign: "there would obviously be" such and such a symptom. What nonsense! Human reactions are not so consistent as that. I have myself heard a medical witness in such a case base his allegation of his colleague's negligence on a series of three postulates, the second of which was impossible, the third highly unlikely, and the first, on which his case rested, was contrary to the evidence that his colleague had given on oath. And I have seen the same witness feed his counsel assiduously with material intended to trip, to confound, and to discredit medical witnesses for the defence, even including sisters and nurses. I felt ashamed when I saw it. If one holds views it is obviously reasonable occasionally to pass a note or a suggestion to the counsel who is putting those views, but to keep up a continuous stream of suggestions in which every possible attempt is made "by hook or by crook" to catch out a fellow practitioner is really carrying zeal too far. And it is all eventually to the discredit of the profession and to the public harm.

I suggest, Sir, that not only should the Ethical Committee of the British Medical Association peruse a full and complete transcript of the evidence in these cases, but also that the pertinent parts should be printed in your *Journal*.—I am, etc.,

Liverpool, 1.

BRYAN MCFARLAND.

SIR,—Mr. G. A. Craig (*Journal*, March 14, p. 618) deserves credit for his comments on the current spate of anti-medical litigation, and particularly the alarming measure of success with which these efforts have been attended.

There would appear to be an unpleasant current tendency for the patient to regard his doctor with a mixture of suspicion and hostility, so that when something goes wrong recourse to the Courts for retribution follows naturally. While no one is immune from the attacks of these factious malcontents, it is clear that both eminence and experience afford considerable protection, and so it is that the more vulnerable younger practitioners must bear the brunt of the assault. Hospital residents appear to be popular targets, and, while some are sheltered by their consultants, the

unfortunate casualty officer, who is constantly exposed to difficult and dangerous decisions, is often unowned and unsupported. He is in fact a "sitting duck," and entirely at the mercy of the aggrieved bereaved. No sane practitioner could claim that mistakes are entirely unavoidable, and it is obvious that the less experienced a man the more often will he be in error. Casualty posts offer the type of experience and remuneration that will appeal mainly to the recently qualified practitioner, whose judgment will of necessity be immature.

We were taught that, provided we exercised reasonable care and a degree of skill compatible with our experience, we were not generally responsible for unfortunate sequelae. However, it is apparent that the exercise of care and skill is no longer a safeguard; and a combination of free law and free medicine is breeding an insupportable doctrine that because someone dies someone must, therefore, have been negligent. A startling illustration of the development of this new concept of negligence is afforded by the outrageous Payne case, which appeared to the majority of the medical profession to be a travesty of moral justice.

While it is undoubtedly comforting to be in a position to face litigation secure in the knowledge that our expenses will be met by our Defence Society, there are few who are satisfied with this purely defensive strategy. Further mischievous and malignant actions must be met with vigorous and uncompromising resistance by the bodies concerned with the legal protection of the profession, so that our safeguard against the consequences of natural and ungovernable phenomena is restored.—I am, etc.,

Northampton.

T. T. E. MICHAEL.

Vitamins

SIR,—Professor D. M. Dunlop and his colleagues in the "Survey of Prescribing in Scotland in 1951" (*Journal*, March 28, p. 694) estimate that in the United Kingdom about two million pounds are spent in the prescribing of vitamins by general practitioners.

This practice is merely an emulation of the widespread use of vitamins in hospital. In the wards of a teaching hospital wherein I worked recently vitamin tablets and iron tablets were issued routinely with each meal, irrespective of whether any specific deficiency was thought to exist.

This costly custom in practice and in hospital assumes that our food is devitalized and deficient. The increasing incidence of diseases of degeneration, viewed in the light of the pioneer work of Sir Robert McCarrison, surely indicates that this assumption is correct. But to attempt to supplement a deficient diet by using the torrent of synthetic products poured out by enterprising chemists is futile, costly, and illogical.

As long as a large proportion of our food is processed, desiccated, and canned our tissues will continue to degenerate, our hospital waiting-lists will be long, and our consulting-rooms full. Those who doubt this statement should study the Cantor Lectures delivered by McCarrison in 1936 and now published under the title *Nutrition and National Health* (London, 1953).

Only a complete reform of our food production and manufacture, beginning with the abolition of the milling of low extraction wheat flour, will restore the health and vitality of the population and make unnecessary the wasting of millions of pounds in worthless prescribing.—I am, etc.,

Aberfeldy, Perthshire.

W. W. YELLOWLEES.

SIR,—It is very difficult to be strictly scientific in our approach to medicine, though the modern tendency seems to be that way. I assume that Dr. A. Lewis (*Journal*, March 28, p. 729) never gives penicillin without first ascertaining that the organism responsible for the illness he is treating is penicillin-sensitive, and never uses any of the still commonly prescribed "expectorants" because clever scientific doctors say they serve no useful purpose. It happens, though, and not infrequently, that experience is a

better guide than the test-tube or microscope, and experience has shown that in early childhood and in pregnancy, as Dr. Lewis admits, and in soldiers on active service, vitamin supplements are of value. Such supplements have been regularly used for many years as part of the routine training diet of undergraduates undergoing the very severe physical training necessary before rowing in the Boat Race. There are no statistically significant figures available, but it seems that the incidence of coughs, colds, influenza, and minor infections generally is lower among the selected few who undergo Boat Race training at Cambridge than among the common undergraduate population. Of course, all sorts of other factors are involved, and the conclusion that vitamin supplements "help" is grossly unscientific. However, it is likely that Cambridge Boat Race crews will continue to use these extra accessory food factors.—I am, etc.,

Cambridge.

E. V. BEVAN.

SIR,—It is astonishing that Dr. A. Lewis, who is so ready to challenge (*Journal*, August 23, 1952, p. 445) statements in the daily press, should be unfamiliar with scientific advances in the study of vitamins during the last two decades. The point of view made in his letter (*Journal*, March 28, p. 729) represents opinions current at least 20 years ago, when little was known of the exact physiological needs for vitamins. The situation is different to-day. While recognizing that requirements vary from individual to individual, we can now make estimates within relatively narrow limits of human daily needs, and can with a good measure of accuracy assess the intake from food.

From the Ministry of Food publication (1952) *Domestic Food Consumption and Expenditure, 1950*, we learn that the average intake of vitamins for all households was above the standard set by the B.M.A., but average values are misleading unless we recognize that they are obtained by the combination of levels below with levels above. It would be reassuring to think that food provided in our universities could always be depended upon to give students protective nutrients up to or above their estimated needs. But can we be sure of this? In a college where special studies are made of nutritional problems 20% of a group of students were found in 1948 to be deficient in vitamin A (Miss Stella Doraiswami and Professor John Yudkin, *British Medical Journal*, 1948, 2, 708).

Cambridge at any rate has decided to err on the side of safety. Dr. Lewis says "vitamins . . . are especially valuable where there is fear of vitamin deficiency." This surely is a justifiable fear. The problem could be settled by an analysis of the food eaten before and during training, when the extent of supplementation by vitamins could be determined with some measure of accuracy. This is, in fact, done by members of the Oxford University Exploration Club, who also take care that they are not short of vitamins.

Dr. Lewis asks for an official statement on the limitations of vitamins. The Report of the B.M.A. Committee on Nutrition, 1950, gives the most recent estimates of needs, and the Ministry of Food's recent new edition of the *Manual of Nutrition* aptly mentions on p. 38 that "shortage of water-soluble vitamins B₁, C, and riboflavin will also take some time to become evident. Then slothfulness, malaise, and minor skin troubles may arise." It would surely be folly on the part of a trainer to wait until these become manifest in his crew before taking steps to prevent such an occurrence.—I am, etc.,

Medical Research Department,
Vitamins Ltd., London, W.6.

AUDREY Z. BAKER.

Crohn's Disease Involving the Stomach

SIR,—The literature in Crohn's disease is extensive, but case reports of the lesion involving the stomach are rare, which gives added interest and importance to the two cases of Mr. F. R. R. Martin and Dr. R. J. Carr (*Journal*, March 28, p. 700). In claiming priority of proof of gastric occurrence I think they must be unaware of the short series of Comfort *et al.*¹ that included "the first case report of a lesion in the stomach identical with regional enteritis and confirmed by pathological examination." The present authors

emphasize the diagnostic role of anorexia and vomiting, regarding these symptoms as pointers to the involvement of the stomach in the absence of stenosis of the intestine. Some clinical experience of the disease finds one at variance with this interpretation. In the first place, anorexia and vomiting do occur in typical Crohn's disease apart from obstruction, and are usually accompanied by pain in the epigastrium or lower abdomen. Indeed, it is often pain which is responsible for the development of anorexia, because the patient is afraid to eat. Aggravation of the pain by food is a characteristic and very real feature, so much so that one man remarked that he preferred "aspirins and brandy" to a meal.

Further, it is hard to follow the authors in their view that there is danger of a gastric lesion being overlooked through lack of attention. Surely the routine barium meal x-ray examination of the gastro-intestinal tract should suffice to reveal any morbid changes in the stomach wall. That they are rarely described is due, I believe, to the fact that they are rarely present, and not to oversight. A comment on the radiological appearances in these two cases may not be amiss. If we accept the consensus of opinion that an infection—slow, chronic, and as yet unproven—is an aetiological factor then it would seem a fair assumption that an acute (allergic) gastro-duodenitis has flared up in this segment previously sensitized to the infective agent—that is to say, an acute-on-chronic reaction. The effect on the mucous membrane would be a necrotizing one, and the necrosis of the mucosa would account for the disappearance of the mucosal folds, even as the inflammatory reaction causes an arrest of peristalsis. With the subsidence of the inflammatory attack peristalsis returns, and regeneration of the epithelium restores the normal mucosal pattern. Some support for this allergic theory is derived at laparotomy when one has seen spasm of the pylorus and of segments of the colon, a characteristic of sensitized plain muscle. A similar explanation can be applied to the phase of the lesion commonly described as "acute ileitis," which represents an allergic exacerbation in a segment of intestine already sensitized to an infection of unknown origin.—I am, etc.,

Ashton-under-Lyne.

F. G. RALPHS.

REFERENCE

1. Comfort, M. W., Weber, H. M., Barrenstoss, A. H., and Kiely, W. F. (1950). *Amer. J. med. Sci.*, 220, 616.

Sympathetic Nerves and Eclampsia

SIR,—Obstetricians generally must welcome Mr. G. W. Theobald's article (*Journal*, February 21, p. 422), especially as it detailed the successful outcome of pregnancy in three patients who hitherto had failed to secure a live child. Even making allowances for the fact that recurrent toxæmia does on occasion fail to repeat itself in a pregnancy, or proves itself milder, the significance of his therapeutics in the survival of the foetus is manifest.

It is unlikely, however, that the reasons he has advanced for the effectiveness of his procedure will remain unchallenged. Although preliminarily he emphasizes the fact that toxæmia of pregnancy is a non-recurrent condition, he subsequently includes under this broad designation three cases (A, B, and C), on which his conclusions have been founded, which should have been more specifically classified as two cases of toxæmia complicating essential hypertension and one case of toxæmia associated with chronic nephritis. The absence of cardiovascular and of renal signs must be viewed against the genetic background and the reasonably predictable after-history of this group of patients. Pickering¹ states: "Essential hypertension . . . probably represents an inherited abnormality. . . . The beginning and middle part of the course are still largely hidden; it is during this period that pregnancies may occur as a series of events which may or may not influence permanently the hypertension." Browne² in reviewing his experience regards 25% of all toxæmias as belonging to this group. Mr. Theobald's three cases cannot be classified outside it either.

Further, it will be observed that Cases A, B, and C all had certain afferent nerves arising from the uterus interrupted when

the internal iliac vessels were injected with phenol. Cunningham³ states that all blood vessels "are accompanied by nerve fibres both medullated and non-medullated, some of which are afferent and some motor." Such injection must have helped to effect a degree of uterine denervation which, in Cases B and C, was well-nigh completed by presacral neurectomy. The result of practically complete denervation in Cases B and C was in marked contrast to that of the incomplete in Case A. The latter patient gained 3 stones (18.9 kg.) by the 37th week, and her blood pressure of 120/74 mm. Hg had risen to 150/90 in the same period. The water retention reflected in her weight gain and the raised level of her blood pressure proclaimed the toxæmic process, which had not advanced sufficiently, however—for example, to systolic level of 160 mm. Hg—to provoke albuminuria or to injure the foetus. Case B, whose uterus had been largely denervated, appeared to be free from toxæmic stigmata. Case C—of severe chronic nephritis—whose kidney function was perilously perched indeed, escaped disaster and thereby helped to prove the value of uterine denervation. Although Mr. Theobald omits to mention the specific gravity of her urine, the mechanism of dilute and copious urine production in this type of case was fully explained by Platt in his Lumsden Lectures (1952). So profound are the processes responsible for diuresis here that any degree of moderate glomerular shutdown, if it had occurred, would have been entirely masked by them.

Denervation in the fourth case was incomplete, inasmuch as presacral neurectomy had not been performed and the effectiveness of the phenol injection of the vessel had not had time to develop. Emphasis is thus once again provided indirectly on the value of uterine denervation in this method of therapeutics, and Mr. Theobald has unwittingly gone far to prove that interruption of nervous stimuli originating in the uterus prevents the toxæmic process. The utero-renal reflex offers an explanation of the pathway of these stimuli, and if interpolated suffices to explain the renal changes of toxæmia. Although the tension of the multiparous uterus is not as high as the primiparous, the renal soil has been so prepared in the essential hypertensive as to react to weaker stimulation (Sophian⁴). It is these stimuli which internal iliac denervation and presacral sympathectomy interrupt, and therefore toxæmia fails to develop.

Mr. Theobald attempts to discount the thesis of a nervously integrated renal shutdown arising from the uterus because of its tension by certain invalid arguments. For instance, he has failed to appreciate Poiseuille's law by constant tension of the uterine wall with a raised intrauterine pressure in his experiment of filling the distensible post-partum uterus in the hope of highly accentuating its tension. There is no proof that he had succeeded in effecting the latter, and it is therefore wrong for him to expect evidence of a utero-renal reflex acutely evoked thereby. In certain experiments of which I have knowledge, the intact (not the denervated) artery of supply to one horn of the rabbit's uterus was electrically stimulated and resulted in renal shutdown. In his experiments both the site of application of the stimulus and the fact that the internal iliac was sympathectomized serve to destroy any analogy.

It is apparent that readers of the article must interpret the data quite differently from Mr. Theobald.—I am, etc.,

JOHN SOPHIAN.

Salisbury, S. Rhodesia.

REFERENCES

1. *Transactions of the 12th British Congress of Obstetrics and Gynaecology*, 1949, p. 140.
2. *Ibid.*, 1949, p. 143.
3. *Textbook of Anatomy*, 1943, 8th ed., p. 1107. London.
4. *Symposium on the Circulation*, 1952. Ciba Foundation.

Incidence of Scabies

SIR,—I wonder whether any of your readers have noticed an increase in the number of cases of scabies occurring in their practices recently? I notice that in the out-patient clinics attended by the dermatological unit in this area we had only four cases of scabies in 1951, and six cases in 1952; whereas in the first 10 weeks of this year we have had 19 cases.

I believe I am correct in saying that a marked increase in scabies arose just before the 1914–18 war, and some 18 months before the 1939–45 war, the significance of this being that in both cases the increase was pre-war. I am not trying to spread alarm and despondency, but would be inter-

ested to hear if there is now an increase in scabies after the marked drop we had at the end of the last war.—I am, etc.,

Bradford.

ALLAN BIGHAM.

Cricket

SIR,—You very kindly published a letter of mine in the *Journal* of June 7, 1952 (p. 1251), in which information was given that a cricket match had been arranged between the B.M.A. and the Law Society at Hurlingham, London, on Sunday, July 5, 1953, at 11.30 a.m. The response to this letter was encouraging. The replies were often informative, not infrequently amusing, and without exception couched in humble terms in regard to the prowess of the writers.

The approach of another cricket season prompts me to put out this reminder in the hope that other members of the Association who are interested in cricket may be encouraged to get in touch with me as soon as possible, so that the best possible available side is obtained. At the moment the most urgent need is a wicket-keeper and a slow left-hand bowler.—I am, etc.,

The Little House,
Broadwater Down,
Tunbridge Wells.

R. PROSPER LISTON.

Life of Hugh Owen Thomas

SIR,—I am writing a new *Life of Hugh Owen Thomas*, together with a revised edition of his collected works. Any assistance in this task would be welcomed; in particular I am anxious to have access to previously unpublished material. Letters or documents relating to any aspect of Thomas's private or professional life, or to the history of the family, will be carefully handled and returned to the owners as soon as possible.—I am, etc.,

10, Harley Street,
London, W.1.

DAVID LE VAY.

POINTS FROM LETTERS

Research in General Practice

Dr. B. BARNETT (Birmingham) writes: Professor Robert Platt's article (*Journal*, March 14, p. 577) has to be welcomed, since it highlights some of the problems of general practice as it operates at present and the richly rewarding work which would incidentally appear from a reorganization of such work. Facility for research can arise only when facility for adequate work has been provided. Records, ancillary workers, fuller examination, adequate facilities, liaison with other doctors, some form of group practice—these are the prime requisites, and until they are met we can expect little. We yet have to be thankful to Professor Platt for showing us a beacon ahead.

Recurrent Boils

Dr. E. McKERROW (Workington, Cumberland) writes: With reference to the Refresher Course article on boils (*Journal*, March 28, p. 721), within the past few years I have had two cases of recurrent boils in elderly couples. In both cases the husband was the first patient, and in both cases the focus of infection was eventually proved to be the umbilicus of the wife. Soon after this was discovered and cleared up there was an end to boils in both cases.

Patients as Individuals

Dr. J. M. MACLENNAN (Vancouver) writes: Dr. R. R. Bomford's "discursive and eclectic review of some changing concepts in medicine" (*Journal*, March 21, p. 633) is perhaps deliberately provocative. Certainly the medicine he was taught nearly 25 years ago is strangely different from that which I was taught at the very same period. Our teachers insisted on the study of the patients as individuals. That there was a personality factor in peptic ulceration, rheumatoid arthritis, asthma, etc., was made very clear to us. We were urged to study people's faces as well as the domestic and industrial environment of our patients. Did Dr. Bomford not hear those things 25 years ago? His Bradshaw Lecture sends one back with renewed appreciation to Professor C. F. W. Illingworth's Refresher Course article on peptic ulcer (*Journal*, July 26, 1952, p. 206), so brief, so clear, so firmly based, and so closely related to the patients and their experiences.

Obituary

ALEXANDER MILES, M.D., LL.D., F.R.C.S.Ed.

Mr. Alexander Miles, who died at his home in Edinburgh on April 9 at the age of 87, was one of the leading surgeons of his day. He will be remembered also for his outstanding work on behalf of the Edinburgh medical school.

Alexander Miles was born at Leith on May 21, 1865, and was educated at George Watson's College and at the University of Edinburgh, where he graduated M.B., C.M. in 1888. He was elected F.R.C.S.Ed. in 1890 and proceeded to the M.D. in the



Swan Watson, Edinburgh

following year, winning the gold medal and the Symes Surgical Fellowship for his thesis. After holding the appointments of clinical assistant in the observation wards and resident surgeon at Edinburgh Royal Infirmary, he became lecturer in anatomy in the University, assistant surgeon to the Royal Infirmary, and surgeon to Leith Hospital. He was also appointed lecturer in surgery in the school of medicine of the Edinburgh Royal Colleges. In 1909 he was promoted to full surgeon at the Infirmary, retiring in 1924. Mr. Miles succeeded the late Sir James Hodsdon as the representative of the Royal College of Surgeons of Edinburgh on the General Medical Council in 1928, and he continued to serve in that capacity until 1943. He was a member of the executive committee of the Council for 10 years; of the penal cases committee and the finance committee for 12 years; the public health committee in 1928-9; the examination committee from 1929 to 1939; and of the education committee from 1940 to 1943. In addition he was appointed a member of the Dental Education and Examination Committee, a committee set up for the purpose of the revision of the dental curriculum in 1931. On Miles's retirement from the G.M.C. the President paid tribute to his sober judgment and wise counsel, especially as a member of the penal cases committee. When the British Medical Association held its Annual Meeting at Aberdeen in 1914 Mr. Miles acted as a vice-president of the Section of Surgery, and from 1926 to 1930 he was a member of the Arrangements Committee. For a time Mr. Miles was joint editor of the *Edinburgh Medical Journal*, and he was a past president of the Royal Medical Society of Edinburgh.

We are indebted to Mr. W. J. STUART for the following appreciation: Despite the fact that Mr. Miles had reached his 88th year he had, until the comparatively recent onset of ill-health, so maintained his active interest in the Edinburgh medical school and all that concerned it that his death means much more than the passing of a half-forgotten figure. He gave the qualifying lecture courses in surgery and in operative surgery in the extramural school of medicine of the Royal Colleges of Edinburgh, and his classes were always large. According to custom he discontinued the classes on his appointment as surgeon to the Infirmary,

a post which he held for the routine period of 15 years till 1924, and during that time and thereafter his work for the university became increasingly important. He was a member of the University Court, and was also one of the Curators of Patronage, in whose hands lie the appointments to certain university chairs in Edinburgh. In 1925 his university deservedly honoured him by conferring upon him the degree of LL.D. His connexion with the Royal College of Surgeons of Edinburgh was also close. He was a most efficient secretary and treasurer for seven years, president for the usual two years, and its representative on the General Medical Council for 15 years. In later life one of his greatest interests lay in the Astley-Ainslie Hospital for occupational therapy, of whose board he was the first chairman, and his constant interest was a significant factor in its success.

The most important of his numerous contributions to medical literature was undoubtedly the *Manual of Surgery*, written jointly with Alexis Thomson, which was first published in 1904. It became an immediate favourite among students and young graduates, and its continued popularity was indicated by the publication in 1939 of the ninth edition, for which, owing to the death of Alexis Thomson, Miles had obtained the collaboration of the late Sir David Wilkie. For the last edition of his textbook on *Operative Surgery*, published in 1950, he had Sir James Learmonth as joint editor: it must be exceptional that any man at the age of 84 should be capable of such work and, moreover, of writing the chapter on amputations contained in that volume.

Miles was one of the prominent surgeons of his time in the Edinburgh school, and it is difficult to realize that it is almost 30 years since the close of his active hospital life. His increased leisure in later years enabled more use to be made of his great administrative and organizing gifts by the university and other institutions, to which he freely gave his services. He is survived by his wife, formerly Miss Helen J. Greig, and a daughter.

We are indebted to Dr. HARLEY WILLIAMS for the following appreciation: Having to choose my first surgical clinic, I consulted an older man, who said, "You will learn a lot from Sandy Miles." He was indeed considered the best all-round surgeon in the Royal Infirmary: from him I learnt all I was capable of learning. He was slight, fresh, and sandy, and he operated without gloves, with his sleeves loosely rolled up. His hands were small but very capable, and in teaching he was neither reticent nor talkative. To watch him handle a patient was in itself a perfect process of learning. Students used to smile at the frequent use he made of his self-invented instrument, the Miles "dissector," which was a very ordinary tool such as we felt anyone might have devised. That was typical of Miles's approach to an operation. Technique for him meant the simplest, most fundamental way of doing a thing. He had a tepid sense of humour, but only once do I remember his throwing an instrument upon the floor—not the beloved dissector, but a pair of forceps that would not grip. His surgical results were the justification of his craftsmanship. Alexander Miles was known at Edinburgh as the conscientious partner in that team of extraordinary opposites—Thomson and Miles. Each was everything the other was not. Alexis Thomson, brilliant, eccentric, reckless: Miles, cautious, careful, conscientious. They hung together over many years with enormous mutual respect. Yet it always seemed amazing that their jointly written textbook could have so successfully emerged from this incongruous association. At the final examinations many students would encounter that strange partnership for the last time. Alexis Thomson was impetuous, impatient, and then bored. The ever-kindly Miles ran the show, calmed the alarmed examinee, and supplied the proper efficiency and fairness.

Under his conventional exterior there must have been a secret poet, for he called his house in Perthshire by a Gaelic name meaning "hill of the fairies" or something of that kind. His only son, Hamish Miles, who died many years

ago, was becoming well known in literature and wrote a life of Arthur Machen. Miles the surgeon lived on for more than 20 years after his retirement, still nimble, young-looking, kindly, a monument to the influence of an equable temperament and the virtues of moderation.

Sir EDWARD WORTHINGTON, K.C.V.O.
C.B., C.M.G., C.I.E., M.R.C.S.

Sir Edward Worthington, who entered the R.A.M.C. in 1900 and was at one time physician to the late Duke of Connaught, died on April 5 at the age of 76.

Edward Scott Worthington was born on October 15, 1876, and was educated privately and at Trinity University, Toronto. Soon after qualifying M.R.C.S., L.R.C.P. in 1899 he volunteered for service as a civil surgeon in the war in South Africa, and in November, 1900, he entered the R.A.M.C. as a lieutenant, having been recommended for a commission by the commander-in-chief. For his services in South Africa he was awarded the Queen's medal, with four clasps, and the King's medal, with two clasps. After a brief period in the United Kingdom in 1902-3 he served in India for five years before returning to England in 1908. Two years later he was present, as medical officer on the staff of the Duke of Connaught, at the opening of the first Parliament of the Union of South Africa, and he later went to Canada when the Duke was appointed Governor-General of the Dominion. When war broke out in 1914 Worthington was recalled to England, and he was with the British Expeditionary Force in France until October, 1916, when he returned to England. Towards the end of the war he was deputy assistant director-general of medical services at the War Office for a short time, and he also became an Honorary Physician to the King. He retired in 1926. Worthington was the recipient of many Crown honours. He was appointed M.V.O. in 1911 and created a knight in 1913. For his war services he was awarded the C.M.G. in 1915 and the C.B. in 1918, in which year he was also promoted K.C.V.O. His appointment as C.I.E. was the reward for his services as medical officer on the staff of the Duke of Connaught in India when the Princes' Council was opened in 1920. Other awards he received were the Belgian Croix de Guerre and the American Distinguished Service Medal, and he was appointed an Officer of the Order of Leopold of Belgium and of the Sacred Elephant of Siam. He was also appointed a Knight of Grace of the Venerable Order of St. John of Jerusalem in 1913. Worthington married Miss Winifred J. Wallace in 1914 and had one son and one daughter.

R. PATERSON SMITH, M.D., D.P.H.

Dr. R. Paterson Smith, who was professor of pathology and bacteriology at Dalhousie University, Halifax, Nova Scotia, for more than 20 years, died in Newcastle-upon-Tyne on April 7. He was 57 years of age.

Ralph Paterson Smith was a native of Greenock and was educated at Greenock Academy and Glasgow University, where he graduated M.B., Ch.B. with honours in 1918. After a period of service in the R.A.M.C., during which he was in Egypt for a time, he returned to Glasgow as assistant to the professor of pathology. In 1922 he took the D.P.H., and in the following year he went to Newcastle—his wife's home town—as lecturer in pathology at Durham University and assistant pathologist to the Royal Infirmary. It was in 1927 that he was appointed to the professorship of pathology at

Dalhousie University, but before he left for Canada he had submitted a thesis for the M.D. degree of Glasgow University on the subject of enteric fever, and for this he was awarded the Bellahouston gold medal.

From 1927 to 1950 Professor Paterson Smith, who was a born teacher, played a prominent part in the medical affairs of the Maritime Provinces of Canada, and his advice was widely sought on medico-legal and educational matters. He examined in pathology for the Dominion Medical Council of Canada and for the Canadian College of Physicians and Surgeons. A Founder Fellow of the College of American Pathologists, he was also a member of several other learned societies in North America. His writings covered a wide range of subjects, including bacteriology, parasitology, and toxicology, but his main interest was in neoplastic diseases, and in this branch of study he left his mark on medical teaching. An important paper on "Lobular Hyperplasia of the Breast" was published in the *Canadian Medical Association Journal* in 1940.

Genial and courteous in manner, Paterson Smith was a most energetic worker, and when three years ago he returned to this country as consultant pathologist to the Newcastle General Hospital he put all his heart into the organization of his department. He leaves a widow and five sons, of whom three have settled abroad and one is a medical student at the University of Durham.

After a prolonged illness contracted on service and borne with great cheerfulness and fortitude, Colonel R. W. VINT died on March 2 at the age of 65. Robert Washington Vint was born at Carrickfergus, Co. Antrim, on July 4, 1887, a twin son of the late Mr. John Vint, and was educated at the Royal Belfast Academical Institution, matriculating at the former Royal University of Ireland, and later studying medicine at the old Queen's College, Belfast, where he was a keen player of Rugby football. After graduating M.B., B.Ch. in 1910 he served as house-surgeon at the Maternity Hospital, Belfast, and later as house-surgeon and house-physician at the Royal Victoria Hospital. He entered the R.A.M.C. by competitive examination in 1912, and was in India when war broke out in 1914. He then served with a field ambulance in Mesopotamia and Persia, gaining considerable surgical experience. After the war he served in the United Kingdom, Malta, and India, chiefly as a surgical specialist, and wherever he went he was universally popular. During the last war he was in command of a large hospital in India, and later became A.D.M.S., Waziristan District, North-west Frontier Province, and an Honorary Surgeon to the Viceroy of India. On reaching the age of retirement he was re-employed to command a large tuberculosis hospital in the Indian hills, and he finally retired in 1947. Colonel Vint is survived by his wife and one son. His death will be deeply felt by a multitude of friends in many parts of the world.

Dr. WILLIAM WHITE, who died at his home at Cappoquin, Co. Waterford, on March 7 in his 80th year, was the son of the late Dr. Thomas Kyran White, of Kilsheelan, Co. Tipperary. William White was educated at Blackrock College and the old Queen's College, Cork, graduating M.B., B.Ch. from the former Royal University of Ireland in 1898. After graduation he held the post of house-surgeon at the County and City Infirmary, Waterford, and afterwards acted as assistant resident medical superintendent at the mental hospital there. During the war in South Africa he served as civil surgeon, and was attached to the 13th Lancers and the 9th Hussars. After the war he entered general practice and worked successively in Liverpool, in Mullinavat, Co. Kilkenny, and in Whitechurch, Co. Waterford, until, in 1914, he was appointed medical officer of health for the Cappoquin

district, where he practised until his death. Dr. White was an all-round athlete. He was a keen horseman from his early days and rode with the Tipperary hounds. Besides being an amateur boxer of some skill, he played Rugby at Black-rock College and at Queen's College, Cork, and gained an inter-provincial Rugby cap for Munster in 1892 and again in 1893. He also represented County Tipperary in the Gaelic Field and was captain of the Shandon Rowing Club, Cork, for some years. The achievements of his youth he recollected pleasantly, but it will be as a general practitioner of the highest order that he will be remembered by his colleagues and his patients. Dr. White kept well abreast of the times, and excelled as a diagnostician, using a happy combination of old and new methods. His punctuality was a by-word in the neighbourhood, his attention to his patients never failed, while his good humour and quiet manner endeared him to all. Dr. White is survived by his son and four daughters, Mrs. White having died in 1944. His son, Thomas Kyran White, was formerly a colonel in the Indian Medical Service, and one of his daughters, Dr. Winifred A. White, is in practice at Cappoquin.—M. O'F.

Dr. E. C. BRADFORD, who was in practice at Horsham, in Sussex, for many years, died in hospital at Durban, South Africa, on March 24, aged 63. Ernest Cordley Bradford was born on August 13, 1889, the son of the late Dr. Cordley Bradford, a well-known general practitioner of Acock's Green, Birmingham, and was educated at Rugby, Pembroke College, Cambridge, and at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1914, and taking the degrees of M.B., B.Chir. in the following year. He was a house-surgeon at the Birmingham General Hospital before entering the R.A.M.C. to serve in the war of 1914-18. After the war he settled in general practice at Horsham, retiring because of illness in 1943. An enthusiastic member of the British Medical Association, he was honorary secretary of the Horsham Division from 1925 to 1933, and chairman of the West Sussex Division from 1934 to 1937. After his retirement Dr. Bradford fought against ill-health with such great courage that in 1951 he was able to take a post as ship surgeon and make several trips round Africa. His new appointment brought with it a return of his old zest for life and enjoyment in work, but unfortunately his health again deteriorated. Although he was really unfit for his last trip, he made light of his symptoms and rejoined his ship. But he had to be put ashore at Durban, and there he died, in harness, as did his father before him. Dr. Bradford was bred in the old tradition of medical practice, and had ingrained in him all the attributes which go to make the ideal general practitioner. First and foremost a family man, he had a wide range of interests, including all kinds of sport. He served the Horsham Hospital with a strong sense of duty, and many local societies and institutions also received his support. A real friend to the families whom he attended, he was quite unsparing of himself and always ready to do acts of kindness which many people would consider unnecessary for a busy man to undertake. So, as with many of the best general practitioners, the strain began to tell, and his last few years in general practice were an increasing struggle against failing health. He leaves a widow and three sons, two of whom are following their father's profession.—J. W. D.

We record with regret the death on March 28 of Mr. KENNETH TURNBULL at the early age of 33. He and his wife were killed in a motoring accident in Southern Rhodesia when their car ran into the back of a stationary lorry. Kenneth Turnbull was born on January 20, 1920, and had a distinguished career at the medical school of the University of Durham, where he graduated M.B., B.S., with second-class honours, in 1942. After holding the appointment of house-surgeon at the Royal Victoria Infirmary, Newcastle-upon-Tyne, he entered the Royal Navy for service in the last war, and was seconded to the Fleet Air Arm in 1943. On his release from the Royal Navy in 1946 he returned to the Royal Victoria Infirmary and was subsequently

appointed surgical registrar. He took the Fellowship of the Royal College of Surgeons of England in 1948. Two years later he went out to Salisbury, in Southern Rhodesia, where he soon built up a large and successful surgical practice. Last year he and his wife and small son returned to this country on holiday for a few months, and they had not been long back in Southern Rhodesia when the tragedy happened.

We are indebted to Professor J. HAMILTON BARCLAY for the following appreciation: Kenneth Turnbull was an outstanding man in every way, and the cutting short of such a promising career is hard to understand. While a student at Newcastle-upon-Tyne he was a noted athlete, and he played for the University of Durham at both Association and Rugby football, and was president of the Durham University Athletic Union, winning the 100 yards two years running. In addition he was also "capped" at Rugby for Durham County. On the surgical side he showed ability much above the average and gave promise of becoming a first-class surgeon. He was a most charming and unassuming man, and was liked by everyone with whom he came in contact. His wife, formerly Miss Jean C. Gossage, whom he met during the war when she was an officer in the W.R.N.S., had also a most delightful and pleasing personality. They leave a little son, aged 3. Our sincere sympathy goes out to the parents of Mr. and Mrs. Turnbull and to their son.

Medical Notes in Parliament

Hospital Medical Staff

Mr. A. BLENKINSOP asked the Minister of Health on April 16 what total reduction in the medical staffs of teaching and non-teaching hospitals he anticipated during the current financial year.

Mr. IAIN MACLEOD replied that he could not predict the results of the special review of medical staff which he had asked hospital authorities to make.

Mr. BLENKINSOP asked how many of the registrars, of which the Minister must know the number, were likely to go out of practice during the next 12 months.

Mr. MACLEOD said there was no particular pressure being put on the department in that matter, although it was a difficult one.

Dr. BARNET STROSS said that many hospitals were finding difficulty in obtaining junior registrars. Had the Minister considered what he could do to help them, so that men in senior appointments had the necessary help to carry on their work?

Mr. MACLEOD replied that the figures for junior registrars had been for some time closely in accord with the planned schedule laid down by the Socialist Government. There were difficulties there, but the total number of specialist posts becoming available was unhappily not as high as was hoped when it was laid down.

Mr. BLENKINSOP asked him to explain how it was that there had been a big drop in the provision made in the estimates for medical staff of the teaching and non-teaching hospitals.

Mr. MACLEOD said that Mr. Blenkinsop was fallaciously comparing this year's estimates with last year's estimates, instead of last year's outlay. There had been, in fact, no change.

Mr. BLENKINSOP also asked the Minister if he would give the number of senior registrars whose appointments were being terminated and for whom there were not likely to be vacancies in hospitals, and what action he proposed to take.

Mr. MACLEOD replied that this information was not available, as the number of hospital vacancies could not be predicted with any accuracy. He was, however, reviewing the position in consultation with representatives of the profession.

Dangerous Drugs

Dr. BARNET STROSS asked the Minister of Health on April 14 if he would list the drugs that were known to cause malignant neutropenia, agranulocytosis, and acute leukaemia; what statistics he had showing the incidence of these conditions during the past two years, as compared with the year 1930; and whether he would withdraw from the official pharmacopoeia any of these drugs known to carry this danger.

Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, replied that any list would be misleading. Many valuable drugs had on occasion been suspected of being the toxic factor in these diseases, but any particular drug had relatively seldom been incriminated; moreover, many patients had taken such drugs without any disorder of the blood resulting. The figures asked for were not available. The contents of the *British Pharmacopoeia* were a matter for the Pharmacopoeia Commission.

Central Purchasing

Mr. A. BLENKINSOP asked the Minister of Health on April 16 why he was proposing to reduce the amount of central purchasing of general medical and surgical stores and appliances and drugs and vaccines in the current financial year, in view of the economies that had been effected by central purchasing in the past.

Mr. IAIN MACLEOD replied that the reduction in estimated expenditure on these supplies in 1953-4 was due mainly to revision of the estimated amount of direct purchases for other Government departments. The amount of central purchasing and contracting for the National Health Service had not been reduced.

Tuberculosis Treatment Abroad

Mrs. JEAN MANN asked the Secretary of State for Scotland how many Scottish tuberculous patients were receiving treatment outside Scotland, where the sanatoria concerned were situated, what was the cost per patient in these sanatoria, and what was the corresponding cost in Scottish sanatoria.

Mr. J. STUART informed her that the present number receiving such treatment under National Health Service arrangements was 195, in three sanatoria in Switzerland. The average daily cost of treatment was about 30s., or 34s. 4d. allowing for transport and incidentals such as dental treatment. The average daily cost in Scottish sanatoria was about 23s. 6d.

Cremation Certificates

Mr. J. REEVES asked the Home Secretary on April 16 whether his attention had been drawn to the high fees charged by medical practitioners for certificates required under the Cremation Acts, and whether he would expedite the negotiations with the appropriate medical professional bodies so that a maximum fee might be fixed within the reach of the ordinary wage-earner.

Sir HUGH LUCAS-TOOTH, the Under-Secretary, said that the Home Secretary hoped to make a statement in the near future.

Industrial Diseases Inquiry

Mr. OSBERT PEAKE, in reply to a question on April 16, stated that the committee to consider the cover for diseases under the Industrial Injuries Act had been appointed, and Mr. F. W. Beney, Q.C., had accepted the chairmanship. The terms of reference of the committee were: "To review the present provisions of the Industrial Injuries Act under which benefit is paid for diseases and for personal injuries not caused by accident, and to make recommendations." The membership was: Mr. J. W. Berry, Sir Ernest Rock, Mr. C. R. Dale, Sir Wilfrid Garrett, Mr. R. Kean, Sir William Laythorpe, Dr. L. G. Norman, Mr. A. Roberts, Dr. Alice Mary Stewart, Mrs. Gertrude Williams. One other member was to be appointed after consultation with the nationalized industries.

Medico-Legal

NEGLIGENCE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

There has in recent years been a large increase in the number of actions which have come before the courts in which allegations of professional negligence have been made against doctors. Sometimes it is the doctors themselves, sometimes the hospital authorities which employ them, that the actions are brought against. This situation is causing concern in the profession, and there is a widespread feeling that the results of such actions show that the courts are not properly distinguishing between the sort of mistakes which are inevitable in the practice of medicine and have to be accepted as the price to be paid for the advance of medical science, and the sort of mistakes which properly deserve the stigma of negligence and for which compensation should properly be awarded.

It has first to be said that in all the recent cases there has been no change whatsoever in the law. In common with all those who hold themselves out as carrying on any skilled activity, the doctor is under a duty in law to use "due care, diligence, and skill" towards his patient. Failure to do so which results in damage to the patient renders him liable to pay damages for negligence. The degree of care, diligence, and skill which he must exercise to fulfil his duty is the degree which would be expected of him by the general consensus of opinion in the profession, his experience and qualifications being taken into consideration, together with what he has set out to do, and the conditions in which he set out to do it. A less exacting standard will be required of the newly qualified surgeon carrying out an emergency operation in a man's home which could not wait until he could be got to hospital than would be required of a specialist carrying out the same operation with all the resources of a hospital at his disposal. This is not only sound law, but, like most sound law, good common sense.

The Importance of Expert Witnesses

Moreover, since it is only by means of the expert evidence of medical witnesses that the law can be applied to each particular set of facts which is brought before the courts, it is the doctors themselves who in the ultimate analysis set the standard of care which dictates whether a mistake is negligent or simply one of those which must be accepted.

No action involving allegations of negligence against a doctor can be won unless the plaintiff can support his case by calling as an expert witness a doctor who will swear that what was done fell short of the degree of care, diligence, and skill which would have been expected in the circumstances by the general consensus of opinion in the profession. If, after hearing that expert witness cross-examined, and after hearing the experts called by the defence to prove the contrary examined and cross-examined, the Court prefers the evidence of the expert witness called for the plaintiff, there will be a finding of negligence against the doctor. But a finding of negligence against a doctor can be reached by no other road.

Accordingly, where the Court in finding negligence against a doctor reaches a wrong conclusion, the most that can be said is that it has preferred the evidence of the wrong expert, and has been misled by a doctor who took the wrong view of the general consensus of professional opinion on the facts of the particular case. There is no other basis upon which a wrong conclusion can be reached.

Effect of Free Legal Aid

If statistics were available they should therefore show that, while there has been a great increase in the number of actions brought involving allegations of negligence against doctors, there has been no significant increase in the propor-

tion of such actions which have been successful. The reason for the increase in the number of actions brought does not lie in any change in the law; nor is it to be found in the institution of the National Health Service, which has in no way altered either the legal concept of the duty of the doctor towards his patients or the test of "general consensus of opinion in the profession" by which the legal concept is applied. The increase in actions has largely occurred since 1949, and is undoubtedly the result of the Legal Aid and Advice Act passed in that year.

Since the 1949 Act it has become financially practicable for any plaintiff, however poor, who can satisfy a committee set up under the Act that on his own version of what happened he has a *prima facie* case of negligence against a doctor or hospital, to litigate his case in the High Court. Before the 1949 Act, unless he had substantial means of his own or from some other source to support him, he had in practice no hope of litigating such an action, owing to the very heavy expense necessarily involved. Now, provided he has a *prima facie* case, the State will make up the deficit which previously would have prevented him from bringing the action, even though he may well lose it in the end.

Like many others who were largely protected before 1949 by the cost of litigation, doctors are now exposed in practice as they have always been in theory to the actions of any patients who consider that they have been injured by a breach of the doctor's duty towards them. The standard of duty is set by the medical profession itself, so that it lies in the doctor's own hands to see that, although occasionally a case will have the wrong result, substantially no injustice either to patient or to doctor will be done.

Universities and Colleges

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College, held on March 12, with Sir Cecil Wakeley, President, in the chair, a report of the death of Professor Johan Holst, of Oslo, an Honorary Fellow of the College, was received with deep regret.

The Hallett Prize was presented to A. T. Matheson (Cape-town) and the Handcock Prize to A. H. Tooley (King's College Hospital). The Council received reports of the renewal of the Mackenzie Mackinnon Research Fellowship of Dr. I. K. R. McMillan (St. Thomas's) and the Streatfeild Research Scholarship of Mr. A. T. Andreasen.

A Diploma of Membership was awarded to D. B. Fox (University College).

At a meeting of the Council of the College held on April 9, with Sir Cecil Wakeley, President, in the chair, Professor Reynaldo dos Santos, of Lisbon, was admitted to the Honorary Fellowship.

The following were elected Fellows of the College without examination as being medical practitioners of at least 20 years' standing: Mr. W. E. Tucker (Bermuda), Professor F. Davies (Sheffield), Mr. J. Dobson (Wigan), Mr. R. Scot Skirving (Sydney), Mr. A. E. Coates (Melbourne).

The Jacksonian Prize for 1952 was awarded to Mr. John Borrie (New Zealand), and a certificate of honourable mention was awarded to Mr. Rodney Smith (St. George's) for their essays on the surgical treatment of carcinoma of the stomach. The Council selected "Melanomas and Melanosis" as the subject for the Jacksonian Prize for 1954.

The Council received a gift of the *Conquest of Ceylon*, in three volumes, by P. de Queyroz, from the Faculty of Medicine, University of Ceylon.

Diplomas in Physical Medicine, in Ophthalmology, in Tropical Medicine and Hygiene, in Laryngology and Otolaryngology, in Industrial Health, and in Medical Radiotherapy were granted, jointly with the Royal College of Physicians of London, to the following successful candidates:

DIPLOMA IN PHYSICAL MEDICINE.—L. S. Bain, E. E. Bullock, A. B. Coyer, J. A. M. Joyce, S. Mattingly, A. P. H. Randle, Dorothy J. Roth, R. A. Shaddick, G. O. Storey.

DIPLOMA IN OPHTHALMOLOGY.—Judith MacA. Brown, R. U. Chowdhary, K. J. Dastur, J. M. Heaton, S. Itchhaporia, B. R. Jones, Mary A. C. Jones, A. T. Karsgaard, M. K. Mehra, J. Moss, M. Nawaz, C. I. Phillips, A. Samad, J. Singh, J. R. van der Merwe, Billie I. Williams, T. Wilson.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—I. Ahmad, Anwar-ul-Islam, T. Awuku-Asabre, A. R. O. Bakare, S. A. Biggart, E. B. Bright, G. H. Burgess, Carmel Cachia, J. E. Cranswick, R. A. Davis, S. R. A. Dodu, P. F. Doherty, I. M. Grant, C. H. Gurd, S. M. M. Haque, H. G. Hendow, C. S. Heymann, Jasmine R. Jacob, V. V. Kalbian, W. N. Laing, A. R. T. Lundie, A. D. A. Maconochie, D. E. Marmion, S. Nadesan, M. C. Peterside, Irene Rajaratnam, D. Ramadwar, S. Paul, A. W. Senft, P. Sirivorasarn, H. G. Skinner, G. J. Stott, Gladys M. Vanniasingham, A. V. A. Vethanayagam, S. Vyas, M. C. Williams, W. Williams, R. Woodward.

DIPLOMA IN LARYNGOLOGY AND OTOLARYNGOLOGY.—P. J. Damato.

DIPLOMA IN INDUSTRIAL HEALTH.—P. H. Nash.

DIPLOMA IN MEDICAL RADIOTHERAPY.—R. Finney.

Hospitals were recognized under paragraph 23 of the F.R.C.S. regulations as follows: Albert Dock Hospital, London, orthopaedic registrar, for six months; house-surgeon, for six months; from January, 1954, casualty and receiving-room officer. Paddington Hospital, surgical registrar; two house-surgeons, for six months. Jersey General Hospital, St. Helier, resident surgical officer, for six months (until March, 1956). Pontypool Hospital, house-surgeon, for six months. Griffithstown County Hospital, senior house officer (general surgery), for six months. Kingston Hospital, *decennial revision*, two senior house officers (orthopaedic and casualty); two senior house officers (general surgery); two house officers (general surgery), all for six months. Ipswich Borough General Hospital, *additional recognition*, junior orthopaedic registrar, for six months. Pembroke County War Memorial Hospital, Haverfordwest, *confirmation of temporary recognition*, resident surgical officer, for one year; house-surgeon, for six months. Bridge of Earn Hospital, *additional recognition*, registrar (general surgery), for six months. Birmingham Accident Hospital, *revision from January, 1954*, four resident surgical officers; six house-surgeons. Royal Hampshire County Hospital, Winchester, *additional recognition*, two house-surgeons (general surgery and ear, nose, and throat); house-surgeon (general surgery and ophthalmology), all for six months, from January, 1954, casualty officer, to be recognized for casualty work and not, as hitherto, for general surgery. Royal Victoria Hospital, Bournemouth, from January, 1954, casualty officer; orthopaedic house-surgeon. Bridgend General Hospital, from January, 1954, casualty house-surgeon. Chase Farm Hospital, Enfield, from January, 1954, casualty officer, to be recognized for casualty work and not, as hitherto, for general surgery. Dulwich Hospital, *redesignation*, "surgical registrar" to be replaced by "resident surgical officer"; from January, 1954, casualty officer. St. Giles's Hospital, London, from January, 1954, casualty officer. St. Andrew's Hospital, Bow, from January 1954, casualty officer. Woolwich Memorial Hospital, *redesignation*, "senior resident surgical officer" now becomes "registrar general surgery"; from January, 1954, casualty officer (senior house officer). Mansfield and District Hospital, *alteration to existing recognition*, omit senior house-surgeon; from January, 1954, two senior house officers to casualty and orthopaedic department. Royal Gwent Hospital, Newport, from January, 1954, two senior house officers (casualty). Northampton General Hospital, from January, 1954, casualty officer; *additional recognition*, fourth house-surgeon, for six months; *redesignation*, "resident surgical officer" now becomes "senior surgical registrar." Perth Royal Infirmary, from January, 1954, house-surgeon (casualty). Queen Mary's Hospital, Sidcup, from January, 1954, casualty officer. St. Nicholas Hospital, Plumstead, from January, 1954, first and second casualty officers. Merthyr General Hospital, resident surgical officer, house-surgeon, both for six months. St. Albans City Hospital, *confirmation of temporary recognition*, two surgical registrars, both for 12 months; two house-surgeons, both for six months. From January, 1954, casualty officer. Bolton Royal Infirmary, paragraph 23c, ear, nose, and throat, registrar. Royal Hospital, Richmond, *decennial revision*, house-surgeon, for six months. Royal Salop Infirmary, Shrewsbury, *additional recognition*, orthopaedic house-surgeon, for six months. From January, 1954, casualty house-surgeon. Portsmouth and Southern Counties Eye and Ear Hospital, paragraph 23c, ear, nose, and throat registrar; senior house officer (otolaryngology). St. Richard's Hospital, Chichester, from January, 1954, casualty officer. Epsom District Hospital, *revision*, increased period of recognition of resident surgical officer (surgical registrar) from six to twelve months. From January, 1954, casualty officer. Queen Mary's Hospital for the East End, *decennial revision*, resident surgical officer, deputy resident surgical officer, both for twelve months; two house-surgeons, each for six months. Poplar Hospital, *decennial revision*, two house-surgeons, for six months. From January, 1954, casualty house-surgeon. Clare Hall Hospital, Barnet, *redesignation*, registrar has now become

"senior registrar." Blackburn Royal Infirmary, *revision*, surgical registrar, for twelve months; senior house officer (general), three house officers, all for six months. From January, 1954, two senior house officers (orthopaedics and casualty). Queen's Park Hospital, Blackburn, *revision*, surgical registrar for twelve months; house officer (general), for six months. Dryburn Hospital, Durham, *additional recognition*, surgical registrar, for six months. City General Hospital, Gloucester, *revision*, orthopaedic registrar; orthopaedic house-surgeon, both for six months. Ballochmyle Hospital, Mauchline, *additional recognition*, two junior house officers, for six months. Birkenhead General Hospital, from January, 1954, two casualty officers. Reduction of period of recognition of posts already recognized from twelve to six months: two surgical registrars; orthopaedic registrar; senior house-surgeon. Chester Royal Infirmary, from January, 1954, casualty officer. *Redesignation*, orthopaedic registrar has been replaced by assistant orthopaedic surgeon (S.H.M.O.). Bootle Hospital, from January, 1954, casualty officer. Ashford County Hospital, *redesignation*, three surgical registrars become one senior registrar and two registrars (12 months); two house officers, for six months, in place of three resident junior house-surgeons, for twelve months. From January, 1954, third house officer to be recognized for casualty work and not, as hitherto, for general surgery. Bedford General Hospital, *revision*, period of recognition of two house-surgeons to be reduced from twelve to six months. From January, 1954, house-surgeon (casualty to six months. Dudley Road Hospital, Birmingham, *revision*, department). Dudley Road Hospital, Birmingham, *revision*, senior surgical registrar and surgical registrar, both for twelve months; three house-surgeons, for six months. From January, 1954, two casualty officers. Gloucestershire Royal Hospital, from January, 1954, casualty officer. *Revision*, period of recognition of first and second house-surgeons to be reduced from twelve to six months. Royal Surrey County Hospital, Guildford, from January, 1954, two casualty officers. Edgware General Hospital, from January, 1954, two casualty officers. Leicester Royal Infirmary, *revision*, omit one (of five) general house-surgeons. From January, 1954, two registrars (casualty and general surgery); senior house officer (casualty department). Bethnal Green Hospital, from January, 1954, casualty officer. Miller General Hospital, London, from January, 1954, casualty officer. Prince of Wales's General Hospital, London, from January, 1954, senior casualty officer. St. Alfege's Hospital, London, from January, 1954, casualty officer. St. James' Hospital, Balham, from January, 1954, two casualty officers. St. Mary Abbots Hospital, London, from January, 1954, casualty officer. Luton and Dunstable Hospital, *redesignation*, senior surgical registrar becomes "registrar" (12 months); senior orthopaedic registrar becomes "orthopaedic registrar," for six months. From January, 1954, house officer (casualty). Poole General Hospital, from January, 1954, casualty officer. Southlands Hospital, Shoreham-by-Sea, from January, 1954, orthopaedic registrar; orthopaedic house-surgeon. *Redesignation*, resident surgical officer now becomes surgical registrar (twelve months); reduction of period of recognition of house-surgeon from twelve to six months. Upton Hospital, Slough, from January, 1954, senior house officer (casualty). Leigh Infirmary, Wigan, from January, 1954, casualty officer to be recognized for casualty work and not, as hitherto, for general surgery. Royal Albert Edward Infirmary, Wigan, from January, 1954, casualty officer to be recognized for casualty work and not, as hitherto, for general surgery.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council of the College, held on January 31, with the President, Mr. A. A. Gemmell, in the chair, D. C. A. Bevis, I. Donald, and I. Macdonald were awarded Leverhulme Research Scholarships for 1953.

The following were elected to the Membership of the College: D. M. Brodie, P. Bruce-Lockhart, D. S. Burris, K. G. Cockburn, S. B. Cooper, Janet G. Cowie, H. J. G. De Villiers, H. G. Dixon, Margaret M. Downes, E. M. Edwards, J. R. Elliott, A. H. Foate, G. S. Foster, A. E. Fyfe, G. H. Garfield, J. M. Gate, G. L. Gleeson, L. Goldman, N. G. Gourlay, M. Grant, R. W. Grayburn, J. M. Holmes, G. C. S. Hunter, Valentine M. Husband, Sarah I. Jacob, R. A. Kenihan, K. Khadenga, H. H. Kirk, B. V. Kyle, J. C. McCawley, J. Macpherson, J. S. McVeigh, Jean Murray-Jones, T. J. M. Myles, L. M. Norburn, E. M. O'Dwyer, S. Panchalingam, R. M. McK. Pratt, M. J. M. Solomons, W. K. Sutton, T. A. Thompson, R. S. Wurm.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The following were admitted to the Membership of the College on February 6: G. T. L. Archer, V. T. B. Doyle, T. M. Gregg, Elinor D. U. Powell.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 4 (No. 13) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	11	1	6	1		29	5	13	0	3
Dysentery ..	423	60	89	2		592	70	67	1	2
Encephalitis, acute	10	0	0	0		6	0	0	0	
Enteric fever: Typhoid ..	6	0	1	0	4	1	0	0	0	
Paratyphoid ..	7	1	0	0		12	0	1(B)	0	
Food-poisoning ..	63	14		1		65	9		33	
Infective enteritis or diarrhoea under 2 years ..				11	7				7	12
Measles*	21,166	953	401	208	232	6,953	270	588	317	476
Meningococcal infection ..	43	6	14	0	2	38	4	32	0	3
Ophthalmia neonatorum ..	36	4	9	0		32	3	16	0	
Pneumonia†	937	72	290	22	6	801	39	400	8	4
Poliomyelitis, acute: Paralytic ..	31	2		0	0	10	1		3	0
Non-paralytic ..	7	1		0		2	0			
Puerperal fever‡	221	27	11	0	1	268	45	17	3	
Scarlet fever ..	1,403	96	146	40	38	1,403	110	176	18	59
Tuberculosis: Respiratory ..			135	42				170	18	
Non-respiratory ..			29	2				30	1	
Whooping-cough ..	2,508	148	273	31	76	3,110	146	262	87	48

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0				1	0		0	
Encephalitis, acute		0		0		1			1	
Enteric fever ..	0	0	0			0	0	0		
Infective enteritis or diarrhoea under 2 years ..	9	1	1	3	1	11		0	0	1
Influenza ..	52	7	7	3	1	34	4	16	0	2
Measles ..		0	0	0			0	2	0	1
Meningococcal infection ..	2	0				2				
Pneumonia ..	267	32	25	12	9	282	25		7	4
Poliomyelitis, acute	4	1			0	1	1			0
Scarlet fever ..		0	0		0		0		0	0
Tuberculosis: Respiratory ..	115	20	15	4	11	119	21	25	3	9
Non-respiratory ..	3	0	0	0	2	1	3	0	1	
Whooping-cough ..	7	1	0	0	2	0	0		0	1
Deaths 0-1 year ..	226	28	26	15	18	257	28	33	9	14
Deaths (excluding stillbirths) ..	5,587	775	599	144	159	5,294	756	661	101	183
LIVE BIRTHS ..	7,185	1,009	925	231	379	7,766	1,188	863	202	381
STILLBIRTHS ..	199	28	21			199	30	29		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Smallpox in the North Country

Up to noon, April 21, there had been 25 confirmed cases of smallpox, including 6 deaths. Since last week's report there have been 1 death, 1 new case, and 1 suspected case. The patient who died was a man aged 61, probably vaccinated in infancy. The new case was a boy aged 16, unvaccinated. The suspected new case was a woman aged 69, vaccinated in infancy. The boy aged 8 whose death was reported in this column last week is now known to have died from haemorrhagic smallpox.

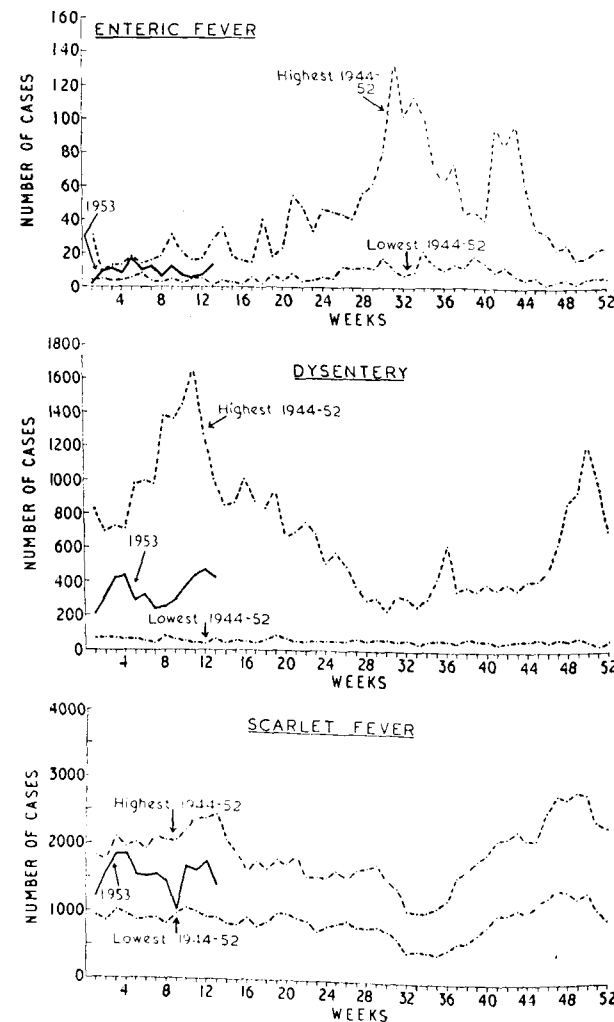
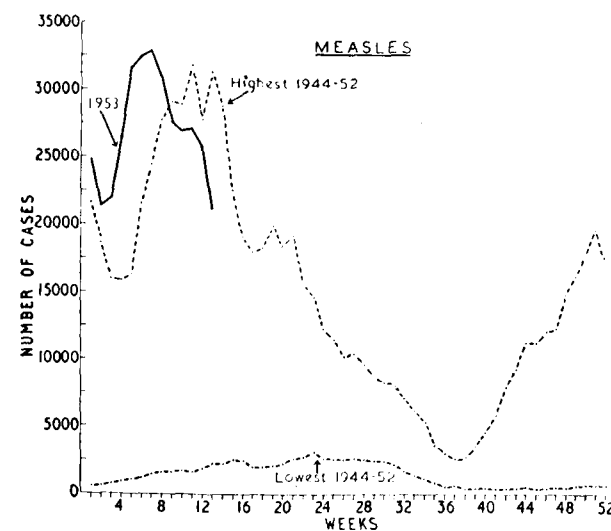
Infectious Diseases in the First Quarter

The chief features of the returns of infectious diseases during the first quarter of this year were the trends of measles and diphtheria. The notifications of measles reached the highest level since this disease was made notifiable, 32,890 cases being notified during the seventh week. The notifications of diphtheria reached the lowest level ever recorded, only 11 cases being notified during the thirteenth week. The incidence of scarlet fever and acute pneumonia was relatively high during the quarter. A comparison of the number of notifications for the first quarters of the past five years is as follows:

England and Wales	1949	1950	1951	1952	1953
Scarlet fever	16,087	24,802	12,088	18,013	20,550
Diphtheria	1,523	955	572	456	264
Whooping-cough	37,221	23,619	66,865	35,042	34,207
Measles	201,140	54,568	311,709	64,596	350,836
Acute pneumonia	17,147	13,720	26,536	12,960	20,005
Meningococcal infections	474	536	662	562	595
Acute poliomyelitis	245	512	339	238	345
Dysentery	886	3,938	13,995	6,936	4,449
Enteric fevers (typhoid and paratyphoid)	100	154	149	126	123
Great Towns:					
Influenza deaths			7,448	496	2,995

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Infectious diseases were less prevalent in England and Wales during the week ending April 4. Falls in the number of notifications included 4,625 for measles, from 25,791 to 21,166; 694 for whooping-cough, from 3,202 to 2,508; and 336 for scarlet fever, from 1,739 to 1,403.

The largest decreases in the incidence of measles were 617 in Yorkshire West Riding, from 1,998 to 1,381; 357 in Kent, from 1,149 to 792; 336 in Bedfordshire, from 616 to 280; 268 in Hertfordshire, from 715 to 447; 256 in Middlesex, from 1,098 to 842; 235 in Leicestershire, from 614 to 379; and 222 in Staffordshire, from 1,272 to 1,050. The largest falls in the number of notifications of whooping-cough were 157 in Lancashire, from 585 to 428; 112 in London, from 260 to 148; 83 in Yorkshire West Riding, from 251 to 168; and 45 in Durham, from 133 to 88. The only large fluctuation in the trends of scarlet fever was a fall of 79 in the number of notifications in Lancashire.

11 cases of diphtheria were notified, 9 fewer than in the preceding week. This total was the smallest ever recorded. The chief feature of the returns of diphtheria was a fall from 10 to 2 in the number of cases notified in Lancashire.

6 cases of typhoid fever were notified, 3 in South Shields C.B., 2 in Wigan C.B., and 1 in Moseley M.B.

38 cases of acute poliomyelitis were notified. These were 11 fewer for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 6 (Rotherham C.B. 2), Surrey 5 (Wimbledon M.B. 2), Essex 4 (Brentwood U.D. 2), and Middlesex 4.

The notifications of dysentery fell from 463 to 423. A rise was recorded in Lancashire from 60 to 109, due mainly

to an outbreak in Lancaster M.B. with 31 notifications. The other large returns in this county were Liverpool C.B. 39 and Manchester C.B. 28. The other large centres of infection were London 60 (Bethnal Green 15, Islington 17), Yorkshire West Riding 41 (Leeds C.B. 13, Barnsley C.B. 10), Leicestershire 38 (Leicester C.B. 38), and Middlesex 26 (Edmonton M.B. 16).

52 deaths were attributed to influenza in the great towns, 48 fewer than in the preceding week.

Northern Ireland's Health in 1952

The Registrar-General for Northern Ireland states that the general death rate, the infant mortality rate, and the death rate from tuberculosis for 1952 were the lowest ever recorded. For the first time since records have been maintained no deaths were reported from diphtheria.

The birth rate for 1952 was 20.9 per thousand of the population, as against 20.7 for the previous year. Although this rate is below the average for the five years 1947-51 it is above the 1939 level of 19.5.

The death rate was 10.8 per 1,000 population. This was a decrease of 2.0 as compared with the rate for 1951, but the rate for 1951 was exceptionally high because of the severe epidemic of influenza which occurred early in that year. The death rate from tuberculosis continued to fall, and now stands at 30 per 100,000 of the population. This rate is about one-third of what it was 20 years ago.

During the same period the infant mortality rate fell from 83 deaths per 1,000 live births to 39. For the past three years the maternal mortality rate has remained unchanged at 1.1 per 1,000 live births, this being the lowest rate ever recorded for Northern Ireland. In 1932 this rate was 5.3 deaths per 1,000 births. Only four cases of diphtheria were notified during the year.

Week Ending April 11

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,266, whooping-cough 2,618, diphtheria 19, measles 23,388, acute poliomyelitis 38, dysentery 325, paratyphoid fever 9, and typhoid fever 2.

Medical News

Regius Chair of Medicine, Glasgow.—The Queen has appointed Professor E. J. Wayne to the Regius Chair of Practice of Medicine at Glasgow University in succession to Sir John McNee, who is retiring on October 1. Professor Wayne, who is 50 years of age, is professor of pharmacology and therapeutics at Sheffield University. He is also physician to the Sheffield Royal Infirmary and the Sheffield Hospital for Children.

Association of British Pharmaceutical Industry.—The Minister of Health was the chief speaker at the annual dinner of the Association of British Pharmaceutical Industry on April 15. Discussing the financial problems that concern the Ministry and the pharmaceutical industry, Mr. Macleod said that the Government, as other Governments had been, was deeply concerned with the size of the drug bill. The total bill that had to be met from Part 4 and Part 2 of the Health Service in England and Wales and Scotland came to about £60 million, of which seven or eight million was paid by the patients. The greatest possible value must be obtained for that large sum, which was a little short of that needed to take sixpence off the income tax. The contribution of the pharmaceutical industry to the export trade was very important, and the industry also had to develop and continue the research which had brought such benefits to mankind. After mentioning the "perfect bill of health" which insulin had been given by

the Monopolies Commission on Insulin, Mr. Macleod referred briefly to the efforts of the A.B.P.I. to get the metric system officially adopted, and concluded with a tribute to the pharmaceutical industry's contribution to the National Health Service. In reply the president of the A.B.P.I., Mr. C. L. Saul, said that if the industry made a present of the drugs dispensed by chemists under the N.H.S. the total cost of the Service would still be over £400 million. "The industry," he said, "had to listen to two voices—the Board of Trade and the Ministry of Health." If there were one central body which at the highest level could look at any problems from the domestic and export angle at one and the same time, the industry would give it full co-operation. After Mr. Saul had proposed the health of the guests, Mr. Richard Law, M.P., made a brief reply.

Local Medical Societies.—Recent meetings have included the following: On March 4 there was a joint meeting of the *Liverpool Medical Institution* and the *Manchester Medical Society*, at which Dr. E. N. Chamberlain read a paper on rheumatic carditis and Mr. J. Howell Hughes reviewed the usefulness of gastroscopy. *Manchester Medical Society.*—On February 11 Dr. M. C. G. Israëls dealt with the classification of the reticuloses in his presidential address to the Section of Pathology. On March 10 Mr. Robert Cooke spoke to the Section of Surgery on "Abdominal Exploration and Re-exploration." He stressed the dangers of delaying laparotomy too long in cases of non-penetrating abdominal injury, the need to explore when in doubt—"We talk of paralytic ileus, when we should be operating for mechanical obstruction"—and the value of surgery in advanced malignant disease. On March 11 Professor R. E. Glover, F.R.C.V.S., read a paper to the Section of Pathology on "The Significance of Mutation in Virus Diseases in Animals," using foot-and-mouth disease and influenza for illustration. On March 19 Dr. Maurice Campbell, addressing the Society on "The Selection of Patients for Mitral Valvotomy and the Results," said that the operation should be considered in all patients with mitral stenosis who were progressively disabled. Orthopnoea, cardiac asthma, pulmonary hypertension, and recurrent pulmonary oedema were special indications; active rheumatic carditis, gross mitral regurgitation, and unrelievable congestive heart failure were the main contraindications. On March 23 Dr. E. Howard Kitching read a paper to the Section of General Practice entitled "Some Psychiatric Disorders of Childhood." He discussed behaviour disorders, "tics, tricks, and habits in children," which he said were almost always determined by innate factors and were usually early manifestations of an obsessional character likely to persist throughout life, and juvenile delinquency. *North of England Obstetrical and Gynaecological Society.*—At a meeting in Leeds on March 27 Dr. A. V. G. Bibby described "Two Cases of Ruptured Uterus in Accidental Haemorrhage"; Mr. G. Manley described a case of "Advanced Epithelioma of the Vulva"; Mr. D. C. Racker read a paper on "The Management of Post-maturity"; and Dr. J. C. W. Somerville read a paper on "Cerebral Vascular Accident in Labour."

B.M.S.A. Regional Clinical Conference.—The clinical conference of the midland region of the British Medical Students' Association was held in Oxford from April 15 to 17 under the presidency of the Regius Professor of Medicine, Professor A. D. Gardner. The conference was organized by the Oxford University Medical Society and attended by 80 students from medical schools throughout the country. The programme included lectures, ward rounds, and visits to departments engaged in research.

The May "Family Doctor."—Two articles in the May issue of *Family Doctor*, which appears on Tuesday, aim at relieving the natural fears of those who must face major surgery: "Challenge to a Woman," by Dr. T. Traherne, offers encouragement for the woman whose breast must be amputated, while "I Had My Throat Cut" will hearten those booked for thyroidectomy. Sex education is represented by an illustrated feature, "The Moment of Concep-

tion," which is the first instalment of a new series by Dr. Roger Pilkington, Ph.D., and by Dr. Winifred de Kok's suggestions on how to tell children about the father's part in procreation. On the more strictly medical side there are articles on migraine, vitamin C, and infant feeding. In "Little Thief," Dr. John Brandon sympathetically examines the reasons why children steal and the ways to cure them. A topical note is provided by "First-aid on the Cricket Field" and "Close-up of Science."

International Medical Art Exhibition.—The Royal Netherlands Medical Association is sponsoring an international exhibition of paintings, drawings, and sculpture by doctors, which will be held at The Hague at the time of the Seventh General Assembly of the W.M.A. in September. The exhibition will be run by the Union of Physician-Painters ("Pincettes et Pinceaux") of the Netherlands. Associations of medical artists or individuals who wish to exhibit are invited to write without delay to the Royal Netherlands Medical Association, Keizersgracht 327, Amsterdam C., Netherlands.

National Film Theatre.—The British Film Institute has decided to end the scheme for free associate membership announced in the *Journal* of December 27, 1952 (p. 1429). This is because the response was so great that the National Film Theatre's bona fides as a private theatre has been cast in doubt. Members of the B.M.A. who joined the scheme are being notified by the B.F.I., and are being offered the alternative of paid individual membership.

Blood Donor Record.—Blood donations in England and Wales last year numbered 647,009, the highest total in any year since the 1944 record of 669,000. The total strength of the blood donor panel at the end of the year was 487,660, but 135,000 more donors are still required.

COMING EVENTS

Hastings Lecture, 1953.—Professor F. A. E. Crew, F.R.S., professor of public health and social medicine in the University of Edinburgh, is to give this year's Hastings Lecture of the British Medical Association on May 6 at 6.30 p.m. in the Great Hall of B.M.A. House. His subject is, "Medicine and Social Policy." Mr. Walter Elliott, C.H., F.R.S., will be in the chair. The Hastings Lecture is expressly intended for the lay public, and it is hoped that doctors will bring this function to the notice of lay people who might be able to attend. Admission is free by ticket obtained in advance on application to the Public Relations Department, B.M.A. House, Tavistock Square, London, W.C.1.

The Irish Medical Schools and Graduates Association are holding their annual spring dinner dance at the Rembrandt Hotel on May 7. The president, Dr. W. R. F. Collis (Dublin), will present the Arnott Memorial Medal to Mr. Terence Millin, and will invest Mr. Ian Fraser (Belfast) with the badge of presidency for the coming year. Those Irish graduates interested in this association are invited to write to the honorary secretaries at 149, Harley Street, London, W.1.

Society of Chiropodists.—The 1953 annual convention of the Society of Chiropodists will be held at the Royal Hotel, Woburn Place, London, W.C.1, from May 7 to 9. The convention will include lectures and demonstrations, and will be officially opened by Sir Heneage Ogilvie at 2.30 p.m. on May 7. The annual general meeting of the Society will be held at 10 a.m. on May 9, and the annual dinner will be at the Park Lane Hotel on May 7.

Occupational Therapy Conference.—The Association of Occupational Therapists is holding a conference in the Hoare Memorial Hall, Church House, Westminster, from April 30 to May 2 inclusive. The conference will be opened by the president, Lord Webb-Johnson, at 11 a.m. on April 30, and at 2 p.m. on that day Sir Russell Brain will speak on "A Neurologist Looks at Occupational Therapy." The ordinary general meeting of the association will be held at 2.30 p.m. on May 2.

Contraceptive Technique.—A lecture and demonstration on contraceptive technique will be given by Marie Stopes, Ph.D., at the Mothers' Clinic, 108, Whitfield Street, London, W.1, on May 7 at 2.30 p.m. No fee is charged, but tickets must be obtained in advance, as space is very limited.

Royal Dental Hospital.—The annual clinical "At Home" will be held at the Royal Dental Hospital of London on Saturday, May 9, at 2 p.m.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, April 27

- INSTITUTE OF OPHTHALMOLOGY.—5.30 p.m., Dr. Alan Woods (Baltimore): American Approach to the Cataract Operation.
- INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.
- POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. Sheila Sherlock: Portal Hypertension.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. N. R. Barrett: Hiatus Hernia; 6.30 p.m., Mr. Denis Browne: Hypospadias, Epispadias, and Hermaphroditism.
- UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., Sir Rudolph Peters, F.R.S.: Inhibitors and Intracellular Chemical Dissection.

Tuesday, April 28

- DUBLIN UNIVERSITY.—At Physiology Theatre, 4.30 p.m., John Mallet Purser Lecture by Professor A. Brodal (Oslo): Pyramidal Tract in the Light of Recent Anatomical Research.
- INSTITUTE OF OPHTHALMOLOGY.—5.30 p.m., Dr. Alan Woods (Baltimore): Recent Studies on the Pathogenesis of Diabetic Retinopathy.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. A. Dickson Wright: Colostomy; 6.30 p.m., Sir Zachary Cope: Actinomycosis.
- SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.30 p.m., Mr. W. A. Hervey: Some Recent Advances in Ear, Nose, and Throat Therapy.

Wednesday, April 29

- BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At Department of Experimental Psychiatry, Medical School, Birmingham, 8 p.m., Professor J. Elkes: Pharmacological Method in Psychiatric Research.
- CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, 8.15 p.m., films: (1) Thrombosis and Embolism; (2) Haemorrhagic Diseases. Discussion to be opened by Dr. J. Marks.
- POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. H. A. Sissons: Growth and Repair in the Pathology of Bone and Muscle.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Sir Clement Price Thomas: Some Aspects of the Surgical Treatment of Pulmonary Tuberculosis; 6.30 p.m., Sir Geoffrey Jefferson, F.R.S.: Stupor—Traumatic and Otherwise.
- ROYAL EYE HOSPITAL.—5.30 p.m., Dr. A. A. Guild: Symptomatology and Treatment of Cerebello-pontine Angle Tumours.
- UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., Professor George Wald (Harvard): Molecular Basis of Vision.

Thursday, April 30

- CHADWICK TRUST.—At Walker Art Gallery, Liverpool, 7.30 p.m., Professor S. E. Finer: Public Health—A Comparison Between the Age of Chadwick and Our Own.
- LONDON UNIVERSITY.—(1) At Anatomy Lecture Theatre, University College, 5.30 p.m., Professor Wayne Dennis, Ph.D. (New York): Productivity of Scientists. (2) At University College Hospital Medical School, 5.30 p.m., Professor R. Nicolaysen (Oslo): Some Dynamic and Quantitative Aspects of Calcium Metabolism.
- NUFFIELD ORTHOPAEDIC CENTRE, Wingfield-Morris Orthopaedic Hospital.—8.30 p.m., Mr. E. W. Somerville: Congenital Dislocation of the Hip.
- POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., two films by Dr. Ian McMillan: (1) Movements of Normal and Pathological Aortic and Mitral Valves; (2) High-Speed Cinematography of the Dog's Heart with Simultaneous Pressure Recording.
- RENAL ASSOCIATION.—At 41, Portland Place, W., 4.30 p.m., annual general meeting. Dr. H. Wirz (Basle): The Osmotic Work of the Mammalian Kidney.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Mr. Norman Barrett: Cardiospasm.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.30 p.m., Mr. R. J. McNeill Love: Gall-bladder and Bile Ducts.
- ROYAL EYE HOSPITAL.—5.30 p.m., Miss M. Savory: Conjunctivitis and its Modern Treatment.
- ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. G. S. Dawes: Changes in the Circulation at Birth.
- ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. D. Williams: postgraduate demonstration in neurology.
- WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At London Airport, 7.30 for 8 p.m., dinner meeting. Sir Harold Whittingham: Some Medical Problems of Air Transport.

Friday, May 1

- INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. M. B. MacKenna: Eczema.
- LONDON UNIVERSITY.—At University College Hospital Medical School, 5 p.m., Professor J. Chassar Moir: Use of Radiology in Forecasting the Course of Labour.
- POSTGRADUATE MEDICAL SCHOOL OF LONDON.—12 noon, Professor R. A. McCance, F.R.S.: Renal Function Before and After Birth; 4 p.m., Dr. J. Goodwin: Cardiac Arrhythmias.
- ROYAL EYE HOSPITAL.—4.30 p.m., Mr. A. J. Cameron: Virus Diseases of the Eye.
- ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Obstetric and Gynaecological Conference, Tuberculosis in Pregnancy. Speakers, Dr. Raymond Cohen and Dr. W. D. W. Brooks.

Saturday, May 2

- MIDLAND TUBERCULOSIS SOCIETY.—At Yardley Green Hospital, clinical meeting.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Toxicity of Detergents

Q.—What is known about the toxicity of detergents in common domestic use? Are there risks from external contact or ingestion? G. S. Wilson¹ has raised the question of their carcinogenic activity. Is this likely?

A.—In their concentrated form some of the modern detergents are acutely poisonous when given by mouth to animals. A single human fatality has been described.²

They are normally handled in very dilute form for washing and cleaning. Animal experiments have shown that quantities larger than any expected to remain as residues on food from ordinary use can be ingested for long periods without causing toxic effects. There are, however, many different preparations in use, and by no means all have been tested in this way. The possibility that some of these detergents may be carcinogenic is being investigated experimentally at the present time.

Because detergents degrease the skin, are commonly alkaline, and may provoke a sensitization reaction they may sometimes do provoke a severe type of dermatitis from which recovery is slow. It is not easy to protect against these dangers, but there is some prospect of success from the use of acid-buffered creams.³

REFERENCES

- ¹ J. roy. san. Inst., 1951, 71, 652.
- ² British Medical Journal, 1952, 2, 1348.
- ³ Trans. St. John's Hosp. Derm. Soc. (Lond.), 1952, 31, 7.

Hay-fever Desensitization

Q.—(1) An adult male suffers from very severe hay-fever every year. In any year he can be prevented completely from having symptoms by a graduated course of 20 injections of the appropriate pollen extract. These injections are quite painful and cause considerable local reaction, especially at the beginning of the course. How can this be prevented? (2) Alternatively, if after a full course had been completed the patient was given only maintenance treatment in the form of the maximum dose once every two months, would this be likely to prevent his hay-fever?

A.—(1) The discomfort attached to starting each new course could be avoided by starting the initial dose at a much weaker strength—approximately one-tenth of the pre-much weaker strength. Excessively large local swellings should be avoided, not only because they are painful, but because they indicate a nearness to a dose which may cause a severe and even dangerous constitutional reaction. If, following an injection, an excessive swelling occurs the dose should be reduced by one-tenth; if a medium swelling occurs the subsequent dose should not be increased but repeated. It would appear that if the present 20 injections were increased to 25 or 30 injections—a more usual scheme—no reactions might occur, and the course would certainly be safer. The maximum dose is correct as the result is satisfactory.

(2) The perennial treatment suggested is a well-accepted method, but the interval between successive maximum doses (or perhaps, preferably, a submaximum dose) should not exceed one month, for a longer interval gives a definite risk of a constitutional reaction. A few patients tend to have constitutional reactions if the interval is more than 10 to 14 days, even on submaximum doses. It is important to remember that solutions of pollen gradually deteriorate in strength, and, when fresh solutions are obtained in the early months of the year, then the dose must be reduced to about 10% of that used with the old extract. The

maximum dose should then be built up again by weekly injections. About four weeks before the onset of the hay-fever season the injections should again be given weekly.

Moniliasis Following Treatment with Antibiotics

Q.—What is the incidence of generalized moniliasis after antibiotic therapy? After which antibiotic is its occurrence most frequent? What are the symptoms, and what is the treatment?

A.—The exact incidence of moniliasis occurring during the course of treatment with antibiotics is not known. That it is not high is suggested by the fact that the report of a single case still warrants publication. Earlier in this issue two fatal cases are recorded: in the first there was widely disseminated moniliasis and aspergillosis associated with agranulocytosis and antibiotic therapy (p. 918); in the second a monilial peritonitis followed perforation of a duodenal ulcer (p. 919).

The causal organism, the fungus *Candida albicans*, usually behaves as a harmless commensal in the upper respiratory tract, but its potential pathogenicity is shown by its ability to cause thrush, and, much less commonly, to invade the lungs, meninges, endocardium, and the blood stream. The administration of the newer "wide-spectrum" antibiotics (aureomycin, terramycin, and chloramphenicol) in high dosage, and especially when two or more are used simultaneously or in combination with streptomycin or penicillin, can destroy the entire bacterial flora of the respiratory and intestinal tracts; in these circumstances the fungi, which are not sensitive to the drugs, proliferate rapidly and may spread widely. As a rule they cause lesions no more serious than the glossitis and stomatitis which are so familiar and annoying in association with aureomycin therapy, but invasion of the lungs gives rise to a serious illness, with fever, wasting, haemoptysis, and cavitation, which may be mistaken for tuberculosis or, alternatively, may be regarded as an indication for still more energetic chemotherapy. No more specific treatment of the established disease is available than stopping the administration of all antibiotics. This relatively rare complication would be still more rare if it were the rule to give an antibiotic for not more than four days in the absence of a favourable clinical response.

Bathing and Urticaria

Q.—What investigations and treatment are advised for a man who regularly develops an urticarial eruption almost immediately after bathing, both in fresh and salt water? The patient is keen to continue bathing. Can any likely causes be suggested?

A.—The treatment of urticaria due to cold water is unsatisfactory. I presume that this reaction to bathing has come on only recently, so it is probable that some new factor in the patient's make-up has become important. Some cases have been cured after search for and removal of septic foci in teeth, tonsils, or elimination of intestinal parasites, and in many cases a very definite psychological stress has appeared to be the cause. If the urticaria is related only to very cold water, repeated baths gradually decreasing the temperature from day to day have been suggested. If none of these causes is present, the only thing to do is to use one of the antihistaminic drugs before bathing takes place. The patient must, of course, be warned of the possible unpleasant side-effects of such drugs, and a drug should be chosen which does not give unpleasant reactions in the particular patient.

Treatment of Congenital Dislocation of the Hip

Q.—What is the best age for the treatment of congenital dislocation of the hip? What is the prognosis for the development of the acetabulum after reduction? Will any dietary or hormone treatment assist this?

A.—The best age for the treatment of congenital dislocation is unquestionably as early as possible; the difficulty

of treating the condition early enough arises from the difficulty of diagnosis before the child walks. This is largely because the mother does not notice anything wrong with the hip until that time. However, there is a great deal of evidence that treatment in the early months of life is both simple and satisfactory. Shortening of the leg and alteration of the creases of the thigh are the more obvious signs of this condition, and would warrant x-ray examination.

The reformation of the acetabulum after reduction is on the whole satisfactory, and the earlier the reduction the more likely it is to occur. A small percentage of reductions fail to develop a satisfactory roof. Present-day opinion is that these will become subluxated and that a shelf operation is indicated if there is a failure of development of the acetabular roof. No dietary or hormonal treatment is effective.

Oiling Floors and Blankets in Boarding Schools

Q.—Is the oiling of floors and blankets likely to reduce the incidence of upper respiratory infections in boarding schools?

A.—Experience of the use of oiling to prevent the dispersal of dust from floors and bedclothes has been largely confined to hospitals and Army barracks. The results obtained there certainly suggested that the treatment often reduced the spread, at least, of infections due to haemolytic streptococci, but except in one instance the reduction was not great. The treatment might well be expected to help also in controlling the spread of similar infections in schools, but it could not of course alone prevent such spread. The technique of oiling bedclothes¹ and floors² has been described in this *Journal*.

REFERENCES

- ¹ *British Medical Journal*, 1944, 1, 615.
² *Ibid.*, 1944, 1, 616.

Immobilization in Spinal Tuberculosis

Q.—What is the best way of immobilizing cases of spinal tuberculosis?

A.—Cases of spinal tuberculosis can be immobilized either in a plaster bed or on a spinal frame of the Robert Jones type. The latter is a more efficient method, and such frames can be obtained from most appliance-makers. Immobilization is usually required for not less than two years.

NOTES AND COMMENTS

Dangers of Aluminium Welding.—Dr. H. G. TAYLOR, D.Sc., M.I.E.E., F.Inst.P. (Director of Research, British Welding Research Association), and Dr. E. G. WEST, Ph.D., F.I.M. (Technical Director, The Aluminium Development Association), write: Your issue of March 14 (p. 631) contained an answer to a request for information on the health of welders of aluminium. Experience with this process now extends over some 50 years, so that its health hazards are well understood, and we should be obliged if you would publish our comments on the reply referred to above. The principal risks are the same as in the welding of other metals—for instance, electric shock and injuries to the eyes and skin as indicated in *The Health of Welders*, by A. T. Doig and L. N. Duguid.¹ Reporting a clinical survey of 247 industrial welders engaged on steel welding, these authors state that the abnormal physical signs sometimes found indicate "a mild form of bronchial irritation and are not associated with evidence of pulmonary fibrosis or of impaired exercise tolerance." Although some abnormal x-ray appearances were observed, these were believed to be due to the deposition of fume, which lies inertly in the lungs and disappears when exposure to fume ceases. The x-ray picture was stated, therefore, to be of little significance in itself, which conforms with the suggestions made in your journal about x-ray pictures taken after 10 years of aluminium welding. Hunter, Milton, Perry, and Thompson² found no evidence that the dust of aluminium or of aluminium oxide produced any disease of the trachea, bronchi, or lungs of 92 men engaged in grinding aluminium-alloy aircraft propellers.

An analysis given in the published reply may perhaps give a misleading impression of the nature of fumes produced in welding

aluminium. Fluorine and chlorine in the free, uncombine condition are certainly never present, although there might conceivably be fluorides and chlorides from the fluxes or electrode coatings used. The modern inert-gas shielded welding arc, however, requires no flux or coating, so that such compounds will be absent. In our view it is highly doubtful whether there are any grave risks associated with the production of ozone or oxide of nitrogen in welding, but good ventilation is essential when working in a confined space if for no other reason than to help dissipate the heat generated. Lastly, we must correct the statement that lead is present in aluminium. No commercial aluminium alloy contains more than 0.05% lead, and the alloy which are welded contain much less than this.

REFERENCES

- ¹ *The Health of Welders*, 1951. Factory Department, Ministry of Labour and National Service.
² *Brit. J. Industr. Med.*, 1944, 1, 159.

OUR EXPERT writes: No doubt aluminium welding was tried about 50 years ago, but my information is that a really satisfactory method of doing it was developed about 1938 and that it has only been done on an appreciable scale during the last eight years. The health risks of the welding of steel are well known, but this was not the subject of the question. The remarks by Doig on the clinical and x-ray features of welders apply only to the welding of steel, and he was able to find only one reference to aluminium welding¹ in the medical literature reviewed.

There is no space to review the many articles on the effects of aluminium on the lungs, but the fact is that some writers say that it damages the lungs, while others say that it is harmless. In quoting analyses of fumes, one can only give the results as stated by the investigators, and admittedly such information might be misleading if it is not interpreted correctly by the reader. It should be pointed out, however, that the soluble fluorides as well as free fluorine are toxic. In correcting the statement that lead might be present in aluminium alloys, the writers admit that my statement is correct, by saying that no commercial alloy contains more than 0.05% lead. It is true that Thrysin, Gerhardtsson, and Forssman² found only small amounts of lead in the fume from aluminium welding. But they did find some, and it would be better from the health point of view if there were no lead at all. It is a matter of opinion whether or not "there are any grave risks associated with the production of ozone or oxides of nitrogen in welding." Medical opinion would certainly classify such a risk as grave when many deaths have been reported as a result of welding in confined spaces. The risk is greater with oxyacetylene than with electric arc welding, and less when the shielded arcs are used. Thrysin *et al.*² also point out that the amount of nitrogen oxides developed depends primarily on the length of the arc, on the voltage, and also on the amperage used. The heat generated constitutes, by comparison, a minor risk.

REFERENCES

- ¹ Renander, A., *Acta radiol. Stockh.*, 1937, 18, 688.
² *Arch. Industr. Hyg.*, 1952, 6, 381.

Spinach.—Dr. H. LEHMANN (Tunbridge Wells) writes: Spinach is not richer in iron than other plants. If anything it is poorer in that respect than most vegetables (Hill, R., and Lehmann, H., *Biochem. J.*, 1941, 35, 1190). The widespread misconception is probably based on the fact that its peculiar preparation for the table involves a degree of concentration not applied to any other greens. Cooked spinach corresponds to about ten times its volume as a raw vegetable. One lb. (0.45 kg.) of fresh spinach occupies, after cooking, a volume of 12 fl. oz. (336 ml.); this is three times less than the space taken up by the equivalent amount of cabbage (1½ pints—994 ml.).

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BRITISH MEDICAL JOURNAL

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COMBINED CHEMOTHERAPY IN BACTERIAL INFECTIONS*

BY

L. P. GARROD, M.D., F.R.C.P.

Bacteriologist, St. Bartholomew's Hospital; Professor of Bacteriology in the University of London

The practice of combining two or even more chemotherapeutic drugs in the treatment of patients is growing commoner, and its merits demand examination. Inquiry soon reveals that the subject is one of great complexity, and that for various reasons these combinations may often be useful, sometimes may be no better than one of the pair used alone, and at least occasionally may be contraindicated because a diminished instead of an enhanced effect results. The laboratory work sometimes required for the intelligent direction of such treatment is perhaps more elaborate and time-consuming than anything previously undertaken in routine clinical bacteriology.

Some Indications for Combined Therapy

The Urgent Undiagnosed Case.—An acutely ill patient evidently suffering from some infection, in whom no bacteriological (and perhaps even no clinical) diagnosis has been made, may require treatment with one antibiotic or another, and it is perhaps tempting to give him both until the situation is clarified. This is often done, but genuine necessity for it should be very exceptional. Premature and blindly directed treatment may obscure the diagnosis, and should not be begun until any specimens have been obtained the examination of which is likely to be helpful.

Mixed and Double Infections.—There are some infections, notably those originating in the bowel, but also including some involving the lungs, the flora of which is so varied that no single drug may be expected to combat the whole of it. In peritonitis due to perforation of the lower part of the bowel treatment with both penicillin and streptomycin has been common practice and is theoretically sound, although I know of no statistical proof of its efficacy. It may well be superseded by the use of the newer antibiotics with their wider range of activity: terramycin, given at first intravenously, has in my experience been particularly effective.

A patient may, on the other hand, have two separate conditions, due to entirely different bacteria: perhaps the commonest of such pairs is a lung infection complicating one of the urinary tract or vice versa. If it should be thought necessary to treat both together no single drug may serve for both, and two may therefore be needed.

Prevention of Toxic Effects.—Another possible indication for using two drugs is the danger of toxic effects from only one. In this category comes the use of sulphonamide combinations—for example, "sulphatriad"—an advantage of which is that each component

*Based on a Holme Lecture delivered at University College Hospital on February 12, 1953.

retains its individual solubility in the urine, with the result that the risk of heavy crystalline deposition and consequent tubular or ureteric blockage is minimized. Among antibiotics, streptomycin is that most liable to produce toxic effects, and any effective combination with it which enabled the dose of streptomycin to be reduced from a risky to a safe level might have this type of advantage.

These three indications are of much less significance than the prevention of acquired resistance and the achievement of synergism.

Prevention of Acquired Resistance

Acquired bacterial resistance is a change which threatens ultimately to extinguish the usefulness of all the present major antibiotics except penicillin. Its gradual development in communities where these drugs are freely available can be delayed in only two ways. One is more discriminating and restricted use, and, to judge by experience hitherto, much cannot be hoped from this direction. The second is to combine with the main drug another with an adjuvant effect. The other may not only exert its own independent effect but prevent acquisition of resistance to the first. Precisely how this is achieved we cannot pretend to say until more is known of the mode of action of antibiotics, but in general terms the mechanism is almost certainly this. Sulphonamides act by blocking a stage in an essential synthesis, and antibiotics probably act similarly. The acquisition of resistance results from a circumvention of this chemical process, another being substituted for it having the same ultimate effect, with which the antibiotic cannot interfere. If the second drug used blocks this second process the alternative metabolic route cannot be established, and the organism therefore remains sensitive.

If this explanation is true, it is perhaps remarkable that so many combinations do act in this way, and it encourages the belief that by this means itself more may be discovered about the points of attack of individual drugs. In practice it may even prove advantageous to use more than two drugs together: Carpenter *et al.* (1945) found that gonococci could be entirely prevented from acquiring resistance to sulphathiazole, rivanol, promanide, and penicillin only by exposing them to all four together, a combination of the first three not being fully effective. Similar *in vitro* studies with antibiotics have been made by Kaipainen (1951, 1952), who has shown that a mutual resistance-preventing relationship exists between streptomycin on the one hand and aureomycin, chloramphenicol, or terramycin on the other. (It does not follow that

these actual combinations will be therapeutically effective, and indeed there is at least a theoretical objection to them on other grounds.) Streptomycin, as the antibiotic to which high resistance is most readily acquired, stands most in need of a partner to prevent this, particularly when it has to be given for long periods, as in the treatment of tuberculosis. Its combination with *p*-aminosalicylic acid, now regarded as obligatory for the treatment of this disease, has been clearly shown to have this effect, provided that the dose of P.A.S. is adequate (Report, 1949; Daniels and Hill, 1952), as well as securing an improved therapeutic response. The combination of streptomycin with isoniazid also militates against the acquisition of resistance to either (Report, 1953).

Synergism

Another notable advantage of combined therapy can be (but by no means always is) the achievement of a synergic effect. This is one of three possible results of combining two drugs, and the terms describing them require definition. In the simplest terms, an additive effect is the sum of those of the same dose of each drug given separately; a synergic effect is something more than this, and an antagonistic effect something less. If these effects can be observed in the form of clinical therapeutic results they are undeniable: if, on the other hand, we are referring to something capable of assessment in the laboratory the definition must be extended by an explanation of what effect is meant. The most easily observed effect is simple inhibition of visible growth, and it is not surprising that so many workers have studied both single and combined effects by this standard only. Unfortunately it is inadequate and misleading for certain combined effects, and a true picture of them can be obtained only by studying bactericidal instead of merely bacteriostatic action, and preferably by following its progress in a series of observations. The definition of synergism proposed by Jawetz and Gunnison (1952a), whose studies of combined drug effects have contributed so largely to our present knowledge, is: "A large increase in the rate of early bactericidal action and the rate of cure of infections beyond that obtainable by simple additive effects of the agents."

An ultimately fatal case of *Str. faecalis* endocarditis was the incentive for Jawetz's (1952) work, and it is in this disease that we find the clearest example of antibiotic synergism yet known. Jawetz and his colleagues showed that when *Str. faecalis* is exposed to an optimal concentration of penicillin the initial bactericidal effect is incomplete and is followed eventually by growth; if, on the other hand, streptomycin is added, even in a concentration quite ineffective acting alone, the initial rate of killing is accelerated and continues to the point of total sterilization (Jawetz and Gunnison, 1950). That this combination of drugs offers the only hope of cure in this infection is now fairly well recognized, and is evident from the extensive series of cases described by Robbins and Tompsett (1951). We have treated four cases of this infection at St. Bartholomew's Hospital: three were included in the four cases of penicillin-resistant bacterial endocarditis reported by Cates, Christie, and Garrod (1951), and the fourth is more recent. The antibiotic sensitivities of the organisms from these patients,

stated in the Table, are strikingly uniform, and would seem to demand some other treatment than that which in fact was required. All four strains were highly sensitive to aureomycin, yet a six-weeks course of this drug was ineffective in Case 1, and an eight-weeks course, during the latter half of which the dose was 8 g. daily, was equally so in Case 2. Case 3 had a 10-weeks course of chloramphenicol, and Case 4 shorter courses of several drugs without effect (most of all this treatment was given elsewhere). The infection was controlled in all four patients by penicillin and streptomycin, although two of the patients died from heart failure, Case 1 after and Case 3 during treatment.

In relation to the task which chemotherapy has to perform, bacterial endocarditis is certainly an exceptional disease and possibly unique. It is not enough, as in most other infections, to prevent further bacterial growth and leave the disposal of survivors to the body defences; this is a disease in which those defences are powerless. It is probably true to say that chemotherapy must eliminate the last surviving streptococcus in the vegetations if relapse is not to occur. That a bactericidal drug (penicillin) should be necessary, or in this particular infection a highly bactericidal combination, is not surprising. There are few reports of cures of this disease by any of the newer antibiotics.

In treating *Str. faecalis* endocarditis we have hitherto assumed that the higher the concentration of each drug that can be maintained in the blood the better, and our patients have accordingly been given large doses of both. The two survivors in the earlier series (Cates, Christie, and Garrod, 1951) both suffered severe vestibular damage from having received 4 g. of streptomycin daily for six and seven weeks, and in our recent case the dose was limited to 2 g. daily in the hope of obviating this effect. There is another possible reason for limiting the dose not of streptomycin but of penicillin. It has been shown by Eagle and Musselman (1948) that *Str. faecalis* is one of the species subject to the zone phenomenon in the bactericidal action of penicillin: the optimum concentration is about 6 µg. (10 units) per ml., and concentrations higher than this kill the organism more slowly. Whether this paradoxical effect operates when streptomycin is also present is of some interest: according to Gunnison, Jawetz, and Coleman (1950) it does not. Strains of *Str. faecalis* from two of our cases were tested to verify this. Both exhibited the zone phenomenon when exposed to penicillin only, a concentration of 10 µg. per ml. killing more rapidly than 500 µg. per ml. When 10 or 20 µg. per ml. of streptomycin was combined with these and intermediate concentrations of penicillin, the much accelerated death rate varied little with the latter, the higher concentrations sometimes giving a slightly faster kill and sometimes not. It appears from these results that little is either gained or lost by massive penicillin dosage in this combination, but there is some suggestion in results obtained by Martin, Chabbert, and Sureau (1953, Table I) by a rather different method that intermediate concentrations are the most effective.

Str. faecalis endocarditis is an exceptional disease, and it may well be asked whether the drug combination required for its treatment is indicated in any other condition. It may be indicated in other exceptional cases which can be identified as requiring it only by elaborate *in vitro* tests: the need for it in mixed infections such as peritonitis has to a large extent been removed by the advent of the new "broad spectrum" antibiotics. The indiscriminate use of penicillin-streptomycin combinations is certainly to be deplored, and it may be thought unfortunate that proprietary mixtures of these two antibiotics, having flourished on the American market for some time, have now been introduced in this country. That these are commercially successful is due to two ideas about them—that they are generally more potent than penicillin itself, and that they afford wider cover in the undiagnosed case. The logical outcome of the latter standpoint would be a chemotherapeutic cocktail supposedly capable of dealing with any microbial infection, and given automatically to any patient with fever. Apart from the general

undesirability of "shot-gun" therapy, the use of streptomycin in patients of whom at least nine-tenths will probably get no benefit from it is to be deprecated on three grounds—the possibility of either toxic effects or sensitization, and the likelihood of evoking bacterial resistance. These and other weighty reasons for discouraging the use of these combinations have been formulated by Jawetz and Gunnison (1952b) in a report published by the Council on Pharmacy and Chemistry of the American Medical Association.

Laboratory Tests of Combined Action

Repeated viable counts in various mixtures and the plotting of death curves constitute a major operation in any laboratory and are almost beyond the capacity of some. A simpler method of determining combined effects must consequently be found if laboratory guidance for such treatment is to be provided. Unfortunately, simple tests of growth inhibition, at least by pairs of antibiotics, seem to be worthless. A few examples from many studies made in this way will show how misleading their results can be. Richter (1952), in a long series of such tests, found that there was not even an additive effect between streptomycin and penicillin acting on *Str. faecalis*, although this is perhaps the clearest example of a synergic combination that we know. Reid, Jones, and Bryce (1952) found that most combinations of five antibiotics acting on four species of Gram-negative bacilli gave an enhanced effect, although one of their combinations, penicillin+chloramphenicol, has been proved by more appropriate methods, including therapeutic tests, to be antagonistic. In some experiments by Bigger (1950) P.A.S. and streptomycin were made under certain conditions to appear antagonistic. Price, Randall, Welch, and Chandler (1949) tested various combinations not only in this way but therapeutically in mice, and obtained agreement between the two methods in only 50% of their results, some being frankly contradictory.

These authors used liquid media; others have hoped to demonstrate synergism even more simply by an agar diffusion method. That this hope is vain may be concluded from the findings of Peyré and Velu (1952), who tested combinations both in plates and in agar columns in tubes, and found that the width or depth of the inhibition zone differed little from that given by the more rapidly diffusing and active of the pair acting alone. It has also been suggested, and found impracticable, to determine combined effect in a plate in which two antibiotics diffuse from paper strips or gutters meeting at a right angle. I have been unable to obtain true or even consistent results in trials of this method. The fact undoubtedly is that mere inhibition of growth, as judged by naked-eye appearance, affords no true reflection of what a combination of drugs does to bacteria. What matters therapeutically is whether the combination kills them, and in a culture showing no visible growth the bacteria may either have been killed within an hour or may even be slowly multiplying.

There is thus no alternative to a method involving the enumeration of survivors after a period of exposure to the drugs. That proposed by Martin, Sureau, and Chabbert (1952) is not unduly complex, and in their hands has afforded a guide to successful treatment. If four antibiotics—for example, penicillin, streptomycin, chloramphenicol, and terramycin—are to be tested singly and in every possible combination, only ten tubes of broth are required, provided that only a single concentration of each antibiotic is to be tested. After incubation for 24 hours or less a measured inoculum from each is spread over a segment of a plate: decimal dilutions of the culture used for inoculation are plated similarly, only four plates being required in all. By comparison with this control it can be seen whether the inoculum in the tubes has multiplied or diminished in numbers: if the latter, the result can be stated as a very approximate percentage surviving.

The difficulty with such a simplified method is to choose appropriate single concentrations of the antibiotics, since to vary them would immediately complicate it: even two con-

centrations instead of one would mean 36 tubes instead of 10. They can evidently be chosen on either of two principles: in relation to the sensitivity of the organism to each used singly or in relation to the concentrations attained in the body by the dosage it is proposed to use. Arbitrary amounts chosen on the latter basis are preferable for routine use. The test is certainly worthy of extended trial as a guide to treatment in difficult cases.

We have recently applied a simple three-tube form of this test to determining whether the penicillin-streptomycin synergy against *Str. faecalis* which can be demonstrated by this as well as by more elaborate methods is also exerted against other species. Some strains of *Bact. coli*, *Proteus*, and penicillin-resistant *Staph. pyogenes* reacted similarly, suggesting that this combination may have uses other than the treatment of bacterial endocarditis.

Sulphonamide-Antibiotic Combinations

I was responsible eight years ago (Garrod, 1945) for a misleading although correct observation—namely, that, as observed by viable counts over an eight-hour period, sulphathiazole reduces the rate at which penicillin kills staphylococci. An explanation of this was not far to seek: penicillin is active only against multiplying bacteria, and another agent which prevents multiplication therefore removes a condition necessary for at least its full effect. The defect of this experiment was that it was terminated too early. Others who have prolonged such experiments have shown that the initial rapid decline produced by penicillin alone may be succeeded by bacterial recovery and actual growth, whereas the slower decline caused by penicillin and a sulphonamide continues and proceeds to ultimate extinction. The explanation for this suggested by Hobby and Dawson (1946) and by Klein and Kalter (1946) is that penicillin reduces the number of living bacteria to a level at which a sulphonamide can exert its full effect: the dependence of sulphonamide activity on bacterial numbers is well known. This is therefore not so much synergy in the ordinary sense as two successive and complementary effects. It is evident from the work of the authors quoted that the result is conditioned by various factors, and, among these, time relationships between the introduction of the two drugs have been particularly studied by Gunnison, Speck, Jawetz, and Bruff (1951), who draw an interesting distinction between the apparent interfering effects of sulphonamides and the newer antibiotics with the bactericidal action of penicillin.

Simple tests of growth inhibition have consistently shown that an enhanced effect is obtained by combining penicillin and a sulphonamide: in this connexion Bigger's (1946) work on *Salm. typhi* may be recalled; Thomas and Hayes (1947) and Stewart (1947) obtained similar results with the same organism, and Bigger (1944) previously showed that they were obtainable with *Staph. pyogenes*. Most authors who have tested penicillin-sulphonamide combinations therapeutically in mice (Ungar, 1943; Soo-Hoo and Schnitzer, 1944; Nitti, Boyer, and Faguet, 1946; Kolmer, 1948; Domagk, 1952) have observed synergic effects. There have been fewer studies of the combined action of sulphonamides and streptomycin, but Klein and Kimmelman (1947) and Knapp (1950) report mutual reinforcement by such combinations, and the former emphasize particularly that the presence of a sulphonamide tends to prevent the development of bacterial resistance to streptomycin.

Clinical experience confirms the general tenor of these findings in two particulars. Waring and Smith (1944) are emphatic that sulphadiazine must be given in addition to penicillin for the treatment of pneumococcal meningitis; 11 out of 12 patients so treated recovered, whereas penicillin alone was less successful. Smith, Duthie, and Cairns (1946) base the same conclusion on a study of 38 cases. The second clear example is provided by the action of streptomycin and sulphadiazine in brucellosis, which was the only effective treatment for this disease until the discovery of aureomycin and chloramphenicol (Spink, Hall, Shaffer, and Braude, 1948; Scowen and Garrod, 1948).

Antibiotic Sensitivities of Four Strains of *Str. faecalis* Isolated from Cases of Endocarditis; St. Bartholomew's Hospital, 1950-2

Sex	Age	Inhibitory Concentrations (µg./ml.)			
		Penicillin	Streptomycin	Aureomycin	Chloramphenicol
F	36	2.5	30	0.15	20
M	57	1.8	30	0.1	6
M	63	2.5	125	0.15	2.5
F	25	2.5	10	0.3	0.6

Antagonistic Effects

Although interference by sulphonamides with the action of penicillin is only apparent, interference by other antibiotics due to a similar mechanism is not merely demonstrable in a similar way *in vitro*, but verifiable by therapeutic tests. That aureomycin may interfere with the action of penicillin or streptomycin was first shown by Lankford and Lacy (1949), but most of our now extensive knowledge of this subject is due to the work of Jawetz and his colleagues, which has been summarized in recent reviews (Jawetz, 1952; Jawetz and Gunnison, 1953). The stages in the development of this work were as follows. It was first shown that chloramphenicol interferes with the bactericidal action of penicillin *in vitro* (Jawetz, Gunnison, and Coleman, 1950), and later that aureomycin and terramycin have a similar interfering effect (Gunnison, Coleman, and Jawetz, 1950). The interfering action of chloramphenicol had meanwhile been confirmed therapeutically (Jawetz and Speck, 1950): mice infected with *Str. pyogenes* and treated with both chloramphenicol and penicillin had a lower survival rate than those treated with the same dose of either drug alone. The objection that such acute experiments, in which only a single dose of the drug or drugs is given, are far removed from the conditions of clinical use appears to be answered by later studies (Speck and Jawetz, 1952) of a subacute streptococcal infection produced by intramuscular inoculation, of which control mice died in five to eight days. Although treatment was continued for five days, the same type of effect was observed, chloramphenicol and particularly terramycin reducing survivors to as low as 45% when combined with a dose of penicillin which alone saved 100%. In another series of experiments, both *in vitro* and *in vivo*, it was shown that the newer antibiotics also interfere with the action of streptomycin, chloramphenicol having the most pronounced effect (Jawetz, Gunnison, and Speck, 1951a).

The explanation of these findings is as follows (Jawetz and Gunnison, 1952a). Antibiotics are divisible into two classes:—Group 1 (bactericidal): penicillin, streptomycin, bacitracin, neomycin. Group 2 (bacteriostatic): aureomycin, chloramphenicol, terramycin.

Combinations within group 1 are often synergic. Within group 2 they are no more than additive. Combinations of the two groups are apt to be antagonistic, the group 2 drug interfering with the bactericidal action of the other. Such antagonism is observed only when the organism is fully sensitive to the bactericidal component: if it is more resistant (although naturally not if completely so) the combination may actually be synergic. Instances of this paradoxical effect are cited by Jawetz, Gunnison, and Speck (1951b), and by Spies *et al.* (1951); both patients had staphylococcal endocarditis, and the successful combinations were terramycin-streptomycin and penicillin-aureomycin respectively.

These patients afford striking confirmation of one aspect of the Jawetz theory. What evidence is there of the clinical reality of antagonism? Certainly the clearest is the experience of Lepper and Dowling (1951) in the treatment of pneumococcal meningitis. Alternate cases were treated with penicillin alone and with penicillin + aureomycin, the penicillin being given intramuscularly only in a dose of 1,000,000 units two-hourly. Of 14 patients given penicillin only 3 died (21%), and in a total of 43 patients so treated 13 died (30%), whereas only 3 out of 14 receiving combined treatment recovered, a mortality of 79%. A similar though less emphatic conclusion may be drawn from the findings of Lepper *et al.* (1952) in meningococcal meningitis: here there was almost no mortality, but the duration of fever and of "mental abnormality" seems definitely to have been prolonged by combining aureomycin with penicillin. It has been remarked by several authors that conditions in the meninges are ideal for antagonism, critical concentrations for this effect being maintained fairly constantly in an area where efficient bactericidal action is probably imperative. Whether antagonism occurs in other situations it is the task of future clinical observation to decide.

Complexity of the Problem

We have seen that there are several specific instances in which drug combinations are clearly indicated either because they delay the acquisition of bacterial resistance or because they exert a synergic effect. In pyogenic meningitis we have a disease in which certain combinations are contraindicated because their effect is antagonistic, and future clinical appraisal may possibly decide that these combinations are either contraindicated or at least without advantage in other conditions. But these conclusions refer to only a few specific and (except tuberculosis) uncommon infections, and leave the general question of the usefulness of combined therapy in everyday medicine unanswered.

It is strongly emphasized by Jawetz and Gunnison (1952b) that no general rules about synergism and antagonism can be laid down. The same pair of antibiotics may exhibit either effect against different organisms, according to their degrees of sensitivity. Other authors have found that the same pair may be either synergic or antagonistic against the same organism according to the concentrations used. The whole of this account of this subject has in fact been oversimplified, for the sake of brevity, by omitting mention of many factors which have been shown to determine the results of combined action.

In any serious case an *ad hoc* effort to provide a rational basis for treatment should be made by laboratory experiment, and the simplified test of bactericidal action proposed by Martin, Sureau, and Chabbert (1952) may afford useful indications with little delay. On the other hand, more elaborate proceedings may be very advisable, and I calculate that various studies in connexion with our last case of enterococcal endocarditis occupied well over 100 hours of laboratory time. I have contended for many years that the action of chemicals, whether simple germicides or chemotherapeutic agents, on bacteria can be determined in the laboratory in such a way as to provide a reliable guide to their use. I still adhere to this view, but I begin to doubt whether such determinations in connexion with combined antibacterial action are practicable. The feasibility of attaining a significant result from a reasonable amount of any such work depends on the number of variables involved. It might be supposed that the introduction of a second drug merely adds one more variable, and this is true in a sense, but drug interactions are so complex that it does no justice to the result. The bacteriologist who tackles individual problems of this kind seriously is facing what I believe to be the most complicated task in the whole of routine laboratory medicine.

I am indebted to Dr. Bernard Sureau and Dr. Ernest Jawetz for the privilege of reading their papers before publication, and for helpful discussions with both and with colleagues of the former, and to my clinical colleagues, particularly Professor R. V. Christie, for permission to cite their cases.

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CLINICAL TRIAL OF A NEW
ORAL DIURETIC

BY

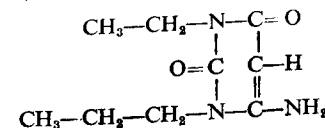
A. G. SPENCER, M.D., M.R.C.P.

Assistant, Medical Unit,
University College Hospital Medical School, London

AND

H. G. LLOYD-THOMAS, M.B., B.Chir., M.R.C.P.
Assistant Registrar, University College Hospital, London

In a search for a potent non-toxic oral diuretic, Kattus, Newman, and Franklin (1951) tested for diuretic activity in dogs a series of compounds derived from the uracil nucleus. One compound, 1-propyl-3-ethyl-6-aminouracil, was found to be an effective diuretic, and produced only a minor degree of gastro-intestinal disturbance. Papesch and Schroeder (1950) had previously synthesized this substance, and for convenience it is referred to by their serial number, S.C.2614. The structural formula is:



Kattus, Arrington, and Newman (1952) subsequently reported that compound S.C.2614 was an effective diuretic when given by mouth to dogs, to normal human subjects, and to patients with oedema. No serious toxic reactions were noted in their studies.

The present report describes an investigation into the effectiveness of compound S.C.2614 as an oral diuretic when given to normal human subjects and to patients with renal or cardiac disease.

Chemical Methods.—The daily renal excretion of protein was determined by micro-Kjeldahl estimation of the protein precipitate obtained from centrifuged aliquots of the 24-hour urine. The other chemical methods have been described previously (Spencer and Franglen, 1952).

Effect on Normal Subjects

Observations on the diuretic effect of S.C.2614 were made during ten tests on nine normal males aged 21–35 years.

These subjects were ambulant and took their normal diet. Urine was collected over two 24-hour periods; the first period being the control day, and the second the test day on which 1,250 mg. of S.C.2614 was taken by mouth in 125-mg. tablets over a period of six hours. The renal excretion of water, sodium, chloride, and potassium was measured on each day, and the results are summarized in Tables I and II.

TABLE I.—Effect of Compound S.C.2614 on Normal Subjects. The 24-hour Renal Excretion of Water and Sodium on a Control Day Compared with that on a Day when 1,250 mg. of S.C.2614 was Taken by Mouth. Ten Tests on Normal Subjects

Subject	Renal Excretion in 24 Hours			
	Water (ml.)		Sodium (mEq)	
	Control	S.C.2614	Control	S.C.2614
G.A. . .	800	2,320	152	260
T.R.B. . .	2,150	3,140	110	251
G.C. . .	1,210	1,430	179	320
A.M.G. . .	1,730	2,630	157	330
A.B.K. . .	2,355	3,620	167	375
M.N. . .	1,545	2,410	154	384
G.M. . .	1,390	2,230	159	210
A.G.S. . .	1,470	2,930	99	303
A.G.S. . .	1,479	2,640	158	457
L.T. . .	1,600	2,960	196	525

TABLE II.—Effect of Compound S.C.2614 on Normal Subjects. The 24-hour Renal Excretion of Water and Sodium on a Control Day Compared with that on a Day when 1,250 mg. of S.C.2614 was Taken by Mouth. Means and Standard Deviations of the Data from Ten Tests on Nine Normal Subjects

	Water (ml.)	Sodium (mEq)	Chloride (mEq)	Potassium (mEq)
Control day . .	1,573 S.D.=460	153 S.D.=29	166 S.D.=32	71 S.D.=9
S.C.2614 day . .	2,631 S.D.=530	341 S.D.=28	378 S.D.=66	97 S.D.=28
Mean difference	+1,058	+188	+212	+26
Mean diuresis as % of control	161	222	227	136
Level of significance	P=0.01	P=0.01	P=0.01	P=0.02

In nine of the ten tests there was a considerable increase in the urine volume and excretion of sodium and chloride on the test day. One subject did not show a significant water diuresis, although his excretion of sodium on the test day was 178% of that on the control day. For all the ten tests the mean excretions on the test day compared with the control day were: water, 161%; sodium, 222%; chloride, 227%; potassium 136%. In these tests the water diuresis in response to oral S.C.2614 was equivalent to that reported by Blumgart *et al.* (1934) for mercurial diuretics when given by intramuscular injection to normal subjects. The effect of oral S.C.2614 on sodium excretion also compared favourably with that reported by Kattus *et al.* (1952) for a 2-ml. injection of a mercurial diuretic in a comparable series of normal subjects, and was much greater than that which was produced by 1.2 g. of aminophylline by mouth.

Toxic Reactions.—Two subjects complained of epigastric pain and abdominal discomfort, one of anorexia, and two of tinnitus. During the administration of S.C.2614 there was no significant change in the low normal rate of daily excretion of protein in the urine, and in no case did urine microscopy show any abnormality.

Effect on Patients: Method of Investigation

The patients were not deliberately selected, and included those with every degree of fluid retention, from little or no pitting oedema to gross anasarca. Fifty tests were completed on 30 patients, 22 with cardiovascular and 8 with renal disease. All patients were confined to bed and, except when otherwise stated, were given a standard hospital low-salt diet (10–25 mEq) of sodium and a measured fluid intake of 30–50 oz. (850–1,420 ml.). There was a preliminary period of observation of at least six days in which to

detect and exclude those patients who were undergoing a spontaneous diuresis in response to rest in bed and the low-salt diet. Patients treated with digitalis were observed for a longer period, usually one to three weeks, so as to avoid confusion with the diuretic effect of this drug.

TABLE III.—Effect of Oral S.C.2614 on Patients with Cardio-vascular or Renal Disease

Case No.	Sex and Age	Clinical Condition	Renal Excretion in 24 Hours			
			Water (ml.)		Sodium (mEq)	
			Control Days ± Range	S.C. Days	Control Days ± Range	S.C. Days
Cardiac Oedema						
1	F	Mitral stenosis, C.C.F., auricular fibrillation, oedema +	(4) 1,090 ± 250	2,500	9 ± 5	104
				2,970		79
2	M	Aortic regurgitation, C.C.F., oedema +	(3) 760 ± 200	2,200	5 ± 5	132
				2,520		214
3	M	Aortic regurgitation, C.C.F., oedema +	(6) 1,373 ± 250	2,270	41 ± 10	123
4	F	Mitral and aortic stenosis, C.C.F., oedema +, ascites +	(5) 598 ± 200	340	7 ± 5	3
5	F	Hypertension, coronary disease, C.C.F., oedema +	(3) 570 ± 100	2,020	16 ± 5	176
6	F	Hypertension, coronary disease, no C.C.F., no oedema	(7) 990 ± 200	1,140	5 ± 5	30
7	F	Hypertension, coronary thrombosis, C.C.F., oedema +, ascites	(5) 1,365 ± 300	3,980	22 ± 10	187
				2,090		79
8	F	Hypertension, coronary disease, C.C.F., oedema +	(4) 1,107 ± 250	2,270	47 ± 10	123
				1,700		63
9	M	Coronary artery disease, C.C.F., oedema +	(6) 825 ± 200	1,820	22 ± 5	86
				1,530		26
10	F	Hypertension, cardiac asthma, oedema O	(6) 870 ± 250	1,640	14 ± 5	67
11	F	Hypertension, cardiac asthma, oedema O	(3) 1,240 ± 1,000	2,400	15 ± 20	36
12	F	Hypertension, C.C.F., auricular fibrillation, oedema O	(6) 980 ± 400	1,020	7 ± 5	4
13	F	Coronary artery disease, C.C.F., oedema O	(3) 640 ± 50	1,420	17 ± 5	58
14	F	Coronary artery disease, C.C.F., slight oedema	(4) 880 ± 400	970	23 ± 5	39
15	M	Coronary artery disease, C.C.F., oedema +	(4) 1,345 ± 200	1,380	18 ± 10	80
				1,980		76
16	M	Coronary artery disease, C.C.F., auricular fibrillation, oedema +	(4) 1,080 ± 200	1,980	7 ± 10	123
17	F	Hypertension, C.C.F., oedema +	(4) 1,500 ± 600	3,070	54 ± 20	92
				2,930		83
18	M	Hypertension, C.C.F., oedema O	(3) 1,900 ± 200	2,400	8 ± 5	82
19	M	Diabetes, coronary thrombosis, C.C.F., oedema +, ascites	(8) 1,260 ± 300	2,470	43 ± 10	279
				3,280		265
				1,980		98
				3,060		95
				2,330		105
				2,270		107
20	F	Constrictive pericarditis, oedema +	(7) 490 ± 400	450	3 ± 5	5
				430		2
				1,220		3
Renal Disease						
21	F	Diabetic nephrosclerosis, oedema +, blood urea 126 mg./100 ml.	(4) 1,710 ± 200	3,600	51 ± 10	178
				3,750		280
22	M	Nephrotic stage chronic nephritis, oedema +, blood urea 99 mg./100 ml.	(5) 1,470 ± 250	2,560	10 ± 5	67
23	F	Diabetic nephrosclerosis, oedema +, blood urea 136 mg./100 ml.	(6) 1,650 ± 400	2,280	14 ± 5	84
24	M	Malignant hypertension, uraemia, oedema +, blood urea 102 mg./100 ml.	(5) 1,036 ± 400	1,440	6 ± 5	8
25	M	Chronic nephritis, hypertension, oedema +, ? C.C.F., blood urea 150 mg./100 ml.	(4) 1,360 ± 200	2,980	31 ± 10	200
				2,410		149
				2,270		107
				1,990		117
26	F	Nephrotic stage chronic nephritis, oedema +, blood urea 76 mg./100 ml.	(8) 910 ± 200	1,310	6 ± 5	10
				910		4
				1,080		7
27	M	Chronic nephritis, oedema +, blood urea 200 mg./100 ml.	(6) 820 ± 250	710	15 ± 5	12

The daily renal excretion of water, sodium, potassium, and chloride ions was measured for three to eight days before the test, on the test day, and for a variable time afterwards. On the test day, starting at 9 a.m., compound S.C.2614 was given by mouth in 125-mg. tablets, two every three hours until 1,250 mg. had been taken. The deposits from the centrifuged urine were examined microscopically in the control period and on the test day. The 24-hour excretion of protein in the urine of 26 patients was also measured.

An approximate comparison of the effectiveness of oral S.C.2614 with a 2-ml. intramuscular injection of mersalyl B.P. was obtained by testing both diuretics in 22 patients. There was an interval of at least four days between the two tests, and nine of the patients received the mersalyl injection before the S.C.2614 tablets, while the others were given the S.C.2614 tablets first.

Two tests were invalidated by errors in urine collection, and three patients were given a diet containing approximately 40 mEq of sodium a day, instead of the standard diet containing 10–25 mEq of sodium. The main results of 47 tests, together with a summary of the clinical condition of the patients, are given in Table III.

Assessment of Diuresis

There were formidable difficulties in the assessment of a diuretic response. The test patients differed in the nature of their disease, in the causation of their oedema, in renal function, and in many other variable factors important in the differential distribution of body fluids, such as the concentration of the serum albumin and that of the plasma sodium. Not only did the patients necessarily differ among themselves but there was a considerable variation from day to day in the same patient of the renal excretion of water and electrolytes. This was still the case when the input was constant within the limits of a standard low-salt diet. The prolonged period of observation, necessary to detect and exclude those patients undergoing a diuresis in response to rest and other forms of treatment, produced two further difficulties. First, many patients lost their pitting oedema before the test; and, secondly, the remaining patients with oedema were no longer a representative series, and in fact many were particularly resistant to all forms of treatment. This selection of patients reduced the chance of a successful diuresis in response to compound S.C.2614; but when such a diuresis occurred it could be attributed with more confidence to the drug.

A successful diuretic response has been defined as one in which all the following standards were exceeded on the test day: a urine volume of 70 oz. (1,990 ml.) containing 75 mEq sodium; an excess renal excretion over the intake of 30 oz. (850 ml.) of water and 50 mEq sodium; an excretion of 150% of the mean control values for both water and sodium, with increments greater than four times the mean deviations.

Results in Patients with Heart Disease

Thirty-four tests were completed on 20 patients with heart disease: four with chronic rheumatic carditis and valvular disease, one with constrictive pericarditis, and fifteen with hypertension or disease of the coronary arteries (Table III). The mean results for all the tests on cardiac patients are given in Table IV.

However, these average figures do not represent the true clinical response to compound S.C.2614. The data are abnormally distributed within the series, so that the average figures are misleading. On applying the strict criteria of a

TABLE IV

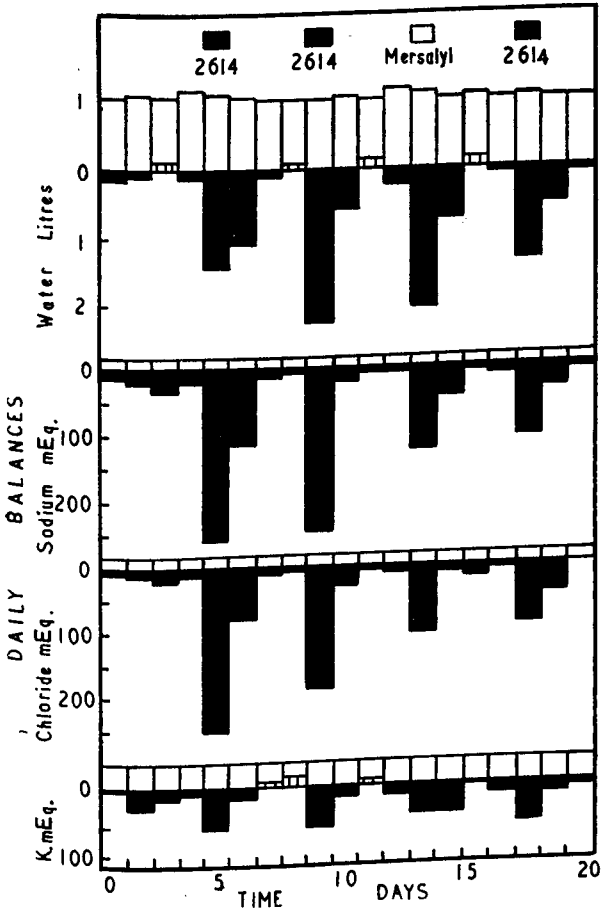
No. of Patients	No. of Tests	Water Excretion		Sodium Excretion	
		Mean Control	Mean S.C.2614	Mean Control	Mean S.C.2614
20	34	1,045 ml.	2,040 ml.	27 mEq	92 mEq

TABLE V

No. of Patients	No. of Tests	Successful Diuresis	Water Excretion		Sodium Excretion	
			Mean Control	Mean S.C.2614	Mean Control	Mean S.C.2614
10	22	19	1,070 ml.	2,530 ml.	23 mEq	121 mEq

successful diuretic response which we have previously defined, it is apparent that of the 34 tests 20 were successful; but these 20 successful tests occurred in only 10 patients. This series has therefore been subdivided into three groups:

(a) *Oedematous Patients Without Evidence of Sodium Depletion* (Table V).—The diuretic response to S.C.2614 in this group of patients was very satisfactory, and, as will be shown later, the results were comparable with those obtained from intramuscular mersalyl. An example of a successful series of diuretic responses is given in the accompanying Chart.



The effect of oral S.C.2614 and of intramuscular mersalyl (2 ml.) on an oedematous patient with congestive cardiac failure. The daily balances of water, sodium, potassium, and chloride ions. Intake 20 mEq sodium and 1,000–1,200 ml. of water a day. Input plotted upwards from the base lines and output downwards from the level of the input, so that the black columns represent the daily negative balances.

(b) *Oedematous Patients with Sodium Depletion.* (Plasma sodium below 132 mEq, or a recent large abdominal paracentesis.) (Table VI).—There was no successful diuretic

TABLE VI

No. of Patients	No. of Tests	Failures	Water Excretion		Sodium Excretion	
			Mean Control	Mean S.C.2614	Mean Control	Mean S.C.2614
2	4	4	540 ml.	605 ml.	5 mEq	3 mEq

response in this small group of patients. One subsequently had a good diuresis following an injection of mersalyl.

(c) *Patients Without Pitting Oedema* (Table VII).—Although none of this group of patients had a good diuresis in response to oral S.C.2614, there was a noticeable effect on water and sodium excretion. This was approximately half of that obtained in those patients with oedema and no evidence of sodium depletion.

TABLE VII

No. of Patients	No. of Tests	Failures	Water Excretion		Sodium Excretion	
			Mean Control	Mean S.C.2614	Mean Control	Mean S.C.2614
8	8	8	992 ml.	1,537 ml.	13 mEq	53 mEq

Comparative Efficiency of Oral S.C.2614 with Intramuscular Mersalyl

Because patients differed widely in their response to a single diuretic, and as the response of the same patient also varied from day to day, it was extremely difficult to obtain a reliable comparison of the relative effectiveness of two different diuretics. In the twin tests of oral S.C.2614 and intramuscular mersalyl (2 ml.) the order in which the diuretics were tested obviously affected the result (Table VIII).

TABLE VIII.—Efficiency of Oral S.C.2614 Compared with a 2-ml. Intramuscular Injection of Mersalyl in Patients with Cardiac Disease

	No. of Tests	S.C.2614 Mean Diuresis			Mersalyl Mean Diuresis		
		Water (ml.)	Sodium (mEq)	Successes	Water (ml.)	Sodium (mEq)	Successes
Mersalyl first..	9	1,760	43	4	2,353	97	8
S.C.2614 first..	13	2,146	81	8	2,173	63	5

When mersalyl was given first it produced twice as many successful diuretic responses as did the subsequent tests of S.C.2614, and the mean excretion of water and of sodium in response to mersalyl was much greater. When compound S.C.2614 was tested first it produced eight successful diuretic responses compared with five by mersalyl, but the mean excretion of water and of sodium was of the same order for both diuretics. For both groups of tests the mean excretion of water and of sodium was, for mersalyl 2,260 ml. of water and 80 mEq of sodium; for S.C.2614 1,950 ml. of water and 62 mEq of sodium. It appeared, therefore, that although compound S.C.2614 was an effective diuretic in the oedematous patients it was not generally such a potent diuretic as a 2-ml. intramuscular injection of mersalyl.

This conclusion is supported by a comparison of the data available for compound S.C.2614 with those published for mercurial diuretics in patients with heart disease (Table IX). The approximate relative efficiency of various diuretics compared with intramuscular mercurials (100%) appears to be: intravenous mersalyl, 120–140%; mersalyl suppositories, 40%; "novurit" suppositories, 80%; oral "unephral"

TABLE IX.—A Comparison of the Response to Various Diuretics in Patients with Heart Disease. Urine Volumes (ml.) on the Test Day

Oral S.C.2614	Oral Mercurials	Mercurial Suppository	Intramuscular Mercurials	Intravenous Mersalyl
1,960 ¹ 1,950 ² 2,530 ³ *70–110%	Mersalyl 1,500 ⁴ Unephral 1,876 ⁴ *60–70%	1,350 ⁵ 2,360 ⁴ (novurit) *40–80%	2,190 ⁴ 2,500 ⁴ *100%	3,000 ⁶ 2,860 ⁴ *120–140%

¹ Kattus *et al.* (1952) all cases. ² Calculated from Evans and Paxton. (1941).
³ Present series, all cases. ⁴ Thomson (1937).
⁵ Present series, oedematous cases. ⁶ Approximate efficiency compared with intramuscular mercurial diuretics used with theophylline and ammonium chloride.

(formerly "neptal"), 70%; oral mersalyl, 60%; oral S.C.2614, 70-110%. The mercurial diuretics contained theophylline and were given in conjunction with ammonium chloride.

Results in Patients with Renal Disease

There were 13 tests of compound S.C.2614 on seven patients, and in only two was there a successful diuretic response (Table III). Two successful responses were obtained from a patient with diabetic nephrosclerosis, and four from a patient with chronic nephritis, but the oedema in the latter case was probably produced in part by congestive heart failure.

Toxic Reactions to Oral Compound S.C.2614

Gastro-intestinal disturbances were reported by 9 of the 39 subjects who were given compound S.C.2614. The complaints were: epigastric discomfort, 9; anorexia, 8; nausea, 7; vomiting, 4. Apart from the four patients who each vomited on a single occasion, the symptoms were mild and did not interfere with the administration of the tablets.

Two normal subjects complained of tinnitus. One patient had a transient sparse urticarial eruption.

Routine microscopy of the urine did not show any alteration in the pattern of the organized deposit following the administration of S.C.2614.

Patients with gross albuminuria often showed a pronounced increase in the 24-hour excretion of urinary protein on the day in which S.C.2614 was given.

Comment

The therapeutic value of a new drug, and its toxic effects, can be assessed only by a prolonged study of its action on a large number of patients. Such a large-scale clinical trial would be justified by the unqualified success of the drug in a pilot experiment. The present trial of S.C.2614 appeared to show that, in a divided dose of 1.25 g., it was an effective oral diuretic in 70% of patients with cardiovascular disease, provided there was definite oedema and no evidence of sodium depletion. In this group of patients oral S.C.2614 was usually about 80% as effective as a 2-ml. intramuscular injection of mersalyl, preceded by ammonium chloride. There was seldom a useful diuretic response to S.C.2614 in the absence of oedema or in patients who had a low plasma sodium, a serum albumin below 2 g. per 100 ml., or a blood urea over 150 mg. per 100 ml. Intramuscular mersalyl was also generally less effective in these patients, but usually more successful than S.C.2614. There was not enough evidence to assess the value of S.C.2614 in patients with renal disease, but there were some good diuretic responses.

This useful diuretic action of S.C.2614 was seriously offset by the high incidence of gastro-intestinal disturbance following the ingestion of the tablets. Although these symptoms were rarely severe, they were sufficient to elicit a spontaneous complaint from 23% of the test subjects. We have therefore begun a pilot trial of a related aminouracil compound which is believed to be less toxic than compound S.C.2614 (Winter, personal communication). For these reasons it is thought that extensive trials of compound S.C.2614 are not justified at the present time.

An effective non-toxic diuretic would undoubtedly be useful in domiciliary practice and when the mercurial diuretics are contraindicated. Further studies of the aminouracil compounds may therefore be profitable, either by themselves or in conjunction with other diuretics.

Summary

A new oral diuretic, an aminouracil compound designated S.C.2614, was tested 57 times in 36 subjects in a divided dosage of 1.25 g.

In normal subjects there was a satisfactory diuresis in nine out of ten tests. Expressed in relation to the

mean excretion on the control days the mean diuresis was: of water, 161%; sodium, 222%; chloride, 227%; and potassium, 136%.

In 22 tests on 10 oedematous patients with heart disease there was a good diuretic response in 19, with a mean urine volume of 2,530 ml. containing 121 mEq of sodium; water excretion 236%, and sodium 520% of the control days. This was 80% of the diuretic effect of a 2-ml. intramuscular injection of mersalyl B.P. in the same group of patients.

Compound S.C.2614 usually failed to produce a satisfactory diuresis in any other group of patients. There were 19 failures in 25 tests on 17 patients. No useful diuresis occurred in cardiac patients without pitting oedema, in patients with a low plasma sodium, a serum albumin below 2 g. per 100 ml., or a blood urea over 150 mg. per 100 ml.

There was not enough evidence to assess the effect of S.C.2614 in patients with renal disease, but there were a few useful diuretic responses.

The high incidence (23%) of gastro-intestinal disturbance provoked by S.C.2614 was regarded as a serious disadvantage, although such symptoms were usually mild.

Further studies are in progress with a related aminouracil compound which may prove to be less toxic than S.C.2614.

We gratefully acknowledge the help given by Professor M. L. Rosenheim and the physicians of University College Hospital; by the nursing staff, the normal test subjects; by Mr. G. T. Franglen, who did some of the earlier chemical estimations; and by Dr. Irwin C. Winter, of G. D. Searle and Co., for information and supplies of the aminouracil diuretics.

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Since the publication of the Curtis Report (1946) and the carrying out of its recommendations for children "taken into care," increasing attention has been given to children neglected or ill-treated in their own homes. The National Association for Maternity and Child Welfare, in collaboration with other bodies, has issued a short report, *Child Neglect and the Social Services*, on the present position and future possibilities for dealing with child neglect or ill-treatment in the home. It is estimated that the 80,000 problem families in England and Wales contain upwards of 250,000 children. A joint circular issued by the Home Office and the Ministries of Health and Education in 1950 drew attention to the powers of local authorities under the Children Act, the National Assistance Act, and the Education Acts. The circular suggested that officers should be designated to be responsible for enlisting the interest and co-operation of local services concerned with the welfare of children in their homes, that these officials should meet regularly officers of local authorities and other responsible organizations, and that cases of child neglect and ill-treatment should be reported to the designated officer. The report is obtainable from the National Association for Maternity and Child Welfare, at Tavistock House North, Tavistock Square, London, W.C.1, price 2s.

CONTROLLED HYPOTENSION IN NEUROSURGERY WITH HEXAMETHONIUM AND PROCAINE AMIDE

BY

DAVID ASERMAN, M.D., D.A.

Anaesthetist, the National Hospital, Queen Square, London

The two greatest difficulties with which the neurosurgeon has to contend are haemorrhage and increased intracranial tension. It is now becoming possible for the anaesthetist to give him the great advantage of working in an almost bloodless field and with a brain shrunken to an easily manageable size; but these benefits are bought at the price of certain dangers. This paper attempts to outline the methods of lowering the blood pressure, to give a list of the main dangers that may be encountered, and to suggest measures for countering them.

Methods of Controlling Blood Pressure

Hexamethonium Bromide (or Iodide).—This is the drug in common use for the induction of hypotension. Its great disadvantage is that it has a failure (or partial failure) rate of some 40%.

Procaine Amide.—This is used extensively in cardiac and thoracic surgery for the elimination of cardiac irregularities. A common side-effect is to cause a slight lowering of the blood pressure, and W. D. M. Paton (personal communication) has suggested that this may be due to a weak ganglion-blocking effect. There often follows a small decrease in the pulse rate, which connotes possibly a decrease in cardiac output. When a case fails to respond satisfactorily to hexamethonium a suitable dose of procaine amide will with a high degree of probability convert it into a successful case of hypotension. The reason for this a potentiation is not clearly understood. It may be due to a simple synergistic action or to the effect of a reduced cardiac output, or to a combination of these factors.

Posture.—This plays an important part in the management of the case. Before the administration of the hypotensive drug the patient is placed in an anti-Trendelenburg tilt of 25 to 30 degrees. This will usually reduce the blood pressure by about 10 mm. Hg. The tilt is decreased during the course of the operation if the blood pressure falls too low. Post-operatively the blood pressure is prevented from rising too rapidly or from falling too low by altering the position of the patient. As an example of the delicacy of blood-pressure control by means of posture, we operated on a few cases on a table which did not have a foot-rest (to prevent the patient sliding down the table). The patients were arranged with the head slightly raised, the body almost horizontal, and the legs hanging over the end of the table. In each case when it became necessary at the end of the operation to increase the blood pressure the mere act of raising the legs to the horizontal position caused a rise of 15 to 20 mm. Hg within a few minutes. In only two cases has it been necessary to resort to methylamphetamine hydrochloride to raise the blood pressure post-operatively.

Dangers of Hypotensive Anaesthesia

1. Allowing the Pressure to Drop too Low

It cannot be said with certainty how low the pressure may be dropped with safety. Pressures below 60 mm. may result in liver damage. Still lower pressures may be associated with anoxia, thrombosis, or even death. One

fatal case probably falls into this category, but with the added results of "retractor anaemia," under which heading it is described.

2. Anoxia

Although there is no supporting evidence, it is possible that a slight degree of cerebral anoxia may be present during hypotension because of the reduced amount of blood passing through the brain. The colour of the brain and blood does not suggest that this is so. Siguier *et al.* (1951) state that the electroencephalogram shows no evidence of anoxia. During direct electroencephalographic recordings of the cortex I have deliberately produced a slight degree of anoxia (without hypotension), and the tracings have shown no changes from the normal. The claim of Siguier *et al.* would therefore seem to be valueless. Nor do tracings under hypotension show variations from the normal. There is evidence to suggest that the blood flow through the brain is less than is indicated by the brachial blood pressure, and that therefore the danger of anoxia may be greater than would appear on the surface.

A man of 20 was having his frontal lobe amputated for epilepsy. His blood pressure before operation was 126/84. An inexplicable rise to 160/120 after induction was lowered to 154 by 50 mg. of hexamethonium, and to 134 by a further dose of 50 mg. All this time, as was to be expected, a good deal of bleeding was going on and the dura was tense. At this stage 400 mg. of procaine amide was given intravenously, and within a few minutes the bleeding had stopped and the brain had retracted from the dura. Yet the blood pressure was 118.

It is hoped to obtain further knowledge on this point by taking blood pressure readings from a cerebral artery. No definite evidence of anoxia has appeared in any cases in the present series, yet its results may possibly have been masked by surgical trauma.

3. Thrombosis

This is an ever-present danger and may occur with even a small drop in blood pressure. Many cases have been reported under this form of anaesthesia. There were no cases of thrombosis in the present series.

4. Reactionary Haemorrhage

In general surgery, under hypotension, reactionary haemorrhage has been one of the most frequent complications. In neurosurgery it is apt to occur under any type of anaesthesia. It has occurred in only one case in this series.

A woman of 54 had an angioma removed in the morning. After an early recovery she became drowsy towards evening and showed signs of intracranial bleeding. On reopening the flap a small subdural clot, together with a quantity of blood-stained fluid, was evacuated. The surgeon felt doubtful whether this was a true haemorrhage. The patient had no further trouble and made a good recovery.

5. "Retractor Anaemia"

So far as I know this condition has not up to the present been recognized, and for that reason and because of its importance it is dealt with at some length. In the series there were three deaths attributable directly or indirectly to the anaesthetic. All three showed evidence of "retractor anaemia," two of them to a marked degree.

When hypotension is induced the brain retracts within the cranial cavity, leaving a clear space between it and the cut edge of the dura. At the same time its consistency is completely altered. It has lost all tone and behaves like soft dough. When pressure is applied it is easily compressed, and on release is slow to regain its normal conformity. Blood is forced out of those parts of the brain on which the pressure is exerted, and because of the small blood flow the vessels are only slowly replenished on removal of the pressure. It can be seen that pressure by a brain retractor may be transmitted even to comparatively

distant parts of the brain, thereby depriving those areas of their blood supply and thus causing irreversible and possibly widespread damage.

A man of 35 had a pituitary adenoma removed. He recovered well from the operation and anaesthetic and was responding within a few minutes of the end of the operation. His condition continued to be satisfactory, giving no cause whatsoever for anxiety, when suddenly, eight hours later, he died. The post-mortem findings were: "Cranium and contents: Haemorrhage had taken place around the bone-flap and no haemorrhage was present under the dura. The convolutions of the cerebral hemisphere were flattened and there was some herniation of the right hemisphere under the falx. A marked degree of tonsillar herniation through the foramen magnum had occurred. . . . Haemorrhage had taken place into the remaining portions of the tumour and into the right frontal lobe. The right frontal lobe was soft in consistency. The right cerebral hemisphere was greatly enlarged, particularly anteriorly, and herniated under the falx. . . ."

The striking part of this report is the great enlargement of the right hemisphere, particularly the anterior part of it—so great, in fact, that part of the lobe had to be accommodated under the falx. (The craniotomy was of course performed on the right side.) The enlargement is undoubtedly due to acute oedema, which, in its turn, is caused by vascular damage. Had vascular damage been caused by hypotension and anoxia due to the anaesthetic one would have expected enlargement of both hemispheres. There seems, therefore, little room for doubt that the damage was caused by retractor pressure. A second death occurred in the following case.

A man of 42 with a right frontal glioma had had his frontal lobe amputated. Post-operatively he did not regain consciousness, and died the following morning. His blood pressure, by an unfortunate chain of circumstances, had been allowed to remain too low, and at the time we attributed his death to this cause. The post-mortem examination showed: "Cranium and contents: no evidence of thrombosis was seen in the venous sinuses. The convolutions of both cerebral hemispheres were flattened and the sulci shallow. The right hemisphere was much larger than the left and had herniated under the falx cerebri. It filled the cranium, although the frontal lobe had been amputated for the removal of a calcified glioma. On the right the hippocampus herniated through the tentorium cerebelli, pushing the right communicating artery downwards, and portions of the hippocampus lay on either side of the vessel. There was no marked degree of tonsillar herniation. A large amount of blood had collected in the cisterna magna. The right frontal lobe had been amputated, but the right hemisphere filled the cranial cavity on this side and herniated to a very marked degree under the falx. . . ."

Here we have a picture very similar to the previous case. Amputation of the frontal lobe is a comparatively innocuous procedure which as a rule causes little or no upset to the patient. A persistent low blood pressure would be expected to cause more generalized changes in the brain. The pronounced changes on the right point once again to the extreme vulnerability of the brain in the hypotensive state, to retractor pressure. A third death occurred in the following case.

A man of 39, with a pituitary adenoma, was one of the early cases in the series; we were then not seriously concerned if the blood pressure fell to below 60. In this case it dropped to 40, and, in spite of reducing the tilt, did not rise more than a few points. He failed to come round after the operation, developed decerebrate rigidity, and died the following day. A post-mortem examination revealed the following: "On removing the skull vault the dura was under marked tension and the underlying brain obviously swollen. . . . On cutting the brain there was marked oedema throughout both hemispheres. . . . Pathological report: " . . . Examination revealed a haemorrhage 2 cm. in diameter situated at a low level in the right cerebral peduncle. . . ."

Bilateral enlargement of the hemisphere suggests generalized brain damage by too low blood pressure. The haemorrhage into the peduncle may have been caused by retractor pressure. Several of the earlier cases were operated on under very low pressure without obvious ill effects, and, while this is no argument that the patient did not die as a result of the damage due solely to low blood pressure, retractor pressure cannot be entirely dissociated as an additional factor.

An interesting comparison with the preceding examples is provided by a case which terminated fatally, a result for which the anaesthetic could in no way be held responsible.

A woman of 56 was being operated on for removal of a phenoid wing meningioma. In the course of the operation the surgeon accidentally opened a big vessel, causing a profuse and rapid loss of blood. In due course the haemorrhage was arrested by clipping two large arteries. During this period the condition of the patient had been fairly satisfactorily maintained by rapid replacement of blood and, of course, by levelling the table. By the end of the operation she was responding well and her general condition was quite good. However, she gradually deteriorated, and died the same day. The necropsy report was as follows: "The cerebral convolutions of both hemispheres were flattened. The right cerebral hemisphere was enormously enlarged and had herniated under the falx cerebri. The adjacent sides of the fronto-temporal lobes had been removed. The fronto-parietal part of the hemisphere was very soft in consistency. Clips were present on the right middle and right anterior cerebral arteries. A considerable degree of hippocampal herniation had taken place on the right side. . . . An extensive infarction was present in the region supplied by the right middle cerebral artery. . . . The hypothalamus on the right side did not appear to be infarcted. . . ."

This picture is strikingly reminiscent of the previously described cases. Each shows the result of widespread ischaemia of the brain, in one case by clipping arteries, in the other cases by retractor pressure on the brain.

Two cases of pituitary adenoma show post-operative signs which may have been due to retractor pressure. As a rule these patients proceed to an uneventful recovery.

A man of 49 made a good immediate recovery, but had a stormy convalescence. On discharge the final note read: "This man has made an excellent recovery following aspiration of a cystic chromophobe adenoma; however, he remains retarded and still has pathological extensor plantar responses. Post-operatively he has some ataxia of his gait and left arm."

A man of 64 was in coma for two hours after operation. He remained drowsy and incontinent after initial improvement. The final note said: "He is alert, fully orientated as regards time, place, and person. He remains, however, quite still, a little sleepy, more than normal."

Technique

Premedication consists of atropine only, given half an hour to an hour before operation. The patient is induced with thiopentone, 0.5 to 1 g., followed by a short-acting relaxant and 50 to 100 mg. of pethidine intravenously. An endotracheal tube is then introduced and anaesthesia is maintained on a nitrous oxide and oxygen mixture with periodic injections of 15 to 20 mg. of pethidine. Rarely, very small quantities of trichlorethylene are added.

Of the relaxants I prefer gallamine triethiodide to succinylcholine chloride, as the duration of action of the latter is so short that introduction of the endotracheal tube will often start a bout of coughing. Gallamine triethiodide allows time for the pethidine to come into action, so that one is rarely bothered by this disturbance. Succinylcholine chloride has the advantage so far as relaxation of the cords is concerned.

In all craniotomies an intravenous drip is put up; in cases in which excessive haemorrhage is anticipated the drip is duplicated. The patient is placed on the operating table, which is then put into an anti-Trendelenburg tilt of 25 to 30 degrees. The head is cleaned and draped, and at this point the hexamethonium compound is injected. If a local analgesic is used, adrenaline must of course be omitted, as it antagonizes the action of hexamethonium.

In certain operations—namely, hemispherectomy or excision of an epileptic focus—the actual operation of ablation is preceded by direct electrical stimulation of the motor cortex and electroencephalographic tracings. Since these investigations involve a considerable amount of time the hexamethonium is withheld until these procedures have been completed.

Neither pethidine nor hexamethonium has any effect on the electroencephalogram, in contradistinction to thiopen-

tone, which, in small doses, potentiates epileptic waves and is given when it is desired to produce this effect.

Enderby and Pelmore (1951) suggest initial doses of 40 to 50 mg. of hexamethonium. Guiot and Damoiseau (1952) postulate a maximum of 50 mg. I have found these doses to be on the low side, and originally my practice was to start with at least 100 mg. in a robust patient, and I have at times increased this to as much as 250 mg. When using procaine amide in addition for resistant cases I am now giving rather smaller initial doses of hexamethonium—40–75 mg. for an elderly patient, 50–100 mg. for a young adult.

Within a few minutes of the injection the blood pressure will begin to fall and in a favourable case will reach a point between 60 and 70 mm. Hg, where it will remain. At the same time the pulse pressure shows a considerable decrease with only a few points marking the difference between the systolic and the diastolic pressure.

As a general rule bleeding is minimal when the pressure is dropped to 70 or lower. This is surprising, as one would expect that in order to obtain what would appear to be this critical point in bleeding it would be necessary to produce a lower blood pressure in a patient with an initial low pressure than in a patient with an initial high pressure. A blood pressure below 60, we now know, may result in liver degeneration. Our aim should therefore be to keep the pressure between 60 and 70.

Frequently, following the injection of hexamethonium, the initial fall in blood pressure, which may reach a point well below 60, is quickly followed by a rise which, favourably, will be held below 70. If the pressure should remain below 60 for more than a few minutes the foot-down tilt must be decreased until this pressure is attained. If, on the other hand, the pressure should continue to rise beyond 70, increasing the tilt will not check the rise. Nor will an additional dose of hexamethonium as a rule have the desired effect. Yet again hexamethonium may fail to give a satisfactory response in the first place, and the pressure may drop by only a few points.

The cases in which hexamethonium fails to give an adequate reaction or in which the action is of extremely short duration constitute a fairly high proportion of the total number—in the neighbourhood of 40%—and until recently they were therefore written off as failures. With procaine amide at our disposal we are now able to "rescue" the majority of them.

The dose of procaine amide is judged according to the previous effect of the hexamethonium and the age and condition of the patient, and varies between 200 and 500 mg. A poor result of hexamethonium demands a high dosage of procaine amide, as does a young and robust adult.

Assuming the hexamethonium has been given, one should be able to decide within five to seven minutes whether a successful reaction is to be anticipated. If after this time the blood pressure fails to reach a satisfactory level, or, having dropped to a suitable level, immediately begins to rise and continues to do so, procaine amide should be given. The injection is made intravenously and slowly, taking ten to twenty seconds for each 100 mg. From now on there is no further tendency for the blood pressure to rise. It will remain stationary for ten minutes or so and then gradually fall. At the same time there will usually be a decrease in the pulse rate.

One cannot predict the duration of action of these compounds. A single dose will often suffice for the complete operation. On the other hand, if the blood pressure rises, causing increased bleeding, the drug will have to be given again. The second dose should be much smaller than the first.

At the conclusion of the operation Siguier *et al.* raise the blood pressure by rapidly returning the patient to horizontal, and all bleeding is then stopped. Our policy from the beginning has been to allow a slow return of blood pressure over several hours. This is carried out entirely by

means of posture. The nursing staff have clear instructions that the blood pressure must, so far as possible, be kept below 100 for several hours.

Recovery

Recovery from the anaesthetic is usually extremely good and very similar to recovery after pethidine anaesthesia. Hexamethonium, in fact, seems to have little added effect. Provided the blood pressure is over 70, consciousness is regained within a few minutes after the end of the operation and the patient will respond to simple commands and answer simple questions, albeit drowsily.

Post-operative restlessness is uncommon, owing, no doubt, to the action of pethidine, which allows a prolonged period of freedom from pain and headache and thus eliminates to a great extent the need for post-operative sedative drugs.

The patient can easily be roused, and there is no danger of confusing this drowsiness with that due to post-operative bleeding.

Contraindications

As thrombosis is one of the chief dangers with this form of anaesthesia, any pre-existing liability to thrombosis would be a contraindication to its use. Unfortunately we are unable to assess this liability, particularly in the case of coronary disease. A previous coronary thrombosis is, of course, an absolute contraindication.

Guiot and Damoiseau give hypertension and arteriosclerosis as contraindications. I should be very chary of employing the method in an advanced case of arteriosclerosis, but early cases, as one would expect, react well to the drugs and do not appear to come to harm.

I have used the method in a number of children, most of whom have reacted favourably. A child of 3 failed to give a satisfactory response, whereas a perfect result was obtained in a 7-years-old child. Comparatively large doses are required in children. The oldest patient was a man of 70.

With the danger of "retractor anaemia" in mind, it follows that this method of anaesthesia is absolutely contraindicated in any operation in which pressure is applied to a portion of the brain that is not to be excised in the course of the operation. There are occasions when it is impossible to decide in advance whether such pressure will be necessary, and in these cases it is advisable to defer the induction of hypotension until the bone flap is turned and the surgeon is quite clear about the condition he has to deal with. In this respect it is the surgeon's responsibility to decide whether hypotension is suitable or not.

When operations in the posterior fossa are carried out with patients in the prone position the same rule will apply. In this unit, however, these operations are performed in the sitting-up position, in which operating conditions are as a rule satisfactory, as regards both haemorrhage and intracranial tension. It would, of course, be foolhardy to use a hypotensive drug with a patient in this position.

Descriptive Cases

A few unusual cases are of interest.

A woman of 50 had a cerebrospinal leak from the anterior fossa. Before the opening was successfully sealed off, three operations were performed at intervals of six weeks and fourteen weeks. In each of the first two operations 150 mg. of hexamethonium produced a perfect result. In the third operation 80 mg. sufficed. The blood-pressure charts were almost identical in the three operations.

A woman of 43 with an angioma had two operations within 11 days. In the first an initial drop in blood pressure with 80 mg. of hexamethonium was followed by a slow rise which necessitated the injection of 300 mg. of procaine amide. The blood pressure fell to 66, where it remained throughout operation. At the second operation 100 mg. of hexamethonium reduced the pressure

to 50, but it rose steadily throughout the operation, which lasted only half an hour. There was a steady blood loss towards the end of the operation.

Two points emerge from these cases. First, it would seem that a patient who once responds satisfactorily to these drugs may be expected to respond in the same way on any future occasion. That being so, the converse is of course true. Secondly, hexamethonium alone may at times suffice for a short operation. If the operation is more prolonged additional hexamethonium may be given, but probably procaine amide will have the more lasting effect.

A man of 70 was being operated on for removal of a meningioma. Thirty-seven minutes after induction with thiopentone, gallamine triethiodide, and pethidine he developed an attack of asthma. Some 10 minutes previously he had been given an injection of hexamethonium, which had reduced his blood pressure to 66. Surprisingly the supervention of bronchospasm failed to cause an appreciable increase in blood pressure and the bleeding remained negligible and the colour good; but movements of the head due to laboured breathing and bulging of the brain during expiration were an annoyance to the surgeon. The condition persisted throughout the operation, clearing up within a few minutes after withdrawal of the endotracheal tube. The patient made a good recovery.

Results

The series consists of 90 cases. I have divided these into two groups, which happen to be equal in number; the first includes all those cases up to the time when procaine amide was first used, the second the remainder. The criteria of success were a negligible amount of bleeding and a good reduction in intracranial tension. Many cases, while not completely fulfilling these criteria, gave unquestionably improved operating conditions, and these I have classified as "partially successful."

In the first group of 45 cases 26 (58%) were successful, 9 (20%) were partially successful, and 10 (22%) were failures. In the second group 38 (85%) were successful, 5 (11%) were partially successful, 2 (4%) were failures.

It will be seen from these figures that procaine amide is a useful adjunct to this form of anaesthesia, as it converts many of the potentially failed and partially failed hexamethonium cases into successful ones.

Three deaths due directly or indirectly to the anaesthetic have occurred. In the light of our experience two at least of these cases are considered to have been unsuitable for this type of anaesthesia.

There was one case of reactionary haemorrhage.

Summary

The advantages of controlled hypotension in neurosurgery are listed.

The dangers of the method are discussed, with special reference to "retractor anaemia."

A method is described of reducing the failure rate of hexamethonium by potentiating with procaine amide.

The results of a series of 90 cases are given.

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The *Hebrew Medical Journal* (Harofé Haivri) recently completed its twenty-fifth year of publication. Although it has been edited and produced in the United States, much of its contents have been published in Hebrew. It is a remarkable achievement on the part of those concerned that they have succeeded in adapting so ancient a language to the needs of modern medicine and have created a medical terminology and literature in Hebrew. The present editor is Dr. Moses Einhorn.

AN OUTBREAK OF DIPHTHERIA: INFLUENCE OF IMMUNIZATION

BY

C. D. L. LYCETT, M.D., D.P.H.

Deputy County Medical Officer of Health and Deputy
School Medical Officer, Staffordshire

AND

J. T. A. GEORGE, M.B., Ch.B., D.P.H.

Medical Officer of Health, Coseley Urban District

During 1951 an outbreak of diphtheria of unusual size for the present time occurred in and around Coseley. Coseley, with a population of 34,414 at the 1951 Census, is an urban district in the Administrative County of Stafford between the county boroughs of Wolverhampton and Dudley and almost surrounded by other industrial districts. Wolverhampton and Dudley were not included in the investigation here considered, but it is understood that Wolverhampton had five cases of diphtheria during the year and that Dudley had 11 (all during the first two quarters). The total population of the seven surrounding districts included in this report was 232,836, and together they had 50 confirmed cases during the year, while Coseley had 58. These 108 cases were 15.5% of the 699 (provisional) corrected notifications for England and Wales in 1951. There has in the past been a steady and at times surprisingly high incidence of diphtheria in the neighbourhood. In Fig. 1, the figures for which were obtained from the annual reports of the medical officers of health of Coseley, the number of notifications and deaths and the population for the years 1908-51 are given.

The incidence of diphtheria in Coseley in recent years compares unfavourably with the national incidence and that of non-county boroughs and urban districts (England only, excluding London), as is shown by Fig. 2, which is based on figures published in the Registrar-General's statistical reviews 1912-49.

Bacteriology

The bacteriology of diphtheria in the Administrative County of Stafford is of interest.

Menton *et al.* (1935) reported the results of 500 swabs from 500 individual patients classified according to the type of diphtheria organism; their figures showed a marked predominance of mitis diphtheria. For 1941-4 the published data of the Stafford Public Health Laboratory showed a change to the gravis and, to a lesser extent, to the intermedius types. Comparable figures for 1946-50 show that the intermedius type exceeded the gravis type, which, however, still almost equalled the mitis type in number. In 1951 the outbreak was due to gravis diphtheria. The data are set out in Table I.

TABLE I.—Relative Incidence of Types of *C. diphtheriae*—Administrative County of Stafford (Based on the Number of Cases Shown in Parentheses)

	Reported in 1935	1941-4	1946-50	1951
Gravis ..	3.8% (19)	56.9% (1,230)	27.0% (98)	98.7% (78)
Mitis ..	68.6% (343)	6.7% (144)	27.5% (100)	1.3% (1)
Intermedius ..	19.8% (99)	36.4% (787)	45.5% (165)	0% (0)
Irregular ..	7.8% (39)	—	—	—

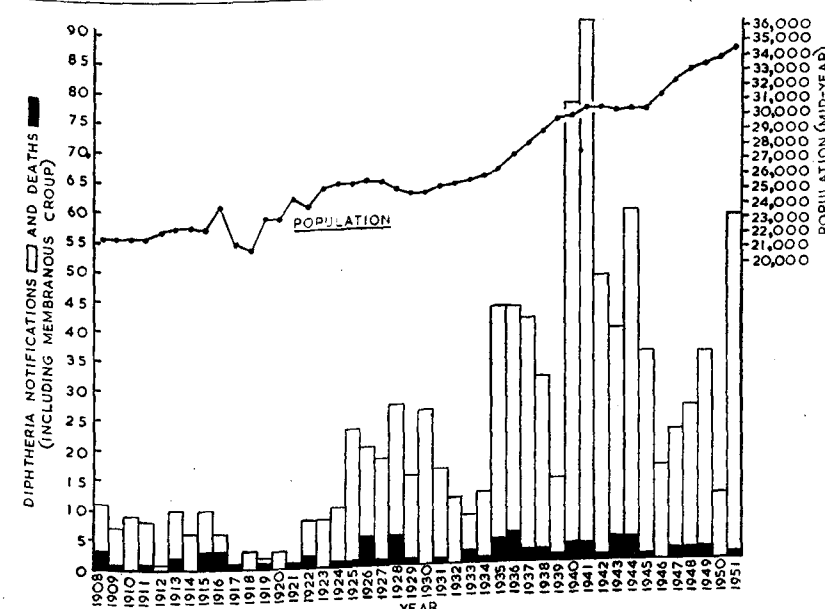


FIG. 1.—Number of cases of and deaths from diphtheria, and population in Coseley for 1908-51.

Logan (1952) considers that the general rapid downward trend in diphtheria cases and deaths in England and Wales may be partly due to the fact that the proportion of mitis strains recovered between 1945 and 1948 almost doubled, whereas the proportions of intermedius and gravis strains substantially declined. Although this change of type occurred in Staffordshire between 1945 and 1948, it was not accompanied by a marked reduction in the incidence of diphtheria, and over the longer period 1935-51 the change in type has been the opposite.

In Coseley, in 1951, swabs from 77 persons (not all confirmed clinical cases of the disease) were positive on culture for the diphtheria organism, and they were all of gravis type with the exception of one of intermedius type. The corresponding figure for the surrounding districts was 28 corresponding figure for the surrounding districts was 28 corresponding figure for the surrounding districts was 28—all gravis. Comprehensive records of swab results obtained in the years 1936-40 are unfortunately not available; therefore the precise period during which the change of type occurred is not known, nor can a hypothetical reason for the change be offered. Fig. 1 shows that the present wave of diphtheria was already well established in 1935, 1936, 1937, and 1938, and that the death rate was as high in 1936 as at any time since.

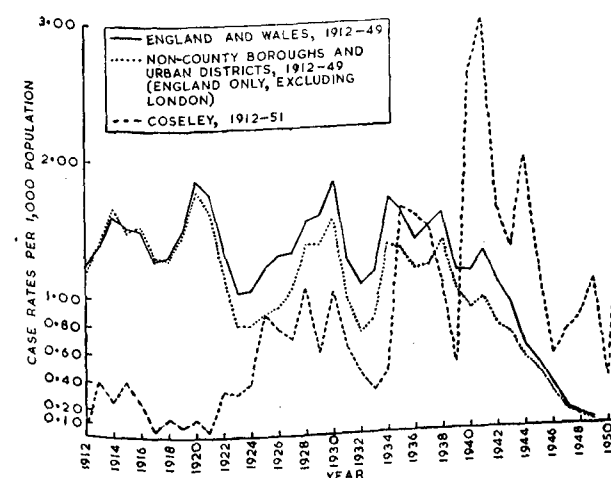


FIG. 2.—Incidence of diphtheria in England and Wales, in non-county borough and urban districts (England only, excluding London), and in Coseley.

1951 Outbreak

During 1951, 108 confirmed cases of diphtheria occurred in the whole area under review, of which 58 were in the Urban District of Coseley. Table II shows the ratio of notifications to confirmed cases and deaths.

Of the 34 unconfirmed notifications in Coseley, 12 (35.3%) had nasal or throat swabs positive for *C. diphtheriae* at some time and 22 (64.7%) never had a positive swab. Of the 44 unconfirmed notifications in the surrounding districts, 4 (9.1%) had positive swabs and 40 (90.9%) had not. These patients had initial signs and symptoms suspicious enough to prompt the action taken by their doctors, but the signs were transient, as no evidence of clinical diphtheria was found after admission to hospital. Those cases with early positive swabs may have been carriers, but this is not thought likely, as there was no previous history of diphtheria or chronic nasal discharge, nor were any positive swabs obtained subsequently. It is

much more likely that they were, in fact, minimal clinical cases which rapidly overcame the disease after contracting it. They form an appreciable percentage of the unconfirmed notifications.

TABLE II.—Diphtheria Cases and Deaths, 1951

Area	1951 Census Population	Notifications	Confirmed Cases	Deaths
Coseley U.D.	34,414	92	58	1
* Surrounding districts	232,836	94	50	5
Total ..	267,250	186	108	6

* Bilston M.B., Darlaston U.D., Rowley Regis M.B., Sedgley U.D., Wednesbury M.B., Willenhall U.D., Tipton M.B.

Of the surrounding districts the one most affected in the outbreak was Bilston M.B., which borders on Coseley and had a population at the 1951 Census of 33,464. There were 18 cases with 3 deaths. Four cases were in one family and 15 were in schoolchildren. Reference is made below to the action taken in Bilston. In the remainder of the surrounding districts 32 sporadic cases occurred.

Seasonal Incidence.—In Coseley, cases occurred steadily throughout the year, but this was not so in the surrounding districts, where the outbreak did not gather momentum until the late summer, reaching a peak in November.

Age and Sex Incidence.—The age incidence of confirmed cases only is shown in Table III. Children of school age formed 65.5% of the total cases in Coseley and 65.7% of all cases.

The confirmed cases are classified according to age group and sex in Table IV. The sexes were attacked in approximately equal numbers in pre-school- and school-children.

TABLE III.—Age Incidence of Confirmed Cases of Diphtheria, 1951

	0-4 Years		5-14 Years		15 Years and Over		All Ages	
	No. of Cases	Rate*	No. of Cases	Rate*	No. of Cases	Rate*	No. of Cases	Rate†
Coseley U.D.	12 (20.7%)	3.86	38 (65.5%)	6.72	8 (13.8%)	0.32	58 (100%)	1.69
Surrounding districts	9 (18.0%)	0.43	33 (66.0%)	0.91	8 (16.0%)	0.05	50 (100%)	0.21
All cases ..	21 (19.5%)	0.87	71 (65.7%)	1.69	16 (14.8%)	0.08	108 (100%)	0.40

* Attack-rate per 1,000 related population (approximate).

† Attack rate per 1,000 related population on 1951 Census.

TABLE IV.—Age and Sex of Confirmed Cases of Diphtheria, 1951

	0-4 Years			5-14 Years			15 Years and Over			All Ages		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Coseley U.D.	7	5	12	20	18	38	4	4	8	31	27	58
Surrounding districts	4	5	9	17	16	33	—	8	8	21	29	50
All cases	11	10	21	37	34	71	4	12	16	52	56	108

Clinical Features

Of the 108 confirmed cases, 61 (56.5%) were classed as mild, 25 (23.1%) as of moderate severity, and 22 (20.4%) as severe, including the 6 fatal cases. In 74 the nose and/or throat swabs were positive for the gravis type of organism, but 34, although diagnosed clinically as diphtheria cases, did not have positive swabs. The exclusive occurrence of the gravis type of diphtheria has not resulted in a generally severe clinical form of the disease. The case fatality of 5.6% compares with 8.1% in the 11,492 gravis cases reviewed by McLeod (1943).

Of the 108 patients, 106 were admitted to hospital, the mean stay being 53 days; the longest stay was 152 days for a boy of 6 whose illness was of moderate severity but whose tonsils were removed for persistently positive swabs.

The complications were those commonly associated with gravis diphtheria. Of the 16 patients who were severely ill but recovered, 15 had paralyses, as did 8 of the 25 moderate cases and 3 of the 61 mild cases. One patient who died showed paralysis; the others did not live long enough to show it. Nine patients, including all the fatal cases, had bull-neck. Only three patients had a laryngeal membrane, and these were all mild cases; 27 had a pharyngeal, palatopharyngeal, or nasopharyngeal membrane, and these included the 6 fatal cases and 13 of the 16 other severe cases.

Of the six patients who died five were children between the ages of 7 and 11 years, all of whom died within seven days of admission to hospital. The other was a male school-teacher, aged 31, who died after 28 days in hospital. The cause of death in each case was myocarditis.

Spread of the Disease

In spite of the majority of cases being in schoolchildren there was little evidence that the infection was spread in school. The occurrence of cases was not affected by the school holidays, nor could a series of cases be found in the same school or class in circumstances suggesting transmission from one child to another by any of the classical and recognized methods, such as the sharing of pencils, contiguous position in class, and so on.

While in most cases there was little or no evidence to show how or from whom the infection was obtained, some of the confirmed cases were concerned in multiple infections in the same household. Nine families in Coseley between them had 23 individuals with positive swabs. Eighteen of these were later confirmed as having clinical diphtheria, this number being 31% of all confirmed cases in Coseley. The occurrence of the first case in each household was as difficult to explain as was the spread within the household easy. These first cases and the 69% of cases arising singly occurred sporadically and irregularly without traceable cause in the great majority of cases.

The location of the cases in Coseley, particularly in relation to the distribution of population, was most interesting. Coseley is not an isolated industrial town with a central business and shopping area, an inner industrial ring, and an outer suburban residential area in the usual way. It is rather a group of a dozen or so villages of varying size spaced throughout the 3,300 acres of the district, the villages being separated by stretches of waste and agricultural land interspersed with factories. During 1951, 59 (76.6%) of the total of 77 individuals found to have positive swabs lived in only five of these relatively sharply defined areas, the

remaining areas either escaping completely or having only the odd scattered case. The cases were punched in a striking manner. In one of these localities, the worst affected, there were 13 confirmed cases and 11 other persons with positive swabs living within an area of about 12 acres.

In the other four areas those with the infection were similarly clustered, though in smaller numbers. In spite of this, interrogation of contacts, neighbours, friends, etc., failed to show any connexion between the cases. Chronologically the cases in these areas did not link up, as they occurred often at widely spaced intervals of time. Inquiries failed to establish connexions between the cases except in one or two instances. It was unlikely, for example, that pre-school children would be in the habit of playing with children aged 12 years or more living near by. The weight of the evidence suggests that the infection was spread at home rather than at school, yet little specific evidence of home spread in individual cases was elicited except for those in the same family.

While these five areas are well defined, they have services common to other areas in Coseley and the surrounding districts. The same public transport, places of entertainment, main shopping centres, and so on are used by people of the affected and unaffected areas and of the surrounding districts. No explanation can be offered of why the cases should be so sharply confined for so many months to the affected areas.

The experience in previous years of the various areas in Coseley is of some interest. Records show that the incidence has been greatest in different areas at different times. Those suffering heavily ten years before escaped entirely in 1951, and vice versa. The irregular movement of the infection from one year to the next resembles that described by Grant (1951) during the years 1936-46 in Gateshead, and by Newsholme (1898) in his report on the 1888-96 epidemic of diphtheria in London.

The possibility that milk might be the vehicle of infection was investigated, but there was no evidence to support this.

The fact that the incidence was highest in schoolchildren led to a search for carriers in the schools and to an inquiry into the immunization state of the child population.

Search for Carriers in Schools

Between June 11 and 22 nose and throat swabs were taken from every child in eight school departments in Coseley. Five of these departments were those in which the greatest number of cases had occurred, and the other three, having only one case between them, were used as controls. The results are summarized in Table V.

Thus in school departments A to E, where the incidence of notified and confirmed cases of gravis diphtheria was 1.5%, a further 1% of the children were found to be harbouring *C. diphtheriae gravis* in the nose or throat, while in Departments F, G, and H, where the incidence of confirmed cases was 0.16%, no further children were found to be harbouring the organism. It must be emphasized that these figures are small and that they are based upon swabbing carried out on one occasion only.

The 15 children with positive swabs were free of symptoms, but nevertheless the evidence seems in favour of their being subclinical cases of diphtheria rather than carriers; none had any history of diphtheria or chronic nasal discharge, and their infection cleared up rapidly upon isolation in hospital; only five had any history at all of adequate immunization within the previous three years. If this is accepted, the investigation showed no evidence of a higher carrier rate in those schools with a number of cases of diphtheria than in those where none or only one case had occurred. As is mentioned above, there was an association in their home surroundings also between the children who were confirmed cases and those found to be harbouring the organism on swabbing, so that these bacteriological findings do not particularly indicate spread of the infection at school.

TABLE V.—Results of Nose and Throat Swabs of Coseley School-children

	School Departments with Highest Incidence of Diphtheria					All Departments
	A	B	C	D	E	
Confirmed cases of diphtheria January 1-June 11, 1951	9	4	3	3	2	21
No. of children on roll	449	371	155	183	242	1,400
No. with positive swab for gravis diphtheria in addition to confirmed cases	1	5	3	1	5	15
Incidence of confirmed cases	2.0%	1.1%	1.9%	1.6%	0.83%	1.5%
Incidence of additional positive swabs	0.24%	1.3%	1.9%	0.55%	2.1%	1.0%

	School Departments (Controls)			All Departments
	F	G	H	
Confirmed cases of diphtheria January 1-June 11, 1951	0	0	1	1
No. of children on roll	278	102	228	608
No. with positive swab for gravis diphtheria in addition to confirmed cases	0	0	0	0
Incidence of confirmed cases	Nil	Nil	0.44%	0.16%
Incidence of additional positive swabs	Nil	Nil	Nil	Nil

Immunization State

The percentage of the child population who had completed a course of immunization at any time before December 31, 1950, according to the annual returns, is shown in Table VI. It is seen that 73% of the school population of Coseley were shown in the return for 1950 as having been immunized.

This method of estimating the immunization state of the child population has, however, obvious disadvantages. It takes no account of the recency or otherwise of the immunization, nor, in the case of schoolchildren, whether they have had a reinforcement dose preceded by adequate primary immunization. It was thought that, in estimating whether or not a child could be regarded as probably adequately protected by immunization, stricter criteria were

TABLE VI.—Percentage of Child Population Immunized Before 1951

	Age Group		Age Group	
	0-4	5-14	0-4	5-14
Coseley	32	73	24	96
Bilston	33	81	37	95
Wednesbury	47	89	51	93
Willenhall	42	86	26	79

TABLE VII.—Immunization Record of Children Swabbed

Presumably adequately protected:	152
With complete primary course within previous 3 years	388
With complete primary course followed by a reinforcement dose, the latter within previous 3 years	540
Total	540
Unprotected or inadequately protected:	764
No record of immunization	589
Primary course more than 3 years previously; no reinforcement dose	32
Record of incomplete primary course only	68
Record of "reinforcement" dose only	15
Complete primary course with reinforcement more than 3 years previously	1,468
Total	1,468

Proportion of 2,008 children investigated whose immunization records showed evidence of adequate protection within previous 3 years 26.9%

needed, and for the purpose of this investigation an admittedly arbitrary standard of complete immunization within the preceding three years was adopted. For all those children swabbed in the schools mentioned in Table V, a detailed survey of the immunization records was made and the result is shown in Table VII.

This result must be qualified by stating that the County Council's immunization records in their present form date only from April, 1949, when they were collated from the previous unstandardized records and a new system of supervision of immunization was introduced. It is probable that the percentage adequately protected, on the rather strict criteria set out above, was appreciably higher than 26.9%; this supposition is strengthened by the results of the inquiry made into the immunization state of those who were confirmed cases of diphtheria, in a number of whom a history of immunization was obtained from relatives or patient, although not entered in the records.

The criticism may also be made that estimation of the antitoxin content of the blood, or even the Schick test, would have been a better method of assessing the probable immunity or susceptibility of these schoolchildren than a scrutiny of the available records of their immunization. Unfortunately it was impracticable to carry out these tests for the 2,008 children.

The total school population of Coseley U.D. in June, 1951, was approximately 4,403, and, although the sample of 2,008 was not entirely unselected (especially as regards age and economic status), the results given above certainly indicated a much lower state of protection against diphtheria of the school population of Coseley than would appear from the official returns or would generally be regarded as necessary to prevent an outbreak of diphtheria.

Reference must here be made to the conclusion of the Tyneside and Dundee investigators (Hartley *et al.*, 1950) that a person inoculated as a child can expect to secure for himself early and adequate protection should he be exposed to infection in later life, because even in the absence of a reinforcing dose the infection itself serves as a secondary stimulus so that antitoxin is rapidly produced, and the disease is mild. Thomson (1951) also concludes, from statistics available to the Ministry of Health, that the prognosis for those who contract the disease, but who at some time have been immunized, is much better than that of those who have never had any such protection.

Nevertheless, the importance of the reinforcing dose of antigen in causing a rise in antitoxin titre, thus protecting the individual against an attack of diphtheria, and the community against an outbreak, remains unchallenged. It is possible that the present standard form of immunization return to the Ministry of Health may give an unduly optimistic impression, especially with regard to schoolchildren, and that further analysis of immunization records of local

TABLE VIII.—Immunization Records of Confirmed Cases

Severity	Age (Years)	Presumably Adequately Protected*	Inadequately Protected†	No Record of Immunization
Mild	0-4	1 (3)	— (—)	10 (8)
	5-14	4 (6)	6 (22)	27 (9)
	15+	— (—)	— (6)	13 (7)
Moderate	0-4	— (2)	— (1)	7 (4)
	5-14	1 (1)	2 (6)	13 (9)
	15+	— (—)	— (—)	2 (2)
Severe	0-4	— (—)	1 (—)	2 (3)
	5-14	1 (1)	1 (5)	16 (12)
	15+	— (—)	— (—)	1 (1)
		7 (13)	10 (40)	91 (55)
		6.5% (12%)	9.2% (37.1%)	84.3% (50.9%)

In parentheses is shown the immunization state based upon the history obtained from relatives and (where possible) from the patient.

* Complete primary course within previous 3 years or complete primary course followed by a reinforcement dose—the latter within previous 3 years.

† Primary course more than 3 years previously—no reinforcement dose, record of incomplete primary course only, record of "reinforcement" dose only or complete primary course with reinforcement more than 3 years previously.

health authorities might show a less favourable state of affairs than is believed to exist. The immunization records of the 108 confirmed cases are shown in Table VIII.

Thus, although 49.1% of all the confirmed cases had some history of immunization, only 12% had been protected adequately within the preceding three years. Of the 22 severe cases, however, only 7 (31.8%) had any history of immunization at all, and of the six patients who died five had never been immunized, while the sixth, a girl of 8, had only a doubtful history of immunization in infancy. Two of the children who died had, however, received one dose of antigen—one about 24 days and the other about 11 days before the onset of the illness.

Of the 31 individuals whose swabs were positive (30 for gravis and 1 for intermedius diphtheria), although they were not clinically confirmed cases, 11 appeared never to have been immunized, while not more than seven were adequately protected.

Action Taken

By the end of September, 31 cases had occurred in Coseley schoolchildren, and it was also plain that the level of immunity of the child population was too low. A special letter was distributed through the teachers to the parents of each child attending the Coseley schools, urging the need for immunization and including a form of consent. Immunization was offered in this way for all the children, irrespective of their immunization history, and consent was obtained for 87%. A full primary course was given to each child, A.P.T. being used for all infants (aged 5-7), and T.A.F. for all secondary-school children (aged 11-15); the intermediate group (aged 8-10) were given A.P.T. or T.A.F. at the discretion of the medical officer performing the immunization. About 3,500 children were thus immunized; the operation began on October 22, and the great majority were completed by December 7.

In the meantime seven Bilston schoolchildren contracted the disease during November, and one died. A schoolmaster in a Bilston school who lived in Coseley also had diphtheria (and died later). A similar immunization campaign was therefore undertaken for the Bilston schoolchildren. Here 79% consents were obtained and about 4,000 children were given a primary course between December 10, 1951, and February 28, 1952, out of a school population of approximately 6,089, leaving a further 800 to be completed after that date.

Both at Coseley and at Bilston the proportion of consents obtained from parents was higher in the presence of the outbreak of diphtheria than had been customary. At the same time the ordinary measures to secure the immunization of pre-school children were intensified.

It was not expected that the special campaigns would produce enough immunity in Coseley and Bilston schoolchildren to control the outbreak of diphtheria until two to three months after their conclusion, but in fact the incidence fell markedly in Coseley at the end of 1951, and in Bilston in February, 1952, especially in schoolchildren. Whether the fall was wholly due to the immunization is uncertain.

From January 1 to November 3, 1952, 17 confirmed cases of gravis diphtheria occurred in Coseley, and 11 in the surrounding districts, but six of these were in Bilston in January and February, before the immunization campaign could have been effective.

Of the other 22 patients, 11 were schoolchildren and 6 pre-school children, but only five had ever been immunized. Of these five three were brothers and sisters who became ill within a few days of each other at the end of October, together with three other sibs, two of whom were unimmunized confirmed cases and the other a symptomless carrier or subclinical case.

Summary and Conclusions

A report is made on an outbreak of gravis diphtheria in Coseley and the surrounding districts in which 108 cases with six deaths occurred during 1951 in a popula-

tion of 267,250 and a further 31 persons were found to be harbouring the organism.

In Coseley there had been for some years an incidence of diphtheria unusual in this country since immunization became general, and the change in the prevalent types of *C. diphtheriae* had been opposite to that in England and Wales as a whole—namely, from mitis to gravis and intermedius. The outbreak was provided with a fertile soil by the low level of immunity of the child population, and was not, so far as can be said, the result of the development of a strain of *C. diphtheriae gravis* more than usually capable of overcoming the immunity produced by the ordinary diphtheria antigens.

Long-term carriers appeared to play no part in the spread, and the large number of persons found to be harbouring the organism with slight or no symptom were probably subclinical cases or transient carriers—that is, the result and not the cause of the outbreak.

The infection was probably spread mainly at home rather than at school, although most of the cases were in schoolchildren. No explanation can be offered of the remarkable grouping of confirmed cases and other found to be harbouring the germ in certain areas in Coseley.

In the two districts most affected the incidence fell immediately after mass immunization of the school population.

The outbreak emphasized the importance of a constant watch upon the proportion of children receiving reinforcement doses of diphtheria antigen, and showed that reliance upon the figures prepared for the annual immunization return may be misleading, especially where schoolchildren are concerned. It occurred in an area in every district of which at least 73% of the school population had completed a course of immunization at some previous time. Nevertheless, the outbreak provided further evidence for the belief that the risk of severe illness or death is reduced for those who have at any time been immunized. It also demonstrated the greater willingness of the public to accept immunization when they are confronted with an outbreak of diphtheria.

We gratefully acknowledge the facilities for the investigation afforded by Dr. G. Ramage, County Medical Officer of Health for Staffordshire. We wish to express our thanks to Dr. B. C. Haller, Medical Officer of Health, Bilston M.B., for information concerning diphtheria in Bilston; to Dr. R. N. Phease, Director of the Stafford Public Health Laboratory, for swabbing 2,000 Coseley schoolchildren and for collating information on the type of diphtheria organism found at the laboratory in the year 1946-50; and to Dr. C. Simpson Smith for kindly supplying clinical details of the hospital patients.

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The British Hospitals Contributory Schemes Association has published Part I of a directory of convalescent home serving the provinces (England and Wales). All the 4 names included have been recommended by hospital contributory schemes affiliated to the association. The directory which is in stencilled form, may be obtained from the association, Royal London House, Queen Charlotte Street, Bristol, 1, price 1s. 6d. H.R.H. the Duke of Edinburgh recently consented to bestow his patronage on the association.

PIGMENTED SCARS

BY

B. S. CRAWFORD, M.B., F.R.C.S.

Registrar, Plastic and Jaw Department, United Sheffield Hospitals

This communication is concerned with those scars, usually of the face, which follow injuries in which pigmented material becomes embedded in the skin and often in the subcutaneous tissues. Those which follow road accidents are the most common, and they are considered in some detail; reference is also made to pigmented scars following injury in coal-miners. Although scars are inevitable after such injuries, most of them would be inconspicuous, and some almost invisible, but for their contained pigment. It is not appreciated by many of those responsible for the initial treatment of these patients that the pigmentation of scars can be prevented by methods which do not require special experience for their application.

There are few references to the methods of preventing the pigmentation of scars, but short accounts are given by Matthews (1946) and Straith and Pilling (1947). In the American literature Iverson (1947) and Sheehan and Swanker (1950) refer to the treatment of established pigmented scars, but I have been unable to trace any work on this subject in the British literature.

Cases of injury in which pigmented material has been forced into the tissues can be divided into two groups—a large one in which the injuries are abrasive in type, and a small group in which the injuries follow an explosion.

Abrasive Injuries

Most of the cases in this group are the result of injury to exposed skin when the subject is flung forward along a road surface as the result of an accident. Motor-cyclists, cyclists, and pedestrians who are poorly protected—especially about the face—are most likely to sustain this type of injury. The skin is lacerated and abraded as it slides over the rough surface of the road, and loose particles of road grit become embedded in the wounds. Those parts of the face which are rendered prominent by the underlying bony skeleton—namely, the upper part of the nose, upper lip, chin, malar and supraorbital regions—usually sustain the severest damage, the lacerations running in various directions owing to the fact that the skin, which is stretched over the bony prominences, is split by impact with the irregular road surface. In these areas the lacerations usually penetrate as far as the subcutaneous fat and may reach the underlying bone, but in areas less firmly supported—for example, the cheek below the level of the malar prominence, and the neck—they take the form of multiple parallel abrasions of the skin which run in the direction in which the patient was travelling during the injury.

Immediately adjacent to these lacerations and abrasions there may be little or no evidence of damage to the skin, although foreign particles are embedded in it in large numbers. Lesions of the lower half of the nose, other than trivial ones, are uncommon, because this portion has a cartilaginous framework which allows it to be thrust aside at the moment of impact; this exposes the upper lip, which, no longer protected by the nose, is injured with unexpected frequency. The lower lip becomes everted as the head slides in a forward direction during the accident, exposing the buccal aspect to direct injury by the road surface, and in many cases the mucosa is split transversely just above the floor of the buccal sulcus. After a severe injury all the areas mentioned above may be damaged; in most cases, however, only one or two of them are found to be involved,

but in practically all cases the lesions are confined to one side of the face.

Exposed skin surfaces other than those of the face—for example, the hands and knees—may also be affected; the knuckle regions of the hands are commonly involved, and in addition similar lesions of the anterior aspect of the knees may be seen in women and children.

In coal-miners lesions almost identical with those due to road accidents are seen as a result of coal falling from the "roof." Sometimes the face is directly damaged, but more often the back receives the force of the impact; the face is then injured if the miner is thrown forward on to it.

Explosive Injuries

In civilian practice pigment-contaminated wounds due to injury by high explosives are rare, and are most likely to be encountered as a result of accidents in industry.

In coal-mining, barriers of stone or coal are sometimes removed by shot-firing, in which a charge of T.N.T. or nitroglycerin is placed in a prepared hole, which is then filled or "stemmed" with a mixture of clay and sand. If the charge explodes before the worker takes cover the skin of exposed areas is tattooed by coal, shale, and stone fragments, with the addition of the materials used in "stemming." Identical injuries may follow the explosion of a compressed-air cylinder in a coal-mine.

Clinical Features of Pigmented Scars

The patients complain of conspicuous scars which excite unwelcome attention, particularly if they are on the face; those with pigmented scars on the upper lip, for example, complain of the frequency with which they are told that their nasal toilet is incomplete. The pigmented scars which follow injuries of the abrasive type are found in one or more of those areas which sustain damage in the way described, their depth and direction varying, like those of the original wounds, with the site of injury. Pigmented scars overlying bony prominences are almost invariably deep and run in various directions; scars in other situations are usually superficial, the pigmentation lying in parallel lines which are generally vertical in direction. The colour varies from light grey to black, depending on the concentration of pigment in the skin.

Multiple blue-black scars in exposed areas (scalp, back, and extremities) are extremely common in coal-miners, who rarely complain of them; indeed, they are usually proud of these marks of their trade. Those of the face which may follow explosive injuries, however, are most disfiguring (Fig. 1). They present a blotchy appearance, as most of the pigmented material lies in scattered pockets of deep damage.

During the first few months after injury many pigmented scars are raised, indurated, and erythematous, and it is remarkable that after this period the scars gradually become flat and supple, in spite of the fact that they still contain a great deal of foreign material.

Pathology

Examination of a wound or abrasion of the skin within a few hours of the injury will reveal an exudate of serous fluid which soon dries to form a surface coagulum. In the case of wounds or abrasions impregnated with pigmented foreign particles, the coagulum is found, on naked-eye and microscopical examination, to contain large numbers of foreign particles. These have also been found to be present in cases in which the surface had previously been freed of contaminants by swabbing and irrigation. It is therefore inferred that pigmented scars contain only those foreign particles which have remained embedded in spite of this natural attempt at extrusion.

A number of pigmented scars removed from a variety of cases were sectioned and examined by Dr. J. L. Edwards, who reported the presence of three types of foreign body: (1) doubly refractile material with sharp edges—possibly

arteritis were conspicuously absent; there were no cases of peripheral emboli, with the possible exception of the patient who showed aphasia. Only three patients had red cells in the urine, but several showed evidence of pulmonary emboli. The rarity of peripheral emboli when infection of a ductus occurs is a result of the direction of the blood flow, which is from aorta to pulmonary artery—that is, from high to low pressure. Consequently, blood clot tends to be carried into the lungs. Peripheral emboli may, however, occur under two conditions: (1) when spread of the infection has occurred to the mitral and aortic valves; and (2) when there is reversal of the shunt as a result of pressure changes in the aorta and pulmonary artery. This occurs when congestive failure supervenes.

Blood Pressure.—As would be expected, a high pulse pressure was found (average 64 mm. Hg, highest 90 mm. Hg, lowest 25 mm. Hg). No correlation was found between pulse pressure and the size of the ductus. The exercise test (Bohn, 1938) was carried out in 11 instances only, and produced a diastolic fall in eight and a rise in two. In one case the response was variable. This suggests that, although the test is not infallible, it is a useful means of confirming the diagnosis. Again no clear correlation could be found between the response to exercise and the type of ductus.

Signs.—All the patients had the classical machinery murmur. One patient had been known to have a ductus murmur for many years; when the ductus became infected there were periods when the murmur could not be heard. This could be due to one of two causes—either the ductus was becoming blocked by vegetations (this seems to have happened in the boy previously mentioned) or it might have been due to equalization of pressures as the left ventricle began to fail. There would then be little flow of blood through the ductus. This seems the more likely explanation, since it was observed that shortly before operation the murmur again became difficult to hear, and during that time the patient was cyanosed, suggesting a reversal of the shunt. On the other hand, a machinery murmur was heard in the second patient who was in failure. Although the machinery murmur is a very constant sign in persistent ductus arteriosus, it may be absent in very young children and during cardiac failure; it disappears when the ductus becomes obliterated or blocked by blood clot or vegetations, and, of course, following ligation. On the other hand a machinery murmur may rarely be present in the absence of a persistent ductus arteriosus. It may be heard in unusual sites in a persistent truncus arteriosus or aneurysm of the sinus of Valsalva. A case in which such a murmur was heard is reported by Björck and Crafoord (1947); it was due to an aneurysmal communication of an anomalous branch of the left coronary artery and a pulmonary artery. In 32 patients a thrill was felt.

X-ray Appearance.—Nineteen patients were thought to have had cardiac enlargement as judged from a simple postero-anterior film. Three of these had associated cardiac defects, leaving 16 cases of pure persistent ductus arteriosus with cardiac enlargement. Of these, five were infected and four probably infected. On the other hand, three infected cases showed no cardiac enlargement. This suggests that cardiac enlargement should make one suspect the presence of infection. Gross enlargement was present in both cases of failure; of these, the patient who was also infected presented the typical picture described by Gilchrist (1945), with a prominent pulmonary artery and patchy consolidation of the lung fields.

Incapacity.—Of the 50 cases of persistent ductus arteriosus, 33 were never incapacitated in any way. One was incapacitated by heart failure, one by palpitations, and nine when they became infected (of these, one developed congestive failure as a result of infection). One woman with an infected ductus had had a child a short time before the diagnosis was made. It is of importance to note that in addition six children had their activities unnecessarily curtailed by their parents. One child of 11, in particular,

had never been allowed to go to school. It would seem that parental overanxiety is the second common incapacitating factor in persistent ductus arteriosus.

Congenital Abnormalities.—The following congenital abnormalities were found in association: one case each of spina bifida, left-sided vena cava and arachnoidactyly, interventricular septal defect, subaortic stenosis, narrowed aorta not amounting to coarctation, and possibly a second case of left superior vena cava.

Complications

Seven cases were with certainty infected, and five were probably infected. The following case is of interest in this connexion.

Case 1.—A woman of 25 had been known to have had a ductus arteriosus since childhood. In April, 1951, she began to complain of sweating, chills, and breathlessness. Blood culture produced a growth of *Streptococcus viridans*, and a diagnosis of infected persistent ductus arteriosus was made. Treatment with penicillin brought initial improvement, but she relapsed when that was stopped after six weeks. She was then treated with aureomycin without response. It was found that so long as she was given 600,000 units of procaine penicillin daily she would keep well, except for occasional chills and joint pains. There were no peripheral signs of the infection. Anxiety was occasioned by the intermittent disappearance of her murmur. She began to accumulate oedema and was intermittently cyanosed. It was decided to ligate her ductus in spite of the smouldering infection, and operation was carried out five months after the onset of infection. The ductus was large and friable, but ligation was carried out without any great difficulty. After operation the patient's condition gave rise to anxiety, as her oedema increased and she developed multiple ventricular extrasystoles. She was treated with digitalis and diuretics with steady improvement. For the first time in three months it was possible to stop penicillin without a recurrence of symptoms and elevation of her temperature.

Cardiac failure as the first manifestation is illustrated by the following case.

Case 2.—A woman aged 40 presented with congestive cardiac failure. She was not hypertensive, and gave no history of rheumatic fever. On examination there was a typical machinery murmur, and x-ray examination showed marked cardiac enlargement, a prominent pulmonary artery, and congestive changes at both lung bases. There was calcification in the aortic knuckle. At operation the ductus was found to be calcified, and it was tied with tape, as it was feared that a silk ligature would break it. After operation there was rapid improvement in her condition and she was able to lead an unrestricted life.

Operation

The postero-lateral approach was used in all cases. Ligation with heavy silk was carried out in most of them, two ligatures being used in two grooves. Where possible, a few drops of 50% glucose solution were injected between ligatures to promote fibrosis of the ductus. In no case was division attempted. In most instances no difficulty was experienced. In three cases bleeding occurred from the ductus; two of these were infected, and once there was considerable bleeding from a large pulmonary artery. Excessive oozing occurred in three cases. On every occasion bleeding was fairly easily controlled.

Controversy exists regarding the merits of simple ligation as compared with division of the ductus. As early as 1939 Gross stated his belief that division would be preferable, but at that time thought it would not be feasible. He points out that ligation in continuity of a vessel is against all accepted principles of vascular surgery. Shapiro (quoted by Potts *et al.*, 1949) collected 643 cases of persistent ductus arteriosus operated on by 46 surgeons; of these, 8.7% recurred. Wangenstein *et al.* (1949) report two recanalizations out of 16 ligations. In view of these figures many surgeons now prefer to divide and suture the ductus. That recanalization is not impossible even then is shown by a case of Crafoord's (1948). Ligation is still the operation carried out by many surgeons, including Blalock (1946). It is preferred in this unit, as it would appear to be a safer

procedure. So far there have been no recurrences among the 50 cases operated upon. Naturally the number of recurrences will depend on the criteria accepted in diagnosing such an event, and a minimal leak may produce marked signs. Hence the figures quoted above may exaggerate the incidence of recanalization following simple ligation. It should be noted that a systolic pulmonary murmur often persists for some time after ligation, presumably as a result of dilatation of the pulmonary artery.

Although on the whole no particular anxiety was felt during most operations, the dramatic and serious events in the following case make it worth recording.

Case 3.—The patient, a girl aged 13, had suffered no symptoms, though she was mentally rather backward. Operation was carried out under thiopentone, followed by nitrous oxide and oxygen and out under thiopentone, followed by nitrous oxide and oxygen and out under thiopentone. Immediately the chest had been opened it was noticed that there was practically no bleeding. The heart was inspected. The auricles were seen to be contracting irregularly, while the ventricles were at a standstill. Cardiac massage was begun at once, followed by intracardiac adrenaline. The ventricles resumed beating immediately, and continued to do so strongly and regularly. It was estimated that they had been standing still for two to three minutes. It was decided to proceed with the operation, and this was carried out without further difficulty. After operation the patient was given cytochrome C, 2 pints (1.1 litres) of quadruple-strength plasma, and sodium succinate. She continued unconscious for two days in an attitude resembling decerebrate rigidity. A hopeless prognosis was given to her parents; nevertheless she regained consciousness and entered a period of restlessness lasting about ten days. Henceforth her mentality improved slowly, though it was many weeks before she could feed herself and had regained continence. Six months after operation she returned to school, though she has difficulty in coping. Nevertheless she appears to be improving.

An exactly similar case is described by Wangenstein *et al.* (1949). One must conclude that it is well worth while to persevere in the treatment of such cases, which in the early stages would appear to be utterly hopeless.

Post-operative Course

One boy aged 6 died two days after operation. He was a typical case of persistent ductus arteriosus, and operation was straightforward. On his way to the ward he was allowed to become cyanosed, and this was not discovered for some time. Although he eventually recovered consciousness he died of cerebral anoxaemia after two days. This death is directly attributable to a shortage of trained nursing staff. One patient had a mild wound infection which cleared rapidly. Four patients developed pleural effusions which cleared completely. One patient had a pulmonary infarct; this was one of the infected cases. Two patients required bronchoscopy for post-operative lung collapse, and one patient produced four or five tracheal casts.

Follow-up Period

This has been up to four years, and there have been no recurrences. The woman aged 40 who was in failure recurred completely—this being one of the few types of cardiac failure in which complete recovery is possible. The infected cases all recovered completely, irrespective of the use of antibiotics. In most cases, however, an attempt was made to cure the infection first by the use of large doses of penicillin. The children who were handicapped by the knowledge of heart disease have all returned to a normal life.

Summary and Conclusion

Fifty cases of ligation of persistent ductus arteriosus, with one death, are analysed. Ten physically handicapped patients made a complete recovery, and six who were held back by the knowledge of heart disease were allowed to return to normal life.

No certain knowledge is available to show how many of the asymptomatic cases, had they been left alone, would have gone on to obliteration of the ductus. It is well known that persistent ductus arteriosus is un-

common in the elderly, and this is sometimes taken as proof of the poor prognosis of the condition. On the other hand, it may mean that obliteration does occur more often at a later age than is at present recognized. Nevertheless, operation seems well justified in view of its low mortality as compared with the dangers of a persistent ductus—mainly subacute bacterial endarteritis and cardiac failure. In some cases the accelerated growth and development following operation are striking. For these reasons operation should not be too long delayed, and about 7 years probably represents a good age to operate.

My thanks are due to Mr. G. L. Cruickshank, who carried out the operations, for permission to publish this series.

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REDUCTION OF POST-OPERATIVE PAIN

BY

D. LINCOLN LEWIS, M.C., M.Chir., F.R.C.S.

AND

W. A. L. THOMPSON, M.B., Ch.B.

(From the Royal Salop Infirmary)

The object of this communication is to present a simple way of diminishing post-operative pain in abdominal incisions. Briefly, analgesia is obtained by injecting procaine every three hours into the rectus sheath through polythene tubes for a period of three days. The method was first used by Blades and Ford (1950) in chest operations, and they suggested that it might prove successful in abdominal surgery. It was subsequently employed by Gerwig, Thompson, and Blades (1951) in 24 patients undergoing cholecystectomy. These writers came to the conclusion that it guaranteed satisfactory analgesia in upper paramedian incisions.

Pain is the chief factor preventing full respiratory excursions and adequate coughing after abdominal operations. Pain can be diminished by morphine, but morphine has an inhibitory effect on the cough reflex, and this may cause pulmonary complications sufficient to endanger a patient who has had an operation such as partial gastrectomy. Pooler (1949) found that pulmonary complications occurred in 19% of patients after upper abdominal operations. Using a spirometer, he found that there was a great diminution in vital capacity. He came to the conclusion that reflex muscle spasm was the chief cause of this reduction, and something more than the abolition of conscious pain was required. This could be accomplished only by interrupting the reflex arc on the afferent side.

Present Investigation

We were led to try the method of local infiltration with procaine, with a few modifications, after observing the reactions of a healthy young man who developed pulmonary collapse following a simple laparotomy through an upper paramedian incision. He had a great deal of pain in the

wound and needed five injections of morphine and pethidine during the first three post-operative days. He would not cough even with persistent encouragement. His temperature rose to 103° F. (39.4° C.) on the second day and remained at over 100° F. (37.8° C.) for three days. It was felt that this complication could have been avoided by the use of some method which reduced wound pain locally.

In this investigation polythene tubes were used in a consecutive series of 30 upper abdominal operations (see Table). The method adds less than 30 seconds to the operative time.

Summary of Cases

Case	Age	Operation	Post-operative Temperature
1	59	Polya type of gastrectomy	100° F. (37.8° C.) 1st and 2nd days
2	46	" " "	99° F. (37.2° C.) 1st, 2nd, and 3rd days
3	48	" " "	100° F. 1st and 2nd days
4	70	" " "	100° F. 1st day
5	57	Billroth I gastrectomy	Normal
6	64	Polya type of gastrectomy	99° F. 2nd day
7	48	" " "	99° F. 1st and 2nd days
8	47	Billroth I gastrectomy	101.5° F. (38.6° C.) 2nd day, 100° F. 6th and 7th days
9	51	Polya type of gastrectomy	100° F. 1st day, 99° F. 2nd day
10	44	" " "	99.5° F. (37.5° C.) 2nd and 4th days
11	42	Billroth I gastrectomy	99.5° F. 1st and 3rd days
12	54	" " "	99° F. 1st, 2nd, and 3rd days
13	34	Polya type of gastrectomy	100° F. 1st day
14	50	Billroth I gastrectomy	99.5° F. 1st day, 99° F. 2nd day
15	40	" " "	99° F. 1st and 4th days
16	37	Polya type of gastrectomy	100° F. 1st day, 99° F. 2nd day
17	49	" " "	Normal
18	42	" " "	99° F. 1st day, 99.5° F. 2nd day
19	50	Billroth I gastrectomy	100° F. 1st day, 99.5° F. 2nd day
20	51	Polya type of gastrectomy	Normal
21	52	Billroth I gastrectomy	99.5° F. 3rd day, 99° F. 4th day
22	31	Polya type of gastrectomy	Normal
23	54	" " "	99° F. 1st day, 100° F. 2nd day
24	56	Billroth I gastrectomy	100° F. 1st and 2nd days
25	78	" " "	100° F. 1st day, 99° F. 2nd and 3rd days
26	55	Gastro-enterostomy	99.5° F. 2nd day
27	44	Billroth I gastrectomy	99° F. 2nd and 3rd days
28	40	" " "	99.5° F. 3rd day
29	52	Polya type of gastrectomy	99° F. 1st day
30	54	Billroth I gastrectomy	Normal

All the cases had considerable relief from pain a few minutes after the injections were given. This in itself should make it a valuable addition to post-operative treatment, since a sense of well-being improves morale. Patients were able to carry out their breathing exercises unhampered by pain, movement in bed was facilitated, and ambulation was made more comfortable. Another point of interest was that some patients found that the passage of urine and flatus was much easier after the injections of procaine. There was no delay in healing or any evidence of wound infection. It is obvious that great care should be taken not to introduce infection at the time of injection.

It was found, however, that many patients did not sleep during the first night, though pain was relieved. They did not complain of pain, but remained wide awake because cerebation was active. To combat this sleeplessness, an injection of soluble phenobarbitone, 3 gr. (0.2 g.), and pethidine, 100 mg., was given on the first night. In anxious patients this was repeated on the second night. The procaine injections were used only for the first three days after operation, as after this time wound pain was not severe enough to call for continuation of the treatment. A degree of euphoria was noted in some cases, possibly due to a central effect of procaine.

The method was also found to be successful in midline incisions, the tubes being placed between the peritoneum and the linea alba.

Anatomy

The rectus sheath is formed in its upper three-quarters by the aponeurosis of the internal oblique muscle, which splits at the lateral border of the rectus muscle into an anterior and a posterior layer. These layers fuse with each other and with those of the other side at the linea alba. The aponeurosis of the external oblique muscle fuses with this anterior layer and the transversus muscle with the posterior

layer. In the lower quarter all three aponeurotic layers pass in front of the rectus muscle, leaving behind it only the fascia transversalis and the peritoneum.

The nerve supply of the rectus muscle, its sheath, and the subjacent peritoneum is derived segmentally from the lower intercostal nerves. T.7 supplies the upper part, T.10 the level of the umbilicus, and L.1 the lower part above the pubis. The terminal part of a typical lower intercostal nerve enters the posterior aspect of the rectus sheath near its lateral border. It supplies branches to the sheath and to the subjacent peritoneum. It then passes forwards, through the rectus muscle which it supplies, and terminates in the overlying skin.

Technique

After closure of the peritoneum a No. 16 B.W.G. needle is inserted through the skin 4 cm. lateral to the lower third of a paramedian incision, and continued obliquely upwards and inwards, passing through the anterior rectus sheath and the rectus muscle. Along the bore of this needle a size 1 polythene cannula is introduced into the space between the posterior rectus sheath and the rectus muscle. The needle is withdrawn and the polythene tube pulled upwards towards the costal margin. It is most important to be sure that this tube is as high up in the sheath as possible. Failure to ensure this will result in the patient's complaining of pain over the seventh and eighth costal cartilages. The pain is probably due to bruising of the cartilages by retraction at the time of operation.

A second tube is introduced into the upper third of the rectus sheath in the same way and passed downwards towards the lower end of the sheath. This method of placing the tubes lessens the chance of accidental removal before the end of three days. Further fixation of the tubes is obtained with elastic adhesive bandage in the form of a modified watershed dressing after closure of the wound.

Before the patient leaves the theatre 4 ml. of 2% procaine is injected into each tube. A further 3-5 ml. is injected every three hours into each tube for the next three days. The amount injected depends on the thickness of the abdominal wall. If only 2 ml. is injected the period of analgesia is very short. Penicillin, 300,000 units every four hours, is given the night before operation and continued for five days.

Conclusions

Procaine injected through polythene tubes into upper abdominal incisions satisfactorily controls post-operative pain.

The necessity for post-operative narcotics is greatly diminished.

Breathing and coughing are facilitated, with consequent diminution in pulmonary morbidity.

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The staffing of many small homes for old people which are being opened throughout the country is an acute problem, and in an attempt to meet this need the National Old People's Welfare Committee has initiated a training course for matrons and assistant matrons. The fourth of these courses, which are supported by the Ministry of Health, begins in October; it will last for four months and comprise theoretical teaching and practical training in the geriatrics units of London hospitals and in old people's homes. Local education authorities are encouraged to assist students from their areas with grants towards the cost of tuition. Further information about these courses may be obtained from the National Old People's Welfare Committee, 26, Bedford Square, London, W.C.1.

A "NEW" Rh ANTIBODY, ANTI-f

BY

R. E. ROSENFELD, M.D.

P. VOGEL, M.D.

NATALIE GIBBEL, A.B.

Mount Sinai Hospital, New York, N.Y., and Bureau of Laboratories, Department of Health, New York, N.Y.

RUTH SANGER, Ph.D.

AND

R. R. RACE, Ph.D., M.R.C.S., F.R.S.

Medical Research Council, Blood Group Research Unit, the Lister Institute, Chelsea Bridge Road, London, S.W.1

A "new" Rh antibody, which we propose to call anti-f, has been found in the serum of a man, Mr. Cl., aged 30, who suffers from haemophilia.

Since childhood Mr. Cl. has received about 35 transfusions of blood, the last of which, in December, 1951, was followed by a shaking chill. He was seen by us, for the first time, in March, 1952,* when three blood-group antibodies were found in his serum—anti-B, anti-K, and anti-S. In addition there was at least one other unidentified antibody. In the hope of clarifying the reactions of this antibody 0.25 ml. of O, NsNs, cDe/cde, kk blood was injected on two occasions; following this, the presence of anti-N was disclosed and, in addition, the antibody anti-f, which is the main reason for this publication.

The blood groups of Mr. Cl. are: A₁, MsMs, P+, CDe/cDE, Lu(a-), K-, Le(a+b-), Fy(a+), Jk(a+b+).

The serum of Mr. Cl. can be absorbed free of the other antibodies, leaving anti-f alone. This absorbed serum has been used to test the blood of 276 unrelated white people and 114 of their relatives. From the results it is clear that the antigen recognized by anti-f is part of the Rh complex of antigens; it is also clear that the antigen is not associated with any other of the known blood-group antigens, with sex, or with the ability to taste phenylthiocarbamide.

Properties

In brief, the antibody reacts with a product of the chromosomes cde and cDe, which may consequently be distinguished by the addition of f. We have been able to classify all the important chromosomes save the rare cD^ue (which we expect to have f).

If the absence of f is indicated by the letter F the chromosomes are:

cdef, cDef, CDeF, cDEF, C^wDeF, CdeF, cdEF, CD^ueF, cD^uEF, CDEF, CD^uEF, C^wdeF, and CdeF.

These are the usual Caucasian chromosomes. For reasons which will be given in a later communication, we expect certain less common combinations to exist—namely, cDeF, cdeF, CDeF, and cDEF. We have found a sample of blood giving the reactions expected of cDeF/cdeF and one giving the reactions expected of cdeF/cdef. If the genes are arranged in a linear order on the chromosome then the order CDEF fits best with the observed facts.

If anti-F exists, as we presume it does, it will be difficult to identify with the test cells commonly available: it will give the reactions of a mixture of anti-C and anti-E, and, furthermore, it may be combined also with anti-D.

*Referred by the Hemophilia Foundation, Inc.

Anti-f agglutinates red cells suspended in albumin, and the results can be confirmed by absorption tests. The reaction of homozygous, ff, cells is stronger than that of heterozygous, Ff, cells. The antiglobulin test is not particularly useful with this example of this antibody.

Anti-f does not promise to be of any great practical importance in routine Rh blood-group work. Certainly it splits off CDe/cde and CDe/cDe from CDe/cDE, CDe/cdE, and Cde/cDE; it also separates Cde/cde from Cde/cdE. But these are hardly day-to-day problems. There is evidence that anti-f may be present in some anti-e and anti-c sera, and so these sera are laid open to investigation from this angle.

From a theoretical point of view anti-f is obviously of the first importance and must be taken into account in any thought about the Rh groups. Many interpretations of this new antibody have been considered, but the reactions can be most simply and conservatively explained by the postulation of a fourth allelomorph pair of Rh antigens, f and F.

A detailed account of the serological and genetical work on anti-f will be published soon, together with acknowledgment to many people who have helped us by collecting samples of blood of rare Rh genotypes.

THREE CASES OF SUPPURATION DUE TO FUSIFORMIS INFECTION

BY

W. M. R. HENDERSON, M.D.

Pathologist, Pembury Hospital, Tunbridge Wells, Kent

A number of non-sporing, non-motile, anaerobic bacilli have been isolated by different workers from necrotic lesions in man and animals. They represent an ill-defined group of organisms classified at the moment as the genus *Fusiformis* (Topley, Wilson, and Miles, 1948). The term "necrobacillosis" has been given to the disease they cause in man.

These organisms have been demonstrated in the normal flora of the mouth, intestines, and genito-urinary tract by Beveridge (1934) and others, and in a variety of human pathological lesions, including ulcerative colitis (Dack, Dragstedt, and Heinz, 1936), in osteomyelitis and mastoiditis (Chandler and Breaks, 1941), in infected wounds (Forbes and Goligher, 1944), in post-abortive fever (Jones, 1944), in puerperal fever (Harris and Brown, 1927), and in appendicitis (Veillon and Zuber, quoted by Topley *et al.*, 1948). These organisms have also been isolated from various necrotic conditions in animals, such as calf diphtheria and labial necrosis of rabbits. A fuller description of these organisms is given by Beveridge (1934), Lemierre (1936), and Schwabacher and Mitchison (1947).

Organisms of the *Fusiformis* group were isolated from the following cases of peritonitis (two cases) and ischio-rectal abscess (one case), and the characteristics of the organisms were substantially the same in all.

Case Reports

Case 1.—A married woman aged 45 was admitted to hospital on March 14, 1950, complaining of pain and tenderness in the right groin for the past eight days. On examination the abdomen was distended and shifting dullness was present. A large ill-defined mass was felt in the right loin and the overlying skin was red and oedematous. Laparotomy was performed next day and general peritonitis was

found with many adhesions. Gentle exploration of the upper right abdominal quadrant liberated a gush of foul-smelling pus, and 2 pints (1.1 litres) was removed by suction, a drain was inserted, and the abdomen was closed. A provisional diagnosis of appendix abscess was made at this time. A course of penicillin, 250,000 units twice a day, and streptomycin, 0.5 g. once a day, was started. In spite of this her temperature did not settle and a further operation was performed on March 23. At this a further 2 pints (1.1 litres) of pus was evacuated through a right subcostal incision, presumably coming from a subphrenic abscess. The patient slowly improved after this, although foul-smelling pus continued to be discharged from her wound for several days. The streptomycin was discontinued after nine days and the penicillin after two weeks, when a total of 6,250,000 units had been given. The patient made a slow but satisfactory recovery, and was discharged a few weeks later.

Case 2.—A man aged 64 came to the out-patients' department complaining of a painful lump on his buttock. On examination an ischio-rectal abscess was discovered. This was incised and about 4 oz. (114 ml.) of foul-smelling pus was evacuated. A drain was inserted, an injection of 1 ml. of "prolophen" was given, and the patient was sent home to rest. A further injection of prolophen was given next day, and the dressing was changed. Two days later he was feeling well and comfortable, and his abscess was discharging through the incision. A week later the wound was healed and the patient was completely cured.

Case 3.—A man aged 43 complained of sudden onset of pain in the lower abdomen. On examination he was pyrexial and there was generalized abdominal rigidity with tenderness in the right iliac fossa. A diagnosis of perforated abdominal viscus was made, and a laparotomy was performed the same day. Free pus was found in the peritoneal cavity, and the appendix was acutely inflamed and had perforated. The appendix was removed and a suitable drain inserted. Penicillin, 500,000 units a day, was given for seven days (a total of 3,900,000 units). Eleven days after admission he began to have rigors and a mass could be felt in the right loin. A second operation was performed, at which $\frac{1}{2}$ pint (285 ml.) of foul-smelling pus was released under pressure from the right paracolic gutter. Two drainage tubes were put in, and a course of chloramphenicol was begun, 8.5 g. being given in five days. The patient made an uneventful recovery.

Bacteriology

In all three cases foul-smelling dirty-brown pus was obtained from the abscesses. Films stained by Gram's method showed pus ++, necrotic debris, and some small Gram-negative bacilli. In addition, in Case 2 some Gram-positive cocci and in Case 3 both Gram-positive cocci and large Gram-negative bacilli were also seen. The material was inoculated on to blood-agar plates and incubated aerobically and anaerobically.

The aerobic plates in Case 1 were sterile, in Case 2 they grew a few colonies of *Staph. saprophyticus* and *Bact. coli*, and in Case 3 *Bact. coli* only. After 24 hours' incubation the anaerobic plates in all cases showed some very small pin-point colonies resembling those of *Haemophilus influenzae*. After 48 hours the colonies measured 0.5–1 mm. in diameter, were smooth and convex, and were slightly opaque like drops of milky water. Stained films showed them to be composed of slender pleomorphic Gram-negative cocco-bacilli, some the size of *H. influenzae* and others as large as coliforms. There were also a few slender filamentous forms. A small zone of haemolysis was now apparent surrounding the colonies. The organisms were subcultured on to blood agar, plain nutrient agar, and into Robertson's meat broth and incubated aerobically and anaerobically. All aerobic plates remained sterile, but the organism grew satisfactorily on blood agar and plain agar under anaerobic conditions, and it also grew in Robertson's broth, from which it was again subcultured on to blood agar and grown anaerobically. At no time was the organism grown under aerobic conditions. The addition of a few

drops of laked horse cells (to supply the X factor) or streaking the plate with *Staph. pyogenes* (to supply the Y factor) did not enable the organism to grow aerobically, but the growth on the anaerobic plates appeared to be improved by their addition, and "satellitism" around the staphylococcal colonies occurred.

In Case 3 an anaerobic streptococcus was grown as well as the fusiformis. The association of anaerobic streptococci with these organisms has already been quoted by Lemierre (1936). The organisms were kept going quite easily by subculturing every two or three days on to fresh blood-agar plates. Acid but no gas was produced in lactose, glucose, maltose, and saccharose, though not in dulcitol or mannite. Two or three days' incubation in an anaerobic jar was required to produce a satisfactory growth in the sugars. The addition of serum to the sugar media did not appear to be necessary. Indole was produced by Case 3 but not by the other two. Gelatin was not liquefied by any of the organisms, and the reaction in milk was neutral. The organism from Case 3 was found to be sensitive to penicillin, streptomycin, and chloramphenicol; the others were not tested.

Broth cultures of the organisms from Cases 1 and 2 were inoculated subcutaneously into guinea-pigs with no apparent ill effect. The animals were killed four weeks later and no abnormality was discovered at the post-mortem examination. Unfortunately no rabbits were available at this time.

Discussion

The organisms from these three cases had very similar cultural and biochemical characteristics, which, so far as they went, also agreed with the descriptions by Schwabacher and Mitchison (1947) for two strains of the genus *Fusiformis* and by Topley *et al.* (1948) for *Fusiformis fragilis*. The organism from Case 3 differed from the others by producing indole, but Chandler and Breaks (1941), Forbes and Goligher (1944), and Owen and Spink (1948) all described indole production in their cases.

There is no doubt that there must be many strains in this group, as various individuals have reported different characteristics, but it is thought that the organisms described in this paper can reasonably be included in the genus *Fusiformis*—the main characteristics of the group being that they are non-spore, non-motile, anaerobic Gram-negative cocco-bacilli which show a variable amount of pleomorphism and filamentous forms. The material from which they are originally obtained is usually foul-smelling pus. Colonial and morphological appearances resemble the *Haemophilus* group, but their ability to grow without X and Y factors, and their dependence on strict anaerobic conditions, exclude them from this group.

In dealing with material from the female genital tract it is important not to confuse fusiformis organisms with morphologically similar Gram-negative cocco-bacilli, which can often be grown from the normal vagina. These latter organisms are not true anaerobes and will grow aerobically as long as X and Y factors are present, but will not grow on plain agar. Moreover, the colonies are smaller and do not show the "milky water" appearance of fusiformis. As they can be found in the flora of the normal vagina of healthy adults and young girls, they are not regarded as pathogenic, and their dependence on X and Y factors for growth suggests that they may be members of the *Haemophilus* group, possibly related to *H. ducreyi*.

The three cases of necrobacillosis described in this paper all recovered, and the one organism tested was found to be sensitive to penicillin, streptomycin, and chloramphenicol. It therefore seems that with modern antibiotics, and surgical drainage where indicated, the prognosis in these cases is good.

Summary

Three cases of suppuration due to infection by fusiformis organisms are described. All made satisfactory recoveries.

The morphological and cultural characteristics of the organism are described, and are compared with those reported by other workers.

A morphologically similar organism found in the normal vagina, which must not be mistaken for fusiformis, is briefly mentioned.

With suitable antibiotic treatment, and surgical drainage where indicated, the prognosis in infection with these organisms is regarded as good.

I wish to thank both Dr. J. L. Pinniger, of St. Thomas's Hospital, London, in whose laboratory this work was done, and Dr. Mary Barber, of the Department of Bacteriology, St. Thomas's Hospital Medical School, for their helpful criticism and advice.

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EXPERIMENT TO DETERMINE IF A PROGUANIL-RESISTANT STRAIN OF P. FALCIPARUM WOULD RESPOND TO LARGE DOSES OF PYRIMETHAMINE

BY

S. AVERY JONES, M.R.C.S., L.R.C.P., D.P.H.
D.T.M.&H.

(From the Division of Insect-borne Diseases, Medical Research Laboratory, Nairobi)

This experiment was undertaken to find out if a proguanil-resistant strain of malaria also showed partial or absolute resistance to pyrimethamine ("daraprim"). I was both subject and experimenter. By the co-operation of Dr. G. I. Robertson, of the I.C.I. laboratory, Nairobi, I received 10 bites by five mosquitoes (*A. gambiae*) infected with a proguanil-resistant strain of malaria parasite imported from the Tampin area in Malaya.

The biting took place on August 21, 1952. All mosquitoes showed sporozoites on dissection. Parasites appeared in the blood on September 1 (Day No. 1) (see Table).

Course of the Infection

Day No.	Maximum Parasitaemia	Ring/Leucocyte Ratio	Treatment	Time of Treatment
1	38/50 leucocytes	0.7:1	50 mg. pyrimethamine	Noon
2	53/50 "	1:1	50 " "	"
3	94/50 "	2:1	100 " "	2 p.m.
			100 " "	10 "
4	625/50 "	12:1	50 " " i.v., 7 tab. chloroquine in divided doses	1 "
5	763/50 "	15:1	10 gr. quinine i.v. and 10 gr. by mouth, 6 tab. chloroquine in divided doses	1 "
6	58/50 "	1:1	4 tab. chloroquine and 20 gr. quinine in divided doses	

REFERENCE

- Wilson, T., and Edeson, J. F. B. (1953). *British Medical Journal*, 1, 253.

This year the number of students applying for admission to American medical schools has again declined, according to a survey by the director of studies for the Association of American Medical Colleges. 3,150 fewer students applied this year than in 1951–2, 7,600 less than three years ago. Of the 16,763 persons applying last autumn only 7,778 were accepted. The survey also shows that the average pre-medical student applies to three or four medical schools, and that the geographical distribution of students is uneven, half the candidates coming from only seven States. One cautious student applied to 45 medical schools and was accepted by one.

On the third and fourth days the white blood cell counts were 4,100 and 4,500 per c.mm. respectively. After the sixth day recovery was rapid, and I was able to leave hospital on the tenth day feeling fit. At no time was toxæmia profound, and mental clarity was retained throughout, though headache became very severe on the fourth day.

Discussion

I had not previously had malaria, so immunity played no part in the infection. The experiment proved that a strain of malaria resistant to proguanil can show absolute resistance to pyrimethamine. This is hardly surprising when it is realized that pyrimethamine resulted from research on the antimalarial properties of diaminopyrimidines undertaken because these compounds showed a structural analogy with proguanil and similarities of microbiological behaviour. It is probable that both drugs act upon the same enzyme system of the malaria parasite.

It is evident that medical policy in Kenya has been wise, in that the African population has not been subjected to treatment with proguanil on a large scale. Because of dispensing difficulties in Reserves this might have been given in doses small enough to allow the widespread rise of resistant strains. The same applies, in theory, to pyrimethamine, though the drug is effective in such small doses that this danger seems unlikely to occur. The sale of 5 mg. tablets for prophylaxis would be dangerous, as adult Africans would use them for treatment, with the certainty of underdosage. Perhaps only tablets of not less than 25 mg. should be allowed for sale. These are readily divisible for treating infants, and, as the drug has a very low toxicity, there seems little to fear from overdosage. Generally speaking, it is probable that the majority of people taking pyrimethamine will do so in doses that, though harmless, are far more than actually required to eradicate infection. The fact that the drug is tasteless and cheap should ensure this.

In a recent paper Wilson and Edeson (1953), as a result of work in Malaya, report no difference in response to pyrimethamine between unselected strains of malaria and those resistant to proguanil. East African strains of malaria parasites are extremely sensitive to pyrimethamine, though recently a case of subtertian malaria which did not respond to pyrimethamine has been encountered, the resistance of the infecting parasite being confirmed by subinoculation. It would be a tragedy if other resistant strains were imported. The presence of men of the King's African Rifles in Malaya creates a hazard, and it is hoped that special care will be taken that none return to East Africa with the gametocytes of Malayan strains of malaria in the blood.

I thank the Director of Medical Services, Kenya, for permission to publish this paper and Dr. B. P. Harris for undertaking treatment at the conclusion of the experiment, when intervention became necessary; thanks are also due to the senior parasitologist, Dr. R. B. Heisch, who watched the parasite rate when I was unable to do so, and to Dr. G. I. Robertson for the great help and interest shown by him in the experiment. The nursing skill and attention were beyond praise.

Medical Memoranda

Persistent Ductus Arteriosus and Pregnancy

The following case is reported because of the current interest in congenital heart disease and on account of the rarity of a second confinement in a woman with persistent ductus arteriosus.

CASE REPORT

A woman aged 31, who withstood one previous confinement surprisingly well, and who had given birth to a healthy full-term infant in June, 1948, after a normal labour lasting 11 hours 40 minutes, was referred to hospital in March, 1951.

There was no history of rheumatic fever, chorea, or recurrent sore throats. She did not suffer from dyspnoea and had never noticed any oedema of the ankles. She had become pregnant for the second time, and the expected date of confinement was in June, 1951. On physical examination there was no clinical evidence of cardiac enlargement; the maximal impulse, which was normal in character, was situated in the fifth intercostal space, just inside the mid-clavicular line. A thrill and a loud clanging murmur were audible to the left of the manubrium. The murmur was maximal at the end of systole and continued through the second sound into diastole. The blood pressure was 125/70. The electrocardiogram was within normal limits. A skiagram of the chest revealed slight left ventricular enlargement and dilatation of the pulmonary artery. Pregnancy pursued its usual course, a normal confinement occurred in June, and the puerperium was uneventful.

COMMENT

Congenital heart disease comprises about 1% of all organic heart disease, so that it is a rare finding in pregnant women. Donovan (1936) expresses the opinion that congenital lesions constitute a contraindication to pregnancy. Most authorities entirely disagree with this opinion. In 1905 Pouliot stated that marriage was contraindicated in congenital heart disease only in the presence of cyanosis, and in 1912 Couderc concluded that if the condition was compatible with adult life the prognosis depended less upon the form of the lesion than upon the state of compensation, the size of the heart, the degree of cyanosis and polycythaemia, parity, and the advent of complications, especially tuberculosis and endocarditis.

Mendelson and Pardee (1941) review a series of 20 cases of congenital heart disease admitted to the New York Lying-in Hospital over a period of nine years. The total number of obstetrical patients in this period was approximately 31,000. In their series there were two cases of persistent ductus arteriosus, the average age being 24, and the average parity 0.5. There was no dyspnoea, cyanosis, polycythaemia, or any cardiac difficulty during pregnancy, labour, or the puerperium. Including the series of Couderc (1912) and Jensen (1938) there are 31 other reported cases of persistent ductus arteriosus complicating pregnancy. Jensen found the average age to be 27.2 and the average parity 2.2. There are six recorded deaths, only two of which can be attributed to the lesion—one patient died of congestive failure at five months' gestation (Von Schulz, 1928) and the other died of congestive failure following caesarean section at term. There is no mention of any cardiac difficulty during pregnancy, labour, or the puerperium in the other cases.

In persistent ductus arteriosus the danger of a veno-arterial shunt developing during labour or the puerperium has been stressed in the literature. Alarming symptoms may unexpectedly develop immediately after delivery. The symptoms are dyspnoea and tachycardia without venous congestion. Carr and Hamilton (1933) suggest that these symptoms are due to a sudden fall in peripheral resistance following emptying of the uterus, and state that they are more apt to occur after caesarean section than after normal delivery. Certain precautions should be taken to avoid this possibility. Arterial blood pressure should be maintained by

avoiding traumatic procedures and post-partum haemorrhage, or by promptly instituting appropriate measures in the event of such occurrences. Judicious use of forceps will obviate undue bearing-down pains, with resulting increased pressure in the pulmonary circuit. Particular attention should be paid to the avoidance of infection. Binding the limbs and abdomen after delivery has also been recommended.

My thanks are due to Dr. M. W. Bailie, who referred the patient to hospital. He conducted the second confinement and provided the details of her first pregnancy.

R. J. KERNOHAN, M.D., M.R.C.P., D.P.H., D.C.H.,
Physician, Mid-Antrim Hospital Group.

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Aberrant Branch of the Splenic Artery

In the course of dissection of museum specimens at Guntur, Madras State, the following variation has been noted. From the splenic artery a fairly large branch is seen to enter the spleen near the medial end (see Diagram). This is in addition to the usual branches that enter the spleen near the hilum. This branch is given off from the splenic artery before the left gastro-epiploic.

It is unusual to encounter branches from the splenic artery entering the spleen except at its hilum. Though it

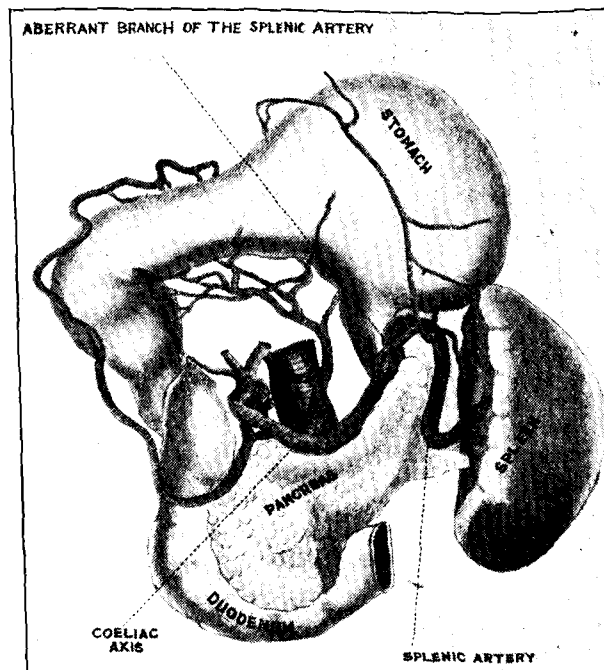


Diagram showing the aberrant branch of the splenic artery.

is a rare type of anomaly, this finding is described, as it has to be borne in mind by surgeons when performing a splenectomy. This arterial branch has to be separately ligated from the splenic artery, as this is given off proximal to the left gastro-epiploic artery. Failure to ligate arteries like this, when present, may account for some of the haemorrhages that result from splenectomy.

My thanks are due to the Principal of Guntur Medical College for the specimen.

V. SITARAMA RAO, M.B., B.S., M.Sc.,
Associate Professor of Embryology and Histology,
Stanley Medical College, Madras.

Reviews

SCIENTIFIC BASIS OF MEDICINE

Lectures on the Scientific Basis of Medicine. Volume I. 1951-2. British Postgraduate Medical Federation. (Pp. 396; illustrated. £1 10s.) London: The Athlone Press. 1953.

This is described as the first of a series of annual volumes to be based on the series of lectures under this title which are arranged each winter by the British Postgraduate Medical Federation. Of the 39 lectures delivered during the winter of 1951-2, 18 are included in this first annual volume. The range of topics is wide, and it is not possible to summarize them in a few words. Most of the articles are transcripts of the lectures and run to 6,000-8,000 words. Two of them, however, have been expanded to over 20,000 words—"Studies of Normal and Pathological Physiology of the Kidney," by Van Slyke, and "Growth of the Human at the Time of Adolescence," by J. M. Tanner—and must therefore be regarded as reviews rather than lectures.

In previous book reviews I have expressed doubts about the value of collecting series of lectures into annual volumes unless they are of the nature of a symposium. The proper place for lectures on the scientific basis of medicine is in the weekly journals, despite recent suggestions that many members of our profession are interested only in reading a strictly practical journal for general practitioners. Leaving this question on one side, I believe that most doctors who have preserved the habit of reading would enjoy each and any of the 18 lectures printed in this volume, whatever branch of medicine they are pursuing, and the British Postgraduate Medical Federation is to be congratulated on having stimulated the production of these interesting lectures.

L. J. WITTS.

B.C.G. VACCINATION

B.C.G. Vaccination. Studies by the WHO Tuberculosis Research Office, Copenhagen. Report prepared under the direction of Lydia B. Edwards, M.D., and Carroll E. Palmer, M.D., Ph.D., with the assistance of Knut Magnus. Monograph Series, No. 12. (Pp. 307. 15s., \$3, French francs 960, or Swiss francs 12.) Geneva: World Health Organization.

This monograph consists of a series of reports on work carried out by the World Health Organization's Tuberculosis Research Office at Copenhagen. The substance of many of the reports has already been published in British and American journals. The present volume, however, contains not only 150 pages of descriptive text but also a further 150 pages of appendices setting out the original observations in tabular form.

The chief aim of the inquiry was to study the numerous variables that affect vaccination with B.C.G. For this purpose the quantitative response of children to tuberculin was used as the main tool. Observations were made on a total of over 40,000 schoolchildren, most of them in Denmark, but some in Egypt, India, and Mexico. Instead of taking an arbitrary figure, such as 6 mm. of induration and over, as a positive reaction, the authors measured the transverse diameter of the reactions and plotted them as histograms. In this way surprising differences were revealed between the behaviour of unvaccinated children in different countries. In Denmark, for example, a high proportion of all children were insensitive to the intradermal injection of 10 T.U. In Egypt and Mexico, on the other hand, some of the children were insensitive or practically so and others reacted strongly, thus giving a bimodal histogram. An increase in dose to 100 T.U. had little effect on the non-reactors in Denmark, but converted many of the non-reactors in Egypt to weak reactors. The authors therefore recognize a high-grade type of sensitivity characterized by a strong reaction

to a small dose of tuberculin, and a low-grade type characterized by a weak reaction to a small dose and a stronger reaction to a large dose. They bring evidence to suggest that the high-grade type of sensitivity is alone indicative of specific infection with the tubercle bacillus.

Other studies lead to the conclusion that there is no simple relationship between the severity of the local reaction after B.C.G. vaccination and the strength of the subsequent allergic response; that B.C.G. vaccine retains its full potency for at least four weeks when stored at 2-4° C., but falls off rapidly at temperatures over 30° C.; that sunlight has a most damaging effect on the vaccine, five minutes' exposure to Egyptian sunshine destroying 99% of the organisms; and that the degree of allergy produced by a given batch of vaccine depends to some extent on the proportions of living and dead bacilli present.

This work, it need hardly be said, is of absorbing interest to the immunologist, and has important practical applications to the attempted control of tuberculosis by vaccination. It is pioneer work carried out by visionaries in the international field, raising more problems than it has solved, and emphasizing once more the danger of assuming that epidemiological conclusions reached in one country are necessarily valid for other countries. The World Health Organization is to be congratulated on its wisdom in fostering this inquiry, and Dr. Carroll Palmer with his associates for their imagination and skill in undertaking a task of such magnitude.

G. S. WILSON.

THE WHITE PLAGUE

The White Plague: Tuberculosis, Man, and Society. By René and Jean Dubos. (Pp. 277. 15s.) London: Victor Gollancz. 1953.

This book is written for laymen as well as for scientists. The reconciling of the language of medicine with presentation to the non-medical reader is always a difficult task. The writer is apt to be too technical and prosy for the layman, or too simple and trite for the pundit. The authors here have skilfully avoided either extreme, and the result is a book of equal interest to both classes of readers.

Part I is devoted to the "White Plague" in the greater part of the nineteenth century, when it was rife, favoured by overcrowding, treated in overheated, ill-ventilated rooms, believed not to be contagious, and the cause was unknown. It often assumed epidemic proportions when introduced into schools, convents, barracks, and among primitive races. To adorn the tale, accounts are given of famous sufferers from the disease—for instance, Keats, Shelley, Paganini, Chopin, and the Brontës. With regard to the Brontës, the usual view is adopted that the Reverend Patrick Brontë was a chronic consumptive and infected his children. It seems more probable that the tuberculosis which destroyed one by one all the members of that gifted family was contracted primarily at Cowan Bridge School, the "Lowood" which Charlotte pilloried in *Jane Eyre*. Two sisters, Maria and Elizabeth, were infected there and, presumably, Charlotte and Emily also. Maria and Elizabeth died after being brought home, and they or Emily transmitted the infection to their brother Branwell and sister Anne. Tuberculosis was endemic in the school. The authors consider there may be some basis for the statement that consumption fosters and nourishes genius, but, as Dr. Andrew Morland has pointed out, creative artists and writers, engrossed in their work and often exposed to privation in their early years, are a likely prey to the tubercle bacillus.

Part II is on the causes, Part III on the prevention and cure of tuberculosis, and Part IV on tuberculosis and society. The book thus ranges over a wide field in the discussion of a complex subject. The authors seem sceptical about therapeutic and surgical treatment and put more faith in public health measures, common sense, and individual and social conscience than in B.C.G. and chemotherapy. Prevention

has achieved much in lowering the incidence and mortality of tuberculosis, and it is highly important in Britain that the treatment of tuberculosis under the National Health Service shall be closely co-ordinated with the preventive work of the local authorities.

Epidemiologists are unlikely to agree with the contention on p. 185 that a study of mortality curves over 150 years shows that tuberculosis began to decrease before any specific measures had been taken against the disease. Reliable figures of the mortality from all forms of tuberculosis in England and Wales first became available since the decennium 1851-60, and do show a marked decline. Since 1848, however, environmental hygiene has greatly improved, especially for the poor. There has been a higher standard of living, more institutional segregation of the highly infective patient, cessation of indiscriminate expectoration, and, as a consequence of these things, less exposure of the public to massive infection. Furthermore, the direct attack on tuberculosis must have exerted a beneficial effect. Yet tuberculosis is still a killing disease, and this book should help to stimulate further endeavour, especially as regards co-operation of the public in preventive measures.

ARTHUR S. MACNALLY.

BRITISH PSYCHOLOGY TO-DAY

Current Trends in British Psychology. Edited by Professor C. A. Mace, M.A., D.Litt., and Professor P. E. Vernon, M.A., D.Sc., Ph.D. (Pp. 262. 15s.) London: Methuen and Co. 1953.

In 1951 the psychology section of the British Association for the Advancement of Science decided in the Festival year to devote their annual meeting to presenting a survey of the work of psychologists in this country. This book contains 20 papers by senior representatives of the different fields of work written for the intelligent layman or the scientist of another discipline, and is therefore ideal for the suspicious medical reader who is doubtful of the credentials of this relatively youthful science.

The first ten papers are devoted to the application of psychology to practical problems. Industrial psychology, arising from the inquiry into the health of munition workers in the first world war, is now concerned with such subjects as working conditions, incentives, and joint consultation, while clinical psychology, which began with the testing of backward children, has now become a valuable aid to psychiatric diagnosis and treatment. Vocational guidance and educational selection are seen recovering from the enthusiasm for test procedures which invaded the Army and the educational system in the war years and after. It is interesting to learn that the interview, the general knowledge test, and even the examination paper are returning to favour, and that the Civil Service Selection Board has moved from the house at Stoke d'Abernon where candidates were subjected to ordeal by house-party.

The second ten papers are concerned with the fundamental concepts and methods of psychology, and particular interest attaches to the work of Professor O. L. Zangwill on the application of psychology to brain function in neurological disease. The studies of defects at the higher levels of integration carried out at the National Hospital, Queen Square, offer the hope of partially quantifying the neurological examination and of extending the work of Goldstein to the problems created by hemispherectomy and other ablations now surgically feasible.

These short papers are for the most part free of technical jargon and give the medical reader the opportunity to judge for himself which workers are contributing something to knowledge or to human welfare and which are suspect of producing a verbal soufflé rather than something more nourishing. On the whole this picture of British psychology shows that its place is established and that its feet are on the ground.

ALEXANDER KENNEDY.

X-RAY SIEVE THERAPY

X-ray Sieve Therapy in Cancer: A Connective Tissue Problem. By Benjamin Jolles, M.D., D.M.R. Foreword by Professor Sidney Russ, C.B.E., D.Sc., F.Inst.P. (Pp. 192; 51 illustrations. £1 5s.) London: H. K. Lewis and Co. 1953.

This work bears the stamp of individuality. The author has devoted most of his professional career to radiotherapy, and throughout his radiotherapeutic work has focused his interest on the connective tissue in its relationship to tumours and to radiotherapy. With some justification he deplores the apparent view of many of his colleagues, including cancer research workers, that the malignant cell is all-important, and he considers that the tissues in which they grow are neglected. He tries first to show the nature of the connective tissue from a discussion of a great deal of literature, emphasizing its highly organized, sensitive, and specific features. The impression made on me was that the connective tissue is important and complex, but the significance of many of the experimental and morphological facts quoted is still obscure. In discussing the importance of the connective tissue in its relationship to cancer he gives the reader increasingly more insight, but it is when he begins to discuss his own work on skin reactions and the development of the "sieve" or "chequer board" type of treatment field that he develops the authority which, even though one might criticize, most impresses the reader. His account of the importance of the periphery of a treated area or volume is original, well done, and of the highest importance. The use of the sieve is pioneer work in Britain, although parallel work has been done in other countries with less scientific basis. The criticisms I would make of this part are that he should have considered the differences between the chequer board and the sieve in which irradiated areas are not contiguous. He should also have discussed the significance of the very much larger doses apparently tolerated through a sieve of this type than any radiotherapist of experience has any right to expect; although such doses have been given in the U.S.A., and, following that experience, in Britain, though more cautiously.

The book is well documented, well printed, and well illustrated, and is to be commended, even though it has shortcomings, for its thought-provoking viewpoint. It should prove of interest to biologists and research workers as well as to those engaged clinically in cancer work.

FRANK ELLIS.

RADIODIAGNOSIS

Lehrbuch der Röntgendiagnostik. By H. R. Schinz et al. Part 8: Innere Organe. Fifth edition. (Pp. 454; 559 figures. M. 96.) Stuttgart: Georg Thieme. 1952.

This volume completes the new edition of the greatest Swiss work on radiodiagnosis, and it maintains the very high standard set by the earlier volumes. The authors discuss the radiography of all the abdominal organs and describe in elaborate detail the precise technique required in each individual case. In every instance we are offered the results of vast experience and of superb technical achievement, so admirably presented as to be of real practical value.

The illustrations throughout are of a very high order, both in execution and in production, and they are worthy of close study quite apart from the text. A special feature of the volume is the attention devoted to normal anatomy, and it is indeed a revelation to learn of the importance of anatomy as revealed by x-ray examination. Of special beauty are the illustrations of the gall-bladder and gall-stones, and of the genito-urinary system.

We are glad to hear that an edition in English will soon be brought out. It should have a wide appeal to all who are interested in the study of the human body in both health and disease.

HENRY SOUTTAR.

BRITISH MEDICAL JOURNAL

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THE EXTRAORDINARY GENERAL MEETING

The Extraordinary General Meeting to take place on May 5 at B.M.A. House is being held on the signed requisition of more than a hundred members of the Association. The requisitionists have put forward for consideration a resolution¹ which "requires the Council forthwith to approach the Minister of Health with proposals for the better protection (financial and otherwise) of the small-list doctor and of the doctor newly seeking entry into practice." They request that the implementation of the Working Party's scheme should be postponed until new proposals have been considered. The requisitionists are clearly dissatisfied with the present scheme, believing that the small-list doctors are being adversely affected, thus reviving the objections that were voiced about ten months ago. The requisitionists have a right to use the constitutional machinery of the Association to bring to the fore, even at this late date, their doubts about the distribution of the Danckwerts award. It is odd to criticize this as undemocratic, as an attempt by a minority to overthrow the wishes of the majority. It is surely essential to democracy that the minority voice should be heard; and, if it fails to convince the majority, then, properly, the majority will have its way. But surely the proper mechanism for this purpose would have been a special Representative Meeting requisitioned by the aggrieved through their Divisions, for the Representative Body is the final court of appeal and the arbiter of policy. It is unrealistic to propose that the Working Party's report should not be implemented, for its implementation has already been carried out. It is hoped, therefore, that the Extraordinary General Meeting will adopt Lord Horder's amendment² that this part of the requisitionists' resolution should be deleted. The meeting will then be able to debate the proposition that the small-list doctor and the new entrant to practice may not be receiving a fair deal.

It is as well to recall that in June and July last year the Special Conference of Local Medical Committees

and the Representative Body accepted all the Working Party's recommendations for the distribution of money to general practitioners in the N.H.S., and accepted them with enthusiasm. In a letter to this journal in August last year Mr. Hilary Marquand³ threw doubts on the scheme and considered it did not adequately improve the lot of the young and poorer-paid doctors. It appeared that he and the discontented wanted to load the capitation fee for the first thousand of a doctor's list. But in 1951 Mr. Marquand's own department, in its plans for a new distribution of the pool, referred to "improving the position of practitioners with lists of the order of 1,000 to 2,500." The Working Party's loading was, and is, on the thousand persons on a list after the first 500, giving a capitation fee of 27s. for numbers 501 to 1,500 on a list. It was suggested in these columns⁴ that, as the average number of patients per doctor in England and Wales was about 2,200, it could be argued that the loading should be on the second thousand of a list. With the loading now in force, the initial practice allowance, and the notional list, it is logically difficult to see how the young and the new entrant should be hard hit. And, as we observed subsequently⁵: "A sound practice is not static, and to rob the Peter of the good established practice to subsidize the Paul of the unestablished practice would be to deprive general practice and its future practitioners of much healthy enterprise." The young man and the new entrant to general practice now have to put up with much less hardship than did their elders when they were young. It is good that it is so. But it would also be good if there were wider recognition of this fact.

It should, too, be recognized that provision was made for cases of hardship that might arise, as they must arise in any scheme of distribution however perfect—and who has ever yet devised a scheme that would satisfy everyone? The G.M.S. Committee has already set up an *ad hoc* committee of the medical members of the Working Party, of the Assistants and Young Practitioners Subcommittee, of the Medical Practitioners Union, and of the Amending Acts Committee of the B.M.A. to consider allocating a proportion of "the final settlement moneys for the purpose of remedying any obvious defects in the distribution scheme." In the terms of the rider to the Working Party's report,⁶ such possible defects relate to "certain groups of practitioners who under the terms of reference of the Working Party might have expected to have benefited [but] have in fact not done so." In its recent report⁶ the G.M.S. Committee observes that "its preliminary work was hampered by lack of reliable information as to the extent of the problem."

¹ See *British Medical Journal Supplement*, March 21, p. 76.

² *Ibid.*, April 25, p. 152.

³ *Ibid.*, 1952, 2, 93.

⁴ *British Medical Journal*, 1952, 2, 327.

⁵ *British Medical Journal Supplement*, 1952, 2, 141.

⁶ See *Supplement*, April 4, p. 99.

It argues that there is no case for altering the scheme to give additional help, for example, to the small-list doctors who are, or may become, junior partners, or to those eligible for the initial practice allowances. It admits that "there may remain a proportion of small-list practitioners devoting their whole professional time and ability to the running and the building-up of their practices for whom modifications may need to be sought."

What is now needed is the ascertainment of the number of doctors so affected. The full Working Party has already met, and has decided how best to obtain this necessary information. The number of hard cases cannot be large, but, however small, everything must and will be done to see that justice is done to them. This will best be accomplished if the Extraordinary General Meeting next Tuesday afternoon tackles the problem in a sober fashion with the aim of getting things done rather than of giving expression to grievances, some of which may turn out to be imaginary.

CONSTRUCTIVE PERICARDITIS

Constrictive pericarditis, sometimes called Pick's disease, is perhaps badly named, since the thickened pericardium does not constrict the heart but restricts the action of the cardiac muscle. Surgical decompression is the only effective treatment. Although not a common disease, it presents a typical picture. Early diagnosis can prevent chronic invalidism by allowing operative treatment before irreversible cirrhotic changes have occurred in the liver. Evans and Jackson¹ have recently reviewed 30 cases treated by operation in England, and Chambliss and others² 61 cases so treated in America. Their conclusions are similar. The disease is four times more common in men than in women, and most often seen in the fourth decade. Dyspnoea on exertion is the commonest symptom, typically disappearing at the moment of halting; it is unusual at rest. Swelling of the abdomen is often the symptom which leads the patient to seek advice; swelling of the ankles is almost as frequent, but usually occurs later. Fatigue may be marked. The onset is usually gradual, except when the disease follows acute pericarditis. Many of the physical signs resemble those of right heart failure, but bear a different emphasis. All patients with constrictive pericarditis have raised venous pressure, shown by distension of the veins of the neck and elsewhere, and all have an enlarged liver, which is firm and smooth but not tender. Pulsation of the engorged veins is a useful sign. The pulse is small, never slow, and seldom paradoxical, and the blood

pressure low; about one-third of the patients have auricular fibrillation. Cyanosis may be seen; it is an unfavourable sign. Ascites or oedema is usually present, often both, the former generally more conspicuous, and paracentesis is often necessary. Pleural effusions may also occur. Features unlike those of heart failure are that the apex beat is seldom displaced and often difficult to palpate; significant murmurs are unusual, but an adventitious diastolic sound is often present, either a third heart sound or a split second sound. Further investigation assists diagnosis. The most informative radiographic sign is calcification, but this is absent in at least one-third of the patients. When present it is usually most conspicuous behind the heart or on the left border; the left anterior oblique view often demonstrates a convincing crescent. The cardiac silhouette is normal or somewhat enlarged in size, sometimes altered in shape to triangular or globular; the right border is prominent, partly from a raised diaphragm, and the superior vena cava may appear distended; there may be pleural effusion or thickening. On screening, diminished or altered pulsation is usually seen. The electrocardiogram will confirm an arrhythmia. The curve is often of low voltage, the T-wave usually low or inverted, and the P-wave often notched or broad. The circulation time is increased and the cardiac output diminished. Liver biopsy shows congestive cirrhosis with central fibrosis, which, if severe, suggests a poor prognosis after operation. If oedema is present the serum proteins are reduced.

Differential diagnosis must be made from valvular heart disease by the findings described, especially the relatively high venous pressure compared with the moderate dyspnoea and the small quiet heart without murmurs. Conditions to be considered include cirrhosis of the liver, in which the venous pressure is normal even when ascites and oedema are present; polyserositis, an inflammatory lesion involving more than one body cavity, of acute onset with fever, usually tuberculous in origin (if the pericardium is involved, constrictive pericarditis may follow, so that the effusions are perpetuated); and malignant ascites due to multiple metastases.

It is likely that constrictive pericarditis is usually of tuberculous origin. (Sound evidence has been brought forward by Andrews, Pickering, and Sellors³ that there are other forms of chronic adherent pericarditis which do not give the usual clinical picture.) Sometimes tubercle bacilli can be cultured from operative specimens; many cases have progressed from acute

¹ *Brit. Heart J.*, 1952, 14, 53.

² *Circulation*, 1951, 4, 816.

³ *Quart. J. Med.*, 1948, 17, 291.

⁴ *Arch. Surg.*, 1950, 61, 266.

pericarditis known to be tuberculous, which, as it heals, restricts the heart; occasionally miliary dissemination has followed operation; other patients have had active tuberculosis elsewhere. The pathological findings in these patients are no different from those who present no direct evidence of tuberculosis, and in all cases it is unusual to find specific features on histological examination, which shows chronic inflammation with much fibrosis and few cells. The disease never follows rheumatic fever, but may occasionally be a sequel to acute non-specific pericarditis and rarely to trauma. It has been suggested that it is often due to the rupture of a caseous tuberculous mediastinal gland into the pericardial sac. Grossly, the pericardium is dense, fibrous, and thickened; both layers are affected and are adherent to the heart, which is encased and compressed; calcification is common and caseation occasionally present. The scar is seldom uniform but may involve any part of the heart, often invading the myocardium, which may even contain cold abscesses. Sometimes the scar is most marked in the atrio-ventricular groove.

The main effect of the constriction is reduction of cardiac output, both filling and ejection being limited, and this can be corrected only by removal of the encasing scar. In most cases it is the scar over the ventricles which is responsible for the disability. As fluid in the pericardium tends to gravitate to the back, the scar is often thickest over the posterior and inferior part of the heart, involving especially the left ventricle. A left-sided approach is therefore the most generally used, with either an anterior or more usually an extensive lateral thoracotomy, passing across the pleural cavity, which may itself be obliterated by adhesions. The relative immobility of the encased heart is striking; the surgeon should not be satisfied until normal action of the heart muscle is restored, and to allow this both parietal and visceral layers must be stripped. It is usually possible to do this by blunt dissection, but sometimes invasion of the myocardium makes it difficult. As much as possible of the heart is freed, avoiding only the region of the coronary vessels; their exact identification may be impossible, since they are often embedded in scar. Arrhythmias or cardiac arrest may occur, but are less likely if pauses are made in the dissection. Haemorrhage can usually be controlled by sutures or by replacing a small flap of the thickened pericardium.

In general the ideal time for operation is as soon as there is evidence of cardiac compression. In cases of insidious onset this will be indicated by the symptoms and signs mentioned, especially the raised venous pressure. In cases of recent acute pericarditis Evans and Jackson advise operating as soon as there

is evidence of fluid retention in the body. Holman⁴ also advises early operation and claims good results, although it was formerly considered that operation is dangerous until the disease is completely quiescent. If the patient has tuberculosis elsewhere, operation should be delayed. The operation is never an emergency, and the patient should be prepared by freeing him so far as possible from excess fluid, which may be evident as oedema or effusions, by restricting salt and fluid intake, by mercurial diuretics, and by aspiration. Many patients improve immediately after operation; in others improvement may be gradual or follow a delay, sometimes of many months. A second operation may be indicated, possibly using a right-sided approach to clear this side of the heart. To complete the decompression at one stage some surgeons use a midline incision, dividing the sternum completely either vertically or horizontally and spreading it widely to give access to the front and both sides of the heart.

Of Evans and Jackson's 30 patients, 18 have been relieved of symptoms for at least five years, and 5 others are improved. Of the 61 patients of Chambliss and others, 38 had excellent results, and 6 others were improved. Of about 500 cases reviewed in the literature and summarized by these authors, satisfactory results have been obtained in nearly 65%. Even in patients completely relieved of symptoms, the venous pressure often remains high, and residual calcification can be seen on a radiograph. A hospital mortality rate of about 15% is still to be expected; but without treatment, although the course may extend over years, natural cure does not occur, the symptoms are severely disabling, and in the end usually fatal.

ANTICHOLINESTERASES

There is a large and diverse group of chemical compounds showing the property of inhibiting those enzymes in the body which hydrolyse the esters of choline. They have gained the generic title of "anticholinesterase." This ugly name includes compounds developed for an ugly purpose, such as the newer war gases produced by the Germans during the last war. Other anticholinesterases more familiar to our readers include eserine and neostigmine and di-isopropyl fluorophosphonate (D.F.P.) used in clinical medicine, and organophosphorus compounds used as insecticides.

Probably the most important of the choline esters in the body is acetylcholine, on whose transitory presence at vital points depends the proper functioning of our brain, nerves, muscles, and glands. By its persistence, however, acetylcholine will undo all the good effects achieved by its passing, hence the importance of cholinesterase to ensure that it does not linger too long upon the scene. Neostigmine has been used successfully for

many years to treat myasthenia gravis, though we are still in the dark about the exact nature of this disease. Such new organo-phosphorus compounds as tetraethyl pyrophosphate and octamethyl pyrophosphoramidate have been tried on a limited scale for this purpose but are so toxic that errors in dosage may have serious consequences. D.F.P. has been used to stimulate peristalsis in paralytic ileus and to contract the pupil in glaucoma.

The ever-growing knowledge about the toxic properties of the new organo-phosphorus anticholinesterases confirms the classical work of Loewi, Dale, and others, who first discovered the importance of acetylcholine and its attendant hydrolysing enzymes. In their work much use was made of the older inhibitor eserine. But a closer study of the action of the new and more toxic compounds has suggested new problems about the role of acetylcholine and cholinesterase. The scale of interest in these problems was reflected in an audience of 200 that attended a two-day symposium organized recently by the British Pharmacological Society and the Society of Chemical Industry. There were a dozen major papers and twice as many shorter contributions, as well as expert introductions and summaries of the four sessions. The interest of the symposium was not centred on medical problems but rather on the physiological and biochemical processes that are disturbed by the anticholinesterases. The action of the highly toxic war gases was described in detail by workers from Porton. This provided a welcome lifting on the ban of secrecy so long applied to work of this kind. The contribution gave an excellent illustration of how defence research can advance general scientific knowledge.

A number of papers posed new problems, though sometimes in a manner difficult to follow. There were two outstandingly clear papers on the use of these compounds as tools in research. One described a study on the nervous control of renal function. The other analysed the mechanism by which enzymes become inhibited. This may well lead to more knowledge of how enzymes work. The unexpected side-effects of some of these compounds which result in serious neurological lesions in both man and some experimental animals aroused considerable interest. The clinical picture of poisoning and the nervous lesions are the same as those known for many years to follow poisoning by tri-ortho-cresyl-phosphate (T.O.C.P.), itself an organo-phosphorus compound. A hypothesis that T.O.C.P. owed its action to its power to inhibit for long periods the cholinesterase associated with the white matter of the central nervous system has suffered the fate of the majority of hypotheses. Nevertheless it has served the purpose of all sensible hypotheses in stimulating research into the mode of action of this interesting compound which, as well as paralysing thousands of bootleggers' customers 20 years ago, has continued to injure those exposed to it during manufacture or from accidental contamination of food. From these beginnings new information may soon be acquired on the metabolism of the nervous tissues about the diseases of which we know so little.

The mysteries and problems discussed in this symposium were not confined to the action of anticholin-

esterases in the body. The biochemists studying the enzymes called cholinesterases have been forced to subdivide them still further according to their properties, thus raising new questions about their real function and the possibility that other esters of choline may have important roles in physiology. Even in the chemical field, where the biologist is inclined to think that everything is much more cut-and-dried, there seems to be no clear basis for deciding what will and what will not make a good inhibitor of cholinesterase or a good poison. The chemists' task is complicated by the fact that some of the compounds produced, having no apparent interest for the biochemist studying their activity against cholinesterase in the test-tube, prove extremely poisonous when injected into the body. The chemist must therefore be prepared for his own handiwork to be unexpectedly improved in a manner he does not yet clearly understand by the metabolic processes of the body. Such possibilities make it seem ever more unlikely that a clear relationship between chemical structure and biological action will become established.

The search for new and more unpleasant poisons will probably not be abandoned, but the medical man may draw a measure of satisfaction from the possibility that the study of them may increase our knowledge of how the body works, and hence our chances of understanding and correcting such disorders of its mechanism as are seen in disease.

TRAINING IN FORENSIC MEDICINE

The most vivid memories of student days are probably of the great teachers rather than of the great subjects in medicine—whichever they may later be thought to be. But forensic medicine, shot with its arresting criminal colours, is perhaps the one department of teaching where lecturer and subject may, in happy symbiosis, provide lasting instruction in a form so easily assimilable that what is being taught may not always be apparent. It is a common misconception among even enlightened academic planners that forensic medicine consists of stabbing, strangling, rape, and the homicidal *causes célèbres* in poisoning. This is far from the truth.

How much forensic medicine—and what sort of teaching—does the medical practitioner need? How much should he be taught as a student, and how much might reasonably be left for experience and postgraduate training should he later wish to practise this branch of pathology? The average doctor need know little of ballistics as a science, of the technical details of reconstruction of human remains, or of serological paternity tests, though he should know enough about them to enable him to co-operate usefully with a consultant called in to deal with a case. Forensic medicine has in the past been somewhat overweighted with tuition in matters best left to the expert. But every doctor must know what to do with a dead body, how to certify death and for cremation, when to ask for the assistance of the coroner or police, and how to collaborate with the law in the best interests of the public. He cannot afford to be ignorant of the law on poisons, abortion, or infanticide or of his own legal and moral obligations in practice.

These are things on which he must have detailed instruction—as much for his own as for general security. The numerous inquiries received from practising doctors by departments of forensic medicine on medico-legal problems, and the increasing recourse to litigation by members of the public, give ample proof of the necessity for such instruction.

The universities have an important task in fostering both undergraduate and postgraduate training—so admirably fulfilled for long in Edinburgh and Glasgow, and now more recently in Leeds and, if only in one medical school, in London. Yet it has so happened that, just when a university department of forensic medicine has been established in one of the London medical schools, the decision has been made to eliminate forensic medicine as a separate subject from the final examination. The student may well overlook the significance of the subject and devote less interest to its teaching—a possibility that carries dangers both for himself and for his patients. The remonstrances of teachers in the subject were apparently overwhelmed by the claims made for the numerous other subjects to be represented in the final examinations.

While undergraduate teaching continues—as indeed it must—and is directed to the needs of future medical practitioners in their contact with the law, postgraduate instruction is being expanded, notably in Glasgow, Edinburgh, and London. In the last city about 8,000 bodies every year come within the jurisdiction of the coroners, and also available for instructional purposes are several school departments of pathology, one department of forensic medicine (with ancillary toxicological and physical laboratories), the public mortuary service, police surgeons' work, and the courts. The ideal arrangements are undoubtedly easier to achieve in a small city, for the population of London provides too many dead over too vast an area to make transport to one central institute of all types of dead a practical proposition. Nor is it necessary. Of 10,000 coroners' cases analysed for a Ministry of Health report towards the end of 1945, no fewer than 5,510 were ordinary natural deaths in which there had been no medical attention, a further 1,388 had some trivial injury, and 120 were "returned by the Registrar." The remainder lay in more forensic fields: 592 were "anaesthetic deaths," and 1,554 were due to accidents; 836 suicidal, poisoning, or criminal fatalities completed the total. What are required are good mortuary facilities with ancillary laboratory accommodation, and the services of specially trained forensic pathologists, and part-time university posts for the senior among these, who, on the basis of their practical daily experience of special material, could devote part of their time to postgraduate teaching in the subject.

Forensic medicine strives to satisfy the growing need for preventing crime at its roots. It teaches practising doctors as well as more specialized pathologists to be ever watchful for "grounds for suspicion," wary of unsatisfactory certification, jealous of the moral and litigious security of the public whom it serves, and able to serve the law before the uniformed man is at the door. The doctor's work may only incidentally include criminal cases, but much of it is of a medico-legal

character which demands skill and proper training, as much for the security of the doctor himself as for the public. It would be unfortunate if the training for this branch of medicine fell behind the needs of those who must practise it, whether as consultants or general practitioners.

TUBERCULOSIS AFTER PARTIAL GASTRECTOMY

The great advantage of surgical over medical treatment for peptic ulcer is that the risk of relapse is much reduced; even if the surgeon needs to qualify his assurance somewhat to the patient with a duodenal ulcer, he can confidently assert that a gastric ulcer will be permanently cured. The immediate mortality from surgical treatment is extremely low in the uncomplicated case, so that it is only the occurrence of a number of undesirable end-results, unrelated to the original disease from which the patient was suffering, that prevents partial gastrectomy from being adopted on a far wider scale than it is at present. Much has been written about the occurrence of anaemia and of the dumping syndrome after partial gastrectomy. The former can always be treated successfully, though it is sometimes not easy to do so. The latter, if it occurs, may be both persistent and unpleasant, and a number of new surgical techniques have been devised with the object of eliminating it—for example, Capper and Butler's¹ proposal to give anatomical support at the time of operation to the remnant of the stomach and to the afferent loop of the jejunum. Less interest has been shown in the loss of weight which occurs after radical gastrectomy in some 50% of patients, though it stands to reason that a lowered standard of nutrition might often adversely affect the patient's subsequent health. Pulvertaft² has reported that 8 patients out of 23 who died two to seven years after partial gastrectomy died of tuberculosis (7 of pulmonary and 1 of meningeal tuberculosis). Only 2 of the patients who died were known to have had the disease before the operation, and it is possible that the development of active disease in the others was brought about by impaired nutrition. Certainly the proportion of deaths due to tuberculosis is far greater than could be expected among a normal population of the age and sex distribution of Pulvertaft's series.

This is the most striking experience that has been reported, but other workers have also noted a disproportionately great number of deaths from tuberculosis. Bruusgaard³ found 4 such deaths out of the 14 which occurred among patients discharged from hospital; and Drablos, Linden, and Skjelbred⁴ found 3 among 30 deaths. Yet others have reported no deaths from tuberculosis, so that before any association can be accepted it will be necessary to ensure that the group of patients studied are properly representative of all patients who have been subjected to the operation. It may be,

¹ *British Medical Journal*, 1951, 2, 265.

² *Lancet*, 1952, 1, 225.

³ *Acta chir. scand.*, 1946, 94, Suppl. 117.

⁴ *Acta med. scand.*, 1951, 140, 327.

⁵ *Lancet*, 1948, 1, 505, 551.

for example, that the extensive resection advocated by Visick,⁵ and which had been performed on most of the patients referred to by Pulvertaft, is more conducive to the development of tuberculosis than the limited two-thirds to three-quarters gastrectomy performed by some other surgeons. It is also possible that the fundamental association is with poor economic status—which is known to be independently linked with both gastric ulcer and pulmonary tuberculosis. Nevertheless, enough evidence is available to make it clear that the final effects of partial gastrectomy cannot be assessed one or two years after the operation. Before it can be confidently recommended as the treatment of choice for young patients it is necessary to know what effect it may have on their lives 10 and even 20 years later—and about that there is, as yet, not enough information.

SMOKING AND CANCER OF THE LUNG IN DOCTORS

Further evidence of a causal connexion of some sort between smoking and cancer of the lung is reported in a recent issue of the *New England Journal of Medicine*. There Dr. E. L. Wynder and Mr. J. Cornfield describe¹ an investigation they have conducted into cancer of the lung in physicians, and the main conclusion of it is that they found a "highly significant association between the use of tobacco and the development of pulmonary cancer."

Their investigation was of a kind that could have been carried out only in the U.S.A. Each week the *Journal of the American Medical Association* publishes short obituary notices, nearly all of which record the cause of death. Selecting notices for the years 1950 and 1951 and the first two months of 1952 (and, for lung-cancer cases, 1949 also), Wynder and Cornfield sent letters containing a questionnaire to the estates of doctors listed as dying from cancer of the lung, colon, stomach, kidney, and bladder, and from leukaemia, lymphoma, and sarcoma. They finally had for analysis completed replies on 63 doctors recorded as dying from cancer of the lung, which comprised 58.9% of possible replies in that group, and completed replies on 133 doctors who died from other malignant diseases, which comprised 63.9% of possible replies in that group. The questionnaire included questions on smoking habits of the deceased doctor, on exposure to dust, fumes, and insecticides, and on the length of the responder's personal acquaintance with him.

The figures showed that in the lung-cancer group only 5.8% smoked on average less than 15 cigarettes or their equivalent a day as compared with 43.4% in the other-cancer group. As regards the heavy smokers, in the lung-cancer group 33.8% smoked 35 or more cigarettes (or their equivalent) a day, while in the other-cancer group only 12.7% did so. The period asked about in the questionnaire was the previous 20 years, and, though they do not explicitly say so, Wynder and Cornfield

assume that the average daily amounts of tobacco they record as smoked were in fact smoked over² the full 20 years. The distribution of doctors between town and country and of those specially exposed to dusts or insecticides did not vary significantly between the two groups.

The writers are aware that their method of gathering the data cannot lead to wholly reliable results. But, while the data are certainly incomplete, they are not likely to be so biased as to invalidate the conclusions. This paper adds confirmatory evidence to the previous work of Wynder himself² as well as of other investigators, including Doll and Bradford Hill in Britain.^{3,4}

EDITED BIBLIOGRAPHIES

If the pioneers have a hard time in some ways, at least they may not have to spend those long hours hunting through the literature that their successors sometimes find irksome. And so voluminous has medical literature become in the last fifty years that guides have had to be devised—for example, by Morton⁵ and Greenwood⁶—to help the inquirer find his way about it. Edited or select bibliographies of various kinds have also been published. Some cover the output of a single country, or the papers in a particular specialty, or the papers in a few selected journals.⁷ A limited bibliography of this type has recently been published to record articles and books published in France in the last few years on diseases of the cardiovascular system.⁸ The whole is in English, including a few abstracts of the more important papers, and Professor René Leriche surveys it in a preface.

On a much larger scale than these restricted lists, but avoiding the unwieldy proportions of a complete bibliography, *Abstracts of World Medicine* is published monthly by the British Medical Association. It selects from about 1,700 periodicals (or about 13,000 issues a year) those papers that seem to be of greatest interest or importance. Its subject and author indexes point to all the main papers on any medical subject soon after they are published, and also to many papers of subsidiary importance, while in the body of the journal short abstracts of them appear. As a guide to current literature, and not merely a compendium of it, the selection practised by *Abstracts* has been found by inquiry to be of special value. While the output of medical literature continues to expand each year—and it has been expanding steadily since the war—the function of an edited bibliography subserved by *Abstracts* becomes increasingly necessary if the inquiring reader is not to get lost.

The next session of the General Medical Council will open on Tuesday, May 19, at 2 p.m., when the President, Professor David Campbell, will take the chair and will deliver an address.

⁵ Morton, L. T., *How to Use a Medical Library*, 2nd ed. London: W. Heinemann, 1952.

⁶ Greenwood, M., *J. roy. Stat. Soc., Ser. A*, 1948, 111, 230.

⁷ Adams, S., *Bull. med. Lib. Ass.*, 1950, 38, 238.

⁸ *French Bibliographical Digest. Medicine: Heart and Blood Vessels*. No. 1M. 1952.

REFRESHER COURSE FOR GENERAL PRACTITIONERS ANTICOAGULANT THERAPY

BY

H. PAYLING WRIGHT, Ph.D., B.Sc., L.M.S.S.A.

Research Assistant, Obstetric Unit, University College Hospital Medical School

The modern treatment of all types of thrombosis is very different from that of twenty years ago. The changes are mainly dependent upon the introduction of anti-coagulant drugs, which, by preventing the initiation or propagation of thrombi, are often able to save the condition of a patient from becoming critical. Unfortunately, both heparin and dicoumarol require scrupulous control if they are to achieve successful therapeutic results without producing haemorrhage, so that their use makes admission to hospital almost essential. Nevertheless, medical practitioners will wish to have a clear understanding of the mode of action of these drugs, their method of control, and their limitations.

In the past decade it has become evident that the Morowitz theory of blood clotting (prothrombin + calcium ions + thrombokinase = thrombin; thrombin + fibrinogen = fibrin) is insufficient to account for all the successive stages in coagulation. For instance, for its conversion to thrombin, prothrombin is now known to require at least four factors, while thromboplastin (thrombokinase) is recognized as occurring in a precursor form (thromboplastinogen) which is activated by an enzyme (thromboplastinogenase) derived from tissue autolysis and platelet disruption. Besides these factors, which can be reconciled with Morowitz's ideas, there are others, inhibitory to the clotting mechanism, which cannot be accommodated by his theory. Although in this article it is impossible to set out in detail current views on the mechanism of blood coagulation, it may be assumed that in the normal person the clotting process and its antithesis, the haemorrhagic process, are so nicely balanced that neither catastrophe occurs. It is on this delicate equilibrium that the anticoagulant drugs exert their effects.

Heparin

Heparin was the first of the anticoagulants to receive wide clinical use. It is a mucopolysaccharide derived from liver, lung, and other tissues, and is believed to compose the granules of the basophil leucocytes. It acts solely on the clotting substances already present in circulating blood, and this accounts for its rapid and transitory action and its effectiveness *in vitro*. Heparin has been shown to have several actions: it prevents the combination of fibrin and thrombin; it reduces the conglutination of platelets and so inhibits the liberation of thromboplastinogenase; and, finally, it has been shown to behave as an anti-prothrombin when coupled with a plasmatic complement fraction. It is thus apparent that this anticoagulant can interfere with coagulation in at least three ways.

Control of Treatment.—Since heparin acts directly upon circulating substances, an estimate of the clotting properties of the blood must be made before each administration. For this, the determination of clotting time by the Lee-White or similar technique gives a satisfactory, though crude, guide to therapy. (The prothrombin-time estimation is not a suitable test for this purpose.) As a general rule the prolongation of clotting time to three times its normal (five to seven minutes) suffices for therapeutic purposes, and this can usually be achieved by 10,000–15,000 international units of heparin, given intravenously every four hours. Slow-acting heparin preparations for intramuscular injection have been prepared, but, owing to variable rates of absorption, their action is erratic. Moreover, they are often extremely painful.

Haemorrhage Following Overdosage.—Should haemorrhage occur during treatment a 1% solution of protamine sulphate* may be injected intravenously in doses of 5–10 ml. Protamine reacts with heparin to neutralize the latter's negative electric charge, thus destroying its anticoagulant action. Blood transfusion may also be used to control bleeding, but in haemorrhage due to heparin fresh blood must be given, since stored blood lacks the labile factor necessary for prothrombin conversion. This factor is absent from the circulation during heparin therapy and must be replaced before normal coagulation can occur.

Dicoumarol and Allied Substances

A haemorrhagic and often fatal condition of cattle, known as "spoiled sweet-clover disease," led Link and his colleagues to investigate the chemical substances found in melilot ensilage. From this they isolated a substance—dicoumarol—which they showed to be a powerful anticoagulant, but which, unlike heparin, had to be ingested and passed into the blood stream before it exerted its action. Dicoumarol is without effect upon the clotting substances already circulating in the plasma, and hence has no anticoagulant action on blood *in vitro*. Its anticoagulant action depends upon its power to modify the ability of the liver cells to utilize vitamin K in the normally continuous synthesis of prothrombin, and this alteration in prothrombin production impairs the clotting mechanism at this level. For this reason, dicoumarol acts slowly, since time is necessary for its absorption from the gut and for the prothrombin already in circulation to undergo its natural depletion.

Control of Treatment.—Treatment with dicoumarol and kindred derivatives is usually controlled by means of Quick's single-stage prothrombin-time estimation. Though this test probably measures other variable factors besides free prothrombin, it offers a safe and easy method of assessing the response of the coagulation mechanism to anticoagulants of the dicoumarol type. The whole-blood clotting-time test used in heparin control is relatively insensitive to alterations in prothrombin concentration, and is therefore unsuitable for the management of dicoumarol therapy. Nevertheless, the prothrombin-time test is not without its pitfalls, and a rigid technique must be employed. Many modifications of the method are in current use, some of which are now recognized as unreliable, and in order safely to control dicoumarol administration it is essential to use a sensitive technique and to know the extent to which results may be effected by personal and environmental variations. When these factors are satisfactorily standardized, a comparison of the patient's prothrombin time during therapy with his own premedication figure or with that of a normal subject gives a satisfactory method of assessing the response to the drug. To enable results from different laboratories to be compared they may be expressed as percentages of normal prothrombin activity. This can be done by constructing a time-concentration curve for "normal" blood with the technique employed in the particular laboratory. Such a curve is obtained by measuring the prothrombin times in serial dilutions of normal whole citrated plasma. These times are plotted against the dilution expressed as a percentage of the initial plasma. This method of recording results is now widely used.

Method of Administration.—The response to dicoumarol administration is slow, 16 to 24 hours elapsing before blood changes become apparent, while the maximal effect is seldom reached before 30 to 40 hours after ingestion. Cumulative

*1 ml. of 1% solution of protamine sulphate = 1,000 international units of heparin.

¹ *New Engl. J. Med.*, 1953, 248, 441.

² Wynder, E. L., and Graham, E. A., *J. Amer. med. Ass.*, 1950, 143, 329.

³ *British Medical Journal*, 1950, 2, 739.

⁴ *Ibid.*, 1952, 2, 1271.

effects may therefore be encountered, and for this reason prothrombin activity should be measured at the end of the first 24 hours and subsequently daily. About one in ten persons is resistant to dicoumarol and requires a greater dose or more prolonged administration to achieve the desired fall in prothrombin level; these cases need particularly careful control if haemorrhage is to be avoided. An average plan of dosage for dicoumarol is 300 to 400 mg., in divided doses, during the first 24 hours; 200 mg. during the second 24 hours; and thereafter 50 to 100 mg. daily as maintenance dose. In most patients this will reduce prothrombin activity to 25 to 35% of normal by the end of the third day. It must be emphasized, however, that derivatives such as ethyl biscoumacetate ("tromexan") and cyclocoumarol and such substances as phenylindanedione have their characteristic rates of absorption, and consequently different dosages. When the prothrombin activity has been reduced to 25 to 35% of normal for some days a dose can usually be determined which will maintain it steadily at this level. It is then safe to reduce the frequency of prothrombin-time estimations to every second day for the next week. Should no marked fluctuations occur during this time, the interval between the tests may be still further extended. However, fluctuations may occur even in a "balanced" patient, and if control tests are infrequent the risk of serious haemorrhage becomes greater.

Out-patient Treatment.—The question of out-patient treatment with the dicoumarol anticoagulants is a vexed one. In my opinion it is permissible only if the following precautions are strictly observed: (1) the patient remains in hospital until satisfactorily balanced while fully ambulatory; (2) the prothrombin activity is not depressed below 25% of normal; (3) prothrombin-time determinations are carried out at least once a week; and (4) no drugs are administered except with the knowledge of the physician in charge of anticoagulant therapy. Even under these stringent conditions, the danger of spontaneous or traumatic haemorrhage is considerable, and the practitioner should explain this risk to the patient. Haematuria is the commonest first sign of overdosage with dicoumarol and similar anticoagulants.

Haemorrhage Following Overdosage.—When overdosage with dicoumarol or kindred substances has occurred, the resulting haemorrhage can be controlled by blood transfusion. Since the prothrombin-activation factor which is absent in stored blood (Quick's "labile factor") is not the same as that which is lacking from the patient's plasma during dicoumarol therapy (Quick's "component B"), the blood of the recipient and stored blood from a donor are complementary; the patient's prothrombin-activating complex is therefore reconstituted equally as fully by the giving of stored as of fresh blood. Transfusion must be continued until the absorption of anticoagulant from the gut has come to an end and normal prothrombin constituents have been restored in the blood. The efficacy of water-soluble vitamin K, either orally or by parenteral injection, in the control of haemorrhage following dicoumarol is controversial. Recently, however, a purified form—fat-soluble vitamin K₁—has been prepared which restores the prothrombin from the haemorrhagic to the normal level within four to eight hours. The mode of action of the vitamin is obscure, but may nevertheless prove a powerful antidote in dicoumarol overdosage.

Indications for Anticoagulant Therapy

Coronary Occlusion.—The value of anticoagulants in preventing immediate propagation of coronary thrombi or the development of further episodes was investigated by the American Heart Association in 1946. The material from 16 large hospitals was reviewed by a panel of investigators who concluded that the results with this type of treatment were highly favourable. Both heparin and dicoumarol were used, often in conjunction, the heparin usually being given only until the prothrombin level of the blood was satisfactorily depressed by the dicoumarol given concurrently. When this level was reached the heparin was withdrawn and the patient maintained on dicoumarol alone. When anticoagulant

therapy was given the mortality was reduced to about two-thirds that of a control group which received conservative treatment only. This advantage was most marked during the first four weeks after the primary coronary episode. The number of thrombo-embolic complications elsewhere in the body during convalescence was also reduced to one-third that in the control group. Anticoagulant therapy must be considered as prophylactic, since it has no effect upon the progressive development of arteriosclerosis, though both heparin and, to a greater degree dicoumarol, have been stated to increase the coronary flow. Moreover, recent experimental work has shown that, in rabbits, artificially thrombosed arteries are recanalized sooner when a steady hypoprothrombinaemia is maintained.

Pulmonary Embolism.*—Intravenous heparin, followed by dicoumarol, should be given as soon as possible after embolism has occurred, so as to reduce the likelihood of further catastrophes. When propagation of the thrombus at the site of origin has been prevented the danger of detachment is much reduced.

Vascular Surgery.—When operations on large arteries are undertaken, heparin often aids in preventing thrombi forming at the site of surgical intervention.

Auricular Fibrillation.—Since mural or auricular thrombi frequently give rise to emboli when auricular fibrillation is reversed by quinidine, the risk of this complication can be much reduced by anticoagulant therapy. Prothrombin activity should be reduced to about 25% of normal, and this level should be maintained for at least five days before quinidine reversion is attempted.

Post-operative and Puerperal Venous Thromboses.—These cases respond most satisfactorily to anticoagulant therapy. Treatment is indicated when venous thrombosis has occurred in the deep veins of the leg. Prophylactic treatment may also be given to patients who have experienced previous thromboses or in whom there are predisposing factors which lead the practitioner to fear the formation of thrombi. The judicious use of anticoagulants will reduce the danger of pulmonary embolism. Venous thrombosis during pregnancy may safely be treated with dicoumarol-like substances, provided the prothrombin level is not depressed below 30% of normal. The drug should be withdrawn for at least one week before delivery is expected, both to minimize the risk of uterine haemorrhage and to ensure that the prothrombin level of the infant at birth shall not be dangerously depressed. In the puerperium, anticoagulants of the dicoumarol group can safely be administered prophylactically or when venous thrombosis has already occurred. Lochial loss is not increased if the prothrombin is maintained at the usual therapeutic levels, nor at these levels are anticoagulants secreted in the milk in sufficient quantity to affect the suckling infant.

Retinal Vein Thrombosis.—Favourable reports on the use of both heparin and dicoumarol in retinal vein thrombosis have been made, but the data available are still very meagre.

Contraindications to Anticoagulant Therapy

Immediately after Surgery.—In the treatment of surgical cases it is advisable to withhold heparin for at least 12 hours after operation. This allows time for the formation and firm attachment of thrombus plugs in the small vessels at the site of operation to take place. Dicoumarol and its derivatives can more safely be started immediately after surgery because the lag in their action allows the completion of these processes. If there is a large denuded operation site, or if ulceration or local infection is present, the risk of haemorrhage with anticoagulant therapy is much increased.

Abnormal Prothrombin Metabolism.—Exaggerated responses to anticoagulants of the dicoumarol type sometimes

*For further information on this subject see *Venous Thrombosis and Pulmonary Embolism*, by A. Neuhauf (1943: Grune and Stratton, New York), and *Thrombotic Conditions and Their Treatment with Anticoagulants*, by C. D. Marple and I. S. Wright (1950: Blackwell, Oxford).

MEDICAL EXAMINATIONS FOR NATIONAL SERVICE

The proportion of young men who are found to be unfit when called up for National Service is about 18%. These are the men who are placed in Grades III and IV by the medical boards; most are rejected for service, but some in Grade III are accepted for the lighter jobs. When these figures were announced to the subcommittee of the Select Committee on Estimates, which has been considering, from the standpoint of economy, the question of call-up, posting, and movement of National Service men, they were described as "fantastic" and "alarming"; but, of course, as a witness from the Ministry of Labour pointed out, everything depends on the standards adopted. The proportion of candidates for the Regular Army who fail on medical grounds is much greater; one witness spoke of "somewhere in the region of 40%." The Committee's report gives some interesting details about the working of the National Service medical boards, of which there are 61 in Great Britain. Each board consists of a chairman and four members, all civilian doctors, and the chairman has power to seek consultant advice where necessary. It is estimated that the examination of a recruit by each doctor in turn occupies on the average seven minutes. One point brought out in the evidence is that only three-fourths of the men are subjected to x-ray examination. This is because of shortage of apparatus and staff difficulties in the remoter parts of the country. Men who have not had an x-ray examination at their medical board are radiologically examined fairly soon after entering the Service. For economic reasons the subcommittee deplores this and recommends that Service x-ray equipment should be made available for use by the medical boards, and that urgent steps be taken to increase the number of civilian x-ray units.

When a man, having passed the medical board, joins the Service an initial military medical examination is made, normally by the unit medical officer, who has before him the form of assessment issued by the board. The number of men discharged on medical grounds during their first 14 days of service is a measure of the difference of opinion which exists between the civilian medical board and the military medical officer. This difference is very slight except in the case of psychiatric disabilities, which, of course, the board is not well placed to detect, seeing that they manifest themselves in anomalies of behaviour and not in physical signs. In 1951 the number of discharges of National Service men from the Army during their first fortnight was 7 per 1,000 of intake, and in rather more than half of these the discharge was on psychiatric grounds (meaning, as one witness stated, nearly always "mentally slow").

The report also contains an important recommendation with regard to intelligence tests. Before his medical-board examination each man undergoes an "intelligence test" supervised by Army sergeants, and the results of these tests and of any interviews which may follow them are reported to the chairman of the medical board. Stress was laid by War Office witnesses on the simplicity of these tests. No exercise of judgment or foundation of experience, apparently, is called for. But a large proportion of the gradings made by these Army testers are subsequently altered by the boards, and the subcommittee holds that there is no reason for the employment of Service men on this work at all. Any testing of this kind would be more advantageously done by specially trained civilian men or women acting under the supervision of the chairmen of the boards, and a common series of intelligence tests should be worked out by the Ministry of Labour and the Service departments in consultation.

Third Report from the Select Committee on Estimates, together with Minutes of Evidence taken before Subcommittee C and appendices. "Call-up, Posting, and Movement of National Service Men." London: H.M. Stationery Office. 4s. 6d. net.

occur. All patients with conditions in which vitamin-K absorption or production is defective, and especially those with disorders of fat digestion, are notably sensitive to oral anticoagulants. These include cases of dietary deficiency or biliary dysfunction, diarrhoea and enteritis, sprue, steatorrhoea, and resection or ulceration of the intestinal tract. Alterations of the intestinal flora brought about by drugs may also cause hypoprothrombinaemia, sometimes to a severe degree. Certain drugs, other than anticoagulants, also lower the prothrombin level of the blood, and are thus synergic in their action. The commonest are the salicylates, though caffeine, theophylline, and theobromine behave in the same way. These drugs should not be given concurrently with oral anticoagulants. Normal prothrombin production may be impaired in persons whose liver function is disturbed, so that some degree of hypoprothrombinaemia may be already present. The administration of dicoumarol to cases with Laennec's cirrhosis, infective hepatitis, carcinomatosis, or liver abscess is followed by an exaggerated response.

Renal Damage.—Impairment of renal function is a contraindication to the use of anticoagulants for two reasons. First, cumulative effects are more apt to develop, so that the danger of haemorrhage is increased. Secondly, renal vessels are particularly vulnerable, as they often prove the first site at which haemorrhage occurs in hypoprothrombinaemia. If the kidney is already injured this danger is further increased.

Next Refresher Course Article.—"Hysteria," by Dr. I. R. C. Batchelor.

IMPERIAL CANCER RESEARCH FUND

The fiftieth annual report of the Imperial Cancer Research Fund was presented at the general meeting of governors held at the Royal College of Surgeons on April 23, the chairman of the council, Professor H. R. Dean, presiding. Mr. A. Dickson Wright, honorary treasurer, said that for the first time in the history of the fund the assets totalled over £1,000,000. Excluding legacies, which amounted to £97,500, the contributions during the year 1952-3 came to close upon £25,000, an increase of £13,000 on the figure for the previous year, and the long list of subscribers illustrated the wide interest shown in cancer research. The general working expenses, however, had increased, leaving an excess of expenditure over receipts of £5,500. The large increase of expenditure was in connexion with the provision for the clinico-pathological investigations which were initiated in 1951, and had made it necessary to obtain additional laboratory space at Lincoln's Inn Fields.

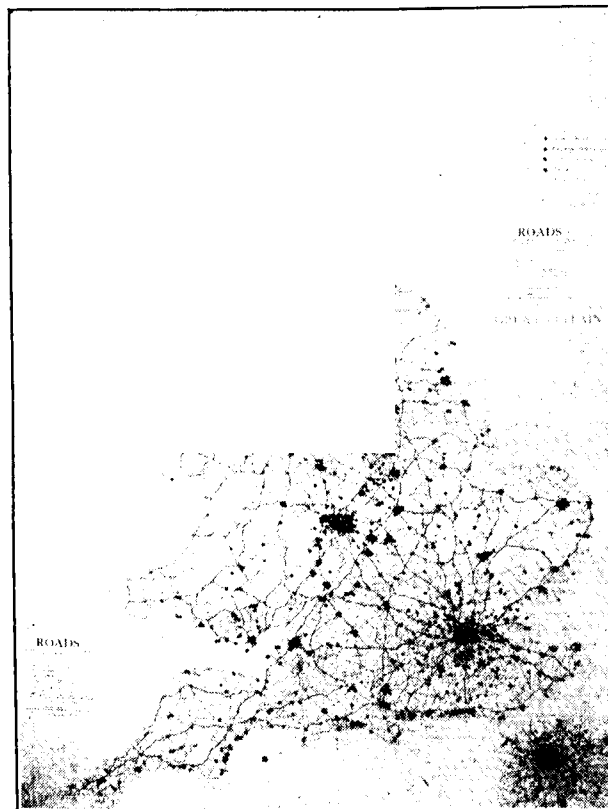
Professor Dean presented the general report on the work of the fund. These new clinico-pathological investigations, which had been placed under the general supervision of Professor Geoffrey Hadfield, would increase the scope of the research work, and the institution of a second laboratory would offer excellent opportunities whereby the clinico-pathological research and the basic research into cancer might, as they should, supplement and stimulate each other. Plans had been drafted which would make it possible to establish four large research laboratories, to come into operation in July of this year, and two additional laboratories would be available in the spring of 1954. This research accommodation would provide laboratory space for at least six research workers. The special investigations which have been taken in hand relate principally to cancer of the breast and of the prostate.

The president of the fund, the Earl of Halifax, was re-elected, as was the honorary treasurer, Mr. Dickson Wright. Tributes were paid to three distinguished workers for the fund whose deaths had occurred during the past year—namely, Sir Holburt Waring, for many years treasurer, Professor W. E. Gye, the former director, and Dr. Charles Kellaway, a member of the council.

COLLEGE OF GENERAL PRACTITIONERS

In its most recent statement (*British Medical Journal*, March 28, p. 725) the College of General Practitioners announced that its peripheral activities would be organized by a number of Regional Faculties. Below are printed the names of the Faculties and the areas which it is proposed that they should serve. As in some cases county boundaries or regional hospital board areas may prove inconvenient, members or associates of the College will be free to choose to which Faculty they should belong.

Regional Faculty	Area Served
England	
London	County of London
Home Counties South	Kent, Surrey, Sussex, Hampshire and the Isle of Wight
Home Counties North	Middlesex, Essex, Hertfordshire, Bedfordshire
Oxford	Oxfordshire, Berkshire, Buckinghamshire
Cambridge	Cambridgeshire, Huntingdonshire, Norfolk, Suffolk
Bristol	Wiltshire, Gloucestershire, Somerset, Dorset
Exeter	Devon and Cornwall
Birmingham	Warwickshire, Shropshire, Herefordshire, Worcestershire, Staffordshire, Leicestershire, Rutland, Northamptonshire
Sheffield	Derbyshire, Nottinghamshire, Lincolnshire
Leeds	South Yorkshire (West and East Riding)
Manchester	North and East Lancashire (East of the London-Glasgow Road A.6), East Cheshire, Westmorland
Liverpool	South-west Lancashire, West Cheshire, North Wales and the Isle of Man
Newcastle	Durham, North Riding of Yorkshire, Northumberland, Cumberland



Map showing distribution of Foundation Membership (1,087) of the College of General Practitioners on March 31, 1953, when the College was three months old. The black dots in the small square in the right-hand corner represent membership in London in addition to those on the larger map. The Ordnance Survey Map is reproduced with the sanction of the Controller of H.M. Stationery Office (Crown copyright reserved).

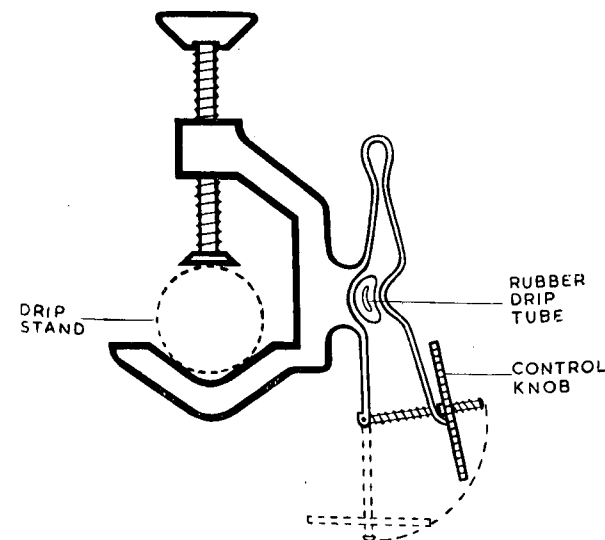
Regional Faculty	Area Served
Wales	
Cardiff	South Wales, Monmouth
Scotland	
Edinburgh	South-east Scotland
Glasgow	South-west Scotland
Dundee	East Scotland
Aberdeen	North-east Scotland
Inverness	North Scotland
Northern Ireland	
Belfast	
Southern Ireland	
Dublin	
Galway	

Will members or associates who wish to make suggestions or comments upon the areas covered by these Regional Faculties please write to the secretary, the College of General Practitioners, 14, Black Friars Lane, Queen Victoria Street, London, E.C.4.

Preparations and Appliances

A FINE ADJUSTMENT INTRAVENOUS DRIP REGULATOR

Dr. H. J. V. MORTON, senior anaesthetist, Hillingdon Hospital, writes: The modern practice of giving potent short-acting drugs by the method of continuous intravenous infusion has created the need for a drip regulator capable of fine adjustment. Such an apparatus is illustrated here. It is intended for use with standard intravenous outfits, and has advantages which are self-evident. The finely threaded control knob swings sideways to allow the introduction of the rubber tube. The light alloy clamp opens to 1½ in.



(35 mm.), and grips the thinnest armboard or thickest drip stand. When used in the latter situation it should, of course, be fixed level with or lower than the infusion needle.

The drip rate can be easily altered by as little as one or two drops a minute, a degree of control valuable to the paediatrician. When used during anaesthesia, in conjunction with a rotameter or variable pendulum indicator (Morton, 1953), dosage can be adjusted quickly, precisely, and with one hand.

The instrument is strongly made, and is obtainable, with or without the clamp, from Bleas Anaesthetic Equipment, Ltd., 12, Hinde Street, London, W.1, to whom my thanks are due.

REFERENCE

Morton, H. J. V. (1953). *Anaesthesia*, 8, 112.

MAY 2, 1953

Correspondence

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

Procaine Amide

SIR,—Since our attention was drawn some time ago by Dr. G. E. H. Enderby to the use of procaine amide to augment the hypotensive action of hexamethonium, described by Dr. A. A. Mason and Dr. J. F. Pelmore (*Journal*, January 31, p. 250), we have investigated some of its pharmacological properties. The action of procaine amide has usually been discussed with respect to its direct cardiac action. But, since procaine itself is well known to be able to interfere with ganglionic transmission, a study of the effects of procaine amide on ganglia seemed necessary.

We have found in cats anaesthetized with chloralose: (1) that procaine amide in doses of 15 mg./kg. or more will cause relaxation of the nictitating membrane excited by preganglionic stimulation; (2) that in doses of 15 mg./kg. it will paralyse the slowing of the heart to vagal stimulation; (3) that in doses of 15–30 mg./kg. it does not lessen the depressor effect of acetylcholine or the pressor effect of adrenaline; (4) in doses of 15 mg./kg. or more it reduces the pressor effect of nicotine. In concentration of 20–50 µg./ml. it reduces the contraction of the guinea-pig's small intestine to nicotine without affecting its response to acetylcholine. These observations indicated that procaine amide can interfere with ganglionic function in three ganglia at least, the superior cervical ganglion and the vagal ganglia of the heart and viscera, without modifying the reactions of the effector cells. It remained to determine the mechanism of action.

Procaine amide, 10 mg., injected during perfusion of the cat's superior cervical ganglion caused complete failure of pre-transmission and abolished release of acetylcholine on preganglionic nerve stimulation. With the perfused ganglion, procaine amide antagonized the stimulant effect of acetylcholine on the ganglion. Using the electrical recording of ganglion action potentials, procaine amide was found to be able to reduce these considerably without causing any depolarization of the ganglion. These results show that procaine amide has two actions at the ganglion-inhibition of acetylcholine release, and an antagonism to the effects of acetylcholine. The second of these two actions should, of course, simply sum with that of hexamethonium, if the two drugs are given together. But the interaction of the first action, that of preventing acetylcholine release, with the action, that of preventing acetylcholine release, might acetylcholine-antagonizing power of hexamethonium, might present novel features. We find, in fact, that in the cat procaine amide and hexamethonium potentiate one another, and that the effect of a mixture is greater than that expected from simple addition of the two components.

It seems probable, therefore, that this synergism between depression of acetylcholine release and competition with acetylcholine could go some way to explain the clinical synergism observed. The question arises whether any of the hypotensive action of procaine amide can be attributed to a direct cardiac action. Our only evidence on this point suggests that, in the cat, this is not true, since the relative potency of procaine amide to hexamethonium in lowering blood pressure is actually less than its relative potency in relaxing the nictitating membrane.

Procaine amide appears to offer, therefore, a new possibility of supplementing the action of a ganglion-blocking agent with a drug active by mouth, with which it might be possible to attack ganglia at present relatively refractory to such agents.—We are, etc.,

W. D. M. PATON.
J. W. THOMPSON.

London, W.C.1.

A.C.T.H. and Tuberculous Meningitis

SIR,—The results of the treatment of acute disseminated encephalomyelitis with A.C.T.H. by Dr. H. G. Miller (*Journal*, January 24, p. 177) interested me very much, as I am working on similar lines, except that I am applying this treatment in cases of tuberculous encephalomyelitis, against the warning of this author, who supposes that therapeutic use of A.C.T.H. in tuberculous meningitis "might well be disastrous."

My experiments are limited to those cases of tuberculous meningitis in children, treated with antibiotics, which develop acute neurological symptoms in the late period of treatment (after 10 weeks). The clinical behaviour of such cases is very similar to the symptomatology of acute disseminated encephalomyelitis. Here also we observe violent attacks followed by periods of relaxation, and we too suppose that they are caused by attacks of "allergic vasculitis" on the basis of a hypersensitive reaction of altered blood vessels of the brain. Lowered chloride levels in the C.S.F. in such cases suggests that oedema of the brain may follow or accompany the changes in the blood supply. This syndrome occurs in about 50% of our cases of tuberculous meningitis treated with antibiotics. They are refractory to further application of chemotherapeutics and their mortality rate is about 70%. In despair we tried A.C.T.H. in such cases. The effects are very encouraging, especially if A.C.T.H. is applied after previous preparatory administration of intrathecal tuberculin. We give 10⁻⁷ solution purified protein derivative tuberculin intrathecally every 2–3 days, in successively increasing doses—0.2, 0.4, 0.6, 0.8, and 1 ml.—then 10⁻⁶ in the same way until a distinct inflammatory reaction in the C.S.F. is provoked as shown by a pleocytosis and increase of protein level. Then the purified protein derivative administration is stopped and A.C.T.H., 15–25 mg., is given intramuscularly four times daily. The mortality rate among children so treated fell from 68% to 33%. In cases of blockade of the circulation of the C.S.F., A.C.T.H. reduces the protein level of C.S.F. and very often re-establishes free communication.

During combined treatment with tuberculin and A.C.T.H. no chemotherapeutics are given.—I am, etc.,

B. HALIKOWSKI,
Paediatric Department
of the Tuberculosis Institute.

Warsaw.

"Butazolidin"

SIR,—In your leading article on "Benefits and Dangers of Butazolidin" (December 27, 1952, p. 1401) you commented on the toxic reactions to the drug, particularly emphasizing the risk of damage to the haemopoietic system. The following case may therefore be of interest.

A woman, aged 24 years, who had suffered from rheumatoid arthritis for many years, was given a course of butazolidin, 200 mg. twice a day, from February 9 to February 18. On February 17 she complained of a sore throat and feverishness. A provisional diagnosis of scarlet fever was made and the patient was given a course of sulphadimidine, 1 g. four-hourly, during February 19–23 without any improvement in her condition. She was therefore admitted to hospital on February 24.

On admission the patient was afebrile and was found to have slight inflammation of her fauces, associated with a generalized erythema. A throat swab was taken, but no haemolytic streptococci were isolated. A white cell count on February 25 gave 1,800 cells/c.mm., with 50% polymorphs and 50% lymphocytes. In view of the neutropenia, a further count was done on February 26, which gave Hb 9.2 g., red blood cells 4.46 million/c.mm., white blood cells 4,500/c.mm., neutrophil polymorphs 34%, eosinophil polymorphs 3%, lymphocytes 58%, monocytes 5%, platelets 340,000/c.mm. The sore throat persisted for 12 days and the rash for 15, following which there was desquamation. The patient remained afebrile during her stay in hospital. The following white cell counts were done before she was discharged on March 14: March 3, white blood cells, 5,100/c.mm., 44% polymorphs; March 6, white blood cells 4,400/c.mm., 36% poly-

morphs; March 11, white blood cells 5,700/c.mm., 62% polymorphs.

The only other drug treatment this patient had had for the rheumatoid arthritis within the previous four months, apart from the butazolidin, was aspirin.—We are, etc.,

G. E. BREEN.
R. T. D. EMOND.

Isleworth, Middlesex.

SIR,—In view of the widespread use of butazolidin for the relief of rheumatic symptoms I draw attention to another death following its administration.

A man of 59, with chronic bronchitis and rheumatoid arthritis of eight years' standing, began taking one tablet of butazolidin twice daily (400 mg. daily) on January 31. It substantially relieved his pain and enabled him to continue working. On March 13 he was "feeling fine" and was full of praise for his new tablets. His white blood count was 12,100, and showed a slight neutrophilia. His treatment was continued, but he was next seen after admission as an acute emergency on April 7. He had been ill for four days, and was then cyanosed, intensely dyspnoeic, and his circulation was failing. He had a massive consolidation of the left lower lobe, and examination of peripheral blood smears showed an absence of granular cells. He died 14 hours after admission.

It is likely that butazolidin contributed to his death, and the case emphasizes the importance of performing a white blood count immediately should a patient taking the drug develop fever or any other symptom of constitutional illness.—I am, etc.,

Sheffield.

G. R. NEWNS.

A New Diphtheria Prophylactic (N.A.F.T.)

SIR,—Since reporting the results of the experiments published in the *Journal* (February 14, p. 370) it appeared from further experiments done in guinea-pigs that different batches of the natural adjuvant varied from one another in their power of augmenting the antigenicity of purified diphtheria toxoid. It was also observed that each batch of the natural adjuvant had a definite optimum. If added to the toxoid in quantities either less or more than this optimum, the protection offered to the guinea-pigs against the challenge of the toxin by such mixtures appeared to be less than that offered by the optimum mixture. It is necessary, therefore, when testing the adjuvant power of a new batch of N.A.F. to employ several different quantities of the dried material—say 0.2 mg., 0.35 mg., 0.5 mg., and 0.65 mg. per Lf of the purified toxoid—instead of any one chosen quantity, and to compare the protection given by each of these different mixtures with that given by the toxoid alone.—I am, etc.,

Bombay, India.

D. C. LAHIRI.

Mental Hospital Service

SIR,—I hope that Dr. Otho Fitzgerald's letter (*Journal*, April 4, p. 781) will attract the attention it deserves, particularly among the junior staff in mental hospitals. There is a growing tendency to concentrate all the hospital's resources on the acute and recoverable patient and to neglect and ignore the chronics. Fortunately this attitude does not apply to all mental hospitals. Following the lead given by Dr. T. P. Rees at Warlingham Park, at least one other hospital has inaugurated a scheme for the rehabilitation of the chronic patient which has revolutionized the atmosphere in the chronic wards, stimulated the interest and imagination of the nursing staff, and literally brought back to life many patients who otherwise would have led a purely vegetative existence to the end of their days.

But all this cannot be done without the active interest and co-operation of the physician superintendent. The National Health Service has done a grave disservice to mental hospitals by encouraging superintendents to discard their administrative responsibilities and to concentrate almost exclusively on clinical psychiatry. The result of this change has been that young men entering the mental hospital service now learn nothing of the administration of the hospital and are ignorant of the facilities

available for the occupation of chronic patients in the various utility departments of the hospital. Comparatively few patients are employed on farms and gardens, yet many psychiatrists would agree that they can provide the best possible form of occupational therapy for a large number of chronic patients. Another disquieting feature is that the hospital has often ceased to be "a happy ship." Friction between lay administrators and medical staff arises, and there is a constant shifting of responsibility through all grades and divisions right back to the regional board.

I maintain that a mental hospital is so constituted that there must be one individual who is responsible to the committee for everything which happens within the hospital. He must be fully conversant both with the administrative problems and with modern psychiatric methods—a benevolent patriarch to whom all can turn for help and advice. There should be no interference with the clinical autonomy of other consultants, but at the same time the superintendent should have proved his ability as a clinical consultant himself so that his opinion would be respected and perhaps even sought when special difficulties arose. In other words, physician-superintendents should be appointed from senior consultants who have also a flair for administration and the teaching of postgraduate students. Naturally, their remuneration should be adjusted to compensate for the additional responsibilities which would attach to the job.

I shall probably be accused of advocating a reactionary measure. This would not be so if sufficient care were taken in the appointing of new superintendents only from applicants of the highest calibre, and such would, in my opinion, be attracted only if the job were up-graded in the way here suggested. A recent advertisement read: "Whole-time Consultant Psychiatrist. The appointment carries the Medical Superintendentship of — Mental Hospital." Obviously the medical superintendent is regarded as subordinate to the consultant. Unless we reverse this relationship the chronic patient is doomed.—I am, etc.,

London, W.1.

J. C. SAWLE THOMAS.

Prolapse

SIR,—I found Mr. A. J. Wrigley's refreshing account of prolapse (*Journal*, April 4, p. 778) most complete and satisfying. The only sentence that I would quarrel with is his statement that "the diagnosis of prolapse is easy." In most cases this is so, but often the painful symptoms of prolapse occur before the patient or her doctor have become aware of any uterine descent. By painful symptoms I mean that low backache and dragging in the groins which may be troublesome only at period time and is sometimes mistaken for dysmenorrhoea. These early symptoms are presumably due to stretching of the parametrial supports, and, like the pain of flat foot, is most marked when stretching is occurring, disappearing later when the prolapse is fully developed.

Diagnosis of prolapse at this early stage by the usual method of inspection during straining may be impossible if there is a good perineal support. There will then be no gaping at the introitus to reveal the descent of the cervix. Thus, if the symptoms suggest prolapse, it is advisable to retract the perineum with a Sims speculum while the patient lies in the left lateral position, and straining may then show an obvious descent of the cervix. If the uterus is retroverted this will be particularly liable to occur, and the backache of retroversion is due to this concomitant prolapse. The diagnosis in these less obvious cases may finally be made only by the empirical use of the pessary.—I am, etc.,

Birmingham.

A. L. DEACON.

Transverse Arrest of Head

SIR,—Mr. Bryan Williams is to be congratulated on his excellent account (*Journal*, April 18, p. 865) of the mechanism and treatment of transverse arrest of the head and occipito-posterior position. It is high time undergraduate teaching of the mechanisms of labour abandoned the idea that the usual engagement of the head is in an occipito-anterior or occipito-posterior position. Another concept that should be stressed more in teaching is the factor of pelvic shape rather than primary deflection of the head as a cause of posterior rotation of the occiput.

In describing the application of Kielland's forceps Mr. Bryan Williams states that only two fingers are needed to introduce the blades. In my limited experience it seems that where transverse arrest has occurred there often remains a loose rim or lip of cervix between the head and the sacral promontory, and I have always found it necessary to introduce a hand to be certain that the blades pass inside the cervix, especially as the handle must be carried far back to enable the tip of the blade to clear the promontory and slide up round the head. In De Lee's illustration of the manoeuvre¹ it is true that only two fingers are ensuring that the blade passes safely, but the whole hand is within the vagina.—I am, etc.,

Northampton.

E. A. J. ALMENT.

REFERENCE

¹ *Principles and Practice of Obstetrics*, 1947, 9th ed., p. 907. Philadelphia.

Intercourse after Syphilis

SIR,—It is tempting to allow Dr. P. Durel's letter (*Journal*, April 11, p. 838) to stand as an answer to your expert's letters, because, after saying that he has seen no relapse later than six months after such treatment as he and colleagues now give, he hedges with quite a strenuous treatment if the spouse becomes pregnant; it reminds one of the captain of the *Pinafore*: "Well, hardly ever." Having regard to the scarcity of new syphilitic infection in, at any rate, this country, until the results are known of such operative studies of the effects of modern treatment of syphilis as are now proceeding under the auspices of the World Health Organization in this and other countries neither your expert nor any other individual syphilologist can say what is the longest period after which no relapse has occurred. And a patient in relapse is sexually as contagious after one form of treatment as after another if the relapse is within the first two years of infection.

Dr. Durel concedes in effect the point which I made—that, psychologically, syphilis can be a life sentence—yet he advocates risking it and seems to write as if we who advocate a longer period of observation wish to make this longer than that imposed after arsenical-bismuth treatment. Anyhow, I do hope that neither will so advise any man who is to marry or has married any girl in whose welfare I am interested.—I am, etc.,

London, S.W.1.

L. W. HARRISON.

Intestinal Polyposis Associated with Oral Pigmentation

SIR,—May I comment on the medical memorandum (*Journal*, March 21, p. 659) of Drs. I. Kaplan and M. Feuchtwanger on this subject? They state that this syndrome was first described by Jeghers in 1944. Fisher,¹ in his report of a case, correctly gave the credit for the original description to Peutz,² by whose name the condition is sometimes known (syndrome of Peutz).—I am, etc.,

Belfast.

R. D. G. CREERY.

REFERENCES

- ¹ *Great Ormond Street Journal*, 1951, 1, 151.
- ² *Ned. Maandschr. Geneesk.*, 1921, 10, 134.

Chemotherapy of Malaria and Trypanosomiasis

SIR,—In the paper on "The Chemotherapy of Malaria and Trypanosomiasis" by Dr. L. G. Goodwin (*Journal*, February 7, p. 311) no differentiation is made between the treatment of infections due to *Trypanosoma rhodesiense* and those due to *Trypanosoma gambiense*. This is a common error found in nearly all the textbooks of tropical medicine.

Early cases of *T. rhodesiense* (that is, cases diagnosed within three weeks of the onset) always do respond satisfactorily to treatment with suramin ("Bayer 205," "antrypol"). There is, in my opinion, no justification for imperilling the chances of recovery of the patient by losing valuable time in trying other drugs.

Early cases of *T. rhodesiense* do not respond satisfactorily to treatment with pentamidine. In 1940 I treated

three cases of *T. rhodesiense* at the request of Warrington Yorke with a substance which he described as "an aromatic diamidine containing no heavy metal." One of the patients was an African male in hospital awaiting operation for hernia, and was diagnosed on the first day of symptoms of sleeping sickness, with high fever, a positive blood, and only two cells per cubic millimetre in the cerebrospinal fluid. The treatment was unsuccessful in all three cases. More recent experiments in 1951 with the latest product, pentamidine, were equally disappointing.

In my opinion pentamidine has no place in the treatment or prophylaxis of trypanosomiasis due to *T. rhodesiense*.—I am, etc.,

St. John's, Antigua.

A. J. KEEVILL.

Intravenous Iron

SIR,—I was most interested in Dr. Betty D. Holt's comments (*Journal*, April 11, p. 834) on my paper on intravenous iron (*Journal*, January 3, p. 21). I would be grateful for space to reply to the points raised.

Although I have no idea how many injections are given in England per year, I have no doubt that they must amount to some thousands. Only the severest reactions are usually recorded in the medical press. With present-day preparations, therefore, intravenous iron is a safe procedure if judged on these grounds. I feel, however, that the dangers should not be minimized and that an attitude of complacency is to be deprecated. I am glad, therefore, to see that Dr. Holt is in agreement with this. I consider these reactions to be largely allergic in character. It is well known that tendency to allergy varies in different races. Perhaps racial differences would account for the absence of reaction in her cases.

Finally, in regard to dosage, my early practice was to use a commencing dose of 100 mg. and follow up on alternate days with the same dose, but, since my adverse experience, I now use 25 mg. to 50 mg. at the start. Although I see that Dr. Holt has had no troubles so far with the large doses (100 mg. to 200 mg.) used, I feel that these are too high, unless, of course, the difference in racial sensitivity is a real factor.—I am, etc.,

Romford, Essex.

I. M. LIBRACH.

Judet Acrylic Prostheses

SIR,—In recent months a number of Judet acrylic prostheses have had to be removed from patients because of mechanical failure. These failures may be due to one or more of the following factors: the unsuitability of the materials employed, design, manufacturing methods, sterilization procedures, position of insertion of the prosthesis, and fit of the acrylic head in the acetabulum. In collaboration with Dr. Zarek, of the Faculty of Engineering, King's College, University of London, experimental work is being carried out the results of which it is hoped may shed some light on the cause of these failures. The number of cases to which we have access is naturally limited. It would be of the greatest assistance if surgeons and pathologists who remove any prosthesis from a patient (which may or may not be broken), either at operation or necropsy, would be kind enough to send it to me at the Plastics Research Unit, The Institute of Orthopaedics (University of London), Royal National Orthopaedic Hospital, Stanmore, Middlesex. The following information is required: (a) a brief pre- and post-operative case history with the actual or estimated weight of the patient (personal details which might identify the patient are not required); (b) all radiographs in which the prosthesis can be seen, which will be returned; (c) details of method of sterilization and, if possible, whether the prosthesis has been sterilized on a number of occasions; (d) the prosthesis.

It is hoped that all those interested in this problem will co-operate, as an investigation of this kind can be of value only if as many as possible of the failures can be investigated.—I am, etc.,

Stanmore, Middx.

JOHN T. SCALES.

The Degradation of Flour and Bread

SIR,—In your issue of March 14 last you gave details of the composition of the new white flour as they were given by Dr. Charles Hill, M.P., in answer to a question in Parliament. The figures given are likely to make us think that all will be well with our new white flour, for they appear to show that for every nutritional constituent taken out of the present 80% flour when reduced to a 70–72% extraction one has been replaced in the new 70–72% “restored” flour, except for a slight reduction in protein.

This is far from the truth, because the figures only include three out of the ten or more vitamins of the B-complex group, and only two out of a dozen or so minerals, and do not mention the loss of the roughage (which has its own part to play in our body economy) or the loss of vitamin E. The degradation of our daily bread from about 1870 down to the present time has been a kind of rake's progress. In the space available to me it is only possible to give a very faint picture of it.

Here are a few approximate figures. The ash of whole wheat is 1.53 g. per 100 g.; in 85% extraction it is 0.75; in 80% extraction 0.59; and in a 70%, 0.41.¹ The ash contains the bulk of the minerals, and the reduction of minerals follows largely this reduction—for example, potassium is reduced from 312 to 82 mg. per 100 g. in a 70% flour, and copper from 60 to 18 mg. per 100 g. The vitamins will also show a somewhat similar pattern of degradation—for example, aneurin from 110 to 22 i.u./g., nicotinic acid from 55 to 8.4 µg./g. The three vitamins aneurin, riboflavin, and nicotinic acid are restored in the new flour to the 80% flour level only; and of two minerals, iron is restored to the 80% level of 1.65 mg. per 100 g. but not to the 3.81 mg. per 100 g. of whole meal. Calcium is dealt with differently, in a reinforced manner.

The general result of all this degradation process of whole meal to the new white “restored” flour will be an unbalanced kind of loaf reduced greatly in all its nutritive constituents—calcium, carbohydrate, and, to some extent, protein excepted. Want of balance can cause a nutritional upset as well as the nutritional deficiency diseases caused by individual shortages. It would take a considerable space to describe all these separately, but we do know that they are something that cannot be disregarded. Two will be mentioned.

In pantothenic acid deficiency there are changes in the anatomy and function of the adrenal gland, with degeneration of the cortex; oxidation of fatty acids is also impaired.² In pyridoxine deficiency the skin, haemopoietic tissue, and nervous system are adversely affected, producing cheilosis and angular stomatitis and a microcytosis accompanied by polycythaemia and fall in haemoglobin concentration.³ Generally speaking it is growing tissues that are most affected when pyridoxine is in short supply.

To conclude, I suggest that before any further steps are taken to put the new white flour on the market an inquiry should be held at once by some competent body containing members with experience in deficiency diseases—for example, members of the Medical Research Council, Nutrition Society, Ministry of Health, the B.M.A., and Society of M.O.H.s. The degradation of our daily bread has reached a stage at which there should be a call to halt.—I am, etc.,

E. H. M. MILLIGAN.

Glossop.

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Survey of Prescribing in Scotland

SIR,—I have read with interest the article by Professor D. M. Dunlop and Drs. R. S. Inch and J. Paul (*Journal*, March 28, p. 694), but I would like to point out an inaccuracy in their figures which may account for the apparent low mean monthly script rate per 1,000 population in the Highlands and Islands.

For the County of Sutherland, the numbers of scripts given by them in Table III as issued in 1951 include only those dispensed by chemists—I have verified this—and it has apparently been overlooked that five of Sutherland's twelve doctors (not eleven as stated, although in October, 1951, one practice vacancy was in the process of being filled) have dispensing practices with a total of approximately

3,800 patients, which figure should have been deducted from the total number of registered patients. It would not be possible to correct this discrepancy by adding the number of scripts dispensed by doctors, as some are paid on a capitation basis and return no scripts except for expensive medications.

This applies to all counties in the Highlands and Islands, and the fact that Shetland has by far the lowest monthly script rate per 1,000 is doubtless accounted for by the fact that this county has proportionately the largest number of dispensing doctors.—I am, etc.,

Golspie, Sutherland.

IAN D. PENNIE.

The Foley Catheter

SIR,—Mr. G. E. Moloney in his informative contribution (*Journal*, March 28, p. 706) on pelvic evisceration and uretero-colic anastomosis reminds your readers that an anal catheter helps to keep the patient dry during post-operative recumbency.

Where hysterocystectomy with uretero-colic anastomosis has been accomplished to extinguish an anterior invasion by cervical carcinoma, my gynaecological colleague, Mr. J. A. Chalmers, and I have found a Foley's catheter the perfect conduit for draining the rectal contents during the early period of convalescence. The catheter is inserted above the ano-rectal ring and the bag is inflated, but not sufficiently to cause mucosal pressure-necrosis. A wide-bore instrument will convey away, without soiling the patient's attire, all the faeculent urine and flatus, allowing full liberty of movement, since it is “self-retaining.” It is also labour-saving, and the perineal cleanliness reassures the patient when her vitality is at its lowest ebb.

I should like to mention the use of Foley's catheter modified for another operation. When the adenomatous prostate has been removed by any method and the surgeon wishes to leave a urethral catheter in position, he fears that it may be blocked by clot or promote infection. If the bag is removed from the catheter before inserting it into the urethra, and if the eyelet occupies the vacant prostatic capsule, the bladder or the capsule may then be closed after haemostasis and the side tube of the catheter can be used for continuous irrigation. With the patient back in bed it is connected to a reservoir supplying a lotion through a drip tube. The greater tube of the catheter is connected to a receiver, another drip tube of large dimensions intervening so that inflow and outflow coincide. Thus, the two-hourly syringing, so tiresome to the nurse and her patient and often septic, is avoided.

I use initially two flasks of sodium citrate solution and follow this with 1/5,000 flavine in saline. The catheter is removed in 48 hours and the patient usually micturates spontaneously. It is lubricated with penicillin cream. This method of irrigation is to be considered as a modification only of Mr. Wilfrid Adams's “third ureter”—a ureteric catheter introduced into the bladder suprapubically after prostatic enucleation and connected to a reservoir of lotion.

If a Foley catheter could have a second side tube for irrigation, its bag intact, then the triple function could be harnessed to the patient's treatment.—I am, etc.,

Worcester.

PAUL HOUGHTON.

Treatment of Perforated Peptic Ulcer

SIR,—I have followed the correspondence on the treatment of perforated peptic ulcer with very great interest, but I am not quite sure that the routine practice of simple closure is obsolete, even though this may entail a second operation later on. I have performed personally, or through my assistants, 673 closures with only one death.

Since I standardized my treatment it has not varied. This consists, immediately the diagnosis is made, in gastric aspiration and a saline drip, and then, after the operation, further aspiration and the continuance of the intravenous saline for at least another 48 hours. I must confess that the majority of these cases were Service people, which means that there was no delay in their admission to hospital and that they were in good condition otherwise. But not a few were performed on African natives before the 1939–45 war. The

one death occurred in a young soldier who had perforated 48 hours before admission: he died a week after the operation and, regrettably, no necropsy was allowed.—I am, etc.,

Epsom, Surrey.

S. M. VASSALLO.

SIR,—Mr. Hermon Taylor (*Journal*, April 4, p. 781), in discussing the conservative treatment of perforated ulcers, says, “Clearly the method of gastric aspiration can achieve all that can be obtained by the method of surgical closure, but with the not inconsiderable advantages of avoiding an operation.” He further states that modern developments have made simple closure of perforations obsolete. To my mind, operation has several possible advantages: (1) fluid can be sucked out of the subphrenic spaces; (2) the size and situation of the ulcer can be assessed; (3) the possibility of malignant change can be largely excluded; and (4) appropriate treatment can be given if the diagnosis proves to be wrong—e.g., perforated cholecystitis, appendicitis with general peritonitis, pancreatitis, or even small-bowel obstruction.

Continuous aspiration has its disadvantages. It is usually necessary for four to five days, and entails intravenous saline with all its dangers and complications. A very high proportion of cases treated by operation only need gastric suction for about 36 hours. A rectal drip is then quite adequate to prevent dehydration.

Surely the discomforts and dangers of operation have been exaggerated during recent years. It has been my practice to combine local and light general anaesthetics, which give complete relaxation without any interference with chest or diaphragmatic movements. The patient usually wakes up almost free from pain. I have personal experience of 385 operations, and I think that a patient who cannot stand this line of treatment is most unlikely to recover from any other.—I am, etc.,

Farnham, Surrey.

STANLEY C. RAW.

Research in General Practice

SIR,—Professor Robert Platt's address (*Journal*, March 14, p. 577) was indeed stimulating, but those who try, however unpretentiously, to carry his ideas into practice do not always find that things go very smoothly. Some years ago I was taunted by a patient that British medicine lagged behind the Soviet variety inasmuch as Russian doctors were completely relieving the pangs of childbirth by injections of vitamin B. This information had been gleaned from a Soviet propaganda publication which had considered a able circulation in this country. I wrote immediately to a firm which is generous in the matter of circulars and samples, and is prominent as a manufacturer of vitamin products. I suggested that the matter might be very quickly tested by the issue to a sufficient number of general practitioners of enough vitamin B to be used in their cases, on condition that reports were sent of the results. The firm's medical adviser pooh-poohed the whole project.

On another occasion I wrote to the *Journal* on the subject of the long-term results of electric shock treatment in mental illness, because I felt that general practitioners would have more reliable views on the subject than those held by the more enthusiastic psychiatrists. If my memory serves me correctly there was no reaction, good, bad, or indifferent, from my colleagues.—I am, etc.,

Launceston.

DONALD M. O'CONNOR.

Chloroform for Bronchography in Children

SIR,—Mr. Leslie J. Temple and Dr. T. Cecil Gray, in their letter (*Journal*, April 18, p. 883) commenting on our article on bronchography in children (*Journal*, March 14, p. 601), state that it implies that the child may suffer from hypoxia during the use of our technique. This is certainly not so. We attain rapidly a short, deep anaesthesia and at all times the child is well oxygenated. We do not suggest

that chloroform should be used by the inexperienced, but we think that explosive agents are better avoided in the x-ray room.

As regards the airway, it may be difficult to prevent obstruction without it in some of those children with enlarged tonsils and adenoids. Finally, an important difference between our technique and Gray and Temple's, not mentioned in their letter, is that we do not “drown” our patients with lipiodol, as we feel that in bronchiectasis there is enough foreign material in the bronchi without adding to it more than the minimum necessary.—We are, etc.,

MARGARET I. GRIFFITHS.

T. D. CULBERT.

Manchester.

SIR,—Having used the method of anaesthesia for bronchography in children described by Mr. Leslie J. Temple and Dr. T. Cecil Gray (*Journal*, April 18, p. 883) since I was first taught it by Dr. John Halton some five years ago, I can only agree with all the authors' remarks concerning the method.

Being worried about the possibility of explosion, I too tried chloroform and other agents, but soon realized, fortunately at the cost only of minutes of acute anxiety on more than one occasion, that as deep anaesthesia is necessary it is most safely produced by ether. I feel convinced that explosions as a result of ignition of ether vapour by x-ray equipment have been much rarer than fatalities from the use of chloroform, and would join Mr. Temple and Dr. Gray in pointing out the dangers of using chloroform where some degree of hypoxia is to be expected as a result of deep anaesthesia and the introduction of oil into a diseased respiratory system.—I am, etc.,

Manchester.

TOM DINSDALE.

Antihistamines and Asthma

SIR,—Drs. A. W. Frankland and R. H. Gorrell (*Journal*, April 4, p. 761) ought to be congratulated on the skill with which they have refuted the assumption that antihistamine treatment of hay-fever causes asthma. Their further conclusion that antihistamines do not improve asthma is hardly justified by their experiments. They have given mepyramine, apparently in four separate daily doses of 100 mg., or another equivalent antihistamine, and have not seen any benefit from it. Nor have I. Antihistamines influence asthma only if a much larger dose is given than that effective in allergic rhinitis. There is ample evidence for their efficiency,^{1,2} but I have never seen a beneficial effect with less than a single dose of 300 mg. of mepyramine. An amount of 100 mg. cannot be expected to influence asthma, just as one would not expect one minim of adrenaline to influence it. It would appear essential that in therapeutic trials, controlled or uncontrolled, the doses used are not subthreshold ones, as in this case.

The difficulty with antihistamines in asthma is that the large doses required often have side-effects which make their use impracticable during the day. They are best used in single doses at bedtime, when they may secure an asthma-free night. The use of one single dose in 24 hours also avoids the development of tolerance, which easily occurs with multiple doses.—I am, etc.,

London, W.C.1.

H. HERXHEIMER.

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Television and the Patient

SIR,—I should like to endorse very strongly the opinion expressed by Dr. T. Hughes (*Journal*, April 18, p. 884) in the letter under the heading “Television and the Patient.” In general, television programmes on medical subjects seem calculated to foster in the minds of ordinary people the

deplorable idea—already far too prevalent—that the attitude of the medical profession can be expressed as, "It doesn't really matter how you live: modern medical science is so wonderful that you can be made fit whatever happens—if you are properly treated." The view that it is the business of the State, through its "Health" Service, to make and keep everyone healthy is thus still further encouraged instead of the true view that it is the duty and privilege of each individual to think and live in such a way as to attain the greatest possible degree of mental and physical efficiency.

Soon after I had a television receiver installed in my home (about two years ago) I was so impressed by the possibilities of television as an educational medium that I summoned up courage to write to the B.B.C. to suggest, humbly, that it might be a very good thing if a small amount of time (perhaps 20 or 30 minutes once a month) could be devoted to a health education series in which a plainly worded and interestingly illustrated exposition of relevant biological facts could be given, coupled with hints on "keeping fit" based on these facts. After some time I received a letter in reply which said that I should be glad to know that the sort of programme I advocated was being sent out from time to time, and went on to instance the very sort of thing that Dr. Hughes has referred to. I wrote again and tried to explain as carefully as I could the difference between that kind of programme and the educational programmes that I felt could be so beneficial, but again I got a reply which seemed to indicate a complete failure to see my meaning, and I am afraid I gave up the struggle as hopeless.

Would it be possible for representations to be made to the B.B.C. on this matter?—I am, etc.,

London, N.W.3.

A. DALBY.

SIR,—As one responsible for the section on anaesthetics in the "Pain" programme referred to (*Journal*, April 18, p. 884), I think that Dr. Trevor Hughes's letter has served a useful purpose in attracting attention to the subject in the daily press. The contribution of anaesthetics to the advancement of surgery is now freely recognized in the medical profession, and the consumers—the public—are entitled to information upon it. From the comments I have heard from time to time from lay members of the public, it is clear that interest in such matters springs from healthy intelligence and but rarely from morbid curiosity.

Whatever the merits of the "rag and bottle" administration of anaesthetics may be, to many people experience of it is a distasteful memory. It is fair that the public should know that in experienced hands more pleasant methods of anaesthesia are available to all in this country—as they should be under the Health Service. Television provides a useful medium for extension of this knowledge. Can Dr. Hughes suggest a better medium, or would he prefer his patients to be kept in ignorance?—I am, etc.,

London, W.1.

I. W. MAGILL.

Polypharmacy

SIR,—Dr. A. T. Mennie (*Journal*, April 18, p. 887) overstates his case. While multiple deficiencies may be common in anaemia—though which is cause and which is effect may be hard to say—it is still a fact that the common so-called "nutritional hypochromic anaemia" can be treated adequately with iron alone. Even when combinations of therapeutic substances produce a more rapid rise in haemoglobin, speed of cure alone is seldom important.

There are those whose hypochromic anaemia responds inadequately or not at all to iron. After investigations have excluded haemorrhagic or other organic causes there may be a place for treatment with multiple agents, the nature and dosage of which should depend upon each patient's needs and not merely be determined rigidly by the contents of a capsule.—I am, etc.,

London, N.W.6.

J. I. E. HOFFMAN.

POINTS FROM LETTERS

Counting High Pulse Rates

Dr. R. J. K. BROWN (London, S.E.24) writes: Dr. E. Montuschi (*Journal*, April 4, p. 781) mentions a technique for counting high pulse rates. May I describe another which is equally applicable to both high and low pulse rates? . . . The number of beats are counted in three consecutive five-second periods: the highest and lowest figures so obtained are then multiplied by 12. For example, if these figures were 6 and 7, one could say the pulse rate was swinging between 72 and 84 (with a mean of 78). I have found this method particularly useful in paediatric practice.

Drunk in Charge

Dr. C. RUTTER (London, E.6) writes: I was interested to read Dr. A. E. M. Hartley's article (*Journal*, March 28, p. 735) on "drunk in charge." I would suggest, however, that the examination should take place immediately on arrival, before the essential questions are asked. The medical history might be long and take time to obtain in full, thus giving the person being examined time to sober up.

Research in General Practice

Mr. A. P. BERTWISTLE (Birmingham) writes: In Professor Robert Platt's admirable paper on the above (*Journal*, March 14, p. 577) he instances the experiment of cleaning the teeth on one side to find out whether the tooth-brush prevented caries. There is an important snag—the subject must sleep on his back. Most of us sleep on the left side, with the result that tartar forms more abundantly on this side, and this may have its repercussion on caries.

Comfort in Air Travel

Dr. FLORENCE ADAM THOMSON (Ipoh, Malaya) writes: I should like to refer to Part I of Sir Harold Whittingham's refresher course article on air travel (*Journal*, March 7, p. 556). I realize that considerable thought has been given to the design of aircraft seating so that passengers may have reasonable comfort in a confined space. Has it been brought to the notice of B.O.A.C. that, despite this, most passengers are quite unable to rest in comfort in the position allowed, and sleep is quite impossible except in very short snatches? I and many friends of average stature have found that after a journey there is such severe oedema of feet and legs that to walk or work in comfort is impossible for several days. Were a little extra space given on the longer runs, with tilted seating and leg rests similar to that on some American lines, passengers could rest and arrive refreshed even when no night stops are made.

Slipped Disk

Dr. HUGH GARLAND (Leeds, 1) writes: I am not quite sure when and where the term "slipped disk" was coined, but it has now passed into common usage and indeed it has become one of the stock jokes of the comedian. It is a most improper term, carrying the implication that the whole disk has slipped in some direction in relation to the vertebrae above and below, and there is a popular corollary that, having slipped out, the disk is capable of slipping back. As far as I know such a pathological state has never been seen by the human eye. I think it is our duty to discourage this terminology, and I was perturbed to see the unhappy term used in the *Journal* ("Any Questions?" March 7, p. 575). Syndromes resulting from damage to intervertebral disks have been diagnosed with increasing frequency over the past 15 years, so that to-day the disk lesion is well known to the public. The main change in the disk is one of protrusion, usually of a very localized kind, and to which the terms "herniation" or "protrusion" are very properly applied—but not "slipped."

Chlorophyll and Asparagus

Dr. JOHN DICKINSON (London, W.C.1) writes: Dr. John C. Brocklehurst (*Journal*, March 7, p. 541) has suggested that doctors should experiment on themselves with asparagus, to determine whether the smell of their urine is reduced by chlorophyll. Since supplies of this drug are expensive there is a danger that the experiment may be invalid through shortage of either doctors or asparagus, or both. Might I suggest that the Medical Research Council should send regular quantities of asparagus to two large groups of doctors? Half of these could then receive chlorophyll and half act as controls. If the experiment was conducted on a sufficiently large scale, statistically significant results could be of the greatest value to the public. Clearly, several weeks or even months of patient trial would be necessary; but nevertheless I am pleased to offer myself as a volunteer—preferably in the control group.

Obituary

H. S. PENDLEBURY, M.B., F.R.C.S.

Mr. H. S. Pendlebury, at one time a surgeon on the staff of St. George's Hospital, died on April 21 at his home at Malvern.

Herbert Stringfellow Pendlebury was the son of John Pendlebury, J.P., of Wigan, and was born there in 1870. He won a scholarship at Pembroke College, Cambridge, and took a first in both parts of the Natural Sciences Tripos. His small stature handicapped him for some games, but he played for his university at hockey. From Cambridge he entered the medical school of St. George's Hospital with a scholarship, qualified in 1896, took the F.R.C.S. in 1897, and graduated M.B., B.Ch. in 1898. In turn he served his hospital as house-surgeon, house-physician, surgical registrar, assistant surgeon, surgeon, and lecturer in surgery. He was also surgeon for many years to the Royal Waterloo Hospital, remaining on the consultant staff there until his death. When Pendlebury was training himself in surgery, Listerian principles had for some years already won their victory; but there were still a good many of the older men in the profession who thought they comprehended them, but in fact did not completely do so. It thus happened that in the 'nineties a group of eager and progressive young surgeons in London (and probably the same was done elsewhere) found themselves producing results which surpassed those obtained by some of their seniors. The expansion of abdominal surgery, set on foot very largely by Sir Frederick Treves, gave them a further opportunity; and Pendlebury was one of those who profited by all this to obtain glittering success in practice at a comparatively early age. He was a deft, rapid, and scrupulously careful operator and a very good teacher. One of his foibles was a somewhat unusual view of the meaning of punctuality, on which he was rightly very insistent: he maintained that to be punctual you must be five minutes early for your assignment, and could be almost bitter in his reproaches of any subordinate who failed to act up to this. For him an operation list commencing at 2 p.m. meant that the first patient must be in the theatre, anaesthetized, and with all the necessary ritual completed, so that the skin incision could be made as the clock struck the hour.

Pendlebury was a man of very great energy and organizing ability, which he employed in the promotion of two ventures, novel at the time, but now accepted as part of the natural order of things. The Royal Society of Medicine was one of these, founded in 1907 by the amalgamation of eighteen societies representing, for the most part, specialties in medicine and surgery. When this federation was accomplished, he was the Society's honorary secretary for some years—the most difficult ones, of course—and honorary treasurer for some years thereafter. In both capacities he served the profession extremely well. The next organization which he helped to promote was that of the Association of Surgeons of Great Britain and Ireland in 1920, in which Lord Moynehan was keenly interested. Here again his organizing ability and enthusiasm were valuable assets.

During the first world war Pendlebury served in the R.A.M.C., being attached to the 4th London General Hospital. He contributed a number of case reports to medical journals, and was the author of two chapters in Latham and English's *System of Treatment*. Besides

being a member of the Court of Examiners of the Conjoint Board, he examined in surgery for the University of Cambridge and the Society of Apothecaries.

Pendlebury married first Lilian Dorothea, daughter of the late Sir T. L. Devitt: she died in 1921, leaving as issue Mr. J. O. S. Pendlebury, who, after gaining an athletic Blue at Cambridge, was rapidly making a name for himself in archaeology, and was killed in Crete in 1941 during the German invasion of the island. He married again in 1925, his second wife being a daughter of Mr. Richard Webb. He was interested, among many other things, in education, and gave £100 to Epsom College to found a prize for Greek studies there.

ALEXANDER MITCHELL, M.B., Ch.M.

Mr. Alexander Mitchell, well known as an orthopaedic surgeon in the north-east of Scotland, died in Aberdeen on April 16, aged 72. Although he had been in indifferent health for some months, he had two days previously, with characteristic sense of duty, insisted on travelling from his home at Old Rayne to attend a hospital board meeting in Aberdeen, and it was while acting as chairman there that he was stricken with fatal illness. He faced death with the same spirit and fortitude that he displayed throughout his life, his thought being not for himself but for the trouble he might be causing others.

Alexander Mitchell was educated at Robert Gordon's College and Aberdeen University, graduating M.A. in 1901, M.B., Ch.B. in 1905, and Ch.M. in 1907. After a few years in general practice he devoted himself entirely to surgery, mainly at the Royal Aberdeen Hospital for Sick Children and Aberdeen Royal Infirmary. He served as a captain in the R.A.M.C. in the first world war, and at its conclusion became senior surgeon at the Children's Hospital, holding that position until he took charge of the orthopaedic unit at the Royal Infirmary in 1936. He organized the orthopaedic services of the north-east of Scotland and was prominent in the councils of the British Orthopaedic Associations, of which he became vice-president. He was also an external examiner in surgery to the University of Edinburgh. When he retired from active surgical practice his services were eagerly sought in hospital management and he was elected chairman of the Special Hospitals Board a year ago. Into this work he threw himself heart and soul, welcoming an opportunity for service in a field where his intimate knowledge of medical practice, both outside and inside hospital, would be of value to the community and the profession. In 1942 he was made a J.P. for the county of Aberdeen.

To every aspect of his work "Sandy" Mitchell brought a driving force and a devotion beyond praise. Chairman of the Aberdeen Division of the B.M.A. in 1929, he was elected president of the Orthopaedics and Fractures Section at the Annual Meeting in Aberdeen in 1939. He served the profession that he loved without stint and without calculation, disregarding his own lameness and labouring day and night for the sick and especially for the crippled. His main attributes were a forthright honesty that informed his every thought and action, a love of his fellow men, outstanding magnanimity, and high courage. As patients flocked to him for relief, so did his colleagues seek his advice and help. He was laid to rest at Rayne, in the land of his fathers that he knew so well and loved so much, and the whole community sorrowed at the passing of a great-hearted and beloved son.

He married in 1913 Ada, daughter of the late Dr. Greig, of Fyvie. She predeceased him, leaving two sons, one of them a major in the R.A.M.C., and a daughter. To them and to his second wife, Alice, daughter of the late Dr. David Rorie, we extend our deepest sympathy.—S. G. D.

F. W. EDRIDGE-GREEN, C.B.E., M.D., F.R.C.S.

Mr. F. W. Edridge-Green, whose work on the testing of colour vision won him international fame, died at Worthing on April 17. He was 89 years of age.

Frederick William Edridge-Green, whose family were well known in the Potteries as the makers of the famous Crown Staffordshire ware, was born in London on December 14, 1863. He received his medical education at Durham University and St. Bartholomew's Hospital, where he won a scholarship and several prizes. He graduated M.B., B.S. in 1887 and proceeded M.D. with the award of a gold medal two years later. He became F.R.C.S. in 1892. After holding the posts of resident surgical assistant at the Newcastle-upon-Tyne Infirmary and assistant medical officer at Northumberland House Asylum he became medical superintendent of Hendon Grove Asylum. At this stage of his career he had two diverse interests—the functions of the mind, especially memory (on which he published several papers), and colour vision, about which he contributed an article to this *Journal* as early as 1889. But gradually the study of the physiology of vision became his overriding enthusiasm, and he continued his researches while retaining his post at Hendon Grove Asylum. Though some of his ideas were strongly disputed by other experts, his devotion to the cause of medical research was wholly admirable.

In those days official recognition was given to the Holmgren wool test as the method of testing colour vision, and Edridge-Green was one of the first to point out the disadvantages of this method, one of his papers on the subject appearing in the *Lancet* in 1900. Although he was made a member of the International Code of Signals Committee, his views were not at first accepted, but after the publication of his treatise on *Colour Blindness and Colour Perception* in 1909 other authorities began to confirm his work, which also received the support of a committee of the British Association. Eventually, soon after the beginning of the first world war, the colour-perception lantern devised by Edridge-Green was brought into official use for colour-vision testing by the Royal Navy, the Board of Trade, the railways, and other bodies throughout the world. The bead test, used by National Service boards, was also his invention. The many honours and distinctions which later came his way testified to the importance of his work. In 1920 he was appointed C.B.E. and also made adviser to the Board of Trade, and, later, to the Ministry of Transport. At the College of Surgeons, having been prosecutor at an early stage in his career, he was Hunterian Professor in 1911 and the Arris and Gale lecturer in 1920. He was also a Beit Memorial Research Fellow and worked for a time at Cambridge. In 1930 he was president of honour at the annual meeting of the Ophthalmological Society of Paris, and six years later he was awarded the Thomas Gray Memorial Prize for his invention of the colour-perception lantern. A distinction which pleased him was the presidency of the Durham Medical Graduates Association.

Much of Edridge-Green's professional work was done as ophthalmic surgeon to the London Pensions Board, and

he was also chairman of the Ophthalmic Board of the Central London Recruiting Boards for National Service. The author of numerous papers in English and foreign scientific journals, he published a book entitled *The Physiology of Vision* in 1920 and wrote the section on colour vision and colour blindness in the *Encyclopaedia Britannica* (1922). He was an able mathematician and a skilful player of chess and bridge. Some details of his life and early struggles are contained in his book *Science and Pseudo-science*, published in 1933. His interest in the physiology of vision continued right up to his death, and only a few weeks ago he paid one of his usual visits of inspection to the factory at Hove where the colour-perception lanterns are manufactured.

In 1893 Edridge-Green married Minnie Jane, daughter of Henry Hicks, M.D., F.R.S. She died in 1901. They had two sons, one of whom died in childhood; the other, who served in the first world war, died shortly after the armistice.

JOHN GUY, M.D., F.R.C.P.Ed., F.R.F.P.S., D.P.H.

Dr. John Guy, who died at his home at Aberlady, East Lothian, on April 11 at the age of 79, was medical officer of health for Edinburgh from 1930 to 1938. He had been in the service of Edinburgh Corporation for 25 years, and was the fourth medical officer of health for the city.

John Guy was born at Saltcoats, Ayrshire, on October 4, 1873, and was educated at the University of Glasgow, where he graduated M.B., C.M. in 1894, proceeding to the M.D. six years later. He took the Cambridge D.P.H. in 1899, and he was elected F.R.F.P.S. in 1911 and F.R.C.P.Ed. in 1917. After graduation Dr. Guy held posts in Poor Law hospitals in Bradford and Leeds before becoming medical superintendent of the Bridge of Weir Sanatorium, where he stayed for seven years. Thereafter he was for a short time tuberculosis officer for Gloucestershire, the first to hold the post, before accepting a similar position at Edinburgh in 1913, an appointment made jointly by the corporation and the burgh insurance committee in accordance with the provisions relating to tuberculosis in the National Insurance Act of 1911.

When he took office as medical officer of health for Edinburgh the health services were being unified under the Local Government (Scotland) Act of 1929. At that period public health administration in the city was limited to the control of infectious diseases, environmental and veterinary services, an infectious diseases hospital, a sanatorium and farm colony, and specialist departments for tuberculosis, venereal diseases, and maternity and child welfare. Under the Act the health functions previously carried out by the parish council and the local board of control were transferred to the public health department, including the conduct of two general hospitals for the sick poor, a mental hospital with over 1,000 beds, and a newly inaugurated institution of 500 beds for mental defectives, and to these new duties was added also the task of supervising the health of 60,000 schoolchildren. The changes represented the largest single addition to the burdens of a medical officer of health, and while they called for careful assimilation they also provided an opportunity for improved co-ordination. By 1938, when he retired, Dr. Guy had succeeded in establishing a chain of three general hospitals in which the treatment of the patients was directed by the medical staff of the University of Edinburgh, whose professors were the heads of the medical, surgi-

cal, and maternity and child life units. The association of "town and gown" raised the prestige of the hospitals and earned the warm approval of the citizens. When war broke out in 1939 the three hospitals, with many more beds and new equipment, became a valuable part of the country's emergency medical service. Dr. Guy had a special regard for the school health service, and this was reflected in his introduction of more frequent medical inspections and an increased scale of specialist treatment.

Dr. Guy was a former lecturer on public health in the University of Edinburgh, on tuberculosis at the School of Medicine of the Royal Colleges, and on hygiene in the School of Social Study at Edinburgh. Together with the late Dr. G. J. I. Linklater, he was the author of a widely used textbook on *Hygiene for Nurses*. A man of deep religious principles, Dr. Guy was associated with various benevolent societies in Edinburgh. He had a keen appreciation of music, and another of his interests was farming. He leaves a widow, three sons, and a daughter.

C. J. MCSWEENEY, M.D., F.R.C.P.I., D.P.H.

We record with regret the death on April 17 of Dr. C. J. McSweeney, medical superintendent of the Cork Street Fever Hospital, Dublin.

Born at Cork in 1899, Christopher Joseph McSweeney was educated at the Christian Brothers' College and at University College, Cork, where his father, Mr. E. P. McSweeney, was a member of the staff. A brilliant student, he won a number of scholarships and prizes and graduated M.B., Ch.B., with first-class honours, in 1921. Nine years later he proceeded to the M.D. After graduation he held the appointment of extern assistant to the Rotunda Hospital, Dublin. In 1925 he took the D.P.H. and became assistant medical officer of health at Cardiff. Two years later he was promoted to be deputy to the then medical officer of health, Dr. R. M. F. Picken. Among his other duties Dr. McSweeney was in charge of the Cardiff Isolation Hospital, and he was also appointed lecturer in infectious diseases and associate examiner for the Welsh National School of Medicine.

In 1934 he returned to Ireland to become medical superintendent of the Cork Street Fever Hospital, Dublin, a post which carried with it lectureships in infectious diseases in the Dublin medical schools together with the appointment of consultant in infectious diseases for the city. In the previous year he was elected a Member of the Royal College of Physicians of Ireland, being admitted a Fellow three years later. From 1937 to 1939 he was a Censor of the College. In addition to the appointment at the Cork Street Hospital, he was deputy professor of preventive medicine at Trinity College and consulting physician in fevers to the National Children's Hospital and the Fairy Hill Open Air Hospital. He was also an examiner for nursing councils, both in Northern Ireland and in Eire, and for the D.P.H. of the Dublin medical schools.

Dr. McSweeney was the author of many important papers about infectious diseases, and his most recent book, *The Clinical Approach to Fevers*, appeared only last month. A paper which he wrote in 1941 was entitled "A Public Health Programme for Eire"; this was published in the *Irish Journal of Medical Science*. He married Miss Evelyn H. Donegan in 1923, and she survives him, together with one son.

We are indebted to Dr. R. M. F. Picken, for the following appreciation: During the first half of the present century, when infectious diseases were still prevalent and epidemics fairly frequent, and while the new personal health services were developing quickly, the most acceptable members of public health departments were those who could turn their minds to new problems or sudden emergencies and cope with them without close supervision. McSweeney was pre-eminently of this type, a type which the public health service has found it hard to retain because of the poor material prospects. When he came to the public health department of Cardiff he was still a very young practitioner. He soon showed that he had this sort of initiative as well as unusual ability and assiduity. A problem became all-absorbing to him until he had found some practical channel for its issue. Thus he undertook from the beginning the management and clinical supervision of an institution earmarked for early cardiac rheumatism in children until it was a going concern. When variola minor broke out in epidemic form in South Wales he threw himself into its diagnosis and control so vigorously that his help was sought in a neighbouring urban district, where his energy and diagnostic skill were instrumental in bringing it quickly to an end. In his latter years in Cardiff he was both deputy medical officer of health and medical superintendent of the isolation hospital and lecturer in infectious diseases in the Medical School, arduous tasks which he fulfilled with signal success.

McSweeney had a delightful temperament, warm, kindly, and friendly to all those in any station of life with whom he came in contact. He had a keen sense of humour and a ready wit. I think he was happy in South Wales and appreciated the qualities of those natives of this other island with whom he worked. We, of course, saw less of him after he became medical superintendent of Cork Street Hospital, Dublin, but we watched with interest and appreciation his development as a clinician and a teacher, and judged from his writings and from fairly frequent personal contacts that he must have had a great and beneficial influence on his younger colleagues and his students. He had just taken up residence in a new hospital which he had been planning for years and which was about to be opened. We mourn his untimely death and extend our heartfelt sympathy to his widow, who was also at one time a teacher in the Medical School in Cardiff, and to his young son.

EUGEN POLLAK, M.D.

Dr. Eugen Pollak, lecturer in neuropathology at Manchester University, died at the Manchester Royal Infirmary on April 9, aged 62. A Viennese by birth and a widower for many years, Pollak was a refugee from the Nazis, arriving in Oxford soon after the rape of Austria. In the Radcliffe Infirmary he found a temporary home in the company of del Río Hortega and Gustav Steiner, with whom he worked in the department of the ever-hospitable Hugh Cairns. Pollak never doubted the outcome of the war, but he must have thought his return to Austria unlikely. In Oxford he was cheerful, courageous, and prepared to bide his time. He longed for work, but demanded nothing; what he was given to do he did willingly, and he never complained. Del Río Hortega was already installed as Oxford's neuropathologist. He and Pollak were as different in personality as they were in training, and with the added difficulty of language there was little contact between them: the Spaniard looked with suspicion on the Austrian whose scientific upbringing made it difficult for him to recognize the concept of the mesoglia. Pollak's opportunity was to come soon. In 1939 he was invited by Sir Geoffrey Jefferson to organize a department of neuropathology in the university service of neurosurgery in Manchester. The acceptance of this offer

he never had cause to regret, and from his letters it was clear that he was happy there—as happy indeed as any Viennese could be in exile. Before he came to England the vivacious Pollak was a prolific writer and was well known for his contributions on tuberculous sclerosis, Wilson's disease, and the neuroglia. His publications, based on his work in the departments of Professors Obersteiner and Marburg, mostly appeared in the *Arbeiten aus dem Neurologischen Institut* and in the *Jahrbücher für Psychiatrie und Neurologie*. He was the author of the section on the anatomy of the spinal cord, medulla, and pons in Bumke and Foerster's *Handbuch der Neurologie*. The forced change of country, however, and the building up of a new department, and latterly the threat of ill-health, disturbed the lines of research on which he had been working, and he never really regained the threads. Dr. Pollak's only daughter lives in Vancouver.

W. H. McM. writes: We remember Eugen Pollak as a hearty man, upright in bearing, dark, clean-shaven, and with an excellent sense of humour. Always confident and at times dogmatic, he could be counted upon to enliven equally a discussion on the political future of Europe or on the functions of the neuroglia. In moments off duty we knew him as a *bon viveur*, with an extensive and practical knowledge of the chef's art, and a lover of music. In the early days over here he knew little English, but he was always resourceful. Once, with an obvious effort of will, he declined a second helping of a rich entremet, pointing to his waist-line and explaining, "For me, please, it is too 'periculous.'" Had he been a younger man Pollak might have done more original work in the kindly environment of Manchester, for he had both originality of outlook and great technical skill. As it was he built up a valuable collection of material which will serve others in good stead. Beneath a brave and cheerful façade Pollak was a lonely man who grieved over the fate of his country and also the death of his sister, another victim of racial intolerance.

We record with regret the death of Dr. ALBERT COLEMAN at his home at Croydon on April 13, the day after his 54th birthday, after a long and trying illness. Albert Coleman was born at Manchester and educated at Manchester Grammar School. In 1917 he was awarded an open classical exhibition at Wadham College, Oxford, but the war prevented him from continuing with his classical education. After active service as a combatant officer with the 2nd Battalion the Manchester Regiment, he entered Manchester University, where in 1923 he gained the prize in clinical medicine and graduated M.B., Ch.B. In 1929 he became a Member of the Royal College of Physicians of London. After graduation he held the appointments of house-physician and house-surgeon at Manchester Royal Infirmary and of resident medical officer at Ancoats General Hospital. In 1926 he was appointed a house-physician at the Brompton Hospital, where he was later resident medical officer for two years. In 1932 Dr. Coleman settled in practice at Croydon, where he rapidly developed a large practice and established a reputation for his sound clinical judgment. He was also a skilful anaesthetist, and in 1942 obtained the Diploma in Anaesthetics of the English Royal Colleges. He was appointed an anaesthetist to Croydon General Hospital in 1936 and was also on the staff of the Bethlem Royal Hospital, the Seamen's Hospital, Greenwich, and Warrington Park Hospital. In 1946-7 he was chairman of the Croydon Division of the British Medical Association, a position he held with distinction. He held definite opinions about the advent of the National Health Service and its impact on the relationship between doctor and patient, and he also had emphatic views about the committee-bound structures he felt had been erected, but he had a kindly and happy disposition and made no enemies.

His recreations were shooting and photography, in which he took great enjoyment and possessed considerable skill. Some of his colour photography won him international repute. The sincere sympathy of his colleagues, friends, and patients will be extended to his widow and two daughters.

We are indebted to Dr. P. POSFORD for the following appreciation: The death of Dr. Albert Coleman has left a sad gap in the ranks of the medical profession. He was a fine doctor, much respected for his skill and professional judgment by a wide circle of doctors in and around the Croydon area, and, while he took great pains to apply the latest advances for the cure of disease, he never forgot that the patient was a person first of all. He was the kindest of men, always gentle, and quick to help those in trouble, and he had a keen and subtle sense of humour. It was always a great pleasure to be with him. It was my privilege to attend him in his last long illness, and, while he bore physical pain with great and quiet fortitude, he derived his main strength to face up to the reality of death from his firm faith in God, which was of more value to him than the medicine of his doctors.

Medical Notes in Parliament

Health Visitors

Mr. SOMERVILLE HASTINGS asked the Minister of Health on April 20 how many health visitors per 10,000 of the population were employed in England and Wales, which were the highest and lowest ratios, and in which county or county borough these were found.

Miss PAT HORNSBY-SMITH informed him that on December 31, 1951, the number of health visitors employed by local health authorities (two part-time being taken as roughly equal to one whole-time) was 0.9 per 10,000 of the population. The highest and lowest ratios were 3.5 in the county of Radnor and 0.16 in the Soke of Peterborough.

Health Service Inquiry

Miss PAT HORNSBY-SMITH, Parliamentary Secretary to the Ministry of Health, stated on April 23, in reply to Mr. A. Blenkinsop, that the Minister hoped to be able in a few days to give further information about the composition of the committee of inquiry into the National Health Service.

Dr. BARNET STROSS asked to what extent the terms of reference of the committee included powers to consider salaries paid to medical and non-medical staff, and the economies that might be effected by employing consultants on a full-time basis only.

Miss HORNSBY-SMITH replied that the Minister would certainly not expect the committee to deal with actual rates of pay. For the rest, the Secretary of State for Scotland and the Minister of Health were anxious not to hamper the committee in their work by seeking to restrict their field of inquiry.

Poliomyelitis Research

Mr. JOHN T. HALL on April 23 asked the Minister of Health if he was aware that constant appeals were being made for funds on behalf of the National Fund for Poliomyelitis Research, what steps were being taken to combat this disease, and whether he would consider increasing Government assistance to facilitate the work of finding a cure.

Miss PAT HORNSBY-SMITH replied that the Minister was aware of these appeals, and welcomed help which the fund might be able to give to supplement research. Treatment was provided within the National Health Service mainly by the hospitals, in an increasing number of which special units were being provided. An extensive programme of research was being sponsored by the Medical Research Council, and was not restricted by lack of funds.

Tobacco and Cancer

Mr. FREDERICK WILLEY asked the Minister of Health on April 23 what further research he was undertaking consequent upon the report of his chief medical officer that suspicion continued to be thrown on tobacco, especially heavy cigarette-smoking, for the disturbing increase in male mortality from cancer.

Miss PAT HORNSBY-SMITH replied that this matter had been referred to the Standing Advisory Committee on Cancer and Radiotherapy, and the Minister was awaiting their advice. Meanwhile the existing research would be continued.

Litigation Against Doctors

Air Commodore A. V. HARVEY on April 23 asked the Minister of Health what steps he was taking to safeguard doctors from litigation resulting from their work in the Health Scheme.

Miss PAT HORNSBY-SMITH replied that officers of the department were discussing with representatives of the profession the relations, financial and other, between hospital authorities and their medical staffs when legal actions were brought against either or both.

Food Hygiene

Mr. G. H. OLIVER on April 23 asked the Minister of Health what steps were taken to ascertain whether persons employed in the preparing, cooking, and serving of food in hotels, restaurants, and road-side cafés were free from infectious diseases such as tuberculosis.

Miss PAT HORNSBY-SMITH answered that there was no general power to require the persons concerned to be medically examined for this purpose, and the Minister was advised that the present state of our knowledge did not suggest that such a power would be justifiable as a means of preventing the spread of infection.

Medico-Legal

DAMAGES AGAINST HOSPITAL

Damages of £4,000 were awarded by Mr. Justice Gerrard on April 22 to Mr. R. J. Crawford, aged 52, against Charing Cross Hospital. Mr. Crawford alleged that damage to his left arm sustained during an operation was caused by negligence. The defendants, the board of governors, denied liability. The judge ordered a stay of execution pending appeal.

In view of the concern which cases of alleged negligence have recently been causing the medical profession, it is to be hoped that it will be found possible to take the case to appeal.

The operation, which was performed at Charing Cross Hospital on July 7, 1950, was on the bladder, and the patient was placed in the Trendelenburg position, with shoulder rests. His left arm was abducted and a vein in it used for blood transfusion. After the operation the arm was found to be partially paralysed. His right arm was already paralysed from an attack of acute poliomyelitis in childhood.

In his judgment Mr. Justice Gerrard said that the operation had been completely successful and allegations of negligence against the surgeon had been rightly withdrawn. It was the anaesthetist who had administered the blood transfusion, and the judge held that he had been negligent in the circumstances of the case in not avoiding the extension of the plaintiff's arm, at any rate to the degree he permitted, for longer than necessary. He found that negligence had contributed to the very severe degree of brachial paralysis. In assessing damages at £4,000 the judge took account of the plaintiff's poor state of health.

Messrs. Hempson's, acting on behalf of the Medical Defence Union, instructed counsel to hold a watching brief on behalf of the surgeon and the anaesthetist.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 11 (No. 14) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	19	0	9	0		22	1	10	0	3
Dysentery ..	325	45	81	8		548	81	55	4	1
Encephalitis, acute ..	5	0	0	0		4	1	0	0	1
Enteric fever: Typhoid ..	2	1	0	0		1	0		1	1
Paratyphoid ..	9	2	2(B)	0		7	0		0	2(B)
Food-poisoning ..	65	7		0		185	12		5	
Infective enteritis or diarrhoea under 2 years ..				23	22				8	67
Measles* ..	23,388	1032	280	209	255	6,836	231	633	227	421
Meningococcal infection ..	60	3	17	2	4	60	6	19	4	
Ophthalmia neonatorum ..	40	1	11	0		38	2	8	0	
Pneumonia† ..	925	51	302	15	6	711	40	304	10	
Poliomyelitis, acute: Paralytic ..	28	6		0	2	15	2		1	1
Non-paralytic ..	10	0		0		4	0			
Puerperal fever‡ ..	265	32	16	1		221	36	8	1	
Scarlet fever ..	1,266	69	171	36	52	1,361	93	183	17	57
Tuberculosis: Respiratory ..			155	29				150	38	
Non-respiratory ..			31	4				23	16	
Whooping-cough ..	2,618	178	288	22	95	3,004	134	266	95	45

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0		0	0	0		0	1
Dysentery ..	0	0				0	0		0	
Encephalitis, acute ..	0				0	0			0	
Enteric fever ..	1	0	0			0	0		0	
Infective enteritis or diarrhoea under 2 years ..	6	2	3	3	0	2	0	7	0	2
Influenza ..	44	5	2	2	2	33	5	6	1	0
Measles ..	0	1		0		0			0	0
Meningococcal infection ..	0	2				0				
Pneumonia ..	260	38	28	16	8	245	33		5	3
Poliomyelitis, acute ..	3	1			0	2	0			0
Scarlet fever ..	0	0		0		0			0	0
Tuberculosis: Respiratory ..	100	17	26	2	7	143	20	20	5	7
Non-respiratory ..		3	4	1	2		1	5	1	1
Whooping-cough ..	8	1	0	0	0	2	1		0	0
Deaths 0-1 year ..	270	25	30	15	12	249	36	44	6	15
Deaths (excluding stillbirths) ..	5,654	784	681	136	176	6,035	638	116	153	
LIVE BIRTHS ..	8,298	1,227	1,050	233	410	8,044	1,256	995	258	446
STILLBIRTHS ..	219	33	24			226	25			

* Measles not notifiable in Scotland, where returns are approximate.

† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Smallpox in the North Country

Up to noon, April 27, there had been 26 confirmed cases of smallpox, including 6 deaths. Since last week's report there has been one new case—in Bury C.B. This patient was a woman aged 69, vaccinated in infancy.

Infectious Diseases

In England and Wales during the week ending April 11 the number of notifications of measles increased by 2,222, from 21,166 to 23,388, and whooping-cough increased by 110, from 2,508 to 2,618, while scarlet fever decreased by 137, from 1,403 to 1,266, and dysentery by 98, from 423 to 325.

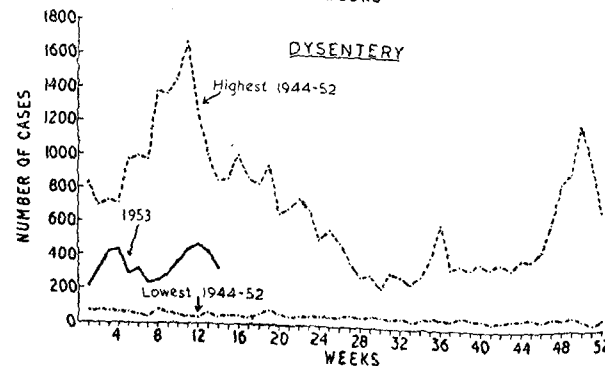
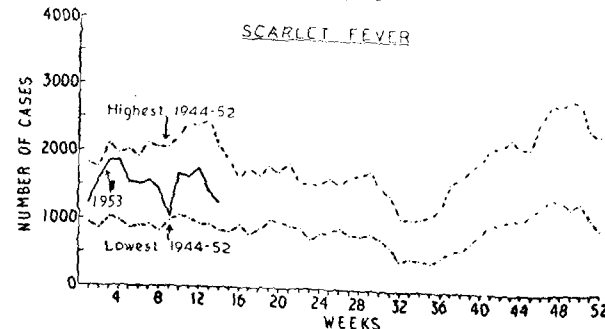
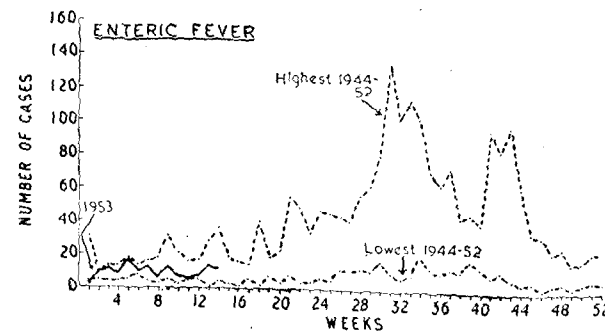
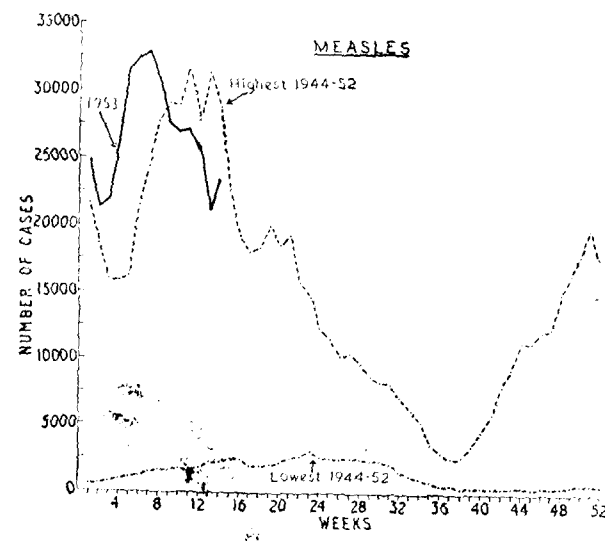
With only a few exceptions a rise in the incidence of measles was reported in every county. The largest increases were Yorkshire West Riding 515, from 1,381 to 1,896; Durham 159, from 549 to 708; the combined five south-western counties 455, from 2,089 to 2,544. The only outstanding exception to the general rise was a fall of 329 in Surrey, from 1,444 to 1,115. The largest rise in the number of notifications of whooping-cough was 44 in Durham, from 88 to 132, and the largest fall was 43 in Warwickshire, from 182 to 139. A fall of 27 in London, from 96 to 69, was the largest fluctuation in the local trends of scarlet fever. 19 cases of diphtheria were notified, 8 more than in the preceding week. The chief feature of the returns of diphtheria was a rise from 0 to 4 in Cheshire.

38 cases of acute poliomyelitis were notified. These were 3 fewer for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were London 6, Middlesex 4, Essex 4, Warwickshire 4 (Birmingham C.B. 4), and Kent 3.

The chief centres of dysentery were Lancashire 82 (Liverpool C.B. 34, Manchester C.B. 19), London 45 (scattered through 16 boroughs), Leicestershire 41 (Leicester C.B. 41), Yorkshire West Riding 21, and Middlesex 20.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



England and Wales in 1951

With welcome promptitude the Registrar-General for England and Wales has produced the medical tables of his *Statistical Review* for the year 1951 only four months after the corresponding volume for 1950. The following figures extracted from it compare death rates per million in England and Wales with those in Scotland for 1951.

Cause of Death	England and Wales	Scotland
Tuberculosis of respiratory system ..	273	379
Tuberculosis, other forms ..	41	55
Malignant neoplasms, including neoplasms of lymphatic and haematopoietic tissues ..	1,951	2,065
Diabetes mellitus ..	84	118
Vascular lesions affecting the central nervous system ..	1,549	1,940
Heart diseases ..	3,638	4,410
Hypertensive disease ..	474	314

England and Wales in First Quarter

In the first quarter this year the stillbirth rate fell to a new low level for any March quarter in England and Wales, and the infant mortality rate was the second lowest. There were 3,957 stillbirths, giving a rate of 22.5 per thousand total births, as compared with 23.3 in the corresponding quarter in 1952 and 38.3 in 1938. Deaths of children under 1 year of age numbered 5,645, or 33.8 per thousand live births. This was only slightly higher than the rate of 33.4 for 1952 March quarter. The corresponding figure for 1938 was 69.3.

Deaths numbered 171,268, giving a rate of 15.8 per thousand population, as compared with 13.4 in 1952 and 19.1 in 1951 (when there was also an influenza epidemic). Live births numbered 171,705—almost the same number as deaths—giving a rate of 15.8 per thousand population, as compared with 15.9 for 1952 and 16.3 for 1951. All figures given above relate to first quarters.—*Registrar-General's Weekly Return for England and Wales*, No. 15.

Week Ending April 18

The notifications of infectious diseases in England and Wales during the week included scarlet fever 994, whooping-cough 2,847, diphtheria 18, measles 18,861, acute poliomyelitis 34, dysentery 282, paratyphoid fever 7, and typhoid fever 2.

Medical News

Southampton Medical Society's Centenary.—The Southampton Medical Society held its centenary celebrations at the University of Southampton on Saturday, April 18. The Vice-Chancellor of the University, Mr. D. G. James, welcomed 200 members and their guests at an afternoon meeting at which Sir Russell Brain, P.R.C.P., delivered an oration on "Evolution in Medicine." The chair was taken by the president of the Society, Dr. R. S. Swindell, who was accompanied on the platform by the Mayor and Mayoress of Southampton, the Sheriff, the two Members of Parliament for Southampton, and the president of the Medical Society of London, Dr. Cuthbert Dukes. In the evening there was a dinner attended by 140 members. Amongst the guests were the Mayor, who proposed the toast of the Southampton Medical Society, the Bishop of Southampton, the Vice-Chancellor of the University, and others who had taken part in the afternoon's proceedings.

Rockefeller Foundation Grants.—In the Rockefeller Foundation's most recent quarterly report is the announcement of two substantial grants to medicine in Britain. The first is a grant of over £20,000 to the London School of Hygiene and Tropical Medicine for a three-year study in public health. This work, which is being carried out in Hertfordshire under the direction of Dr. J. H. F. Brotherhood, lecturer in public health at the school, is concerned particularly with the care of the elderly sick and the use of that families make of the Health Service. The second is a grant of £7,000 and \$5,400 to the Welsh Regional Hospital Board for the support of the Neuropsychiatric Research Centre at Whitechurch Hospital, Cardiff. Here, under the direction of Dr. Derek Richter, work is in progress on brain metabolism, the effects of anaesthetics on the brain, hallucinations, and suggestibility. Notable grants made by the Rockefeller Foundation towards medical projects outside Britain include \$500,000 for the development of the medical division of the American University of Beirut in the Lebanon, and a grant of \$121,000 to the Indian Council of Medical Research for postgraduate medical fellowships.

Cerebral Palsy Centre in Belfast.—Lady Wakehurst, wife of the Governor of Northern Ireland, recently opened Malcolm Sinclair House, the cerebral palsy treatment centre of the Northern Ireland Council for Orthopaedic Development. As a result of a survey financed by the council and carried out by the Department of Social and Preventive Medicine at Queen's University it has been estimated that there are 500 spastic children in the province. The centre is intended to provide treatment for those of them likely to be able to benefit from it. After the opening ceremony Dr. C. D. S. Agassiz, physician-superintendent, Queen Mary's Hospital for Children, Carshalton, gave an address on cerebral palsy. Among those present at the opening were the Minister of Health and Local Government and the Minister of Education.

Royal National Institute for the Blind.—The Queen has commanded that the National Institute for the Blind shall in future be known as the Royal National Institute for the Blind.

Crash Helmets for Motor-cyclists.—At long last the idea of protective headgear for motor-cyclists, so ably advocated by the late Sir Hugh Cairns, is catching on with the public. Both official sources and the trade testify to this. The British Standards Institution is now preparing a standard specification for the helmets ("protective hats" in official parlance). Helmets must be light and capable of withstanding both impact and compression tests. The outer shell must be weather-proof and without dangerous projections: peaks, if worn, should be flexible. Between the harness fixing the helmet to the head and the outer shell a space with padding is recommended.

Pharmaceutical Industry and the Metric System.—Twelve months ago the annual general meeting of the Association of the British Pharmaceutical Industry adopted a resolution that bulk supplies of solid drugs, liquid galenicals, and pharmaceutical chemicals should be sold to pharmacists by metric weight and measure instead of by Imperial measure as at present. Most of the large pharmaceutical firms have agreed to this proposal. The target date for the change is July 1, but the process of altering packs and containers is bound to take some time.

Boiler-scaling and Pneumoconiosis.—By Regulations which came into force on April 22 the Minister of National Insurance has added the occupation of boiler-scaling to those covered for pneumoconiosis under the National Insurance (Industrial Injuries) Act. This will allow boiler-scalers with pneumoconiosis to obtain benefit under the Act.

Nepal and W.H.O.—At the sixth World Health Assembly, which opens in Geneva on May 5, a request from Nepal to join W.H.O. will be considered. At present there are 79 Member States and 3 Associate Members (Morocco, Southern Rhodesia, and Tunisia).

Foreign Members of the Royal Society.—Among the four distinguished scientists elected Foreign Members of the Royal Society last month were Professor M. J. C. R. Courrier, deputy director of the Collège de France, Paris, who is noted for his work on endocrinology, and Professor H. J. Muller, of Indiana, U.S.A. Professor Muller's classical experiments on the chromosomes of the fruit fly *Drosophila* are familiar to most students of biology and medicine.

Sir Robert Robinson, F.R.S., Waynflete Professor of Chemistry at Oxford, has been awarded the Priestley Medal of the American Chemical Society. This is the society's most important annual award. In the medical field Sir Robert is particularly noted for his work in connexion with the synthesis of penicillin and, more recently, of steroid hormones.

Dr. John Gillies, reader in anaesthetics at Edinburgh, has been awarded the Henry Hill Hickman medal for outstanding work in anaesthesia. The presentation is being made in London by Dr. F. M. R. Walshe, F.R.S., on May 1 at the annual general meeting of the Section of Anaesthetics of the Royal Society of Medicine.

Dr. C. B. Allsopp, D.Sc., reader in physics at Guy's Hospital Medical School, has been appointed to the London University Chair of Physics Applied to Medicine, tenable at the medical school.

Professor R. M. Walker, professor of surgery at Bristol University, has been made an honorary Fellow of University College, London.

COMING EVENTS

Territorial Medical Officers' Dinner.—The annual dinner of the Territorial Army Medical Officers' Association will be held on May 8. Further particulars concerning the dinner can be obtained from the honorary secretary, 19, Queen Anne Street, London, W.1.

Grenfell Volunteers' Reunion.—The annual reunion of Grenfell Volunteers will take place at the Overseas League, Park Place, St. James's Street, London, S.W.1, on May 6, from 3 p.m. to 5.30 p.m. The speaker will be Dr. W. A. Paddon, who is in charge of the hospital station at North-west River, and the chair will be taken by the Reverend Henry Gordon.

Society for Endocrinology.—A symposium entitled "The Determination of Adrenal Cortical Steroids and Their Metabolites" will be held by the Society of Endocrinology at the Medical Society of London, Chandos Street, London, W.1, on May 21 at 9.30 a.m. Non-members wishing to attend are asked to communicate with Professor N. F. MacLagan, Westminster Medical School, London, S.W.1.

National Marriage Guidance Council.—The seventh annual conference of the National Marriage Guidance Council is to be held at Llandudno from May 14 to 17. The theme of the conference will be "Marital Conciliation," and those wishing to attend are asked to communicate with the office secretary, National Marriage Guidance Council, 78, Duke Street, Grosvenor Square, London, W.1, from whom further details may be obtained.

Laboratory Animals.—The Laboratory Animals Bureau has arranged a symposium on laboratory animals to be held at the Royal Society of Medicine, 1, Wimpole Street, London, W.1, on May 14 at 2.30 p.m. The chairman will be Dr. H. J. Parish, and other speakers include Mr. A. N. Worden, Mr. A. E. Mundy, Mr. J. Scarnell, and Dr. J. S. Paterson. The symposium will be followed by an open discussion.

NEW ISSUES

British Journal of Ophthalmology.—The next issue of this journal (Vol. 37, No. 5) will be available in a week's time. The contents include:

NOTES ON OPHTHALMOLOGICAL PRACTICE IN LUND. Sven Larsson.
CAUSES AND TREATMENT OF CONGENITAL ECCENTRIC NYSTAGMUS. J. Ringland and Anderson.
ARTERIOLE INVOLVEMENT IN DIABETIC RETINOPATHY. Norman Ashton.
VASCULAR CHANGES THAT OCCUR DURING THE PHASIC VARIATIONS OF TENSION IN CHRONIC GLAUCOMA. J. H. Dobree.
CORNEAL THICKNESS IN INTERSTITIAL KERATITIS. Charles Cook and Maurice Langham.
EXPERIENCES WITH THE LINDNER-GUIST OPERATION. A. Lister.
CORRESPONDENCE BETWEEN VISUAL ACUITY, REFRACTIVE ERROR, AND THE SPEED OF VISUAL PERCEPTION. T. H. Eames.
UNUSUAL APPEARANCE IN A CASE OF EALE'S DISEASE. A. G. Cross and D. P. Choyle.
INFRA-RED IMAGE CONVERTER IN ROD SCOTOMETRY. M. F. P. Marshall.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, May 4

CAMBRIDGE UNIVERSITY.—At Department of Pathology, 4.30 p.m., Dr. P. Lépine (Institut Pasteur): Electron Microscope Studies in the Virus Field, with Special Reference to the Study of Intracellular Development of Viruses.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. H. Wirtz (Basle): Osmotic Work of Mammalian Kidney.
UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., Sir Rudolph Peters, F.R.S.: Inhibitors and Intracellular Chemical Dissection.

Tuesday, May 5

CAMBRIDGE UNIVERSITY.—At Department of Pathology, 4.30 p.m., Dr. P. Lépine (Institut Pasteur): Present Position of the Poliomyelitis Problem: Research and Epidemiology.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. E. J. Moynahan: Urticaria.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Humphry Davy Rolleston Lecture by Professor R. A. McCance, F.R.S.: Overnutrition and Undernutrition.

ROYAL EYE HOSPITAL.—5 p.m., Mr. T. M. Tyrrell: Cataract Surgery and its Complications.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. D. Hunter: Prevention of Occupational Disease.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY, St. Mary's Hospital Medical School.—5 p.m., Almoth Wright Lecture by Dr. Leonard Colebrook, F.R.S.: Almoth Wright—Pioneer in Immunology.

Wednesday, May 6

● BRITISH MEDICAL ASSOCIATION.—6.30 p.m., Sir Charles Hastings Lecture by Professor F. A. E. Crew, F.R.S.: Medicine and Social Policy.
INSTITUTE OF DENTAL SURGERY.—5 p.m., Dr. F. W. Clement (Toledo, U.S.A.): General Anaesthesia in Dental Surgery.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Histology of Normal Skin.

LONDON UNIVERSITY.—At School of Pharmacy, 5.30 p.m., Dr. W. O. Jones, F.R.S.: Formation of Alkaloids in Plants.
OXFORD UNIVERSITY.—At University Museum, 5 p.m., Litchfield Lecture by Professor W. T. Astbury, F.R.S.: Some Leading Questions in the Fine Structure of Biological Fibres.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. R. J. Ludford: Tissue Cultures—Pathological Aberrations of Cellular Structure and Functioning.

Thursday, May 7

FACULTY OF HOMOEOPATHY.—5 p.m., Dr. D. M. Gibson: Observations on Homoeopathy in Relation to Psychoneurosis.

● HAMPSTEAD GENERAL HOSPITAL.—3 p.m., Dr. D. Hector-Jones: Radiology of the Large Gut; 4.15 p.m., Mr. Harland Rees: Urinary Calculi.
LONDON UNIVERSITY.—At School of Pharmacy, 5.30 p.m., Dr. W. O. Jones, F.R.S.: Formation of Alkaloids in Plants.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. H. S. Banks: Acute Meningitis.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Humphry Davy Rolleston Lecture by Professor R. A. McCance, F.R.S.: Overnutrition and Undernutrition.

ROYAL EYE HOSPITAL.—5.30 p.m., Miss M. Savory: Influence of Cortisone on Inflammatory Eye Conditions.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. J. L. Nickerson: Current Research in Ballistocardiography.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. M. A. Partridge: postgraduate demonstration in psychiatry.

Friday, May 8

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. F. R. Bettley: Atopy.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. T. Holmes Sellers: Treatment of Pleural Infection.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. Russell Fraser: Use of Radio-iodine in Thyroid Diagnosis.

ROYAL EYE HOSPITAL.—5.30 p.m., Miss J. M. Dollar: Surgery of the Orbit.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Obstetric and Gynaecological Conference. Dr. Hugh McLaren: Early Diagnosis of Carcinoma of the Cervix.

Saturday, May 9

WEST MIDLANDS PHYSICIANS ASSOCIATION.—At Gulson Hospital, Coventry, 11 a.m., general meeting

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Aitken.—On March 2, 1953, at Queen Charlotte's Hospital, London, W.1, to Jean, wife of Dr. C. A. M. Aitken, a son—Timothy John McClelland.

Bailey.—On April 7, 1953, to Jeanne, wife of David Bailey, F.R.C.S., twins—Timothy and Patricia.

Benstead.—On March 30, 1953, at the Christiana Hartley Maternity Hospital, Southport, to Mrs. Nancy and John Benstead, a son—Richard John Rand.

Cameron.—On April 3, 1953, at Maryfield Hospital, Dundee, to Frances, wife of H. MacDonald Cameron, M.B., B.Ch., D.Path., a son.

Charlton.—On April 16, 1953, to Maureen (formerly Rodgers), M.S.R., wife of John C. Charlton, M.B., B.Ch., of Lurgan, Station Road, Mickleover, Derby, a son.

Comper.—On April 18, 1953, at Farnborough Hospital, Kent, to Pamela (formerly Mayes), wife of Dr. John Comper, a son.

Drewitt.—On March 18, 1953, at Ivy Lodge, Lockwood Street, Driffeld, Yorks, to Kathleen Rose (formerly Blair), S.R.N., wife of Dr. A. H. Drewitt, a daughter—Suzanne Elizabeth Blair.

Evans.—On April 10, 1953, at the Hammersmith Hospital, London, W.1, to Marjorie, wife of Lynn A. J. Evans, F.R.C.S., a son.

Forbes.—On April 15, 1953, to Pamela, wife of John Forbes, M.D., of Pen-y-wern, near Mold, Flintshire, a son.

Foxell.—On April 13, 1953, at Suffolk House Nursing Home, Stanmore, Middlesex, to Maureen, wife of Dr. Alan Foxell, a son.

Manson.—On April 4, 1953, at Moffat Hospital, Kanye, Bechuanaland Protectorate, to Jocelyn, M.S.R., C.T., wife of John M. S. Manson, M.D., D.T.M.&H., D.Obst.R.C.O.G., a daughter.

Pickford.—On April 14, 1953, at Wisbech, Cambridgeshire, to Whinifred, wife of Dr. Steven Pickford, a son.

Powell.—On April 1, 1953, at Amman Valley Hospital, Glamorgan, Carmarthenshire, to Muriel (formerly Davies), wife of Dr. F. I. Powell, "Brynteg," Gannart, Carmarthenshire, a son—David Huw.

Pratt.—On April 12, 1953, at the Duke of York Nursing Home, Bradford, Yorks, to Dorothy (formerly Boothroyd), S.R.N., wife of Dr. Peter Pratt, a brother for Christopher.

Scriven.—On April 20, 1953, at Wrecclesham Grange Nursing Home, Farnham, Surrey, to Dr. Jeanne (formerly Edwards), wife of Dr. W. H. Scriven, M.B.E., a son.

Watkinson.—On April 5, 1953, at St. James's Hospital, Leeds, to Marie, wife of Dr. Geoffrey Watkinson, a brother for Anne.

Welch.—On April 11, 1953, at Elvet House, Dean Road, South Shields, to Dr. and Mrs. H. D. Welch, a daughter.

MARRIAGES

Newborne-Skelton.—On April 18, 1953, at St. Giles Church, Oxford, Laurence Perceval Anthony Newborne, M.D., to Mary Skelton, M.C.S.P.

Tannert-Whalley.—On April 11, 1953, in London, John Tannert to Elizabeth Whalley, M.B., B.S.

DEATHS

Corfield.—On March 20, 1953, at the Middlesex Hospital, London, W.1, Walter Francis Corfield, M.D., D.P.H., formerly of Colchester, Essex, aged 73.

Croft.—On April 21, 1953, at Lawn Bank, Tarleton, near Preston, Lancs, Lawrence Croft, M.B., B.S., aged 71.

Davies.—On March 21, 1953, at "Conquerors," Stunts Green, Hurstmonceux, Sussex, Frederick Spencer Davies, M.R.C.S., L.R.C.P., late of Buckhurst Hill and Harlow Common, Essex.

McGowan.—On March 20, 1953, at his home, 18, Clare Road, Halifax, Joseph McGowan, M.B., B.Ch.

Sutton.—On March 19, 1953, Margaret Joan Sutton, L.R.C.P.&S.Ed., L.R.F.P.S., of Poynton Park, Poynton, Cheshire, aged 28.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Prophylactic Chemotherapy of Measles

Q.—Some practitioners favour the prophylactic use of sulphonamides or penicillin in the early stages of measles. Is any evidence available to prove that such treatment cuts down the incidence of complications due to secondary bacterial invaders?

A.—The early damage to the cells of the mucous membrane in measles is virus-induced and cannot be affected by chemotherapy. The effect of this damage, however, is to produce a "soil" which facilitates bacterial infection so that the majority of the complications are bacterial in nature. There thus seems a reasonable case for prophylactic chemotherapy. But, when considering chemoprophylaxis, two different situations must be borne in mind. In the open hospital ward the child will be exposed to the bacterial flora of many unrelated persons. The danger of acquiring a secondary bacterial infection is therefore increased, and prophylactic penicillin is worth considering. When so used, the danger of inducing a chronic ward infection with a penicillin-resistant strain must be kept in mind; if complications arise unexpectedly, the organism isolated must immediately be tested for sensitivity and appropriate steps taken. In private practice the argument for prophylactic chemotherapy is less sound. Here the patient will be exposed solely to the family bacterial flora, and secondary infection will be less commonly encountered. Further, the danger period is short—three to five days—and during this time the child should be under daily clinical observation, so that it should be possible to bring any complication which does arise under immediate control. My own view is that such treatment should be considered only between the age of 6 months to 2 years, and even then only in the severe case of measles. It should never become a routine, but always be guided by clinical judgment.

Finally, one might perhaps emphasize that the complication of greatest importance is otitis media. For this reason the drumheads should be inspected daily during the early danger period so that penicillin may be started at the earliest sign of inflammation. (In the earliest days of the sulphonamides their value as prophylactics was reasonably well established, but one would now hesitate to advocate their use for this purpose in view of their toxicity and the greater efficiency of penicillin.)

Seaweed Baths

Q.—What is the therapeutic basis for the use of seaweed baths? What do they contain, in what conditions are they useful, and how are they given?

A.—The procedure of this bath is as follows: fresh seaweed is treated with boiling water until a jelly is produced; the jelly is added to a reclining-bath of warm sea-water in which the patient immerses himself. Subsequently the patient is given an ordinary sea bath, rubbed down, and packed in hot towels. These baths are available only at a few seaside resorts; no chemist's pack containing seaweed is on the market.

Seaweed thus administered can have no specific action, as none of its constituents will be absorbed through the skin. The total effect of the procedure outlined above is similar to that of an ordinary warm reclining-bath—namely, it brings about relaxation of the patient as a whole and of the muscles and joints in particular. This effect will be temporary only.

Dangers from the Use of Relaxants in E.C.T.

Q.—As a psychiatrist without any special anaesthetic training, is there any unwarrantable risk in my administering a relaxant, such as succinylcholine or gallamine triethiodide, with small doses of a barbiturate before E.C.T.? What precautions should I take apart from having facilities for controlled respiration? What are the dangers of laryngeal spasm and of cardiac arrest, particularly in senile patients?

A.—If the doses of the relaxant and of the barbiturate are correct for the particular patient, the only real risk involved is that of temporary respiratory arrest. The administrator should have sufficient experience and confidence in performing rhythmic inflation of the lungs to maintain good ventilation until spontaneous breathing returns. This will usually be within a few minutes. Very occasionally the return of spontaneous breathing may be delayed for longer. Even so, adequate and correctly performed controlled respiration will tide the patient over until the effects of the relaxant have worn off. There is little danger of spasm of the glottis with these relaxants unless for some reason mucus or stomach contents come in contact with the larynx during the recovery phase. In any case, if the barbiturate dosage is small no harm will result. Cardiac arrest during E.C.T. is no more likely to occur with a relaxant than without, so long as adequate oxygenation is maintained at all times.

Phosphorus Poisoning

Q.—It is stated that in phosphorus poisoning no oil may be given. Could you tell me the reason for this and what harm the oil might do? Also, what is the chemical reaction of potassium permanganate in such cases?

A.—Phosphorus is insoluble in water, but readily dissolves in fat. In the absence of fat it is absorbed from the alimentary tract, but the speed with which it would be absorbed would almost certainly be increased if edible oil were given. Liquid paraffin, however, has been recommended in treatment presumably because it is not absorbed and carries away the phosphorus in it.

Potassium permanganate oxidizes phosphorus to its oxides, which in turn react with water to form phosphoric acids. Both the reagent and products of the reaction will be extremely irritating to the stomach. Repeated gastric lavage is probably the most rational therapy.

Aspermia

Q.—A healthy man of 30 is sterile owing to complete aspermia. What is the aetiology, prognosis, and correct method of investigation and treatment?

A.—This is a formidable question, the full answer to which is quite outside the scope of "Any Questions?" The aetiology can be either obstructive, spermatozoa being prevented by duct blockage from reaching the urethra, or due to failure of spermatogenesis. The former most commonly follows infection of the upper genital tract (e.g., gonococcal epididymo-orchitis), but may also be the result of aplasia of the vas or congenital anomalies of the epididymis. Failure of spermatogenesis may be the result of primary or secondary hypogonadism, congenital absence of the germinal epithelium, trauma, or infection. Mumps after puberty, with bilateral orchitis, may result in testicular atrophy and aspermia (though this is not invariable). Hernia operations may be followed by testicular ischaemia and resultant failure of spermatogenesis. If the testicles are not in the scrotum at puberty, spermatogenesis is unlikely to occur and aspermia follows.

The prognosis clearly depends upon the aetiology. If the germinal epithelium is destroyed the condition is hopeless; if spermatogenesis has never started (secondary eunuchoidism) there is a hope of stimulating it by suitable treatment.^{1,2} If spermatogenesis is taking place and the duct system is blocked, surgery offers a potential solution.

Investigation involves repeated seminal analysis to establish the existence of the condition (a single aspermic ejaculate means very little). If the testicles are small, urinary follicle-stimulating hormone assay will differentiate primary hypogonadism (with a high F.S.H. titre and hopeless prognosis) from secondary failure (with a low titre). If the testicles are normal in size, testicular biopsy will reveal the existence of spermatogenesis, thus indicating an excretory block; or else damage to the germinal epithelium. However, according to Bayle,⁴ testicular biopsy causes a risk of blocking the vasa efferentia as a result of the slight haemorrhage which is inevitable; he therefore advocates open surgical exploration of the testicle with incision of the head of the epididymis. If this reveals the presence of spermatozoa, and patency of the vas deferens can be established, then vaso-epididymostomy is performed—bilaterally whenever possible. In surgically suitable cases this operation has given a 66% cure rate in Bayle's hands. Apart from surgery for obstructive aspermia, treatment appears to hold out hope only when there is secondary hypogonadism as mentioned above. Then prolonged treatment with testosterone (preferably by implantation) or with chorionic gonadotrophin seems to have led to normal fertility at least in some patients. For further information the reader may be referred to the monograph by Hotchkiss.⁵

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- 1 del Castillo, E. B., Trabucco, A., and de la Balze, F. A. (1947). *J. clin. Endocr.*, 7, 493.
- 2 Huxthall, L. M., Bruns, H. J. and Musulin, N. (1949). *J. clin. Endocr.*, 9, 1245.
- 3 Swyer, G. I. M. (1951). *Proc. roy. Soc. Med.*, 44, 157.
- 4 Bayle, H. (1950). *Presse méd.*, 58, 276.
- 5 Hotchkiss, R. S. (1944). *Fertility in Men*. Lippincott.

Unnecessary Vitamin B

Q.—Is any harm likely to follow prolonged dosage with any of the B vitamins when the diet is already adequate in this respect?

A.—There is no direct evidence that the prolonged dosage of well-nourished people with any of the B vitamins is likely to be harmful. Theoretically, an excess of one might cause imbalance of the others, as has been claimed to occur in cases of subnutrition; and the manufacture of B vitamins, such as nicotinic acid, by intestinal organisms might be suppressed by the administration of large exogenous doses. It is unlikely, however, that these theoretical objections have practical validity.

Allergy to Condoms

Q.—A man who has used a well-known make of condom for years has in the last few months been troubled with itching, redness, and, on one occasion, oedema of the skin of the penis for a few days after use of the sheath. The irritation is relieved by an antihistamine cream. Is the powder on the condom likely to be the irritant? Is a change of make desirable, or do most manufacturers treat sheaths with the same powder? The man is unwilling to complicate intercourse further by using any sort of "barrier cream" unless this is really necessary.

A.—Sensitivity to rubber seems far more likely than sensitivity to the powder. This point could be settled by carrying out a patch test with rubber which has been carefully washed to remove any of the powder, and another patch test either with the powder alone or with rubber on which powder has been allowed to remain. Sensitivity to rubber is usually due to chemicals used in processing rather than to the rubber itself. For this reason sensitivity to one type or brand of rubber does not necessarily imply sensitivity to others. Manufacturers are not always very willing to reveal the exact composition of their products, and once the dermatitis has been definitely identified as due to contact sensitivity the best plan for the patient would be to try various makes in order to find one which will not bring on this trouble.

A barrier cream, in any event, is not likely to be successful, and in a case of this sort the only solution will be for the patient to avoid this particular make of rubber.

NOTES AND COMMENTS

C.S.F. Changes in Psychoses and Epilepsy.—Dr. J. H. FLEISCHACKER (Shenley) writes: My attention has been drawn to the question and answer on C.S.F. changes in psychoses and epilepsy ("Any Questions?" January 31, p. 285), where a paper of mine was mentioned. While it is true that the problem—with the techniques used in this laboratory—has been followed up systematically only by myself and co-workers,^{1,2,3,4} it may be said that an increase of globulins in the C.S.F. of schizophrenics was described first by Golant-Ratner,⁵ later by Kafka and Samson⁶ and Neal *et al.*⁷ All authors used different techniques, and came to the same conclusions. Such findings have since been confirmed among others by Schenk⁸ and von Storch *et al.*,⁹ and also by German and French workers.¹⁰ These findings, though "typical" only and "non-specific," are in my opinion of high differential-diagnostic significance, but their pathogenetic or aetiological importance is not clear.⁴ The controversy about the value of these findings is due, essentially, to the fact that there is no agreement on the "norm of C.S.F.s."¹¹ I cannot help feeling that C.S.F. from patients suffering from organic and often active diseases of the C.N.S. should not be considered as "normal."

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- 5 *Münch. med. Wschr.*, 1924, 71, 1128.
- 6 *Z. ges. Neurol. Psychiat.*, 1928, 115, 85.
- 7 *Acta psychiat. neurol. scand.*, 1933, 8, 609.
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- 9 *Arch. Neurol. Psychiat. (Chicago)*, 1950, 64, 668.
- 10 Personal communications.
- 11 *British Medical Journal*, 1950, 2, 218.

Toxaemia in Pregnancy.—Dr. JOHN SOPHIAN (Salisbury, Southern Rhodesia) writes: In your issue of February 21 (p. 466) you furnish a reply to a correspondent inquiring under "Any Questions?" about the present view of the aetiology and pathology of toxæmia of pregnancy. In this you state that the present tendency is to regard its aetiological basis as uterine and placental ischaemia. Reynolds¹ has shown the interdependence of uterine blood flow on tension of the uterine wall in the rabbit. He has also demonstrated² the fact that the primiparous uterus develops marked heightening of tension from the 20th week onwards—a period during which toxæmia of pregnancy has its greatest incidence. Such researches indicate with certainty that the aetiological thesis must include increased tension of the uterine wall in its explanation when it is appreciated that it has been shown in rabbits by Franklin and Sophian³ that diversion of the renal blood flow from cortex to medulla is provoked by increasing the uterine tension. Especially is confirmation to be found in the renal manifestation of the toxæmic state. In the great majority of diseases of the kidney oedema and albuminuria have never been denied a renal origin. Ischaemia of the kidney has been invoked by Goldblatt⁴ and Shorr and Zweifach⁵ as responsible for the production of renal pressor substances. The triad of symptoms can have their explanation in ischaemic renal changes which the utero-renal reflex can provoke. In its turn the reflex is dependent on heightened tension of the uterine wall, which Reynolds has found to be present in the primiparous uterus in that period usually contemporaneous with toxæmic manifestations. Reduced blood flow in uterus and placenta is material in considering foetal survival alone. But the toxæmic state imperils the maternal organism as well, and your reply has failed to include its consideration.

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- 2 *Publ. Carneg. Instn.*, 1951, vol. 34.
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- 4 *Amer. J. Med.*, 1948, 4, 100.
- 5 *Amer. Heart Ass. Proc.*, 1949, 22nd sci. session, June.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Altology, Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London*. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London*. B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 9 1953

THE PREMENSTRUAL SYNDROME

BY

RAYMOND GREENE, D.M., M.R.C.P.

Physician, Royal Northern Hospital and New End Hospital, Hampstead

AND

KATHARINA DALTON, M.R.C.S., L.R.C.P.

General Practitioner, Edmonton, London

The Literature

"Premenstrual tension," as it has hitherto been called, is the commonest of the minor endocrine disorders. The fact that a large number of women suffer from a variety of symptoms, unpleasant at their mildest and at their severest incapacitating, during the ultimate seven to ten days of the menstrual cycle is well known; but in this country very little has been done to alleviate their distress. This is partly due to the attitude of the patients. Just as, before the days of stilboestrol, women in general accepted the unpleasant symptoms of "the change of life" as a necessary part of the business of being a woman, so still they pass through one week of discomfort in every month, usually without complaining to their doctors but not necessarily without disturbing the tranquillity of their homes. The frequency of the condition is testified to by the fact that in one American factory, employing 1,500 women, 36% applied for treatment in the premenstrual phase (Bickers and Woods, 1951). Israel (1938) stated that symptoms of the kind to be described occur in 40% of otherwise healthy women. It is, we are convinced, equally common in this country, and it is therefore curious that, although many papers on the subject have been published in the U.S.A., we have been able to trace only one in a British journal (Singh *et al.*, 1947), which did not refer to British patients.

The term "premenstrual tension" is unsatisfactory, for tension is only one of the many components of the syndrome. Its use has commonly led to a failure to recognize the disorder when tension is absent or is overshadowed by a more serious complaint. We have preferred to use the term "premenstrual syndrome," but as our investigation has progressed it has become clear that this term also is unsatisfactory. Though the syndrome most commonly occurs in the premenstrual phase, similar symptoms occasionally occur at the time of ovulation, in the early part of the menstrual phase, and even, rarely, in the first day or two after the flow has ceased. The term "menstrual syndrome," though correct, for in each individual the symptoms recur at monthly intervals, may wrongly create the impression that they occur only during menstruation. We have finally decided to retain the term "premenstrual syndrome" in the full realization of its imperfection. The full elucidation of its cause may later suggest a more appropriate and more accurate nomenclature.

The first description of the syndrome is that of Frank (1931). He records a condition of indescribable tension and a desire to find relief by foolish actions difficult to restrain. There were often severe headaches and palpable oedema, especially of the face, hands, and feet, accompanied by oliguria and an increase in weight. Sometimes there were diffuse spontaneous subcutaneous haemorrhages, asthma, and, in rare instances, epileptiform seizures. All symptoms were rapidly relieved at the onset of the menstrual flow, but recurred at varying times as the end of the cycle drew near. The condition of the patients became worse if the onset of the flow was delayed. Soon other symptoms with a similar periodicity were observed, including a remarkable degree of oedema, which caused, in two cases described by Thomas (1933), a gain in weight of 12 to 14 lb. (5.4 to 6.4 kg.), relieved on the first day of menstruation by a diuresis of 4.5 litres, continued on the succeeding days.

Sweeny (1934) described tightness of the clothing and stiffness of the hands, and found that 30% of 42 healthy women gained 3 lb. (1.4 kg.) or more in the premenstrual phase. Puech (1942) laid stress on premenstrual asthmatic attacks, rhinorrhoea, fever, and lumbar pain. Israel (1938) recorded ulcerative stomatitis and transient nymphomania. Of 38 patients described by Gray (1941), 5 had nymphomania and 15 some form of "psycho-sexual disorder." Rubenstein (1942) stressed the incapacitating headache common at this time, in one patient associated with abnormal hunger; and Morton and McGavack (1946) were inclined to associate this with hypoglycaemia. Morton (1946) drew attention to the frequent association of the other symptoms with pain in the breasts.

Stieglitz and Kimble (1949) found, in a series of 67 patients, that 68% suffered from emotional instability, 65% from headache (in 12 instances amounting to typical migraine), 50% from backache, 47% from depression, 36% from aching in the thighs, and 9% from "bloating" of the abdomen. Of Morton's (1950) 29 patients, all had transient emotional instability, and the majority had pain in the breasts, increased appetite, lower abdominal pain, abdominal bloating, and gain in weight. Almost half had palpable oedema, about one-third had

menstrual irregularity, and a few had nausea and vomiting, increased sexual desire, and pruritus vulvae. One patient had headache, papilloedema, vertigo, and projectile vomiting of a degree suggesting an intracranial tumour. Cooke (1945) reported that 84% of crimes of violence by women occurred during or immediately before the menses. Morton *et al.* (1952), in a study of prison inmates, found that crimes of violence had been committed in 62% of the cases in the premenstrual week, in 19% at mid-cycle, in 17% during menstruation, and in 2% after the end of menstruation.

Analysis of 84 Cases of Premenstrual Syndrome

This series contains the histories of 84 cases of premenstrual syndrome which were treated with ethisterone and/or progesterone, and an analysis of results of treatment in 78 cases. All cases were seen between 1948 and 1952 and attended for a follow-up interview in 1952. Of the 84 patients in the series, 16 were first seen in hospital by R.G. Most of the remainder were collected by K.D. in her own practice (which has a National Health panel of 5,000), after the successful treatment of her own case, and were referred to R.G. Sixteen patients were referred to K.D. by her fellow general practitioners.

All the cases had attacks of various symptoms, which occurred during the premenstrual phase, during menstruation or ovulation, or at the time of a missed period, and all cases were symptom-free at other times. All cases included in the series had experienced attacks during each of the last three menstrual cycles; thus any chance coincidence between the attack and menstruation was eliminated. Any case in which the time relationship was not definite was temporarily excluded, the patients being treated symptomatically and asked to keep a calendar.

The "presenting" and other symptoms which occurred during attacks are shown in Table I. "Presenting symptoms" always occurred with each attack, but the other

TABLE I.—Symptoms

Symptom	Presenting	Other	Total
Headache	53	63.1%	58
Nausea	2	2.4%	25
Irritability	2	2.4%	5
Depression	1	1.2%	5
Lethargy	—	—	11
Vertigo	1	1.2%	9
"Rheumatism"	5	6.0%	14
Skin and mucosal lesions	9	10.6%	11
Oedema	1	1.2%	5
Rhinorrhoea	3	3.6%	6
Asthma	4	4.8%	4
Epilepsy, petit mal	3	3.6%	5
"grand mal"	—	—	1
Mastalgia	—	—	2

symptoms were not necessarily present with each attack. The site of the premenstrual headache in the 58 cases was: bifrontal, 19; hemispheric, 13; bitemporal, 4; between eyes, 1; behind eyes, 1; over one eye, 12; occipital, 4; vertical, 1; not recorded, 3. In 22 cases the severity necessitated rest in bed, and in 10 cases concomitant symptoms made a diag-

TABLE II.—Sites of Premenstrual Rheumatism

	Presenting Symptom	Other Symptoms	Total
Shoulder	1	1	2
Knees	—	1	1
Feet	2	—	2
Sciatica	2	—	2
Lumbago	2	4	6
Hips	—	1	1
Thighs	—	2	2
Neck	—	1	1
Hands	1	—	1
Total	8*	10	18

* Some patients mentioned more than one site.

nosis of migraine inevitable. The visual symptoms noted in these 10 cases of migraine were: photophobia, 4; mistiness, 1; hemianopia, 2; burning pain, 2; flashes of light, 1. Table II shows the sites of premenstrual rheumatism, and Table III the types of skin and mucous lesions.

TABLE III.—Types of Premenstrual Skin and Mucous Lesions

Type	Site	Presenting	Other Symptoms	Total
Acne	Face	1	1	2
Acrocyanosis	Shoulders and back	2	—	2
Styes	Toes	1	—	1
*Seborrhoeic dermatitis	Eyes	1	—	1
*Dry eczema	Cubital fossa	—	1	1
*Erythema multiforme	Neck	1	—	1
"Glossitis"	Lower lip	1	—	1
	Tongue	2 (sisters)	—	2
Total		9	2	11

* Diagnostic label attached by dermatologist.

In view of the suggestion of Salmon (1947) that the onset may be related to sexual dissatisfaction, a search was made for this and other possible psychological causes. No case of sexual maladjustment was found. The incidents (not necessarily significant) associated with the onset of symptoms in our 84 cases were as follows: puberty, 27; childbirth, 15; menopause, 14; widowed, 1; divorced, 1; mumps oophoritis, 1; thyroidectomy, 1; marriage, 3; unknown, 21.

TABLE IV.—Duration of History of Regular Attacks of Premenstrual Syndrome

Under 1 year	18	21.4%
1-5 years	35	41.6%
6-10 "	10	12.0%
11-15 "	7	8.4%
16-20 "	5	6.0%
Over 20 years	—	—
Total	84	100

Menstrual History

Fig. 1 shows the usual time of onset of the attack. In this series 70 patients expected attacks in the premenstrual week, 9 at the onset of menstruation, and 4 during menstruation.

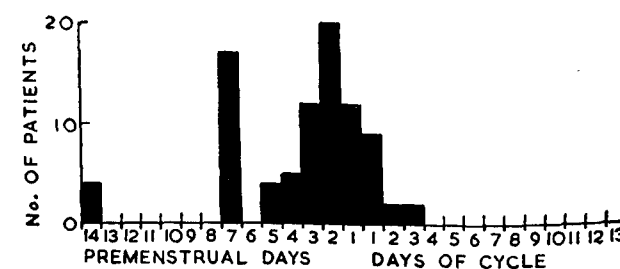


FIG. 1.—Time of onset in relation to flow.

One patient had regular attacks only at ovulation, and 3 had bimensual attacks at ovulation and premenstrually. One of these had ovulatory bleeding. When, as at puberty and in the climacteric, periods are missed, the attacks nevertheless occur on the expected dates. Table V and Fig. 2 show the age at which the first menstrual loss occurred. This was normal in 72 cases, with only 2 cases (2.4%) occurring at the early age of 10 years, and only 5 cases (6%) occurring later than the normal time of onset (arbitrarily assumed to be 11 to 16 years).

Table VI shows the duration of menstrual loss. In only three cases was it abnormally short (two days), and in only one abnormally long (10 days).

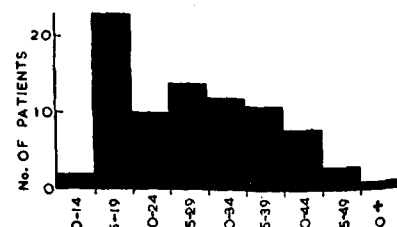


FIG. 2.—Age at onset of symptoms.

TABLE V.—Age at First Menstrual Period

Years:	Normal Age Limit										Total
	10	11	12	13	14	15	16	17	18	?	
Cases	2	6	10	19	19	12	6	3	2	5	84
%	2.4	7.1	12.0	22.6	22.6	14.2	7.1	3.6	2.4	6.0	100

TABLE VI.—Average Duration of Menstrual Loss

Days:	1	2	3	4	5	6	7	8	9	10	?	Total
Cases	—	3	11	17	23	14	12	—	—	1	3	84
%	—	3.6	13.1	20.2	27.4	16.7	14.2	—	—	1.2	3.6	100

TABLE VII.—Length of Menstrual Cycle

Days:	Under 21	Normal Length			Total
		21-30	31-42	Irregular	
Cases	1	78	4	1	84
%	1.2	92.8	4.8	1.2	100

Table VII, giving the length of the usual menstrual cycles, shows that the cycle exceeded the normal 30 days in four cases only—in women aged 16, 17, 30, and 31 years. The series is conspicuous for the normality of the menstrual history. An irregular cycle had been present in one woman of 49 for twelve months, and presumably heralded the climacteric. In one woman of 27 ovulatory bleeding had occurred regularly at the 14th to 15th day of a 28-day cycle, and she also suffered from migraine at this time. In this respect our experience differs from that of Singh *et al.* (1947), who found a high incidence of abnormal menses.

Two patients had "slight" dysmenorrhoea—that is, the patient had some discomfort relieved by simple analgesics, but the pain was not sufficient to interfere with normal work or necessitate lying down. The other 82 patients had no dysmenorrhoea. One case of associated severe dysmenorrhoea has since been observed.

Effect of Pregnancy

TABLE VIII.—Parity of Series

	Our Series	Registrar-General's Figures (Ages 15-45)
Single women	13 (15.5%)	43.2%
Married, no children	13 (15.5%)	13.3%
" 1 child	25 (29.8%)	18.3%
" 2 children	11 (13.1%)	14.4%
" 3	13 (15.5%)	5.7%
" 4	5 (6.0%)	2.7%
" 5 or more children	4 (4.8%)	2.4%

Table VIII shows the parity of the series. The patients conceived easily and none had required medical advice on account of infertility. Most had their children in close succession, and all but two married women who had not had a child in the previous twelve months stated that they were practising some form of contraception. Three normal deliveries and one miscarriage at ten weeks occurred during treatment.

TABLE IX.—Health After First Trimester of Pregnancy

More energetic, symptom-free	36 (62.1%)
Symptom-free	18 (31.2%)
Symptoms (depressed 2, migraine 1, asthma 1)	4 (6.9%)
Total	58 (100)

Table IX shows the state of health of the patient after the first trimester. After the third month of pregnancy the premenstrual symptoms ceased in all but four patients, and 36 patients reported feeling more energetic than usual.

Toxaemia occurred in 11 of 58 parous women and complicated 21 of 128 pregnancies, thus accounting for the following obstetrical complications: surgical induction, 12; caesarean section, 4; forceps, 2; stillbirth, 3; sterilization, 1.

In 5 out of 11 cases the premenstrual syndrome began after the pregnancy complicated by toxemia. The possible association between the syndrome and toxemia is under further investigation.

Effect of Childbirth

In all cases in which the syndrome existed before pregnancy the attacks occurred with increased severity at the first menstruation after childbirth. Three patients with migraine had an attack during the puerperium; 15 dated the onset of regular attacks from childbirth.

In seven cases childbirth was followed by increasing weight and lethargy in addition to the premenstrual syndrome, a condition easily misdiagnosed as myxoedema, but which responded to ethisterone or progesterone therapy.

In view of the frequency of the syndrome no sound conclusions about familial incidence can be drawn from so small a series. It may, however, be worthy of note that the mothers of 29 of our patients had suffered from migraine: of these, 14 suffered from attacks which were related to menstruation and which ceased at the menopause. Seven of our patients reported similar conditions in their sisters, in five instances in relation to menstruation. One patient reported that her father suffered from migraine. Two patients who were cousins were able to trace premenstrual migraine in four generations.

Is Water Retention the Cause of the Syndrome?

That the symptoms are due to water retention is strongly suggested by the oliguria and gain in weight which announces their arrival and the diuresis and loss of weight which accompanies their relief at, or soon after, the onset of menstruation. To the observations already quoted may be added those of Thorn, Nelson, and Thorn (1938), who found a premenstrual gain in weight of more than 1 kg. in 48% of healthy women, and, be it noted, a mid-menstrual gain in 76%. They showed that at neither time was the gain attributable to increased intake of food, an important point in view of the increased appetite occasionally reported. Morton (1950) found that in his series of cases of "premenstrual tension" a higher proportion (52%) gained weight and that 45% had pitting oedema. Bickers and Woods (1951) found a good correlation between the gain in weight and the severity of the symptoms, and reproduced them by injections of "pitressin." Relief of the symptoms by various diuretic measures has been reported. Greenhill and Freed (1940) claimed success in all their patients treated with ammonium chloride and a diet low in sodium, and in a later and larger series (Greenhill and Freed, 1941) in 34 patients out of 40. Thorn and Emerson (1940) were successful with a diet low in sodium and high in potassium. Stieglitz and Kimble (1949), in order to avoid the chloride ion, preferred ammonium nitrate and obtained relief in 91% of their patients. Argonz and Abinzano (1950) treated 30 patients with large doses of vitamin A because of its reported diuretic effect, and claimed success in every case. Bickers and Woods (1951) relieved all symptoms with the new diuretic pyralamine-8-bromothephyllyne, which reduced the average gain of weight from 5.2 to 1.4 lb. (2.4 to 0.6 kg.). Their results were less good with ammonium chloride, which reduced the gain only to 4.3 lb. (2 kg.). Vainder (1951) was successful in 153 cases treated with "pyrabom" (pyralamine-8-bromothephyllyne).

Nevertheless, it is necessary to be on guard against too ready an explanation of the syndrome solely by water retention. Thorn, Nelson, and Thorn (1938), as we have seen, found that a gain in weight occurred more often at mid-cycle than in the premenstrual phase. Similar symptoms do sometimes occur at the time of ovulation, but they are far less common. Thorn and Emerson (1940) were disposed to explain this by the experimental fact that progesterone and oestradiol both have the capacity to cause water retention, and that, whereas only oestradiol is operative at mid-cycle, both are present before menstruation; but, for reasons which will later be obvious, this explanation is not

acceptable. In our series, symptoms occurred at mid-cycle in only four cases. Such women usually have two attacks, and sometimes these last long enough to merge with each other, especially when the cycle is short and the gap between menstruation and ovulation therefore also short. One unfortunate Irishwoman complained: "I only feel well when I am poorly." If we include mastalgia with the other symptoms we can assure ourselves that a factor other than water retention is involved. Greenhill and Freed (1941) noted that this symptom, alone in the syndrome, was not improved by dehydration, a fact which we have repeatedly confirmed.

Moreover, observation of a patient by one of us in 1938 (Fig. 3) suggests that a factor other than water retention

in "dog units," oestradiol 700, progesterone 400, oestrone 200-300, pregnanediol 140, testosterone 80, and testosterone propionate 25. Despite this, as we shall see, there is ample evidence of the effectiveness in treatment of progesterone, testosterone, testosterone propionate, and methyltestosterone. Still more surprising is the statement of Chiray *et al.* (1940) and Rubenstein (1942) that occasional cases respond to oestrogens, a claim we have been unable to confirm. Moreover, Singh *et al.* (1947) were able to induce attacks with oestrogens.

Though at first sight the water-retaining properties of progesterone and testosterone appear incompatible with their success in treatment, a hypothetical explanation may be suggested. The effects of progesterone on the excretion of

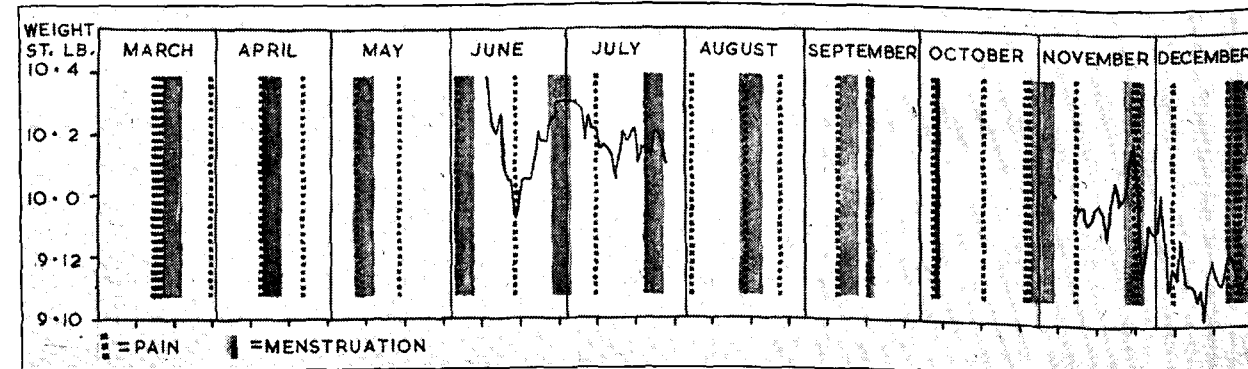


FIG. 3.—Occurrence of pain in relation to 11 menstrual cycles, together with weight changes during four cycles in a patient.

may sometimes be involved. She complained of attacks of migraine, occurring usually at intervals of a fortnight. She was intelligent and co-operative, and kept careful notes of her symptoms over a period of 11 cycles. During four cycles she plotted her weight day by day. These 11 cycles varied in length from 24 to 27 days. The attacks were of two kinds, occurring either during the interval or near the beginning of menstruation. The intermenstrual attacks, which all lasted for one day only, occurred nine times on the 14th or 15th days before menstruation. The two exceptions occurred on the 10th day before (when, uniquely in this study, no menstrual attack succeeded it) and on the 17th day before (when, again uniquely, it was accompanied by uterine haemorrhage and succeeded by a scanty menstrual flow). The menstrual attacks occurred in 10 cycles. They varied in length from one to three days, and their onset varied between the third day before the beginning of the flow to the second day after the beginning of the flow, in this way differing from the majority, in which all attacks were premenstrual.

It is important to observe that in the cycle in which there was an intermenstrual but no premenstrual attack, the weight dropped sharply by over 4 lb. (1.8 kg.) in the first half of the intermenstrum (the attack occurring at the nadir) and rose again by almost 4 lb. (1.8 kg.) in the second half (without any attack at the zenith). In the succeeding cycle weight changes were far less obvious and bore no relation to the attacks. Later in the series of cycles, one was observed in which the intermenstrual attack occurred before the nadir, though the premenstrual attack occurred at the zenith, and one in which an attack occurred intermenstrually before the nadir and premenstrually without a significant rise. Such observations enjoin some caution in assuming that water retention is the sole cause of intermenstrual and premenstrual or early menstrual migraine.

Another difficulty to be overcome arises from the reported effects of sterols in treatment. Oestrogens, androgens, and progestogens all have the property of causing water retention (Thorn and Engel, 1938; Kenyon *et al.*, 1940). Thorn, Nelson, and Thorn (1938) estimated that the relative potencies of the common sterols in this respect were, represented

oestradiol may more than counterbalance its weaker direct effect on water metabolism. That progesterone has this effect is shown by the observations of Smith and Smith (1931, 1938), which have been amply confirmed (Burrows, 1945).

Why Does Water Retention Occur?

The fact that two peaks of oestradiol secretion occur in each normal menstrual cycle—one at the time of ovulation and one in the premenstrual phase—suggests a hypothetical explanation of the retention of water at these times. That oestrogens are capable of causing water retention is well known, especially from the observations of Zuckerman and his colleagues (Krohn and Zuckerman, 1937; Aykroyd and Zuckerman, 1938; Zuckerman *et al.*, 1938).

Direct evidence of an excess of oestrogens at the time of the occurrence of symptoms is of doubtful validity. Frank (1931) and Frank *et al.* (1934), it is true, claimed that their patients' blood contained twice the normal amount of "ovarian hormone," and that after the relief of symptoms by x rays applied to the ovaries the ovarian hormone level became normal; but the difficulties inherent in the estimation of ovarian hormones in blood make it necessary to accept the statement with reserve. Morton found that vaginal smears were suggestive of excessive oestrogenic activity. On the other hand, Frank's suggestion of a high renal threshold for oestrogens was found by Israel (1938) in fewer than half his patients, which led him to suggest that the cause of the trouble was not so much a high level of oestradiol as a lack of antagonism by progesterone.

The concept of an abnormally high oestradiol/progesterone ratio has much in its support. Greenblatt (1940) contested the suggestion because in most of his patients he found a normal progestational pattern in their endometria and a normal excretion of pregnanediol; though he also noted a deficient excretion of oestrogens. Gray (1941) failed to find any correlation between the premenstrual syndrome and anovular cycles, and in the series reported by Bickers and Woods (1951) the basal temperature curve was invariably biphasic and the endometrial pattern progestational. Provenzano (1944) found a normal pattern in 12 out of 15 patients. It should, however, be pointed out that the hypothesis that the cause of the syndrome is an abnormally high

oestradiol/progesterone ratio does not at all depend on the demonstration of a consistently high level of the former or low level of the latter, since only the ratio between the two is on trial.

The hypothesis is supported by several observations. Morton (1946) has reviewed the evidence that painful breasts, so common a feature of the syndrome, are due to a high oestrogenic level, and he (Morton, 1950) was able to induce the syndrome artificially by the administration of large doses of oestrogens in two castrates and one post-menopausal woman, thus confirming the earlier observations of Singh *et al.* (1947). That the administration of progesterone is effective in relieving it was shown by Gray (1941), Puech (1942), and Albeaux-Fernet and Loublié (1946), and has been amply confirmed by ourselves. The hypothesis is further supported by the experimental evidence produced by Gillman (1942), who showed that progesterone administered to baboons reduces oestrogenic perineal swelling to normal in from four to seven days, an observation confirmed by Krohn (1951). Herlant (1939) had previously suggested that this effect was due to the suppression of the gonadotrophic activity of the pituitary by progesterone, but Krohn pointed out that the effects are too rapid for such an explanation and thought that a direct antagonism in this respect between oestrogens and progesterone was a more likely explanation. The pregnanediol output was subnormal in 10 of Morton's (1950) 29 patients, the endometrial pattern showed progestational deficiency in 22, and the basal temperature curve was "anovular" in 23.

Water Retention and the Oestradiol/Progesterone Ratio

If water retention due to an abnormally high oestradiol/progesterone ratio is the cause of the symptoms, how is it brought about? Several explanations have been postulated. Is there, for instance, a change in the metabolism of sodium, a sodium retention bringing about a water retention? Thorn, Nelson, and Thorn (1938) and Thorn and Emerson (1940) found that the excretion of sodium and chloride is decreased before and increased after both ovulation and menstruation. Morton (1950) found at these times a diminished excretion not only of sodium but also of potassium and chloride. Danforth *et al.* (1946) failed to find any consistent fluctuation in sodium or potassium metabolism, but confirmed the common rise in weight reported by other workers and found it to be associated with a decline in haematocrit and plasma proteins. Greisheimer *et al.* (1946) found no constant menstrual change in the blood, in pH, CO₂ content, chloride, or total base either in the premenstrual syndrome or in the controls, and concluded that the menstrual cycle is not characterized by any regular change in the acid-base equilibrium of the serum. Males showed as much fluctuation as females. The success of the treatment of the premenstrual syndrome by reduction in sodium intake has been noted above.

Many points are still obscure and several difficulties in interpretation have yet to be overcome; it does, however, appear that the best working hypothesis is that which postulates a cyclical change in sodium (and therefore in water) metabolism which occurs to a slight extent in healthy women and to an exaggerated extent in sufferers from the premenstrual syndrome. The rhythm of this change seems to be controlled by the level of oestradiol in the tissues, and this in its turn to be under the partial control of progesterone. Excessive water retention may therefore be present even with a fairly low level of oestradiol if progesterone is entirely lacking; or absent even with a very high level of oestradiol if progesterone is present in adequate amounts. It is the oestradiol/progesterone ratio which determines whether or not symptoms occur.

Symptomatology

If this hypothesis is correct a ready explanation of many of the symptoms is available.

Migraine and lesser degrees of headache may well be due to an increased hydration within the indistensible cranium.

We have seen a male patient suffering from the oliguria and water retention which so often follow epidemic encephalitis who had frequent attacks of the severest migraine which were entirely prevented by the reduction of salt and water in his diet and the administration of urea. That urea is a useful treatment in some cases of migraine was always taught by Sir Walter Langdon-Brown and has been often confirmed by many workers—for example, Brown (1943)—and on other grounds water retention has been incriminated in migraine by the work of Földes (1933) and of Goldzieher (1941). Bickers and Woods (1951) produced the symptoms of the premenstrual syndrome by the injection of "pitressin" and found a close correlation between the consequent gain in weight, the severity of the symptoms, and the subsequent diuresis. The occasional epileptiform fits may be looked upon as the natural counterpart of the pitressin-water test for epilepsy.

There is no evidence that fluid retention causes bronchospasm. Indeed, the persistence over several days of premenstrual "asthma" suggests that the bronchial obstruction may be due to a less transient cause. A more prolonged obstruction by swelling of the mucosa may be present, though we have not yet confirmed this suggestion by bronchoscopy. The relationship between hyperaemia and oedema of the upper respiratory tract and the pelvic organs has long been recognized. It has been briefly reviewed by Greene (1943). The relationship was known to Hippocrates and was brought to the attention of the moderns by Mackenzie as early as 1884. He observed that the nasal mucosa of women becomes congested before the menstrual periods and that actual bleeding may then occur ("vicarious menstruation"). Some women, as Hoesason (1938) pointed out, suffer at this time from rhinorrhoea. Mortimer *et al.* (1936, 1937, 1939) showed that in monkeys there is an increase in colour of the nasal mucosa at monthly intervals coincident with the swelling of the sexual skin. The nasal changes were, indeed, 8% more regular as a sign of ovarian activity than menstrual bleeding itself, and were most obvious in the fertile months of September and October. Immature and adult monkeys of both sexes, whether intact or castrate, react to oestrogenic treatment by reddening of the nasal mucosa, which occurs even if the nasal tissue is transplanted elsewhere (Bachman *et al.*, 1936).

The papers from the Montreal school were followed by several clinical reports of good results in the treatment of atrophic rhinitis by injections or local applications of oestrogenic substances. That these results may be accounted for by the selective concentration of oestrogens in the nose is suggested by the experiments of Fisher *et al.* (1936). The immediate effect of this concentration is local vasodilatation, as Reynolds and Foster (1940) showed. Apart from their specific action, oestrogens produce hyperaemia in many tissues (Hechter *et al.*, 1940) and it is natural that this hyperaemia should be greatest in those tissues in which a concentration of oestrogens occurs. This hyperaemia is due to the liberation of acetylcholine in these situations (Reynolds, 1939; Reynolds and Foster, 1940), and effects similar to those of oestrogens may indeed be obtained by spraying the nose with neostigmine (Bernheimer and Soskin, 1940). The rhinorrhoea of the premenstrual syndrome—and perhaps the asthma as well—is thus explicable by the excessive local activity of oestradiol which would be expected *ex hypothesi*. The oedematous nasal mucosa may lead to blocking of the exits from the nasal sinuses and consequent "vacuum headaches."

The occasional association of premenstrual mastodynia with the commoner symptoms can be plausibly explained by the relatively high oestrogenic level without involving the consequent water retention. The evidence that the "painful nodular breast" is caused by excessive oestrogenic stimulation has been reviewed by Morton (1946) and by Greene (1950).

That so-called rheumatic pains may be due to water retention is well recognized. The rather ill-defined pain and tenderness in the soft tissues of obese women (often referred

to as "fibrositis" and "panniculitis") usually responds well to a dehydrating regime. A possible explanation has been offered by Copeman (1949).

The dermatoses of the premenstrual syndrome are less readily explicable on the present hypothesis. The explanation must await further work on the relationship between steroid metabolism and the state of the human skin. That such a relationship exists is clinically obvious. The laboratory evidence has been reviewed by Burrows (1945).

Treatment of the Syndrome

It has been indicated that numerous treatments have been suggested in the past. These include the following.

Dehydration.—References to this method of treatment have been cited in the discussion on the possibility that water retention is the cause of the syndrome. There seems little doubt that in a fair proportion of cases it is effective. It was not adopted in the present series. It has been tried by one of us (R. G.) in earlier cases with occasional success. It is greatly disliked by the patients, and only those suffering from the severest symptoms can be bothered with it for more than a few months. The newer diuretics have not been tried.

Androgens.—The "literature" of the subject leaves little doubt that androgens may be useful (Greenblatt, 1940; Albeaux-Fernet and Loublié, 1946; Freed, 1945, 1946; Chiray *et al.*, 1940). Androgens, such as testosterone propionate, which must be administered by injection, are no longer worthy of serious consideration. Methyltestosterone, administered by mouth, is sometimes effective, especially in those patients in whom mastalgia is a prominent symptom. It is less generally successful than progesterone in relieving other symptoms of the syndrome. Its chief disadvantage is the danger of virilization. It occasionally happens that the dose needed to relieve symptoms is high enough to cause acne, the growth of a slight moustache, and lowering of the voice. Menstruation may be suppressed.

Vitamins.—M. S. Biskind (1943) was influenced in his views by the occurrence of glossitis in the syndrome and obtained relief by the administration of vitamin B. He quoted G. R. Biskind and Mark (1939), who had shown that in vitamin-B deficiency the liver's ability to inactivate oestrogens may be impaired. With G. R. Biskind and L. H. Biskind (1944) he published 11 cases, all relieved by this therapy. In a small series treated by one of us (R. G.) before the present one was begun no success was achieved. Bickers and Woods (1951) were also unsuccessful. The effectiveness of vitamin A has been vouched for by Argonz and Abinzano (1950). Vitamin A has not been tried by us. If, as is suggested, its efficacy depends on its diuretic properties, it can hardly be expected to compete with mersalyl, urea, or the newer diuretic drugs.

Oophorectomy and X-ray Treatment of Ovaries.—These have been used successfully by Frank (1931). They are measures obviously too drastic for the present day.

Treatment with Progestogens

Progesterone has been used successfully by Gray (1941), Puech (1942), and Albeaux-Fernet and Loublié (1946). These workers administered the hormone by intramuscular injection. No report has so far appeared of the use of ethisterone, or of progesterone other than by intramuscular injection.

All patients in this series were treated by means of progestogens. The results of the treatment of 84 patients are presented. All were treated between January, 1948, and June, 1952, some of those included in the analysis of symptoms being excluded from consideration here for lack of a sufficiently long period of observation.

Cases of mild and moderate severity were treated at first by means of ethisterone, given in oral doses of 30 to 150 mg. daily for twelve days from the fourteenth day of the cycle. If at the end of the cycle a patient remained symptom-free, she was observed at monthly intervals. If she improved without becoming symptom-free, treatment was continued

TABLE X.—Results of Treatment

No.	Symptoms	Ethisterone	Progesterone	Final Treatment	Side-effects
1	Asthma	—	Free	Implant 10.52	—
2	Migraine	No relief	—	" 10.52	—
3	"	Improved	—	Observation 3/12	Dysmenorrhoea
4	"	—	—	Implant 10.52	—
5	"	Free	—	" 6.51	—
7	Oedema	—	—	Observation 4/12	Heavy periods with clots
8	"	—	—	Implant 10.49	Dysmenorrhoea
9	Acne	Improved	—	Observation 4/12	—
10	Rheumatism	—	Free	Implant 11.52	—
11	Acrocyanosis	Improved	Improved	" 10.52	—
12	Migraine	Free	Free	" 4.51	—
13	"	—	—	" 2.52	—
14	Asthma	No relief	—	" 6.48	—
15	Migraine	—	—	" 1.49	—
16	"	—	—	Observation 7/12	Erythema at injection site
17	"	—	—	Implant 2.50	Shorter cycle, heavier loss
22	"	—	—	" 2.49	Hyperchromic anaemia, Hb 49%
23	Vertigo	—	—	Observation 5/12	—
24	Styes	Free	—	" 5/12	Nausea with each injection
25	Migraine	—	—	" 3/12	—
26	"	Improved	Free	" 3 1/2 years	—
27	Acne	—	Improved	" 3/12	—
28	Asthma	—	Free	Implant 12.48	—
29	Migraine	Free	—	Observation 2/12	—
31	Rheumatism	—	—	" 4/12	—
32	"	—	—	Implant 11.49	—
33	Migraine	Postponed attack	—	Observation 3/12	—
34	"	No relief	Not known	Did not return	—
35	Petit mal	Free	—	Ethisterone	—
36	Migraine	—	Free	Implant 2.51	—
37	Petit mal	No relief	No relief	Improved on testosterone	—
38	Migraine	Free	Free	Implant 7.52	—
39	"	—	—	" 6.50	—
40	"	—	—	Observation 6/12	—
41	Rheumatism	—	—	" 10/12	—
42	Migraine	No relief	—	Implant 11.51	—
43	"	Free	—	" 7.52	—
44	Erythema multiforme	No relief	Free	Progesterone injections	—
45	Migraine	—	—	Observation 7/12	—
46	"	—	—	" 14/12	—
47	Migraine and seborrhoeic dermatitis	Improved	—	" 7/12	Erythema at injection site
48	Migraine	—	—	Implant 4.52	—
49	"	—	—	Observation 5/12	—
50	Asthma	—	—	Implant 9.52	—
51	Eczema	—	Improved	Observation 5/12	—
52	Irritability	—	Free	Implant 12.48	—
53	Migraine	No relief	No relief	Free on testosterone	—
54	Acne	Improved	—	Observation 4/12	—
55	Migraine	No relief	Free	Progesterone injections	Sl. ovulatory bleeding
56	"	—	Not known	Did not return	—
57	"	Improved	Free	Observation 5/12	—
58	Glossitis	Free	—	" 3 years	—
59	Glossitis and petit mal	—	—	" 3 "	—
60	Migraine	—	Free	" 8/12	—
61	Nausea	—	—	Implant 2.49	—
62	Migraine	Free	—	Continuing ethisterone	—
63	"	—	—	Observation 5/12	Longer period
64	"	—	—	" 5/12	—
65	Rheumatism	—	Free	" 3/12	—
67	Migraine	—	—	" 3/12	Erythema at injection site
68	"	Free	—	" 3/12	—
69	"	Not known	No relief	No report after ethisterone	Headache with each injection
70	"	No relief	Free	Awaiting implant	—
71	Irritability	Free	—	Continuing ethisterone	—
72	Rheumatism	—	—	Observation 3/12	—
73	Migraine	—	—	Implant 11.52	—
74	"	No relief	—	Observation 2/12	—
75	"	Free	—	" 5/12	—
76	"	—	—	Continuing ethisterone	—
77	"	No relief	Improved	Progesterone injections	Sl. ovulatory bleeding
78	"	Free	—	Continuing ethisterone	—
79	"	Improved	Free	" "	—

TABLE X.—(Continued)

No.	Symptoms	Ethisterone	Progesterone	Final Treatment	Side-effects
80	Rheumatism	—	Free	Observation 2 1/2 years	—
81	Nausea	—	—	Observation 2 1/2 years	—
82	Migraine	—	No relief	Artificial menopause; migraine now worse	—
84	"	Free	—	Continuing ethisterone	—
85	Styes	No relief	Free	Awaiting implant	—
86	Migraine	" "	" "	Implant 10.52	—

Cases 6, 18, 19, 20, 21, 30, 66, and 83 did not report back after treatment. Cases 85 and 86 not included in previous analysis owing to insufficient history.

until she became symptom-free. If no improvement occurred she was given intramuscular injections of progesterone instead, in doses at first of 10 mg. daily during the second half of the cycle. Later it was found that an injection of 25 mg. on alternate days was equally effective. Severe cases were treated by this method from the outset. Patients who responded to this treatment were kept under observation: if they were only improved, treatment was continued until they were symptom-free. Those who became symptom-free but afterwards relapsed for lack of treatment were selected for treatment by means of implantation, doses from 200 to 500 mg. being employed. In a few cases in which treatment with oral ethisterone or intramuscular progesterone was used, the symptoms instead of being completely relieved were postponed until the later days of menstruation or even until the post-menstrual phase. Such patients were subsequently treated with ethisterone or progesterone throughout the entire month, and were ultimately treated by implantation.

Tables X and XI show the results obtained. The oral administration of ethisterone gave complete relief in 22 cases (47.9%) and partial relief in a further 8 cases (17.4%).

TABLE XI.—Comparison of Results of Treatment with Ethisterone and Progesterone Injections

Result	Ethisterone		Progesterone		Total After Final Treatment	
	No.	%	No.	%	No.	%
Symptom-free	22	47.9	51	83.5	66	84.7
Improved	8	17.4	4	6.6	6	7.7
Postponed attack	1	2.1	—	—	—	—
No relief	14	30.5	4	6.6	3	3.8
Not known	1	2.1	2	3.3	3	3.8
Total	46	100	61	100	78	100

Of the 14 cases unsuccessfully treated 9 had complete relief and 1 partial relief when treated with intramuscular progesterone, 2 obtained no relief from intramuscular progesterone, and 2 patients did not report the result. The results with intramuscular progesterone in 61 cases were more satisfactory—51 (83.5%) became free from symptoms, 4 (6.6%) improved, and 4 (6.6%) obtained no relief. Of the 4 patients unsuccessfully treated with progesterone 2 were treated with methyltestosterone, 5 mg. twice daily, from which one obtained complete relief and one partial relief. One patient unsuccessfully treated failed to report the result of treatment with ethisterone. The remaining unsuccessfully treated woman, aged 45, had suffered from toxæmia in all her five pregnancies and had been sterilized in 1942. In 1949, after the unsuccessful trial of progesterone she was given an artificial menopause by means of radiotherapy. After this her migraine, which had previously been premenstrual, became weekly, and had remained so when last seen in March, 1952.

Table XII summarizes the final treatment of 78 patients: thirty are symptom-free without regular medication and 43 much improved that regular medication is unnecessary; 28 were treated with progesterone implants, and, of these, 27 had complete relief and one partial relief of symptoms.

TABLE XII.—Final Treatment in 78 Cases

Final Treatment	Total Cases	Total %	Free		Improved		No Relief
			No.	%	No.	%	
Observation	34	43.6	30	44.7	4	57.1	—
Progesterone implant	28	35.8	27	40.5	1	14.3	—
Continuing ethisterone	7	8.9	7	10.4	—	—	—
" progesterone	3	3.9	2	2.9	1	14.3	—
Testosterone	2	2.6	1	1.5	1	14.3	—
Artificial menopause	1	1.3	—	—	—	—	1*
Not completed	3	3.9	—	—	—	—	—
Total	78	100	67	100	7	100	1

In three cases "not completed," patients did not report after change of treatment.

* Migraine worse after artificial menopause.

Summary

A large proportion of women, estimated by one author as 40%, suffer a variety of distressing symptoms during the final week or so of the menstrual cycle. In occasional cases, similar symptoms may occur at monthly intervals at other points of the cycle. They are probably produced by water-retention, and the evidence at present available suggests that this in its turn is due to abnormal elevation of the oestradiol/progesterone ratio.

Various treatments aimed at either dehydration or a correction of the disturbed hormonal ratio have proved partially effective. Treatment with a progestogen is almost invariably successful. In mild cases relief is usually obtained by the oral administration of ethisterone in a dosage of 25 mg. twice daily during the second half of the menstrual cycle. A larger proportion of patients can be relieved by the intramuscular injection of progesterone, 25 mg. on alternate days during the same phase of the cycle. Such cases are more effectively treated, with less labour for the patient, by the implantation of progesterone, which remains effective for many months.

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THE PREMENSTRUAL TENSION SYNDROME AND ITS TREATMENT

BY

LINFORD REES, M.D., B.Sc., M.R.C.P., D.P.M.

Regional Psychiatrist for Wales; Consultant Psychiatrist,
East Glamorgan and St. David's Hospitals

Premenstrual tension is a syndrome occurring during the second half of the menstrual cycle and consisting of a number of mental and physical symptoms. The syndrome is composed of marked general tension and irritability, together with one or more of the following symptoms: anxiety, depression, bloated abdominal feelings, swelling of subcutaneous tissues, nausea, fatigue, painful swelling of the breasts, headaches, dizziness, and palpitations. Less frequently there may be increased sex desire, excessive thirst, increased appetite, and hypersomnia. The symptoms usually start about seven to fourteen days before menstruation and pass off soon after the onset of the menses, although some patients continue to have symptoms throughout the period. The syndrome must not be confused with the premenstrual discomfort experienced by many women. The premenstrual tension syndrome may seriously interfere with work and social activities, and can be incapacitating. The condition is by no means as uncommon as suggested in some reports.

Literature

The aetiology of the condition is still obscure. Frank (1931), who introduced the term "premenstrual tension," considered it to be due to excess of circulating oestrogen. Israel (1938) believed the syndrome not to be due to excess oestrogen itself, but rather to the action of unantagonized oestrogen resulting from faulty luteinization. Gillman (1942) and Hamblen (1945), in contrast, implicate progesterone as the responsible hormone. Convincing evidence in support of the hypothesis of faulty luteinization permitting the action of unantagonized oestrogen as the primary cause of premenstrual tension is, however, given by Morton (1950).

Water retention is postulated by Greenhill and Freed (1941) as the immediate cause of premenstrual tension symptoms. Hoffman (1944) considered that an unstable nervous system was an important factor, and a number of authors have expressed the opinion that the condition seems to be more frequent in unstable women.

Rees (1953), in a psychosomatic study of 145 subjects, including normal and psychiatric patients, found that marked premenstrual tension could exist in normal women of stable personality and that many severely neurotic women were free from it. In neurotic patients with premenstrual tension

there was a positive correlation between degree of premenstrual tension and degree of personality instability and severity of neurosis. Rees, while in general supporting the theory that the condition was primarily physiogenic and due to changes resulting from defective progesterone secretion, stressed that the syndrome was of complex causation in which personality and constitutional and emotional factors operate in addition to the primary physiogenic changes.

There is now considerable evidence to suggest that the bodily changes of the premenstrual tension syndrome are primarily due to a lack of progesterone, which allows the unopposed action of oestrogens during the second half of the menstrual cycle. It is known that oestrogens cause sodium and water retention. Hydration is a common feature of the premenstrual tension state, and many patients put on from 2 to 9 lb. (0.45 to 4.1 kg.) in weight during the premenstrual phase and lose a corresponding amount with the diuresis following the onset of the menses. Oestrogens stimulate growth of the epithelia of the breast, vagina, and endometrium, and this together with hydration may account for painful swelling of the breasts. Hypoglycaemia and hyperinsulism have been noted to occur during premenstrual tension states (Billig and Spaulding, 1947; Morton, 1950) and may be the cause of increased appetite and fatigue noted in some patients. These changes in the internal environment cause a number of specific symptoms and also may result in autonomic lability, causing such symptoms as palpitations and dizziness. The patient's reaction to these changes can be influenced by such factors as personality type and stability, emotions, attitudes, and degree of autonomic instability.

The treatment of premenstrual tension can therefore be directed at different aetiological levels. (1) Psychotherapy, including explanation and re-education to improve attitudes, relieve symptoms, and minimize degree of incapacity. (2) Dehydration by means of diuretics to relieve symptoms due to hydration and possibly to facilitate elimination of the noxious agent. (3) Administration of progestogens to compensate for any lack of progesterone and to antagonize action of oestrogens. (4) Administration of androgens to antagonize action of oestrogens as suggested by Greenblatt (1940), Geist (1941), and Freed (1945).

Gonadotrophins are generally considered to be ineffective (Bowes, 1950), and as oestrogens tend to intensify symptoms (Morton, 1950) they are contraindicated.

Present Investigation

The following therapeutic methods have been studied in a group of 30 patients suffering from severe premenstrual tension: psychotherapy; dehydration therapy using ammonium chloride; administration of progestogens, including progesterone by injection and ethisterone by mouth; and administration of androgens in the form of methyltestosterone by mouth. The patients have been observed for from six months to four years, giving a total of 207 cycles.

The assessment of premenstrual tension was made from data obtained during clinical interview and from special daily records of symptoms. Detailed instructions were given to patients regarding the daily recording of symptoms, so that scoring was, so far as possible, kept standardized. The day-to-day records were kept for some months before starting treatment, and the data so provided permitted a detailed assessment of the premenstrual tension and provided a baseline for measuring the effects of treatment.

Clinical Data.—The age distribution of the group was 15-24 years, 8%; 25-34, 56%; 35-44, 36%. Most patients had developed premenstrual tension before 35 and about one-fifth before the age of 20. Two developed premenstrual tension after childbirth, and three just before the menopause. 80% of the group were married. The mean age of menarche was 14.7 years and the frequency distribution of menarchial ages was similar to that described by Ellis (1947) for normal British women. The symptoms of premenstrual

tension usually started about seven to ten days before the period and usually cleared up soon after the onset of menstrual flow, but in some patients they occasionally continued throughout the menses. The symptomatology of the group was as follows: tension, 100%; irritability, 100%; depression, 80%; emotional lability, 80%; anxiety, 73%; swelling of fingers or legs, 73%; painful swelling of breasts, 63%; fatigue, 63%; headaches, 63%; insomnia, 40%; pruritus, 40%; palpitations, 40%; nausea, 37%; marked thirst, 20%.

Results

Psychotherapy

Premenstrual tension was not found to be amenable to psychotherapy alone. Psychotherapy of a simple kind can help the patient in understanding the condition and can improve her attitude and reaction to it. The tense, anxious, striving obsessional type of woman feels greatly frustrated by the interference with physical, mental, and social well-being caused by the premenstrual tension state. She may tend to force herself to keep up the tempo of her work and life in spite of her symptoms. This tends to lead to greater frustration and increase in tension. In this type of patient an understanding of the nature of the condition and the fact that there is an underlying physiological basis for her symptoms can help, together with the advice to modify the demands she makes on herself in relation to her premenstrual symptoms. The person who, on the other hand, is hypochondriacal or very dependent may allow the premenstrual tension state to interfere unnecessarily with her work and social activities. Again explanation, and re-education with the aim of producing a more salutary attitude to her symptoms, can be helpful.

Sixteen patients of the group were attending the psychiatric clinic for treatment of neurosis in addition to premenstrual symptoms. In all these the onset of premenstrual tension antedated the onset of neurosis. Some of them recovered from their neurosis without any significant improvement in premenstrual tension symptoms; conversely, some patients showed improvement in premenstrual tension with hormonal therapy without change in the coexisting neurosis. These facts indicate that premenstrual tension cannot be regarded as being primarily a neurosis.

Suggestion is not thought to play an important part in the condition. Most of the patients develop premenstrual symptoms without realizing the relationship to the menstrual cycle. Exhibition of inert tablets given as a control to hormone therapy produced no significant improvement.

Dehydration Therapy

Dehydration treatment was applied by giving enteric-coated tablets of ammonium chloride in 7½-15-gr. (0.5-1-g.) doses three times a day for twelve days before the period, with restriction of sodium intake. This was found to be effective in preventing the development of swelling of the fingers, legs, face, and other parts of the body. It was also successful in removing these if they had already developed.

The majority of patients reported that they felt more comfortable and had relief of the following symptoms in particular: bloated feeling in abdomen, heavy feelings in head, swelling of subcutaneous tissues and tightness of skin, general pruritus, and pruritus vulvae.

Although effective in preventing excessive water retention and its attendant symptoms, the method was not always effective in relieving the nervous tension, irritability, depression, and anxiety. This suggests that hydration is not responsible for all the symptoms of the syndrome. This is borne out, too, by the fact that some women develop signs of hydration midway between the periods without signs of hydration tension that develops premenstrually, and in the emotional tension that disappears at the onset of some patients the nervous tension disappears at the onset of the menses in spite of the fact that hydration may continue for some days afterwards.

Progesterone Treatment

Progesterone was given intramuscularly on alternate days for twelve days before the period in five patients, and was found to be effective in relieving the symptoms of premenstrual tension. In view of the practical disadvantage of a treatment involving a series of injections an extensive trial was given to the orally active preparation ethisterone. This was given to all patients in the series, and observations were made on over 100 cycles.

Ethisterone was given for twelve days before the period, starting with 5 mg. twice daily, increasing to 10 mg. twice daily if necessary. Most patients responded to a dosage of 5-10 mg. daily. In about 85% of the trials ethisterone was found to produce significant relief of premenstrual symptoms. The signs and symptoms of hydration were prevented and there was usually relief of tension, anxiety, depression, fatigue, headaches, bloated feelings, and pruritus. The pain of dysmenorrhoea was not relieved, and often the patient reported increased pain indicative of more powerful uterine contractions. Occasionally delay of a few days in the onset of the menses was noted when the patient was on ethisterone.

Androgen Treatment

Treatment with methyltestosterone has been tried in 10 patients and observations were made on 40 cycles. It was given in doses of 10 mg. daily for twelve days before the period. Marked relief of premenstrual tension symptoms was obtained, including tension, irritability, anxiety, and depression; also signs and symptoms relating to hydration were prevented. As with ethisterone, the period may be delayed and uterine contractions more painful.

The relief of symptoms of premenstrual tension with methyltestosterone seems to be as effective as that given by ethisterone.

Discussion

The complex symptomatology comprising the premenstrual tension syndrome is of multiple causation. Some of the symptoms and signs are attributable to the effects of hydration, others are due to proliferative changes in the breasts and uterus. Some are possibly due to changes in blood sugar, whereas others are manifestations of autonomic imbalance. Subjective factors, such as the patient's emotional stability, personality, and her attitudes, will also influence the intensity of the degree of incapacity resulting from various symptoms.

Our observations and therapeutic results appear to lend support to the theory that the primary cause is lack of progesterone secretion, permitting the unantagonized action of oestrogens.

Oestrogens are known to cause sodium ion and water retention and proliferative changes in the breast and endometrium, and also to cause various chemical changes in the blood, including hypoglycaemia and increased carbohydrate tolerance (Billig and Spaulding, 1947; Morton, 1950). These effects would appear to explain many of the symptoms and changes associated with the premenstrual tension state.

Treatment with ammonium chloride causes diuresis and removes or prevents excessive hydration, and may also serve to aid the excretion of oestrogens or other agents that may be pathogenetic in premenstrual tension. Our evidence suggests, however, that hydration does not account for the whole of the syndrome.

Progesterone and ethisterone treatment was found to be effective in alleviating not only hydration and its symptoms but also nervous tension, irritability, depression, anxiety, etc. Progesterone promotes diuresis (Selye, 1950), and our observations with ethisterone suggest a similar effect, in contrast to the water-retaining effects of oestrogens. Testosterone also promotes diuresis (Selye, 1950) and is similar in chemical constitution to ethisterone.

Ethisterone and testosterone are both diuretic and antagonistic to oestrogen, and this would appear to be the rationale for their beneficial therapeutic effects on premenstrual tension.

The conclusion is that the simplest method of treating premenstrual tension is by means of diuretics such as ammonium chloride, and, if this is not effective, ethisterone or methyltestosterone should be tried.

Summary

The clinical features of premenstrual tension are described and the possible mode of origin of the various symptoms is discussed. Hydration, blood chemistry changes, autonomic nervous system responses, as well as psychogenic and personality factors are believed to play a part in the syndrome. A working hypothesis on which treatment was based is postulated.

Treatment was applied at various aetiological levels, including psychotherapy, dehydration therapy, and administration of progestogens and androgens.

Psychotherapy has an important but limited role. Dehydration therapy was found to alleviate some of the symptoms only. The most effective methods of treatment were administration of a progestogen such as ethisterone or an androgen such as methyltestosterone during the second half of the menstrual cycle.

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BRIGHT'S DISEASE

AN ATTEMPT AT A STATISTICAL ASSESSMENT OF THE CLASSIFICATION PROPOSED BY ELLIS

BY

J. B. ENTICKNAP, M.D., D.C.P.

AND

C. L. JOINER, M.D., M.R.C.P.

(From the Departments of Pathology and Medicine,
Guy's Hospital, London)

[WITH SPECIAL PLATE]

In 1827 Richard Bright described the disease of the kidney to which his name is still attached. His cases included all forms of renal disease unassociated with obvious changes in the lower urinary tract, and so were composed mainly of the three main groups of chronic pyelonephritis, hypertensive nephrosclerosis, and true nephritis. The second of these was clearly separated by Allbutt (1895-6), and the last has been defined by Osler (quoted by Osman, 1939) as "bilateral, non-suppurative inflammatory disease of the kidneys." The importance and frequency of the first group as a cause of Bright's disease has only recently been recognized.

Numerous attempts have been made to subdivide these cases, but none has received general acceptance. Ellis (1942), as a result of a combined clinical and pathological investigation of "about 600" cases, "about 200" of

which were fatal, suggested that nephritis could well be separated into only two groups, which he called types I and II.

Type I nephritis is characterized by an abrupt onset with haematuria, and is often preceded by an acute infection such as a sore throat. In most adequately treated cases recovery is complete. Death may occur in the acute stage, and some cases follow a progressive course ending in death in a few months. Other cases appear to recover completely, yet after many years develop renal failure and hypertension.

Type II nephritis, on the other hand, is of insidious onset and usually presents as oedema with albuminuria. There is no history of preceding infection, and haematuria is uncommon. The course of the disease is steadily downhill, and if renal failure and hypertension supervene the oedema tends to abate. Many of these patients die from secondary infection and the remainder from hypertension or uraemia.

Ellis further suggested that the two types were not only clinically distinct but were associated with specific renal histological changes and were unrelated aetiologically. Davson and Platt (1949) supported his conclusions with the exception of the last, upon which they reserved judgment.

The present communication describes a similar investigation of a comparable group of cases, with the difference that, where possible, clinical and pathological diagnoses were made quite independently. There were two main objects. The first was to examine the lesions found in fatal Bright's disease, and the second was to see what support analysis of a further group of cases lent to Ellis's views.

Material and Method

In all, 154 cases were examined. They were those that had been indexed as Bright's disease in the necropsy records of this hospital during 1931-51. No non-fatal cases were investigated, so no comprehensive survey of the natural history of these diseases can be offered.

Twenty-seven of these cases have not been included in the analyses: 8 of them because there was a history of toxæmia of pregnancy, 2 because of industrial exposure to heavy metals; 1 was a typical case of polyarteritis nodosa, and 1 was associated with scleroderma; in the remaining 15 cases the clinical or pathological material was incomplete.

The clinical diagnoses were made on the ward records, which were examined by C.L.J., only very few of the patients being seen by either of us during life. The original necropsy reports were consulted, where necessary, only for the macroscopic observations, the histological data presented being derived from an examination of preserved material by J. B. E. At first these investigations were entirely independent, and extreme care has been exercised to avoid either diagnosis being influenced by evidence proper to the other. In all cases in which clinical and pathological diagnoses differed a re-examination was made, the only additional information at each observer's disposal then being the fact that a discrepancy had been encountered. It was rarely found possible to alter a diagnosis at this stage, and if agreement was not reached the available information was discussed and a definite decision on grouping was made. In only 9 cases (7.1%) was agreement then reached, leaving 19 cases of disagreement. All analyses, except where otherwise stated, have been based on the assumption that, wherever pathological and clinical conclusions conflicted, those drawn from the latter material were the correct ones.

Nomenclature

The classification proposed by Ellis has been used throughout, and his criteria for the diagnosis of nephritis of

types I and II have been strictly adhered to. He does not include chronic interstitial nephritis in his table, but follows the recent trend of referring to these cases as chronic pyelonephritis (Ellis and Evans, 1933; Longcope and Winkler, 1933; Weiss and Parker, 1939; Platt and Davson, 1950), of which condition they are thought to represent a healing or healed stage. In our diagnoses we have depended largely on the descriptions quoted, and since the lesions closely resemble those of the healing stage of "ascending" renal infection we shall, for convenience, call them "chronic pyelonephritis."

The term "nephrosis" is restricted to a predominantly tubular condition in which there is no evidence whatever of inflammatory disease and of which we have encountered only one case.

In the diagnosis of nephrosclerosis the descriptions of Allbutt (1895-6), Ellis (1938), and Platt (1948) have been followed.

The other conditions in Ellis's table have been seen in numbers too small to merit further discussion (e.g., amyloidosis), or not at all (e.g., focal nephritis), or have been excluded (e.g., toxæmia of pregnancy).

Results

Of the 154 cases examined 15 had been admitted in terminal uraemia, and, although clear histological pictures were seen in 13 of them, no further clinical diagnosis could be made. In the remaining two of these and in seven other cases in which the diagnosis could be established clinically, no more precise conclusion than "contracted kidney" (see below) could be reached from the pathological material. To 16 cases renal lesions were unexpected necropsy findings to which there were no relevant clinical notes. In the remaining 116 cases clinical and pathological diagnoses could be made.

TABLE I.—Distribution of the Cases by Their Clinical Diagnoses

	This Series	Platt and Davson (1950)*
Acute type I nephritis	9	23
Chronic type I nephritis	21	25
Type II nephritis	24	26
Pyelonephritis	12	16
Benign nephrosclerosis	14	24
Malignant hypertension (primary)	13	3
Amyloid disease	2	
Lipoid nephrosis	1	
Clinical uraemia (Table IIIA)	15	
Incidental necropsy findings of Bright's disease (Table IIIB)	16	
	127	
Toxæmia of pregnancy	8	2
Exposure to heavy metals	2	
Scleroderma	1	1
Polyarteritis nodosa	1	15
No diagnosis	15	
	154	

* These authors made their diagnoses on all available clinical and pathological information; in our series this procedure would have doubled the number of cases of pyelonephritis.

TABLE II.—Cases Which Were Both Clinically and Pathologically Diagnosed as Specific Conditions

	Acute Type I Nephritis	Chronic Type I Nephritis	Type II Nephritis	Chronic Pyelonephritis	Acute Microscopical Form of Periarteritis Nodosa	Total No. of Cases of Inflammatory Disease	Benign Nephrosclerosis	Primary Malignant Hypertension	Amyloid Disease	Lipoid Nephrosis	Total No. of Cases of Degenerative Disease	Combined Totals
(1) Diagnosis agreed ..	7	9	16	11	0	43	12	12	2	1	27	70
(2) Diagnosed clinically ..	9	17	23	11	0	60	13	13	2	1	29	89
% (1/2)	78	53	70	100	—	72	92	92	100	100	93	81
(3) Diagnosed pathologically ..	7	11	21	20	1	60	14	12	2	1	29	89
% (1/3)	100	82	26	55	0	72	86	100	100	100	93	81
(4) Diagnosed either clinically or pathologically ..	9	19	28	20	1	61	15	13	2	1	30	89
% (1/4)	78	47	57	55	0	70	80	92	100	100	93	81

General Discussion

Highly significant agreements have been found between clinical and pathological diagnoses made on Ellis's criteria after great care had been exercised to avoid collusion. We must conclude, therefore, as did Davson and Platt (1949), that his classification does fit the observed facts. This does not, however, necessarily imply that the features of types I and II require acceptance in every particular. Indeed, it may mean no more than that the less dramatic clinical stories are associated with the less remarkable pathological pictures. Thus while the percentages for the chronic inflammatory diseases shown in Table II (4) represent significantly more agreements than would be obtained by chance, they clearly do not in our hands imply a very high degree of diagnostic accuracy. The independent operation of personal factors may be very important here and cannot be allowed for other than by examining an adequate series with sufficient care. It is of course common experience that any case of more than ordinary complexity may, in the hands of different clinicians and different pathologists, give rise to widely differing opinions as well as to discrepancy between the *ante mortem* and *post mortem* diagnoses; but we believe that the nature of these 154 cases and the materials on which our diagnoses have been based are such that our conclusions are unlikely to be very different from those of other observers making use of the same criteria. If this is so the figures quoted strongly suggest that these criteria may not have been exclusive enough.

It seems to us, therefore, that Ellis's types I and II of nephritis are not mutually exclusive entities, but in his Croonian Lectures little attention was paid to this possibility. The more guarded conclusions of Davson and Platt (1949), the fact that in their investigation clinician and pathologist found it necessary to confer before agreement was reached, and their statement that pathological diagnosis was often made by deciding which was the predominating lesion make it clear that in their series there was some evidence in its favour. In particular, their Case 11, in which the changes of malignant hypertension were found in a type II kidney, may be noted—a combination that we also saw in one case.

We think it more probable, therefore, that the different appearances of type I and type II nephritis represent variations in the response of the renal parenchyma to a single disease rather than to entirely different processes. If this be so, and in view of the difficulties experienced in diagnosis, it seems to us that this classification has little to recommend it from a descriptive point of view. We present no new aetiological evidence, but others have already suggested (Davson and Platt, 1949) that some criticisms may be levelled on these grounds. The pathogenesis has not been elucidated, and it is not necessary to specify the pathological lesion present before giving a prognosis to a patient diagnosed clinically. It may be considered preferable, then, to await some aetiological indications, since these are the only basis for a lasting classification, before accepting a new terminology for nephritis.

Conclusions

In our series of 154 fatal cases of Bright's disease we found chronic pyelonephritis to be about as common as all other forms of inflammatory disease. Acute glomerulonephritis occurred fairly often, but we have no data from which to calculate a fatality rate for this condition. We regard it as an entity separate from and probably commoner than the acute microscopical form of polyarteritis nodosa.

We have obtained significant agreements between independent clinical and pathological diagnoses in all the major groups in the classification suggested by Ellis. Those for degenerative disease and for acute type I nephritis were much better than those for chronic inflammatory conditions. Considerable overlapping was discovered between types I and II of nephritis, and only 63% of them were accurately diagnosed.

From these figures we conclude that the Ellis classification does fit this series of cases, but in its most important aspect, the separation of types I and II of nephritis, it so lacks precision that its adoption hardly seems justified.

We found type II nephritis to be renal failure of insidious onset which may be associated with a variety of pathological conditions. These included acute nephritis, pyelonephritis, and hypertensive and polyarteritic renal lesions. Kidneys showing more than one histological feature said to be individually characteristic were common.

For the present, therefore, it seems that there is little reason for departing from the time-honoured procedure of classifying nephritis into acute, subacute, and chronic forms on clinical grounds. Recognition of nephritis—the acute form of which can usually be distinguished—chronic pyelonephritis, and vascular lesions is probably all that can be accomplished on morphological grounds alone.

Summary

A series of 154 fatal cases of Bright's disease occurring in Guy's Hospital between 1931 and 1951 have been examined independently by us, one making a clinical and the other a pathological diagnosis. The diagnoses were compared and an attempt was made to analyse the results statistically.

Of the lesions responsible for fatal Bright's disease, chronic pyelonephritis accounts for a large proportion, and acute nephritis is not uncommon.

Significant agreement between clinical and histological diagnoses was discovered in all groups when the Ellis classification was applied to these cases. Those for chronic inflammatory conditions were, however, less close than for any of the other major forms of renal disease. Considerable overlapping was encountered and diagnosis was often difficult.

Type II nephritis as diagnosed clinically may be due to several different pathological lesions.

For the present it is suggested that the classification of clinical nephritis into acute, subacute, and chronic forms be continued, and that pathological subdivision be restricted.

We wish to thank Dr. W. J. Martin, of the Department of Statistics, London School of Hygiene and Tropical Medicine, for advice and help with the presentation of the data.

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During the twelve months to November 30, 1952, 4,858 children came into the care of the L.C.C., while 4,169 were discharged. On that date there were altogether 8,027 children in care. This represents an increase of about 700 over the previous year, and of 2,300 compared with three years ago. The numbers in the various age-groups were as follows: Under 2 years, 681 children; 2 to 5 years, 1,411; 5 to 15 years, 4,964; and over 15 years, 971. Of the children taken into care during this period, 45 had no parents, 269 were abandoned, 2,637 were taken into care owing to the illness or infirmity of their parents or guardians, and 631 came as a result of "fit person" orders. These figures were given at a meeting of the Children's Committee of the L.C.C. on April 27.

MAY 9, 1953

BRITISH
MEDICAL JOURNALH. PAYLING WRIGHT, M. M. KUBIK, AND M. HAYDEN:
RECANALIZATION OF THROMBOSED ARTERIES UNDER ANTICOAGULANT THERAPY

FIG. 1.—Femoral arteriograms from rabbit treated with anticoagulant. A, Complete occlusion 24 hours after thrombosing. B, Three weeks later, artery again patent.

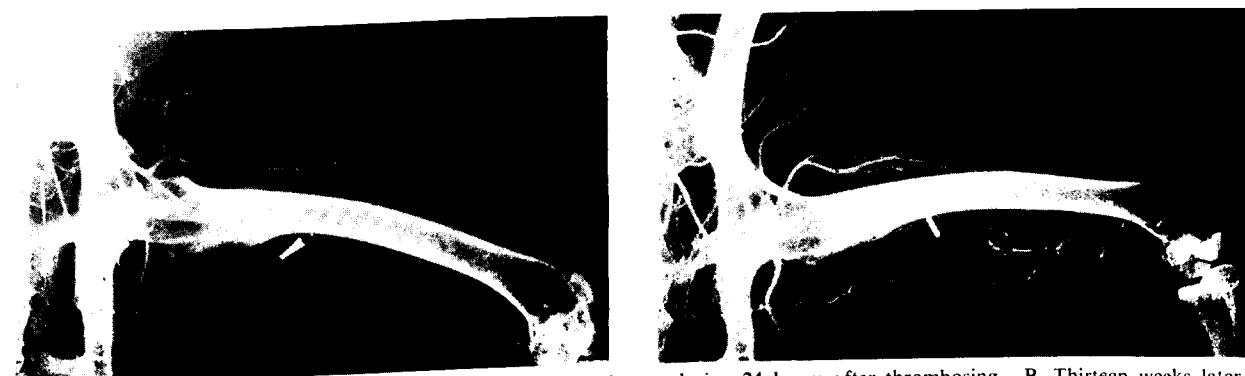


FIG. 2.—Femoral arteriograms from control rabbit. A, Complete occlusion 24 hours after thrombosing. B, Thirteen weeks later, artery still occluded. Development of collateral vessels is marked.



FIG. 3.—Section through femoral artery of treated rabbit at level of thrombus after patency has been restored. (x64.)

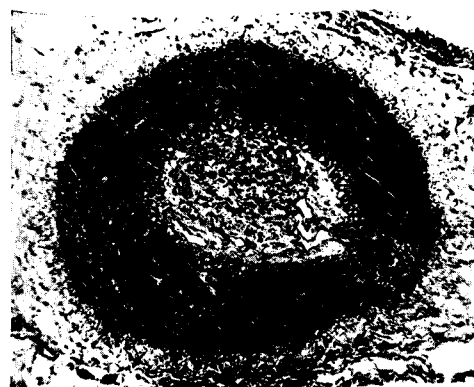
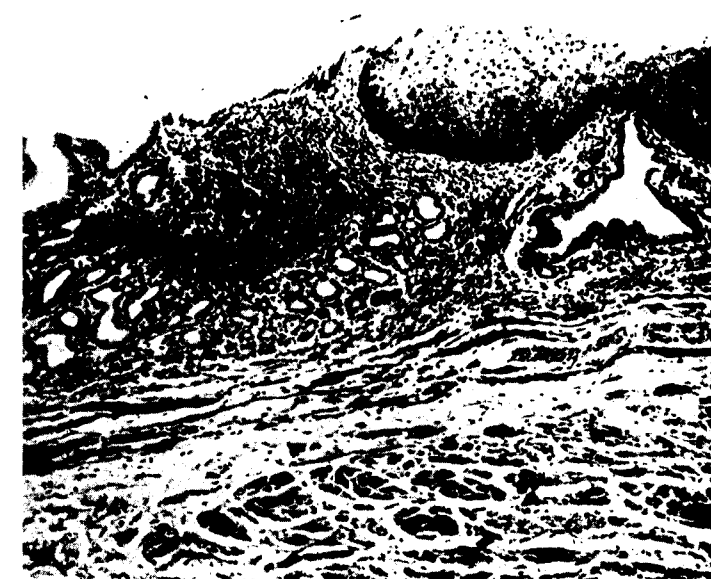


FIG. 4.—Section through femoral artery of control rabbit at level of occlusion. (x64.)

G. RIOS-SOLANS: SLIDING HERNIAS THROUGH THE
OESOPHAGEAL HIATUS

Section showing junction of stratified squamous lining of oesophagus and mucous membrane of stomach. (x33.)

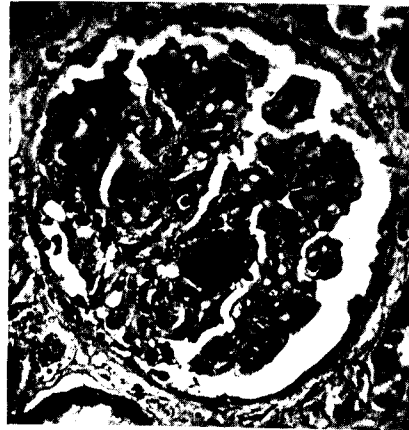


FIG. 1.—Early focal-necrosis stage of type II nephritis in a kidney from a case clinically diagnosed as type I. (H. and E. $\times 210$.)

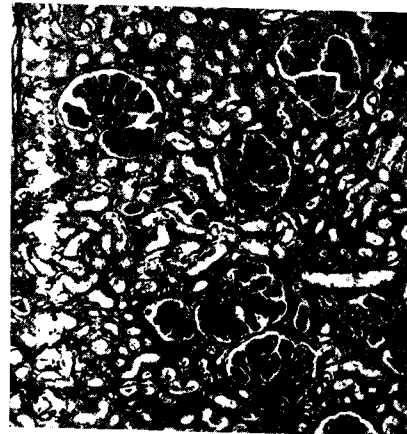


FIG. 2.—Type II nephritis in a case clinically diagnosed as type I. (Mallory. $\times 50$.)

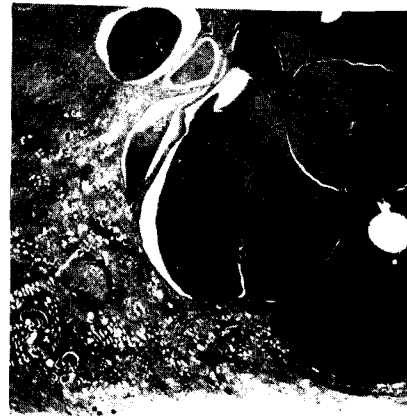


FIG. 3.—Chronic pyelonephritis in a case of type I nephritis. (H. and E. $\times 16$.)



FIG. 4.—Benign nephrosclerosis in a case of type I nephritis. (H. and E. $\times 200$.)

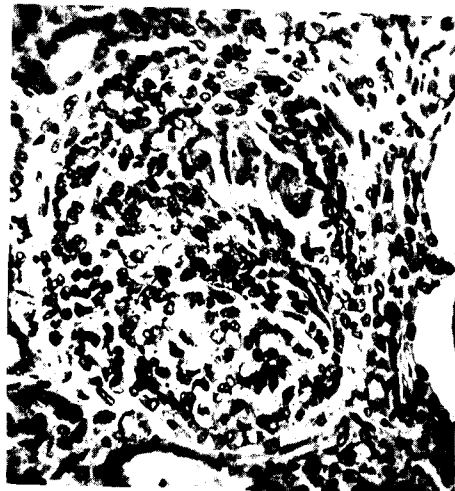


FIG. 5.—Type I glomerular lesion in a case of type II nephritis. (H. and E. $\times 180$.)



FIG. 6.—Chronic pyelonephritis in a case of type II nephritis. (H. and E. $\times 70$.)



FIG. 7.—Type II glomerular lesion in a case of benign nephrosclerosis. (H. and E. $\times 200$.)

E. H. STRACH : OSTEOID OSTEOMA



Sagittal section of the terminal phalanx showing the osteoid osteoma at the tip. (Low power.)

RECANALIZATION OF THROMBOSED ARTERIES UNDER ANTICOAGULANT THERAPY

BY

I. PAYLING WRIGHT, Ph.D., B.Sc., L.M.S.S.A.

M. M. KUBIK, M.D., M.R.C.S.

AND

M. HAYDEN

Technical Assistant

(From the Obstetric Unit, University College Hospital Medical School, London)

[WITH SPECIAL PLATE]

Arterial occlusion, due entirely or partially to thrombosis, is a result of various pathological processes. In every case, however, it is a serious development which endangers the vitality of the organ or extremity concerned. It is evident that details of treatment must be defined according to the primary disease and the artery affected. Apart from promoting the collateral circulation and other measures designed to balance the disproportion between blood supply and local oxygen requirements, it is the dissolution or recanalization of the obstructing clot which should be the ultimate aim of treatment.

We have already presented evidence that the rate of recanalization of venous channels which had been thrombosed experimentally was greatly accelerated when the prothrombin activity was adequately lowered by the administration of suitable doses of a dicoumarol anti-coagulant (ethyl biscoumacetate, "tromexan") (Wright, Kubik, and Hayden, 1952). Encouraged by the findings of a preliminary investigation upon recanalization of arteries (Kubik and Wright, 1950), a more complete experimental study has been undertaken to assess the value of dicoumarol treatment in thrombosis in these vessels.

Methods

Since it was found that blood prothrombin levels fluctuated considerably during anticoagulant treatment and that doe rabbits often died from uterine haemorrhage, full-grown young bucks were used throughout the following experiments.

Under pentobarbitone sodium anaesthesia the femoral artery was exposed for a length of 2 cm. on one or both sides through a longitudinal incision on the median aspect of the thigh. The stripped length of vessel was lifted on fine ligatures spaced about 1 cm. apart, so that its lumen was able to be compressed in three sections. Just enough pressure was applied to the ligatures to prevent the blood flowing in the artery while 0.02 ml. of thrombin solution (1,000 units per ml.) was injected through a fine intradermal hypodermic needle into the middle section and 0.02 ml. of 10% sodium morrhuate into the proximal and distal ones. In those animals in which mechanical interference to the vessel caused arterial constriction, a solution of papaverine hydrochloride (1.25%) was applied to overcome the spasm (Morrison, 1952). The injected substances were maintained in the occluded sections for ten minutes, after which time the pressure on the ligatures was gradually released.

A small flow of blood was occasionally apparent immediately after the release of the pressure, but when fresh blood came in contact with the sclerosed areas and with a local thrombin coagulum, thrombosis occurred within

a few moments and could be recognized from the outside of the vessel as a fusiform dark-red section, incompressible when gently pinched.

In our preliminary report (Kubik and Wright, 1950) peripheral gangrene was often found in the foot after thrombosis of the femoral artery. This was possibly due either to injury of the femoral nerve or to thrombosis of the arteries of the foot produced by morrhuate carried peripherally by the blood stream. This complication did not occur with the improved technique described here.

After arterial occlusion the animals were divided into two groups: (A) those which received ethyl biscoumacetate daily by mouth, starting 24 hours after the thrombus had been formed; and (B) those which, as controls, received no treatment. The ethyl biscoumacetate, as a suspension in methylcellulose ("cellofas") (Wright, Kubik, and Hayden, 1952), was given through a short rubber tube, which was passed to the back of the pharynx so that regurgitation could not occur. The dosage was controlled by prothrombin estimations carried out three times a week, using the Quick single-stage technique on blood drawn by ear-vein puncture. The prothrombin time aimed at for every animal was 30 seconds (rabbit normal, 9 seconds), and, to achieve this, doses of 100–300 mg. per kg. body weight were required daily. Prothrombin-level fluctuations in rabbits are, however, both rapid and profound, and in the course of the experiments several animals were lost through concealed haemorrhage into the caecum. Nevertheless, the prothrombin times in the majority were maintained between 25 and 35 seconds throughout the experimental period, and only these animals are included in this report.

An arteriographic technique was used to follow any changes which might occur in the occluded vessel, the first x-ray film being taken 24 hours after thrombosing to show the extent of the obstruction. Under pentobarbitone sodium anaesthesia, a 3-cm. midline abdominal incision was made, the gut was held aside within the body cavity, and the aorta was exposed for a length of about 1 cm. A fine hypodermic needle (No. 16), inserted into a polythene tube about 20 cm. long and with a syringe attachment at the distal end, was introduced into the exposed aorta. Through this, 2 ml. of thorotrast, as contrast medium, was injected during a period of 4 seconds and the x-ray film was taken while it was still flowing in. Double-wrapped 10 by 12 in. (25 by 30 cm.) "improved fast Ilfex film" with exposure factors of 53 kV, 50 mA, and 0.5 second was used throughout.

Further x-ray films were made with the same technique at two-weekly intervals for Group A and at four-weekly intervals for Group B.

Results

It was early apparent that a considerable difference in the time required for the recanalization of the femoral arteries occurred between those animals which received adequate anticoagulant treatment and the untreated controls. In the eight animals in Group A, the average time taken for one or both vessels to become patent was only 3.25 weeks, while in Group B none of the six controls were patent by 8 weeks, and further x-ray films taken at various later dates showed no evidence of recanalization at any time. The details of both groups are set out in the Table. Typical arteriograms of animals (Nos. 6 and 10) from each group are shown in the Plate, Figs. 1 and 2.

The criterion of "occluded" or "patent" is, moreover, a stringent one. In Group A, when one artery has become patent, the thrombus in the remaining occluded vessel generally shows a considerable reduction in its length, even though complete patency has not been established. A longer period of treatment would presumably further reduce the size of the occluding mass, if not allow of its entire removal. In the control group, on the other hand, no such changes were evident, the size of the occlusion showing no material diminution; indeed, in one animal (No. 12) which was

Time Taken (Weeks) for Recanalization of Thrombosed Arteries

	Week of X-ray Film	Right Femoral	Left Femoral
Group A (treated):			
Rabbit 1	2½ (died)	O	O
" 2	4	P	P
" 3	4	O	P
" 4	3	O	P
" 5	3	P	P
" 6	2	O	P
" 7	8	—	P
" 8	2	—	P
Group B (control):			
Rabbit 9	8	O	O
" 10	13	O	O
" 11	22	O	O
" 12	46	—	O
" 13	12	O	—
" 14	15	O	—

O=Occluded. P=Patent.

specially kept, the artery was still fully occluded after eleven months. Other animals of this group were destroyed at varying intervals.

Histological sections of arteries from animals of both groups were examined at the end of the experimental period. In the treated group the animal was sacrificed after the patency of the femoral artery had been established by arteriogram. Fig. 3 shows a photomicrograph of the artery from rabbit No. 6, which was open after three weeks of anticoagulant treatment. The intima appears normal except at one point where there is a small residual mural thrombus. The lumen is otherwise free from obstruction.

In the control group histological sections were taken through the vessel at the level of the obstruction. Fig. 4 shows a typical organizing thrombus with fibroblasts and haemosiderin granules in the granulation tissue matrix three months after arterial obstruction had been produced (rabbit No. 10).

Discussion

In comparison with the interest shown in the influence of anticoagulants on experimental venous thrombosis, little attention, so far as we know, has been paid to corresponding changes in arteries. Experimental work on coronary occlusion has been undertaken, but even here the arterial block was produced by ligation of a branch of the coronary vessel. The result of subsequent anticoagulant therapy on the myocardial infarction so produced was described by Beattie and his colleagues (1948). Le Roy and Nalefski (1948) investigated the possible ill effects of dicoumarol on the myocardium, but it is obvious that neither of these groups of workers were interested in the effects of their therapy on the primary occlusion, or the technique of ligation would not have been used.

It is remarkable that, though a considerable number of experiments have established the fact that the administration of dicoumarol or its derivatives reduces the formation of intravascular coagulation (Marple and Wright, 1950), the experimental investigation of the influence of these drugs on preformed thrombi *in situ* has been omitted. Loewe (1947) and Loewe and Hirsch (1947) suggested that the administration of heparin facilitated the reopening of veins recently occluded by fresh unorganized thrombus, but a study of thrombosed arteries has been largely neglected, though it obviously has a wide clinical application.

Experimentally it is difficult to produce conditions similar to those occurring in the majority of occlusive arterial diseases. First, in the naturally occurring process the endothelium undergoes changes which cannot be reproduced in the experimental animal; the actual thrombosis occurs in a vessel previously diseased. Secondly, in clinical practice, except in cases of embolism, the obstruction develops gradually and there is, as yet, no experimental method for producing such a progressive occlusion. In the third place, the inflammatory character of certain of the arterial diseases cannot be fully imitated, though recently Rabinovitch and Pines (1949) have claimed satisfactory results in reproducing this change in veins by injecting staphylococci into the wall

of the blood vessel. In our method, using both thrombin, which produces a red coagulum, and morrhuate, which damages the endothelium, we believe that many of the features of normally occurring arterial occlusion are paralleled.

In assessing the results presented here it must be borne in mind that rabbits are relatively resistant to the coumarin group of anticoagulants. Their plasma possesses a considerably greater prothrombin activity than that of human blood (Quick, 1936). Larger doses and more prolonged treatment are consequently needed to influence their prothrombin levels to correspond with the human equivalent. In these animals, moreover, wide fluctuations of prothrombin activity while receiving coumarin treatment make it difficult to maintain them at an adequate level without the risk of haemorrhage. The results which we have obtained, however, make it clear that the administration of the anticoagulant has, under the conditions of our experiments, the effect of promoting the recanalization of the thrombosed lengths of the arteries.

How this effect is brought about is still uncertain, but in a previous paper (Wright, Kubik, and Hayden, 1952) we described our findings and suggested a possible mode of action of ethyl biscoumacetate on venous thrombi. The increased rate of recanalization observed is possibly due to the normally continuous action of fibrinolysin, which is usually masked by the continual deposition of small quantities of fresh fibrin on the thrombus surface, and which is disclosed in the presence of anticoagulant when fibrin deposition is prevented. The action of the anticoagulant would therefore appear to be an indirect one.

From preliminary experiments it was found more difficult to thrombose an artery than a vein, but once occluded it remained so. We did not observe any spontaneous recanalization in our control group even after many weeks. In the light of this it is difficult to explain the disappearance of the arterial thrombus with ethyl biscoumacetate treatment wholly by its indirect action. Schmid and Stockinger (1951) observed that dicoumarol, and still more ethyl biscoumacetate, significantly depressed the growth and dividing power of fibroblasts in tissue culture. This effect was present even in the low concentrations found in the blood during anticoagulant therapy. It is therefore possible that the organization of the thrombus is modified by these drugs, and this plays a leading part in promoting the recanalization of the intra-arterial thrombus.

Application of experimental data to human pathology is always somewhat hazardous. The conclusion seems justified, however, that adequate prolonged treatment with dicoumarol in general and with ethyl biscoumacetate in particular has a favourable influence on the reabsorption of arterial thrombi, provided therapy is started soon after occlusion has occurred. Such treatment may result in reopening of the occluded vessel when the obstruction is due to thrombotic and not to arteriosclerotic changes.

Summary

A method for producing thrombi in rabbits' femoral arteries is described.

The time taken for recanalization to take place in control and anticoagulant-treated animals was recorded by arteriography.

The treated group showed an average recanalization period of 3½ weeks, while the controls were still occluded after several months.

The influence of anticoagulant treatment is dependent upon the maintenance of a low prothrombin level.

A discussion of the possible mode of action is offered.

We wish to express our thanks to Dr. C. J. Hodson and to members of the x-ray diagnostic department for their help with this work.

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METABOLIC CHANGES ASSOCIATED
WITH OPERATION*

BY

IAN W. MACPHEE, M.D., F.R.C.S., F.R.C.S.Ed.
 Research Assistant in Surgery, University of Liverpool

That the recovery from injury follows a recognized pattern has been known from very early times. This was clearly appreciated by John Hunter (1794). In 1872 Bauer observed that an increased elimination of nitrogen followed upon haemorrhage, and Hawk and Gies (1904) showed that the actual operation of venesection without withdrawal of blood was enough to cause increased urinary output of nitrogen and sulphur. This increased nitrogen loss was also noticed by Benedict (1915) during prolonged starvation. Since that time many observers have noted this increased nitrogen catabolism as a result of injury, associated with increased phosphorus, sulphur, and potassium loss (Cuthbertson *et al.*, 1939; Cuthbertson, 1942; Wilkinson *et al.*, 1949). The varying nature of the injuries causing this has tended to emphasize that something inherent in the trauma, or some underlying response, might be common to many and various injuries done to the body, and deprivations to which it might be exposed.

Wilson and Stewart (1939) noted that, in burns, sodium was lost from the extracellular fluids into the cells of the damaged tissues, and also into the erythrocytes of the general circulation. The observations of Cuthbertson *et al.* (1939) on the urinary excretion of potassium and nitrogen led them to believe that the increased excretion of these substances was due to muscle catabolism following operative injury, but they noted that potassium was lost in greater proportion than nitrogen when compared with their relative concentrations in muscle protoplasm. Howard *et al.* (1946) have also shown that the nitrogen, potassium, sulphur, and phosphorus loss is not proportional to their content in muscle, and that the greatest potassium loss occurs in the first 24 hours. Blixenkrone-Møller (1949) demonstrated that the maximal potassium loss after operation precedes the maximal nitrogen excretion.

Wilkinson *et al.* (1950) demonstrated that after surgical operation potassium is lost in the urine in high concentration when the potassium intake is low, that the loss is greatest in the first three days after operation, and that it precedes in time the nitrogen loss, which persists throughout the first post-operative week. In a previous paper Wilkinson *et al.* (1949) had drawn attention to the marked retention of sodium and chloride in the early

post-operative period, occurring at the same time as the phase of increased potassium loss. Annersten and Norinder (1946) had previously observed a slight reduction in serum sodium and chloride after operation. They did not believe that these changes were significant. Similarly Wilkinson *et al.* (1951) noted such slight changes, but again did not believe them to be an explanation of the retention of sodium and chloride after operation.

I first became interested in this problem in 1948, when I observed the retention of chloride and of sodium after operation. The effect was thought to be very similar to the results of the administration of 11-deoxycorticosterone acetate (D.C.A.). In view of the observations of Hans Selye, it was believed that these electrolyte changes might well be due to increased adrenocortical function following the stimulus of operation. It was decided to observe these changes again and, at the same time, to measure adrenocortical function.

Results

Electrolyte Changes

Fig. 1 shows the typical features of the electrolyte changes in the plasma and urine before and after operation. In all cases a great reduction in the excretion of sodium and of chloride in the urine was observed immediately following operation; this persisted for about seven days. After this, the sodium and chloride excretion in the urine tended to rise above the pre-operative level. Associated with these changes, a constant but much diminished fall in serum sodium and plasma chloride was detected during the same period. A return to the pre-operative level occurred about the end of the first week.

During the same period the serum potassium concentration appeared to be variable and showed no pronounced change. In general, the concentration of potassium in the

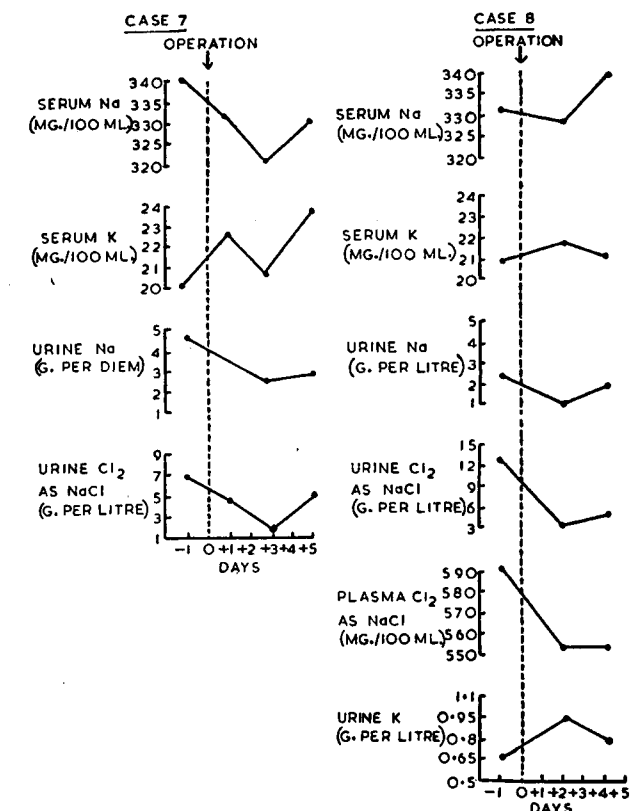


Fig. 1.—Typical examples of electrolyte changes in blood and urine.

*Part of a thesis submitted for the degree of M.D. of the University of Glasgow.

serum was slightly elevated during some part of the post-operative period. Fig. 2, a composite diagram of the potassium excretion of another series of eight cases under the same conditions, demonstrates the continued loss after operation of potassium in the urine during the period of negligible potassium intake. The increased excretion of potassium appears to decline after the third post-operative day.

From the previous work discussed above, and as a result of observations made in the present study, it seems that after operation a reduced excretion of sodium and chloride is to be expected, associated with an increased excretion of potassium. The changes in the blood, however, are not so well established. As has been stated, the decrease in plasma chloride and serum sodium immediately after operation observed by Annersten and Norinder (1946) and by Wilkinson *et al.* (1951) was not considered by them to be significant. The changes in serum sodium of the nine cases of the present series are typically represented by those shown in Fig. 1. The majority are greater than the experimental error of the method used, and, though small, seem to be none the less real. This applies also to the plasma chloride changes detected in ten patients. Since the potassium lost must, in the end, result, be derived from cell potassium, it was thought that the small apparent loss of sodium and chloride in the body fluid after operation, at a time when the body is retaining sodium and chloride, might be due to a replacement of cell potassium by sodium and to an increase in cell chloride. Fig. 3 shows the results of the study of erythrocyte sodium and plasma sodium in another series of six patients. In four of the cases the estimations were made on the day before and after operation. The results show that the decrease in plasma sodium after operation equalled almost exactly the increase in cell sodium (Fig. 3, A and B). In two of the cases the estimations were performed on the day of operation, and on the fourth post-operative day (Fig. 3, C and D). By this time the changes had been reversed; the cell sodium content was now below the pre-operative level and the plasma sodium was above the pre-operative level.

Similar estimations of cellular and plasma potassium were undertaken on these patients, but no constant and appreciable changes were detected. Though no conclusion can be deduced from this small experiment, it does suggest that the slight decrease in serum or plasma sodium after operation is due to that amount of sodium entering the tissue cells.

Body Water Changes

Blood Volume.—(a) *Haemoglobin and haematocrit estimations:*—At the same time as the observations were made on electrolyte changes, some estimations of any

changes to be detected in the body water were also made. Fig. 4 shows the pre- and post-operative haemoglobin and haematocrit levels in the original nine patients of the series. There seem to be two distinct reactions in this series. As would be expected following any haemorrhage, five patients show evidence of haemodilution. The second group of four patients, under the same circumstances, show evidence of haemoconcentration.

(b) *Plasma volume:* In only two patients of this series was the plasma volume determined by the dye method. No significant reduction in plasma volume was detected. (c) *Plasma proteins:* Estimations were undertaken in five patients before and after operation. In four the total plasma protein content was reduced, and in one the increase was not significant. As will be seen from the Table, there was a general reduction in both the albumin and the globulin fraction after operation. (d) *Blood pressure:* These recordings were made in five patients in whom any degree of post-operative shock could be definitely excluded. No significant alteration in blood pressure, except on the day of operation, was noted in any case.

Plasma Protein Content Before and After Operation

Day:	-2	-1	0	+1	+2	+3
Case	Alb. Glob.	Alb. Glob.	Alb. Glob.	Alb. Glob.	Alb. Glob.	Alb. Glob.
27	3.9 3.2		4.5 2.1	4.8 2.3	4.7 1.5	
28		5.0 2.3	4.6 2.4	4.8 2.3	4.2 2.0	
29		5.0 2.7				4.6 2.2
30						
31						

Extracellular Fluid-space Volume.—This was estimated in only two patients, using sodium thiocyanate. As only relative changes were to be considered, the inaccuracy of the "thiocyanate space" as a measure of the extracellular fluid space was not important. No significant change was observed after operation.

Total Body Water.—Because more elaborate methods, such as the use of deuterium oxide, were not available, changes in total body water were estimated by means of changes in body weight. Fig. 5 shows a typical example of the changes in body weight, measured in pounds, following operation in patients weighed at the same time each day, in the same clothing, on the same machine, and after a 12-hours fast. A weight loss is noted in three of the cases, a gain in three, and no change in one case. The daily weight loss for the average

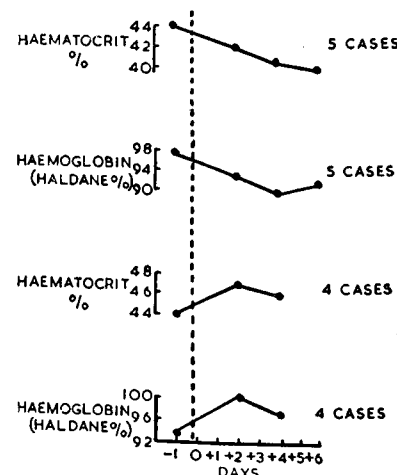


Fig. 4.—Composite diagrams of haematocrit and haemoglobin levels, showing the two different types of reaction.

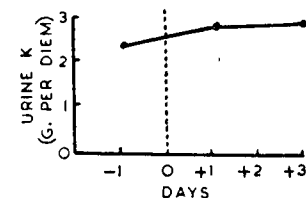


Fig. 2.—A composite diagram of the urinary potassium excretion during the early post-operative phase in eight cases.

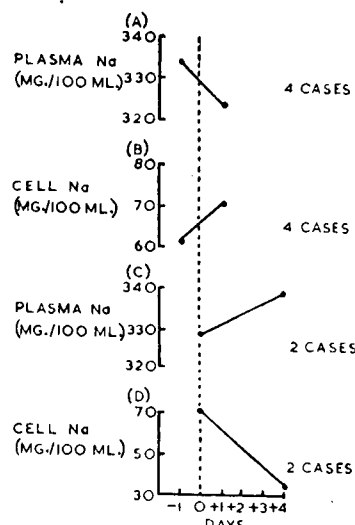


Fig. 3.—A composite diagram of erythrocyte and plasma sodium, in four cases on the day before and after operation, and in two cases on the day of operation and the fourth post-operative day.

Similar estimations of cellular and plasma

male during starvation and without water depletion has been estimated as about 260 g., or 9 oz. (Wright, 1940). If after operation the nitrogen loss is even greater than in starvation alone, a still greater weight loss might be expected. Any weight gain or maintenance of previous weight must therefore be a measure of water retention within the body. Four of the seven cases appear, therefore, to show a water retention after operation.

Urine Volume.—In this paragraph only urinary volume studies are under review. Fig. 6 is a composite diagram of

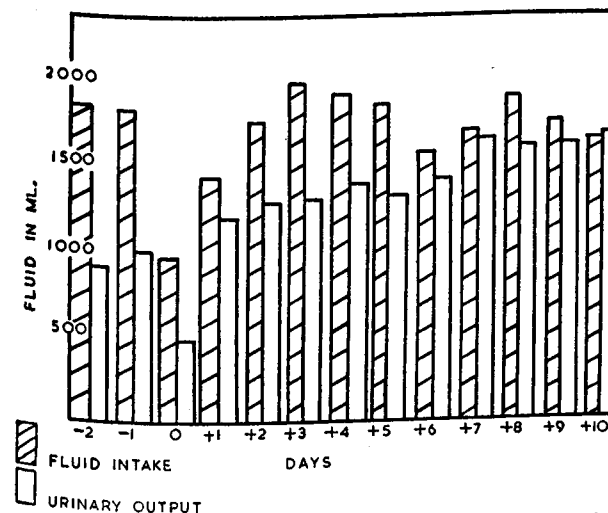


Fig. 6.—Composite diagram of the average fluid intake and urine output of the nine cases.

the average daily fluid intake and urine output of the nine patients. Except for the day of operation, the urine output in the first six days after operation appeared to remain remarkably constant in these adequately hydrated patients. During the next four days the urine output increased, and approximated to the fluid intake.

Evidence of Increased "Glucocorticoid" Activity

The tests used here to measure increased secretion of corticoids are not necessarily the best for the purpose, but simply those most suitable for performing as routine estimations in a teaching hospital.

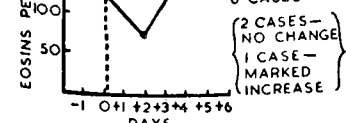


Fig. 7.—Composite diagram of circulatory eosinophil counts in six of the nine cases.

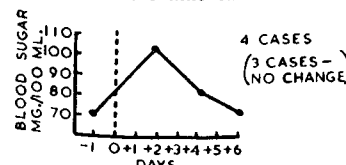


Fig. 8.—Composite diagram of blood-sugar changes in four of the seven cases in which sugar determinations were made.

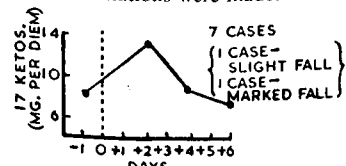


Fig. 9.—Composite diagram of urinary 17-ketosteroid excretion a day in seven of the nine cases.

were made in seven of the nine patients. Fig. 8 shows the blood-sugar levels in four of the seven patients. These four patients showed a considerable rise in blood sugar in the immediate post-operative phase. The remaining three patients had no change in the blood-sugar levels after operation.

It is interesting to observe that, of the three patients in whom there was no evidence of decreased eosinophil counts after operation, one showed increased blood-sugar concentration after operation. Further, of the three patients who showed no evidence of an increase in blood sugar after operation, all showed a considerable fall in eosinophil counts. Thus, applying both tests, only two patients did not give any evidence of increased "glucocorticoid" activity after operation.

Evidence of Increased Androgen Formation

17-Ketosteroid Excretion.—Fig. 9 is a composite diagram of the excretion of 17-ketosteroids a day in the urine following operation. Seven of the nine cases showed evidence of increased 17-ketosteroid excretion on the first or second day. The increased ketosteroid excretion in these cases tended to fall below the pre-operative level by about the sixth day. Of the two cases which did not show an increase in ketosteroid excretion after operation, one was excreting 17-ketosteroids at the upper limit of normal in the pre-operative phase. This was followed in the early post-operative period by a marked fall, followed by a sharp rise again on the fourth day.

Discussion

The Electrolyte Changes

The reduction in the excretion of sodium and chloride in the first week after operation, and the increased excretion of potassium previously noted by Blixenkrone-Møller (1949) and by Wilkinson *et al.* (1949, 1950, 1951), are confirmed in the present series. This study also indicates that these features are common to relatively minor surgical procedures, where no intravenous electrolyte or blood replacement therapy has been undertaken either at the time of operation or thereafter. Gamble (1942) has shown that the intravenous infusion of saline is sufficient, by itself, to cause an increased excretion of potassium in the urine. This factor can be excluded in the present series.

It would seem that the increased excretion of potassium after such operations is a phenomenon similar to the increased potassium excretion following operative fracture of the long bones, as demonstrated by Cuthbertson *et al.* (1939). Cuthbertson (1942) considered this to be part of an intimate response of the organism to trauma. His findings, and those of Wilkinson *et al.* (1950), indicate that the potassium loss after operation occurs to a degree greater in proportion than the nitrogen loss, that it precedes the nitrogen loss, and that it terminates before the phase of negative nitrogen metabolism has ceased. Blixenkrone-Møller has detected an increased potassium excretion within six hours of operation. Benedict (1915) and Howard *et al.* (1946) have shown that the potassium loss during starvation and in progressively diminishing diets is directly proportional to the nitrogen loss when compared with the concentration of both substances in muscle.

It would appear, therefore, that factors over and above rest in bed and starvation are effective in causing the sodium and chloride retention and increased potassium excretion associated with operation. Selye (1950) believes that these electrolyte changes are a part of the "stress" response, and partly due to an adrenocortical response to injury. Similar retention of water and salt with increased excretion of potassium is observed after the injection of 11-deoxycorticosterone acetate (D.C.A.) in animals (Ferrebee *et al.*, 1941), and in man (Ingle and Thorn, 1941), and also after the administration of A.C.T.H. (Forsham *et al.*, 1948; Mason *et al.*, 1948; Elkinton *et al.*, 1949).

The Cellular Electrolyte Changes

The older concepts that the cell membrane offered an impermeable barrier to the passage of sodium and potassium is now known to be incorrect. Maizels (1949) has shown that in blood stored at 37° C. an active expulsion of sodium from the cell takes place, accompanied by an uptake of potassium. Mullins *et al.* (1941) have shown the rapid penetration of the erythrocyte by radioactive potassium, and to a less extent by sodium, in three hours. During anaerobic metabolism, in the absence of glucose, the potassium concentration of the serum (Danowski, 1941), or the brain-tissue fluid (Dixon, 1949), has been shown to rise, owing to a loss of potassium from the cells of the respective tissue. Ferrebee *et al.* (1941) have shown clearly that, in dogs, symptoms of cellular depletion of potassium may arise after the administration of D.C.A. It has also been shown that in animals fed on a low-potassium and high-sodium diet partial replacement of deficient cellular potassium can be induced by increase in cell sodium (Heppel, 1939; Miller and Darrow, 1940). Fenn and Cobb (1936) found that after prolonged indirect stimulation of muscles in anaesthetized rats, potassium was lost from the muscle cells and replaced by sodium. After two hours' rest these changes were reversed, indicating that no permanent damage had been done to the muscle.

From all these observations there is strong experimental and clinical evidence to show that potassium and sodium, under certain circumstances, may be interchangeable across the cell membranes. Such an interchange would account for the increased potassium excretion following operation. It would also account for the relatively slight fall in the serum sodium and chloride observed here, and considered not significant by Annersten and Norinder (1946) and by Wilkinson *et al.* (1951). The short study of intracellular electrolyte in the present series confirms this conclusion—an increased erythrocyte sodium content being observed in the immediate post-operative period, and the plasma sodium being reduced by the corresponding amount. No change was noted in the erythrocyte potassium content. This does not invalidate the assumption that the potassium has been derived from tissue cells, as demonstrated by the workers already cited.

The question why potassium should leave the cell under a variety of circumstances seems to be open to two interpretations. Gamble (1942) believes that, in conditions of clinical dehydration, water and potassium pass out from the cell, depending upon the changes in extracellular fluid and electrolyte. In the present series of cases no question of extracellular dehydration arises. Indeed, it has been shown that water and electrolyte, probably in equal relative proportion, are retained within the body.

Another concept, which seems to fit the facts in a more extensive range of conditions leading to the same end-result, has been suggested by Maizels (1949). It is indeed curious that the normal cell-to-tissue cation equilibrium should remain established at any time. As Maizels has indicated, this accumulation of potassium in the cell against the concentration gradient has long been a cause for speculation. Maizels, from his own observations, does not believe that an active excretion of sodium from the cell requires an active absorption of potassium. He believes that potassium passes into the cell passively, and secondarily to the active expulsion of sodium.

It would therefore seem that, following operation or trauma, the relative permeability of the cell-membrane is altered, potassium is liberated, and any tendency to a marked rise in extracellular potassium is prevented by the rapid excretion of that ion in the urine. Either, to replace this cell base, sodium appears to enter the cell from the surrounding extracellular fluid, or else, if Maizels's view is accepted, the "pumping" mechanism breaks down, sodium is not sufficiently expelled from the cell, and perhaps, to maintain the correct osmotic tension, potassium leaks out into the tissue fluids.

Alterations in Body Water

Plasma Volume.—Wilkinson *et al.* (1951), in a series of 10 cases, demonstrated a decrease in plasma volume immediately after operation—directly by the dye method (T 1824) and indirectly by changes in haemoglobin and haematocrit readings. Studies of plasma-protein fractions indicated that this was due to a reduction in plasma albumin and an increase in plasma globulin. These results, in association with some of the electrolyte changes considered above, led them to suggest a transudation of water, albumin, sodium, and chloride into the tissues at the site of injury. Their cases all received blood transfusion at the time of operation, and were undergoing major surgery. In the present investigation the direct plasma-volume studies were not extended sufficiently to be of any value. So far as indirect mensuration may be of value, five of the patients showed evidence of haemodilution in the immediate post-operative phase and four showed evidence of haemoconcentration. No confirmation of a relative reduction in plasma albumin with an increase in globulin was obtained.

Extracellular Space Volume.—Wilkinson and his associates, in their study of the total extracellular space volume in the same cases, did not observe any regular change in the post-operative period. The studies in the present paper are too few to be of value, but they do tend to confirm this finding.

Total Body Water.—As has been shown in the present series, evidence has been obtained of an increase in total body water in some of the cases. Whether this is due to an increase in the extracellular extravascular space as determined directly by Wilkinson and his associates, or whether it is due to an increase in cellular water, has not been determined here. As Darrow has shown (Gamble, 1942), the excretion of potassium in infantile diarrhoea is associated with cellular dehydration. On the other hand Fenn and Cobb (1936), in their experiments on continued muscle stimulation, showed that the passage of sodium and chloride into the cells was associated with an increase in the intracellular water space.

Urine Volume.—The gradual approximation of the urine excretion to the fluid intake late in the post-operative period would tend to suggest that a water retention had occurred at an earlier stage. The relative diuresis for each patient seems to occur on a different day after the first post-operative week. For this reason the combined chart masks this relative diuretic effect.

Evidence of 11-Oxysteroid Activity

Eosinophil Counts.—Forsham *et al.* (1948) and Carlisle (1950) have indicated that both A.C.T.H. and cortisone depress the circulating eosinophil count. Cope *et al.* (1951) point out that it is specifically cortisone and 17-hydroxycorticosterone which exert this influence in the adrenalectomized animal. The depression of the eosinophil count, provided the reduction is at least by 50%, has often been used in clinical medicine as a measure of adrenocortical activity (Roche *et al.*, 1950). Unfortunately, accurate eosinophil counting is difficult, and Godlowski (1951) has demonstrated that heparin in large doses may produce an eosinophilia in spite of injected cortisone or A.C.T.H.

In the present series six of the nine patients who showed the electrolyte and water disturbances described above also showed a reduction of the eosinophil count by 50% in the immediate post-operative period.

Annersten (1949), in measuring the post-operative rise in blood-adrenaline concentration, has observed an immediate post-operative rise in blood sugar. In an earlier paper (Annersten and Norinder, 1946), a raised blood sugar was also observed on the first and second days after operation. In view of the observations of Annersten (1949) and the work of Cannon (1929), this early hyperglycaemia is undoubtedly due to the liberation of excess adrenaline. Although not commented upon, the results of Annersten

(1949) show that the blood adrenaline is falling by the second post-operative day, whereas the high blood-sugar level is maintained. In the present series a considerable rise in blood sugar occurred in four of the seven patients studied, little or no change being observed in the three others.

Urinary 17-Ketosteroid Excretion

The whole 17-ketosteroid excretion in women, and a part of it in men, is derived from cortical androgens (Forbes *et al.*, 1947). The remainder in men, about 4–6 mg. a day, is derived from testicular tissue.

It was early noticed (Fraser *et al.*, 1941) that there was a diminished excretion of 17-ketosteroids in the urine following trauma and surgical operations. However, the same workers (Forbes *et al.*, 1947) demonstrated later that they had missed an early rise in 17-ketosteroid excretion in the first 24 hours after operation. After this, ketosteroid excretion fell to its lowest point about the fourth or fifth day, and by the tenth day regained normal levels. Control patients showed that starvation alone did not cause this rise, and then fall, in excretion. Landau *et al.* (1948) also showed that starvation by itself decreases the total 17-ketosteroid excretion. A sharp rise in the excretion of 17-ketosteroids followed by a fall to below normal levels in 30 patients suffering from haemorrhage, fractures, burns, infection, and operation was shown by Stevenson *et al.* (1944). A similarly elevated 17-ketosteroid excretion was noted by Freeman *et al.* (1944) after severe muscular fatigue. Talbot *et al.* (1945) found evidence of increased urinary excretion of 11-oxysteroid-like substances in active Cushing's syndrome, in adrenal cortical virilism, after burns, and in post-operative patients. Cope *et al.* (1951) observed increased excretion of 11-oxysteroids in acute medical conditions such as diabetic ketosis, congestive cardiac failure, bronchopneumonia, coronary infarction, and status asthmaticus. Forsham *et al.* (1948) demonstrated an increase of both 17-ketosteroids and 11-oxysteroids in the urine after A.C.T.H. therapy. This finding has been confirmed by Sprague *et al.* (1950) in a large series of cases.

In the present series seven of the nine patients showed a large increase in ketosteroid excretion in the first two days after operation, followed by a fall reaching a minimum at the sixth post-operative day. Of the two patients who did not show increased ketosteroid excretion, one showed a slight fall. The other case, excreting 17-ketosteroids before operation at the upper limit of normal, had at that time a very low eosinophil count. After operation 17-ketosteroid excretion fell dramatically, associated with a marked rise in the eosinophil count.

Conclusions

Some evidence has been produced of increased 11-oxysteroid secretion and 17-ketosteroid excretion as a measure of increased adrenocortical activity after operation. This has often been shown in recent years in association with trauma, burns, acute medical conditions, and operation itself. The present study has shown that these changes are also associated with alterations in electrolyte and water balance. Changes of sodium, chloride, and water retention, associated with increased potassium excretion and with exchanges of sodium for potassium within the cells, are very similar to the effects of 11-deoxycorticosterone. Though they may be accounted for by other means, such as local accumulation of fluid and electrolyte in damaged tissues, the fact that they are associated with other evidence of adrenocortical activity suggests that they are themselves linked with such activity. Prunty (1949) has recognized a similar phase of decreased plasma sodium and chloride in acute porphyria. The study of eosinophil counts, uric acid excretion, and neutral reducing steroid excretion indicated an increased adrenal activity during the acute phase of the disease. As Selye has suggested, such a response may occur in a variety of conditions, all in themselves a reflection of injury to the organism.

The retention of sodium chloride and water in the body after operation, in amounts greater than apparent needs, has now become recognized. The diminished urinary excretion of chloride in the first weeks after operation vitiates the urinary chloride estimation as a measure of body chloride requirements. This has been accepted by Marriott (1951). Attempts to replace the apparent chloride deficiency will only lead to water and salt overload. I believe that plasma chloride estimations in the post-operative period are of greater value in estimating body chloride deficiency. Even these determinations, as has been demonstrated in this paper, will give a false low reading.

The importance of potassium in the serum and extracellular fluids has been well recognized ever since the work of Ringer (1883). In recent years great interest has been focused on the loss of potassium in various acute medical and surgical conditions. Brown *et al.* (1944) described low levels of serum potassium in chronic nephritis, associated with muscular weakness and paralysis. Holler (1946) drew attention to a similar low potassium level during the treatment of diabetic coma. It is, however, largely due to the work of Darrow and his associates that clinical potassium deficiency has become widely recognized (Govan and Darrow, 1946; Darrow, 1948; Darrow and Pratt, 1950). As shown by these and other workers, potassium can be lost to the body in gastro-intestinal disorders such as diarrhoea (in children), sprue, intestinal fistulae, prolonged vomiting, and in certain types of diet, such as the Borst diet (Kolff, 1950).

Tarail and Elkinton (1949) have demonstrated that in both normal and potassium-depleted patients the kidney has a limited minimal excretion of potassium, below which minimal level the excretion does not appear to fall. This continued potassium loss, even in the presence of cellular potassium deficiency, they believe to be an important factor in producing further depletion. If, in addition to these other sources of potassium deficiency, the incident of a surgical operation increases the urinary potassium loss, cellular potassium depletion is further increased, and the production of a state of clinical potassium deficiency is hastened. The fact that the rapid mobilization of cellular potassium after an operation is often associated with a rise in serum potassium concentration makes the recognition of cellular depletion all the more difficult. I have seen several patients with a cellular potassium deficiency in which the serum potassium, though falling from a concentration greater than normal, was still within the normal range when electrocardiographic evidence of cellular potassium deficiency was detectable.

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ANNULAR PANCREAS

BY

B. F. SWYNNERTON, D.M., M.R.C.P.

Weir Research Assistant, Wandsworth Hospital Group

AND

NORMAN C. TANNER, F.R.C.S.

Senior Surgeon, St. James' Hospital, London

The commonest developmental abnormalities of the pancreas concern the ductal systems. Accessory pancreatic tissue—isolated masses separate from the main gland—occurs not infrequently in the stomach or duodenum, but may be found in most of the abdominal viscera. Other anomalies are pancreas divisum (Hyrtl) consisting of two separately functioning glands; bifid tail of the pancreas; and annular pancreas in which a band of pancreatic tissue encircles the duodenum, usually in its second part. Cysts and fibrocystic disease may occur.

In 1933 McNaught was able to find descriptions of only 40 cases of annular pancreas in the literature, the first three referring to the condition in birds, in which it is apparently a normal finding (Ravitch and Woods, 1950). In June, 1952, the total number of cases recorded was at least 75, and it is significant to note that 20 of these have been recorded since the end of 1949, indicating a higher actual incidence than the statistics show. In the absence of obstruction, cases may easily be overlooked either at operation or at necropsy.

A further case has recently been brought to light during an operation for chronic duodenal ulcer by one of us (N. C. T.).

Case Report

A male clerk aged 30 was admitted on October 13, 1951, with a history of two and a half years' epigastric pain two hours after meals, relieved by food, rest, and alkalis. There had been periods of freedom of up to nine months. He had no vomiting, but had lost 28 lb. (12.7 kg.) in weight since the onset. After investigation elsewhere he was told that a duodenal ulcer was present. The only abnormality

detected was a gastric succussion splash. A gruel fractional test meal showed a high acid curve rising to 65 ml. N/10 free HCl at one hour.

A barium-meal examination disclosed a spastic deformed duodenal cap with folds radiating from an ulcer scar. There was no gross obstructive lesion of the second part of the duodenum. In view of his relapse despite more than one good course of medical treatment, he was operated upon on October 16. The presence of an anterior chronic duodenal ulcer was confirmed. The rest of the viscera appeared normal, except that, about 2–3 cm. below the junction of the first and second parts of the duodenum, the organ was encircled by pancreatic tissue of healthy appearance and texture, the abnormal part being a band about 1–2 cm. in diameter (see illustration). A subhiatal vagotomy and Heineke–Mikulicz pyloroplasty was then carried out. During the pyloroplasty opportunity was taken to feel the duodenum from within its lumen, and there appeared to be no appreciable constriction. The patient made an uncomplicated recovery from this operation, and an insulin test meal 17 days later showed a much lower acidity and no secretory response to the insulin.

Nine months after operation the patient was symptom-free, and a further barium-meal examination showed no delay in emptying of the stomach and no evidence of constriction of the duodenum.

Discussion

Aetiology.—The condition affected males in 50 out of the 64 cases in which the sex was recorded. Various theories have been advanced concerning the embryological origin of the ring—for example, persistence of the left half of the ventral anlage of the pancreas which ordinarily atrophies, fixation of the ventral bud of the pancreas to the duodenum before rotation of the gut, or a smooth spread round the duodenum as is said to occur in birds. Other congenital abnormalities have been found associated with the annular pancreas in some 20 cases, the most frequent being malrotation of the abdominal viscera.

Symptomatology.—Patients with annular pancreas may present at any age with symptoms due to the condition, or the condition may be symptomless. The youngest recorded case was in a 16-mm. embryo (Weissberg, 1935), while two cases were operated upon at the age of 74 (Smetana, 1928; Custer and Waugh, 1944). Thirty-seven cases had symptoms due to the annulus. Most of the nine presenting in the first decade appeared shortly after birth, with symptoms of high intestinal obstruction or with jaundice probably due to compression of the common bile duct. If symptoms have not developed by this time it would seem reasonable to suppose that the patient has a good chance of remaining symptom-free throughout life. A study of the literature suggests that this is not the case. Adults usually present with high intestinal obstruction, with symptoms suggesting peptic ulceration, or, less commonly, with acute haemorrhagic pancreatitis. In the first there may be rapidly progressive or recurring episodes of obstruction. This sometimes results from pancreatitis of the annulus, but this is not a constant finding in those specimens which have been sectioned. Those patients with a history suggesting peptic

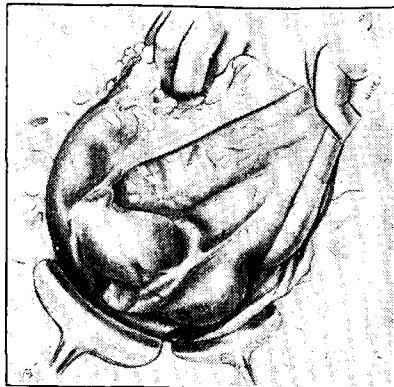


Diagram showing band of pancreatic tissue encircling the duodenum.

ulceration may indeed have peptic ulcers as in the present case. Eight additional cases associated with peptic ulcers have been recorded (gastric 3, duodenal 5). Four further patients had a history of haematemesis or melaena. Acute haemorrhagic pancreatitis is a rare presentation, but has been recorded.

Differential Diagnosis.—The diagnosis has been suggested pre-operatively in eight cases. It will be considered only when there is a sufficient degree of deformity or obstruction to be shown by a barium-meal examination. Other possibilities to consider include congenital bands associated with malrotation, tumours of the pancreas or sphincter of Oddi, ulcer and rarely primary or secondary cancer of the second part of the duodenum, and pressure by enlarged glands from without.

Treatment.—If surgical treatment is indicated the choice of procedure lies between section of the ring and some form of by-pass operation. The former carries some risk of fistula formation, and so the site of division should be protected by a drain to the exterior. This may be combined with longitudinal division and transverse suturing of the duodenum, the suturing being made in such a way as to drain the cut ends of the pancreatic annulus into the lumen. This duodenoplasty overcomes any intrinsic duodenal narrowing and the possibility of recurrent obstruction. Partial gastrectomy is a somewhat severe method of dealing with an annular pancreas unassociated with other gastroduodenal disease. Gastro-jejunostomy introduces an undoubted risk of stomal ulceration, and, if feasible, duodeno-jejunostomy would be preferable.

Summary

A case of annular pancreas is reported. The finding was an incidental one at operation for chronic duodenal ulcer. No obstruction of the duodenum was produced, and the presence of the condition did not affect the operative treatment of the ulcer.

We are indebted to Drs. R. Quilliam and A. Jenkins for the radiological reports and to Mrs. Mace for the picture.

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SLIDING HERNIAS THROUGH THE OESOPHAGEAL HIATUS

BY

G. RIOS-SOLANS, M.D.*

(From the Gardiner Institute of Medicine, University of Glasgow)

[WITH SPECIAL PLATE]

The anatomical abnormality of hernia through the diaphragm was first referred to in 1570 by Ambroise Paré, who noticed the condition at a post-mortem examination and attributed it to trauma. Fothergill (1746) described a congenital variety. The first diagnosis during life was made by Newman (1888), who also performed the first operation for its cure. Akerlund (1933) made a careful study of all types of diaphragmatic hernia, and his classification has formed the basis for much subsequent work. In recent years the frequency of diaphragmatic or hiatus hernia has been fully recognized, and there are many publications available on the subject.

*Working as a scholar from Spain under the British Council.

The present paper deals with only one variety of hiatus hernia, the so-called "sliding hernia," which is the commonest of all, and which has been excellently described by Allison (1951). A sliding hiatal hernia is chiefly encountered in adults who are past middle age, and must therefore be regarded as quite distinct from a congenital defect. In considering its aetiology, two matters appear to be of prime importance: (1) the exact anatomical status of the so-called "cardia," or junction between oesophagus and stomach; and (2) the part played, structural and physiological, by the terminal part of the oesophagus as it passes through the diaphragm.

The So-called "Cardia"

In a study of the cardia, clarity in certain anatomical points is essential: (a) the nature of the boundary between the oesophageal and gastric mucous membranes; (b) the normal relationship of the boundary of the two mucous membranes to the exit through the diaphragm; (c) the question of a real anatomical sphincter at or close to the boundary; and (d) the site of the change in shape from tubular (oesophagus) to saccular form (stomach). These points can be made out only by careful microscopic examination of the whole zone in specimens removed in the post-mortem room and fixed by most careful technique to preserve and identify exact relationships. Macroscopic methods such as changes in colour, difference of shape, and even x-ray films taken during life are not exact enough, and may indeed be very misleading. Oesophageal structure is clearly identified microscopically by its stratified squamous epithelium, and stomach structure by its characteristic mucous membrane. Microscopical investigation clearly shows that the junction of the two mucous membranes is not a ring, but follows an irregular curve. Moreover, although the junction of the two mucous membranes is clean-cut, it is not unusual to find areas of gastric mucosal glands lying below the stratified oesophageal lining membrane. The opposite, however, does not occur.

In the photomicrograph (see Plate) this transition is clearly seen, and the two muscular layers are also well demonstrated. The point should also be noted, as has been found microscopically, that the diaphragmatic muscle does not clasp the oesophagus at a fixed level or point—there is an agglomeration of muscle fibres and loose fibrous tissue which allows the oesophagus to slide up and down for a short distance, this being essential for the normal respiratory movement of the diaphragm. In what may here be termed normal cases, accurate marking showed that the level of the diaphragmatic insertion and the junction of the two mucosae never coincided. Oesophageal stratified epithelium was always found at this level, indicating that the normal junction is below the diaphragm and just above the point where the saccular expansion of the stomach begins. This explains the curious observation that carcinoma of the fornix of the stomach extends to the cardia. That is to say, it invades the lowest tubular portion, with resultant incompetence or stenosis. No observation has been made of a carcinoma of the oesophagus (properly called) subsequently invading the fornix. It would seem, therefore, that a tumour always infiltrates the same structure and the change of lining membrane constitutes a barrier. A gastric carcinoma which invades the lowest tubular part invades its own structure, not the oesophagus.

Terminal Part of the Oesophagus

No evidence was found microscopically of any true muscular sphincter at the lower end of the oesophagus. As has been stated, the joining line between the two mucosae is an irregular curve and never a ring, and a ring form would almost be required for a true muscular sphincter. Thus, as Barrett (1952) has pointed out, the cardia and sphincter mechanism are not synonymous.

Lendrum (1937), in a careful anatomical study of the cardia in 150 cases, also concluded that no ring-shaped muscular reinforcement was present. No muscular thickening was found in the present investigation. Although there is thus no obvious and clearly defined muscular sphincter, this does not exclude some potential sphincter mechanism of a kind less positive than, for instance, the pylorus of the stomach. I believe that a segment of the oesophagus, extending for about 1 in. (2.5 cm.) above the stomach, may act as a sphincter. This view is supported by our knowledge of cardiospasm (first described by Purton in 1821), in which there is no ring of closure but a narrowing over about 1 in. (2.5 cm.) of the tube. This, indeed, is the basis of Heller's operation, with an incision in the oesophagus about 1 in. (2.5 cm.) in length.

There are many other views concerning a potential sphincter mechanism between oesophagus and stomach, and the action is often nowadays referred to as resembling a "pinch-cock"—generally adequate, but easily overcome to permit regurgitation. Lendrum (1937) has even suggested that muscular fasciculae in the stomach wall may on contraction contribute to a sphincter action, but this view has not received support. As Alvarez (1939) points out, the diaphragm will act as a sphincter when the intra-abdominal pressure is very high. Its action cannot be important, however, since patients with patency of the hiatus or hiatus hernia do not have continuous regurgitation.

The sphincter action, such as it is, is clearly under nervous control by Auerbach's plexus and by the sympathetic and parasympathetic systems.

Patency of the Oesophageal Hiatus

The question of patency of the hiatus was investigated in the post-mortem room of the Western Infirmary in 50 consecutive necropsies, in adults between the ages of 31 and 78 years. A finger—sometimes two fingers—was inserted into the hiatal region from the abdomen, and cases in which one or two fingers could be inserted for a distance of 2-3 cm. are described as *positive*, and the others as *negative* (see Table). Cases in which an operation had been performed in

Summary of 50 Consecutive Necropsies

Case No.	Age	Sex		Case No.	Age	Sex	
1	40	F	+	26	61	M	+
2	63	F	—	27	61	F	—
3	45	M	—	28	64	F	—
4	51	M	—	29	52	F	—
5	78	M	+	30	52	M	—
6	60	M	—	31	72	M	+
7	52	M	—	32	72	F	—
8	65	F	—	33	47	F	+
9	65	F	—	34	62	M	—
10	66	F	+	35	45	F	—
11	57	M	—	36	35	F	—
12	77	M	—	37	61	F	+
13	59	M	—	38	55	F	—
14	55	M	—	39	54	M	—
15	55	F	—	40	31	M	—
16	37	F	—	41	78	M	—
17	69	M	—	42	75	M	+
18	62	M	+	43	64	M	—
19	75	M	+	44	55	M	—
20	60	M	—	45	59	M	—
21	68	F	—	46	49	F	—
22	60	M	+	47	53	M	+
23	54	F	—	48	73	M	—
24	73	M	—	49	35	F	—
25	73	F	—	50	64	M	+

the area of the stomach or adjacent parts were excluded. The Table shows that in 13 of the 50 cases examined (26%) the hiatus was to some extent open so that herniation above the diaphragm would easily be possible. It is not thought that the laxity of tissues in the cadaver would account for this, in view of the numerous negative results. It must be remembered that three important structures pass through the diaphragm close to one another—the aorta, the inferior vena cava, and the oesophagus. The first two openings are always firmly closed, so that herniation is virtually impossible; it is only the oesophageal opening which is not.

The oesophageal passage is elliptical in shape, to allow for considerable distension of the oesophageal tube as food passes through it, and the extra space is filled up by loose fibrous tissues. Here is obviously a weak spot in the separation of the abdominal and thoracic cavities.

In the series of cases referred to, patency was found only in the anterior and left lateral part of the hiatus, and never in the posterior and right lateral part, although loose fibrous tissue surrounds the oesophagus on every side. The reason is clearly because (Gray, 1926) only the anterior and left side is covered by peritoneum on the abdominal side, and it is only in such a place that a sliding herniation can arise.

X-ray Findings Compared with Post-mortem Findings

Johnstone (1952) and Pickard (1952) have both reported a surprising number of hiatus hernias during routine x-ray examination of the gastro-intestinal tract, but only when the patient is placed in the "head-down and feet-up position," as first recommended by Soresi in 1919. Pickard's percentage in such x-ray examinations was 11%, in contrast with 26% in my series of post-mortem observations. There must be some reason for this discrepancy, and it is suggested that it is only when patency is well marked that the hernia appears during x-ray examination.

Summary

An investigation has been made of various points concerning the aetiology of the "sliding" type of hiatus hernia.

It was evident that before reaching any conclusion a careful study of the so-called "cardia" was essential—that is to say, of the junction between oesophagus and stomach and of the passage of the oesophagus through the diaphragm.

The results of macroscopic and microscopical examinations of this area are given in detail.

There is no clearly defined anatomical sphincter at the lower end of the oesophagus, and the squamous lining ends in an irregular curve and not in a ring. This, however, does not exclude a broad but weak contractile mechanism in the lower part of the oesophagus.

In an unselected series of adults carefully examined in the post-mortem room, patency of the hiatus was detected in 26%. This finding has been interpreted as evidence of potential hiatus hernia. The patency was always found at the anterior and left lateral part of the passage of the oesophagus through the diaphragm.

This investigation was carried out during the tenure of a British Council Scholarship. I am indebted to Professor Sir John McNee for help and guidance, and also to Professor D. F. Cappell and his staff for many facilities in the department of pathology at the Western Infirmary, Glasgow.

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A recent survey by the National Agricultural Advisory Service has shown that washed eggs are specially likely to go bad after storage. This is an important factor, since the survey also revealed that an average of one egg in three is soiled in the nest. Research into this problem is being carried out by the Food Investigation Organization.

OSTEOID OSTEOMA

BY

E. H. STRACH, M.Ch.Orth., F.R.C.S.

Senior Orthopaedic Registrar, Alder Hey Children's Hospital, Liverpool

[WITH SPECIAL PLATE]

Osteoid osteoma is a benign tumour of bone. Since its first description (Jaffe, 1935) many cases have been reported in the American literature, but there are singularly few publications on this subject in the British literature, and only one case report (Vaughan-Jackson, 1950). This would suggest that osteoid osteoma is a rarity in the British Isles, whereas it is more likely that the condition often passes unrecognized. This would seem to be of no great consequence, because the lesion is benign and if untreated probably heals spontaneously after many years (Sherman, 1947b; Moberg, 1951). On the other hand, amongst the abundant case reports from the United States and Canada are some of patients who underwent unnecessarily radical treatment such as amputation and resection because of a mistaken diagnosis of malignancy or tuberculosis. The recognition of osteoid osteoma is therefore of importance. The following case is reported as a typical example of the condition.

Case Report

A girl aged 12 was referred to the orthopaedic department of Alder Hey Children's Hospital in September, 1950, suffering from pain in the tip of her right second toe of two years' standing. She did not recall having injured the toe. The pain was slight and intermittent at first, but during the past few months it had been more severe, especially at night.

On examination there was a bulbous, tender soft-tissue swelling of the terminal phalanx. The toe-nail was slightly deformed. A radiograph showed a small, rounded, well-defined, translucent area in the tip of the terminal phalanx containing what appeared to be a minute sequestrum. An inflammatory lesion was suspected, and amputation of the terminal phalanx was carried out in November, 1950. The wound healed by first intention and all symptoms subsided. When the patient was seen in March, 1952, the stump was found to be satisfactory and there were no complaints.

Pathological Report.—Gross Appearance: The terminal phalanx of a toe disarticulated at the joint. On longitudinal section, at the tip of the phalanx, there is a well-circumscribed yellowish-grey finely trabeculated lesion 3 mm. in diameter. At the distal end the normal cortex cannot be distinguished from the lesion. It is moderately firm in consistency and does not exude pus on compression (see illustration, Special Plate). **Microscopical Examination:** "The proximal portion of the phalanx shows a perfectly normal picture. As one progresses distally, the cortex beneath the nail shows well-marked narrowing and osteoclastic absorption. In some small areas it has been destroyed and replaced by the expanding central lesion. The distal end and a little of the undersurface of the phalanx show a similar picture. The lesion itself consists of irregularly arranged trabeculae of osteoid in which there is early calcification. The intervening spaces are filled with a vascular matrix, consisting of large numbers of cells with fibrillary processes, which at the edges of the spaces are arranged as rows of active osteoblasts. In some areas previously formed and calcified trabeculae are being destroyed by osteoclasts. Occasionally there lies between the lesion and the surrounding bone a fairly narrow zone of the vascular matrix mentioned above, devoid of

trabeculae of osteoid or bone. The lesion is a typical osteoid osteoma. There is no histological evidence of infection, and cultures from the lesion were sterile."

Discussion

In retrospect the case appears to be typical of the condition, and the diagnosis should have been suspected on clinical and radiological grounds. An almost identical case has been reported (Pritchard and McKay, 1948) as occurring in the terminal phalanx of the second toe of a boy of 13 in whom the diagnosis of tuberculosis was made and the phalanx was amputated.

Osteoid osteoma occurs in adolescents and young adults and is rare after the age of 30. It is twice as common in males as in females. It is a single lesion, more common in the bones of the lower limbs than elsewhere.

Characteristic clinical features are the well-localized and persistent pain, often worse at night, and the local tenderness. Swelling is a less constant sign, and is confined to the soft tissues if the lesion is in the spongiosa of a small bone. Should the tumour be situated in or near the cortex of a long bone a bony thickening due to reactive periosteal new-bone formation may be present. Other signs of inflammation, local or general, are consistently absent. If the lesion is situated in the vicinity of a joint it may cause a non-specific synovitis (Sherman, 1947a).

Radiologically, there is a well-defined rounded translucent area, seldom larger than 2 cm. in diameter. In the early stages the contained tumour nodule is radio-translucent, but later the osteoid material becomes calcified and looks like a sequestrum in the x-ray film. Often there is a narrow ring of increased density surrounding the lesion.

The tumour may be situated either within the cancellous bone or in the cortex of a long bone (subperiosteal or subcortical). In the latter situation it gives rise to a marked periosteal reaction, and dense subperiosteal bone is deposited which may obscure the translucent lesion. In this particular situation it is difficult to differentiate it from a chronic infective lesion—the chronic subperiosteal abscess (Brailsford, 1942). Only histological and bacteriological examination will decide whether it is an osteoid osteoma or an inflammatory process.

Treatment by local excision or curettage has been found satisfactory by all authors and no recurrence has been reported.

Summary

A case of osteoid osteoma is reported. The clinical, radiological, and pathological features are described.

I wish to thank Mr. F. C. Dwyer for permitting me to publish this case, and am indebted to Dr. E. G. Hall for his detailed pathological report.

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The London County Council has a scheme whereby medical officers employed by the council at maternity and child welfare centres are exchanged with paediatric registrars at the following hospitals: St. George's Hospital, the Hospital for Sick Children, Westminster Children's Hospital, King's College Hospital, Guy's Hospital, Paddington Green Children's Hospital, and the Queen Elizabeth Hospital for Children. In addition there is an exchange system with St. James's Hospital, Balham, and a paediatrician from St. Thomas's Hospital goes to North Lambeth Babies' Care Welfare Centre to take weekly child welfare sessions.

Medical Memoranda

Haemolytic Disease in a First-born Infant

Haemolytic disease is rare in first-born infants; the stimulus of a second rhesus-positive foetus is apparently nearly always required before the maternal antibody is produced in sufficient potency to affect the infant. When haemolytic disease has been observed in a first-born it has usually been explained by previous sensitization to the Rh antigen by a transfusion or injection of Rh-positive blood or a pregnancy which ended in an early abortion. The following case is of interest because it seems likely that there was no sensitization before the onset of the first pregnancy, which ended with the birth of an infant suffering from haemolytic disease.

CASE REPORT

A woman aged 27, who had been married for three years, was delivered of an apparently normal female infant weighing 7 lb. (3.2 kg.). A few hours after birth slight jaundice was noticed, and the next day the skin was a deep golden yellow.

On admission to hospital some 36 hours after birth, the infant was still deeply jaundiced, with slight enlargement of the spleen; otherwise it appeared perfectly normal. The laboratory findings were typical of haemolytic disease. The mother was Group A rhesus-negative and her serum contained strong saline and albumin rhesus antibodies. The infant was Group O rhesus-positive. The direct Coombs test was strongly positive. The serum bilirubin was 20 mg. per 100 ml.

The infant's haemoglobin fell steadily from 80% (11.8 g.) on admission to 58% (8.6 g.) on the ninth day, when, after a transfusion of 180 ml. of blood, it rose to 102%. There was a further slow fall in haemoglobin, but no further transfusion was needed.

The mother was an intelligent woman, a laboratory worker, who understood the significance of her evidence. She had previously been a blood donor, but neither she nor her parents could recall any occasion when she had been injected with blood or serum; she had, in fact, always been in good health. Furthermore, she had never had any abortions; whilst her menstrual cycle had always been irregular (4-7/24-35), the longest period of amenorrhoea prior to becoming pregnant was 39 days, ending with a menstrual loss no heavier than usual.

COMMENT

Mollison (1948) states that antibody formation may begin as early as the twelfth week of pregnancy, but it is not usually until the second or later pregnancy that haemolytic disease appears.

It is well established that the injection of rhesus-positive blood into a rhesus-negative subject acts as a most powerful stimulus to the production of antibodies, so that a woman's first-born child may suffer from haemolytic disease.

It is, however, not so well proved that, in the absence of previous sensitization, the first-born may be affected: when Levine and Waller (1946) reported 28 cases of haemolytic disease affecting the first-born, they found that 19 of the mothers gave histories of a previous transfusion or injection of blood; of the other nine cases the authors concluded that the possibility of previous sensitization could not be excluded, as it used to be a widespread practice—that is, in the U.S.A.—to inject a few millilitres of blood at birth to prevent haemolytic disease. Cappell (1946) mentioned four families in which the first-born were affected; and Spalding (1947) recorded a first pregnancy resulting in a hydrops foetalis: the mother had rhesus antibodies and there was no history of previous sensitization.

Few other cases have been published, although the incidence may well be greater than this fact suggests.

My thanks are due to Dr. J. J. Tillie for permission to publish this case and for advice, and to Dr. P. N. Coleman for laboratory reports.

C. F. ANDERSON, M.B., B.S.,
Late House-physician, Children's Department,
Middlesbrough General Hospital.

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Subcostal Pain Following Controlled Respiration

An unsolicited complaint of subcostal aching during the first post-operative day after controlled respiration, especially with succinylcholine relaxation, seems to be a common complication.

The cases seen so far have been confined to females aged 20 to 65 years, both athletic and sedentary. Thus in a series of 40 consecutive dental operations (12 males, 28 females) there was no complaint from the male group, but subcostal pain was noted in six (21.4%) of the females (see Table).

Agent	Male		Female	
	No. of Cases	Subcostal Pain	No. of Cases	Subcostal Pain
Succinylcholine ..	7	0	12	4
Gallamine triethiodide ..	1	0	4	1
No relaxant (thiopentone, pethidine) ..	4	0	12	1
Total cases (40) ..	12	0	28	6

The site of operation in these cases—for example, dental procedures, excision of glands of the neck, etc.—is remote from the abdomen: the pain following operative trauma in the latter presumably overshadows, or is associated with, post-operative subcostal ache. Most of the patients have required passive inflation for short periods only (5 to 10 minutes) after intubation.

This subcostal pain first appears soon after consciousness is regained, and persists for 24 to 48 hours. It varies in severity and distribution from that of a minor anterior subcostal discomfort to a severe ache encircling the costal margin and extending to the back. Forced respiration and movements involving the abdominal musculature, such as sitting up or turning, cause acute discomfort. The disturbing feature is that the patient, at the time, usually complains more of the discomfort subcostally than of the pain at the site of operation. (A young lady who awakens expecting an aching jaw, only to find something worse at her midriff, rightly asks for an explanation.)

This complication has only occasionally been seen when relaxation has been produced with other agents, and seems to be more commonly associated with the greater degree of relaxation obtained by succinylcholine. Thus, with this agent, passive inflation can presumably cause a greater degree of stretch of the respiratory musculature with minimal resistance. I do not think that the transient excitation preceding paralysis with succinylcholine is concerned in the mechanism.

That the complaint has been confined to females is probably accounted for by their inherent thoracic type of respiration, passive inflation with full relaxation causing an unaccustomed stretching of the muscle fibres of the diaphragm. As one intelligent patient put it, "My diaphragm feels as though it has just played its first game of squash for the season."

An awareness of this complication might indicate the need for less vigorous inflation during the period of complete relaxation, which should result in a decrease in the incidence of post-operative subcostal pain.

Acknowledgments are due to my colleagues at the Westminster Hospital for allowing access to their records and to Dr. G. Organe and Dr. C. F. Scurr for their helpful criticism.

TREVOR T. CURRIE, M.B., B.S.,
Anaesthetic Registrar, Westminster Hospital.

Reviews

ATLAS OF INFECTIOUS DISEASES

World Atlas of Epidemic Diseases. Part I. Edited by Professor Ernst Rodenwaldt. (Pp. 126; 52 maps. No price given.) Sponsored by the Bureau of Medicine and Surgery, Navy Department, Washington, 25, D.C. Hamburg: Falk-Verlag. 1952.

Epidemiologists are continually faced with the problem how to present data about incidence of infective diseases geographically whilst at the same time taking account of the degree of completeness of records, seasonal variation, and year-to-year variation or long-term trend. When reporting on events in a single country in a single year the problem is comparatively simple, but to present in a nutshell a world-wide picture of endemicity in relation to climate, geography, migration of population, and advance of civilizing influences, of the spread of epidemics in space and of seasonal swing in relation to latitude, is far from simple. No more ambitious attempt to accomplish this has been made than in the publication of the *World Atlas of Epidemic Diseases*.

The atlas, designed to appear in two parts, is edited by Dr. Ernst Rodenwaldt with numerous collaborators in Germany, under the sponsorship of the Bureau of Medicine and Surgery of the U.S. Navy Department. Part I, now available, consists of 40 large folding maps dealing with 17 infectious diseases and the distribution of rainfall, temperature, and population in Europe, a series of 12 basic maps of different regions of the world, and 118 pages of textual comment in German and English. The whole is bound together in a massive cover permitting removal of the maps.

The maps are beautifully reproduced and coloured according to altitude, the epidemiological data being superimposed on them by various diagrammatic devices. Seasonal swing, for example, is depicted by a circle containing a red sector which indicates by its position the month when incidence is greatest and by the length of its radius the relative frequency during that month compared with the average frequency during that month. Comparative incidence in a specified period of years is depicted by cross-hatching. Most of the maps in this part are limited to Europe and the Near East, but world maps are included for typhoid, paratyphoid, cholera in 1863-8, and leptospirosis. The climatological maps of Europe and the Near East are a most useful feature, including as they do average rainfall, January temperature, July temperature, annual temperature, and range.

It is not possible in a short review to comment on the textual matter. The defects of the basic data available from many of the countries are well known to epidemiologists and are admitted by the editors. The cost of production must have been very considerable, and it is to be hoped that the atlas, which measures 19 by 15 in. and weighs over 12 lb., will not spend its life on library shelves, for its usefulness in teaching is enhanced by the facility with which individual maps can be taken out for demonstration purposes.

PERCY STOCKS.

RADIOGRAPHY OF SKULL AND BRAIN

The Skull and Brain Roentgenologically Considered. By C. Wadsworth Schwartz, Ph.B., M.D., F.A.C.R., and Lois Cowan Collins, B.S., M.D. (Pp. 386; 335 figures. £3 17s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1952.

That plain radiographs are essential in the diagnosis of tumours and many other lesions of the skull and brain has been recognized for nearly half a century now. What seems to be much less obvious is that plain radiographs are usually only the first step in the radiological investigation. More than one textbook on the radiology of the head has been

published in recent years in the English language confining its attention almost entirely to plain radiographs. The present work is no exception. The title would appear to imply that the reader will find the answers to the diagnosis both of skull and brain tumours and of tumour-like masses. In this he will be disappointed, particularly so far as the brain is concerned.

Although a magnificent museum collection of lesions demonstrable by plain radiography is displayed in over three hundred radiographs, the point is not made clear that in only a small minority of cases can x rays, without the aid of contrast substances, reveal the site and pathology of an intracranial mass sufficiently accurately for a surgeon to approach the lesion with confidence.

The authors first describe the normal appearances and variants seen in the skull. Chapters on congenital anomalies and fractures follow. The remaining two-thirds of the book is given to neoplasms and miscellaneous diseases. The student or uncritical reader will derive a quite false impression of the relative commonness of lesions seen in neuro-radiology. For example, nearly twice as much space is given to tumours of the skull itself, relatively rare lesions, as to gliomas—quite the commonest brain tumours. Air studies and angiography would appear to play a small part in the diagnosis of the latter, in spite of the well-known fact (mentioned by the authors) that only about 13% of gliomas calcify. The chapter on acoustic tumours is very poor. The diagnostic value of plain radiographs in cases of acoustic tumour is not made clear, but reference to Chart II, some ninety pages earlier in the book, gives 15% as the figure for widening of the internal auditory meatus visible on plain radiographs. Over 70% is the usually accepted figure.

Clinicians and morbid anatomists will also have faults to find. For example, on page 204 the authors state: "Tumours of the acoustic nerve, as a rule, develop in patients during their third decade. . . ." Of colloid cysts they say: "It is extremely rare for one of these cysts to contain sufficient calcium to be seen in the roentgenogram"; then again, "The larger cysts may block the aqueduct or posterior part of the third ventricle." The reviewer is unaware of any calcified colloid cysts in the literature. Moreover, it is generally accepted that these cysts are derived from the para-physis, a structure which lies some 4 cm. away from the aqueduct.

The many radiographic reproductions are of excellent quality. However, if a second printing is made it is hoped that Fig. 194, which reproduces the optic foramina upside down, will be correctly orientated. The interpretation of radiographs of the optic foramina is not always easy even when viewed the right way up.

J. W. D. BULL.

CAUSALITY IN THE MIND

Reason and Unreason in Psychological Medicine. By E. B. Strauss, M.A., D.M., F.R.C.P. Foreword by Sir Russell Brain, P.R.C.P. (Pp. 55. 8s. 6d.) London: H. K. Lewis. 1953.

The principle of causality—that is, the operation or relation of cause and effect—is often assumed to be valid when in fact it lacks adequate philosophic support. Psychological medicine, following in the wake of general medicine, has fallen into unreason, according to Strauss, because of its whole-hearted acceptance of causality. This has led to a pseudo-scientific attitude of mind towards aetiology and treatment. "Diseases" are regarded as entities with causes which, if known, can be removed by treatment. The urge to find a simple efficient cause of disorders, to the exclusion of other relevant agents, has produced ineffective forms of treatment.

The title of this book is that selected by Dr. Strauss for the Croonian Lectures for 1952. These and a third lecture, "Quo Vadimus?" form the book. The theme is a scrutiny of the principle of causality as it bears on the theory and practice of medicine, and in particular psychological medicine. The main force of the argument, or rather indictment,

falls on psycho-analysis. Psycho-analysis as a body of knowledge and as a therapeutic system rests on the assumption that there is an efficient cause for all neuroses and faulty adaptations to life—namely, failure to solve the Oedipus complex. The conclusions of psycho-analysis are grouped round this complex, the most significant finding of Freud and his disciples. Causality, Strauss contends, is not so plain as this. Aetiology is multiple, a network rather than a simple cause-effect relationship. His thesis, supported by cogent reasoning, is an important contribution and should be of special interest to psycho-analysts, who “inhabit a little world of their own that is apt to be quite out of touch with systems of thought which are foreign to them.”

The principle of multiple aetiology, so strongly advocated, has much to commend it. But it is not the final answer. Strauss makes no reference to the principle of synchronicity which has figured in recent work in analytical psychology. This omission might well be remedied should an enlarged version of this volume be called for.

E. A. BENNET.

STERILITY

Sterility: Its Cause and Its Treatment. Part I: The Infertile Female. Part II: The Infertile Male. By J. Jay Rommer, A.B., Ph.G., M.D., A.I.C.S. (Pp. 424; 152 figures. £4 10s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1952.

The author claims that this book crystallizes all existing thinking and knowledge on the cause and treatment of sterility, and it certainly covers a wide field. But the claims cannot be upheld, for the bibliography is far from up to date, and, perhaps more important still, many old and now outmoded ideas are put forward quite uncritically. There are also some muddled and even erroneous descriptions, such as those of the gonadotrophins and the alleged inflow of seminal fluid through the cervical canal.

Long lists of causes of sterility “culled from the literature, both American and foreign,” even with percentage incidences (of uncertain derivation) have a strictly limited value. The chapter on anatomy and embryology scarcely warrants a place and is most oddly sandwiched between “Physiology of Coitus” and “Psychic Trauma and Fertility.” It is not clear why two photomicrographs of testis showing normal spermatogenesis should be included, and still less why crystals of testosterone should deserve an illustration occupying two-thirds of a page. The aspiration of the epididymis and testis is advocated as a method of examining for spermatozoa. It is admitted that this may be quite fallacious, and may cause severe pain, so why not condemn it outright? Instead two large illustrations of the technique are shown. The most impressive aspect of the book is its general format, the standard of which is very high; but so is the price at 90s.

G. I. M. SWYER.

HAMEY THE YOUNGER

The Stranger's Son. By John J. Keevil. (Pp. 230. £1 1s.) London: Geoffrey Bles. 1953.

“Let us now praise famous men . . . but some there are that have no memorial.” Baldwin Hamley the younger (1600–76) does not belong to either class. He is not famous save among those few interested in the history of the Royal College of Physicians of London, where alone he has some small memorial. But the telling of even the meanest life—and Hamley's was very far from mean—if rightly told, may be an entrancing human document. For such telling Dr. Keevil has all the essentials. He is an industrious historian, well trained though self-trained; he chooses subjects for whom he has special understanding; and he has that narrative skill that conceals the teller in the tale. Some literary Mephisto has beguiled him into putting some of his best points into notes, but, when free of his demon, Dr. Keevil is a writer of high distinction.

The book is a sequel to Dr. Keevil's *Hamley the Stranger* which we reviewed in the *Journal* of April 11 (p. 821). The younger Hamley was most happily born and taught, for his armour was his honest thought and simple truth his utmost skill. He inherited a sound but highly conservative medical tradition and practice in London, where he was born. He drew on the advantages of education at Leyden and Oxford and the moral support of the Royal College of Physicians, to which he was devoted and of which he was a great benefactor. He was happily married to a charming and able woman. His professional integrity was spotless, and by his practice he amassed a fortune, which he disposed of most generously during his lifetime. He was ever a patron of poor scholars, and he died respected and loved. His life course crosses that of many great men of the time, including Harvey. He was to the end a cultivator, along the most rigid lines, of the classical languages, just when the Royal Society had decided to abandon them for scientific and medical discourse. Although he was a capable, industrious, and well-trained anatomist, his conservatism caused him to miss entirely the whole movement—then called “the new philosophy” but which we call “science”—active at his very doors. None of these things suggest a very eventful life, but the events of life are within and not without.

With his sympathy, his power of insight, and his skilful use of background, Dr. Keevil has produced a most readable volume which pictures practice in London 300 years ago with a vividness to which there are very few parallels.

CHARLES SINGER.

CASCADE STOMACH

L'Estomac en Cascade. By Dr. Jean Roussel. (Pp. 132; 60 figures. No price.) Paris: Masson et Cie. 1952.

This monograph is based on the clinical and radiological study of eight examples of cascade stomach in men. Each example is illustrated by retouched radiographs accompanied by explanatory diagrams. The author considers the possible cause of the condition in great detail and is satisfied that contraction of the various gastro-epiploic folds due to “perigastritis” is the essential lesion. This contraction, he believes, may result from organization in folds initially shortened by spasm due to splanchnic irritation. In one case he attributes the cascade appearance to reflex irritation from a mildly inflamed appendix. Yet as common causes of perigastritis he lists alcoholism, arteriosclerosis, chronic peritonitis, and syphilitic and tuberculous peritonitis, in none of which does spasm, such as he envisages, appear likely to occur. He rejects the opinion that gaseous distension of the colon is in any way connected with it.

Roussel associates with the radiological appearances two major clinical symptoms—epigastric fullness and loss of weight. He finds that the fullness is often accompanied by eructations, palpitation, regurgitation, and even vomiting. The loss of weight, which may be rapid and considerable, he attributes to protective anorexia, the patient refusing to eat because he feels more comfortable with an empty stomach.

The treatment advocated ranges from medical restrictions of diet through splanchnic blocks, operative adhesion section to gastro-gastrostomy with anastomosis between the upper and lower pouches of the cascade stomach. A section is also devoted to rather abstract consideration of the mechanism of production of the radiological appearances in terms of forces and tone.

The author's conclusions are too often based on abstract theories and on inductive reasoning to deserve the consideration that might otherwise have been their due. Cascade stomach may at times be accompanied by symptoms, and this deserves recognition and further study. The best service the author has done is to stimulate interest in the condition.

F. PYGOTT.

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PREMENSTRUAL TENSION

Women are slow to complain about what they regard as woman's lot. The cramps of dysmenorrhoea, the sorrows of dyspareunia, the pangs of childbirth, and the discomforts of the climacteric may all be suffered, if not in silence, at least without complaint to the doctor. To these more notable disabilities must be added the premenstrual tension state, a syndrome thus named by Frank in 1931¹ of physical and mental symptoms occurring in the ten days or so immediately before the menstrual period and usually abating dramatically with the onset of the flow. This syndrome was the subject of an annotation in these columns two years ago,² but has otherwise received little attention in Britain. The two papers in this issue of the *Journal* describing this common condition and its treatment are therefore to be welcomed. Dr. Raymond Greene and Dr. Katharina Dalton offer the viewpoints of physician and general practitioner, while Dr. Linford Rees writes as a clinical psychiatrist, but there is close accord between their respective ideas on aetiology, symptomatology, and treatment.

In the premenstrual tension state there may be a preponderance of psychic symptoms such as mental tension, irritability, depression, insomnia, and emotional outbursts, but somatic symptoms, including headache, dizziness, nausea, lower abdominal fullness, oedema, mastalgia, thirst, and easy fatigue, are nearly always present. The time of onset of these symptoms is usually but not always immediately premenstrual, but their recurrence is characteristically cyclical. Menstruation itself is nearly always normal in frequency and duration. The degree of disability varies from patient to patient, but it has been estimated that the symptoms occur in some degree in at least one-third of otherwise healthy women.

The aetiology of the syndrome is still not completely understood, but several contributory factors are apparent. That water retention is an important feature is indicated by the frequency with which gain in weight, oedema, and oliguria mark the onset, and

diuresis and loss in weight accompany the decline of each attack. But water retention is not the sole factor or the basic fault, for measures taken to discourage or counter it while relieving the physical rarely affect the mental symptoms. Further, the water retention is associated with changes in sodium metabolism and is accompanied by manifestations of autonomic imbalance, and all of these are influenced by hormonal factors. It is natural therefore to look for some endocrine upset to account for the development of this syndrome and for some method of remedying the hormonal imbalance to relieve it. Drs. Greene and Dalton and Dr. Rees suggest as pathogenetic an abnormally high oestrogen-progesterone ratio, a hypothesis that differs little from Frank's attribution of the symptoms to hyper-oestrinism in 1931. That there is an undue preponderance of oestrogen in this condition is supported not only by laboratory data but also by clinical evidence presented in these two papers. For example, primary spasmodic dysmenorrhoea occurs only in ovular cycles in which the oestrogen-progesterone ratio is likely to be normal. Greene and Dalton found dysmenorrhoea in only 2 of their 84 patients and then only in slight degree; and they, as well as Rees, noted that treatment with progesterone, although relieving the presenting symptoms, occasionally brought on dysmenorrhoea.

If these hypotheses are valid, the rational treatment is to restore the oestrogen-progesterone balance. This can be done by supplementing the supply of the latter artificially, and indeed there have been several previous reports of the efficacy of progesterone therapy. Greene and Dalton cured nearly half of their cases and obtained improvement in another one-sixth by giving a daily dose of 50 mg. of ethisterone orally for 12 days beginning on the fourteenth day of the cycle. In severe or resistant cases progesterone had to be injected or, more conveniently, implanted, but altogether in only 3 of their 78 cases followed up were progesterone and ethisterone completely ineffective. Dr. Rees also obtained good results, and with the smaller daily dosage of 5–20 mg. of ethisterone 85% of his cases obtained significant relief. An alternative method of restoring the oestrogen-progesterone ratio to normal is to counter the relatively high level of the former by giving androgens, and Dr. Rees confirmed that methyl testosterone is at least as effective as progesterone. Methyl androstenediol might be preferable to testosterone for this as for other gynaecological disorders, because it is less likely to produce masculinization or to increase libido³—the latter a point of importance, for increased sex desire is not uncommon in the premenstrual tension syndrome.

¹ *Arch. Neurol. Psychiat.*, 1931, **28**, 1053.

² *British Medical Journal*, 1951, **1**, 1068.

³ Kupperman, H. S., and Goodman, S. J., *Amer. J. Obstet. Gynec.*, 1953, **65**, 141.

It has been claimed that the emotionally unstable are particularly liable to develop the premenstrual tension state; that sexual maladjustment, marital disharmony, or continued frustrations are responsible for its onset; and that psychotherapy must therefore be the first line of treatment. Dr. Rees discounts these claims. He believes that, while psychogenic and personality factors play a part in the syndrome, premenstrual tension is not primarily a neurosis, and that psychotherapy has but a limited, though important, role in its treatment.

The premenstrual tension syndrome therefore is a common condition, although complained of infrequently. And when some of the symptoms are described by the sufferer it is understandable by their nature that they may be discounted by the practitioner as unlikely to have a physical basis. But awareness by both patient and doctor that this is a condition which occurs frequently, which deserves diligent inquiry, which causes much misery, and which responds well to a simple form of treatment could do much to alleviate the suffering not only of the victim herself but also of her household.

EXTRAORDINARY GENERAL MEETING

On Tuesday of this week there was a Special Meeting of the Conference of Representatives of Local Medical Committees in the morning and an Extraordinary General Meeting of the Association in the afternoon to consider the implications of the following resolution put forward by the requisitionists of the latter meeting:

"That the Association, being concerned by the modification of the present method of remuneration by capitation fees agreed in the Working Party's report, requires the Council forthwith to approach the Minister of Health with proposals for the better protection (financial and otherwise) of the small-list doctor and of the doctor newly seeking entry into practice, and requests the Minister of Health not to implement the Working Party's report until the scheme for distribution of remuneration has been considered in the light of such proposals, and meanwhile to continue the present method of payment."

At the Conference (see this week's *Supplement*, page 206) Dr. Talbot Rogers, chairman of the G.M.S. Committee, gave a calm and reasoned statement of the various negotiations in connexion with the Danckwerts award and its distribution. He pointed out that the implementation of the award depended on a scheme of distribution which would be acceptable to the medical profession, the Minister of Health, and Parliament. It was obvious that any solution could

not be expected to satisfy everyone. Fears were expressed that doctors with small lists, or at least some of them, might suffer hardship; hence the rider of the G.M.S. Committee in relation to this group. The G.M.S. Committee had set up a small subcommittee composed of the medical members of the Working Party and representatives from the Medical Practitioners Union, the Assistants and Young Practitioners Subcommittee, and the Amending Acts Committee to look into the problems affecting the small-list doctor. The subcommittee found the situation much more complicated than it had thought it would be. The small-list doctors did not fall into any one category. The number of those who might suffer could not be exactly ascertained. The amount of money that might be available to those suffering hardship could not be precisely assessed. Dr. Rogers gave some of these and other facts to the Extraordinary General Meeting on Tuesday afternoon (see this week's *Supplement*, page 205). He reminded his audience that in 1951 Mr. Hilary Marquand agreed there was a case for increasing the remuneration of general practitioners, agreed to arbitration, and said that any award would not be paid out unless there was agreement on its distribution by a working party composed of representatives of the profession and of the Ministry of Health. The Working Party was to devise a scheme of distribution which would ease the entry of new doctors into the Service, would discourage the building of large lists, and would encourage group practice and help those least favourably placed. Dr. Rogers told the meeting that he himself had insisted that if the Working Party could not reach agreement on a scheme of distribution the scheme itself should also go to arbitration. He admitted there might have been some hurry in getting the scheme agreed to, but this was necessary in view of the approaching summer recess of Parliament last year and of the urgent desire of the profession for concrete results. Dr. Rogers reiterated what he stated in the morning—namely, that it had been impossible to find a solution of the small-list problem before April 1, 1953, when the new distribution scheme came into operation. Until that date they could not have obtained the necessary information; for example, it was known only this week that there were a number of new principals in the Service, and this alone would determine the final settlement for the coming year—a fact which would have a bearing on the money that will be available to do justice to those small-list practitioners at present suffering hardship. They had, he continued, recently asked the Ministry of Health to call together the Working Party once more, and this body was already in the process of getting exact

information on which to base action. Any financial readjustments that would be made when the inquiry was completed would be retrospective to April 1 of this year. He saw no difficulty in securing sufficient money to remedy any existing injustices out of the sum set aside for the purpose and also out of the increased money for final settlement.

Under the chairmanship of Dr. E. A. Gregg, the Extraordinary General Meeting was conducted in a calm and orderly fashion, and the pros and cons of the resolution before the meeting were discussed in a spirit free from bitterness. This was due in no small part to the admirable way in which Dr. W. J. Grant, of Shrewsbury, proposed the requisitionists' resolution. He claimed that the method of distribution penalized those with a list of 1,500 or under, and said he was satisfied that some doctors were now underpaid as the result of the Working Party's scheme. He insisted that there should be equal pay for equal work, and that the Government should provide extra inducements to attract doctors into difficult areas. It was wrong, in his view, to try to effect redistribution by economic pressure. He criticized the proposals in the rider of the G.M.S. Committee as a form of charity, and in particular challenged what in effect was a means test to which the small-list doctor should be subjected before financial readjustment could be made. He pointed out that the Danckwerts award had been based on an assessment of general practitioners' remuneration from all sources. Dr. Schiff, who seconded the resolution before the meeting, referred to the agreement in 1949 that in any increased remuneration the loading should be on the first thousand. Dr. Talbot Rogers pointed out that their approach to the distribution scheme had to be based on the terms of reference of the Working Party, and in 1951 both the Conference and the Representative Body gave the medical members of the Working Party full power to use their own discretion in devising the method of distribution.

Lord Horder's amendment, to which reference was made in last week's *Journal*, was accepted by the meeting, as was a similar amendment in reference to the machinery of approach to the Ministry of Health. But by the time the amended resolution was put to the vote it was clear that the great majority of those present were satisfied that the G.M.S. Committee and the Working Party were setting about their task on the right lines to remove any existing injustices. In fact, when Dr. Grant replied towards the end of the meeting he said that he personally did not mind whether or not the meeting passed the resolution, because he and his fellow requisitionists had secured

what they wanted—namely, that this problem should be fully debated, and that something should be done about it. The Extraordinary General Meeting did at least succeed in doing one thing, and that was to bring into the open the fact that the Association was as much concerned about the position of minority groups in the profession as it was about the majority. It is to be hoped that before long those adjustments will be made which will put at rest the minds of those, however few of them, who are now suffering financial hardship because of a scheme of distribution that is acceptable to the majority of general practitioners in this country.

POLYMYXIN

The first antibiotic ever shown to exert a systemic antibacterial action—gramicidin—was derived from a *Bacillus*. While combing the microbic world for further antibiotics—a search which began when the powers of penicillin were recognized—this genus was not neglected, and many species or strains have been found to yield substances with a powerful action on various other bacteria, including in some instances tubercle bacilli. That none of these has come into such general use as the better-known antibiotics is due largely to misgivings about their toxicity: all are polypeptides, and the organ which they are generally apt to damage is the kidney. The most promising among them, and now regarded by some workers as having an assured place in therapeutics, are bacitracin and the polymyxins. It is interesting that these two very similar substances, derived from closely related organisms, should have totally different ranges of activity: the organisms most sensitive to bacitracin are Gram-positive cocci, and to the polymyxins Gram-negative bacilli.

The history of the polymyxins is highly confusing, chiefly because there are five of them differing in amino-acid content and in biological effects, both antibacterial and toxic. Earlier studies were made with what is now known as polymyxin A, originally called in Britain aerosporin, and the observed toxic effects of this substance discouraged further progress and delayed the acquisition of our present knowledge. An account of these developments and of the properties of the five polymyxins now recognized has been given by Brownlee and others.¹ Those most suitable for clinical use are B and E, and there is now some clinical evidence of their utility and of their safety under certain conditions of dosage. The specific infection where they are most clearly indicated is that due to *Ps. pyocyanea*, since this organism is highly sensitive to polymyxin and often resistant to all other forms of chemotherapy. Its three main spheres of activity all happen to be amen-

¹ *Brit. J. Pharmacol.*, 1952, 7, 170.
² *Lancet*, 1951, 2, 137.
³ *J. Lab. clin. Med.*, 1951, 37, 402.
⁴ *Arch. Intern. Med.*, 1952, 89, 90.
⁵ *Lancet*, 1953, 1, 110.
⁶ *Biochem. J.*, 1952, 51, 558.
⁷ *Brit. J. exp. Path.*, 1949, 30, 407.
⁸ *Brit. J. Pharmacol.*, 1951, 6, 417.
⁹ Gowans, J. L., et al., *ibid.*, 1952, 7, 438.

able to treatment other than by the administration of full doses parenterally. These are, first, superficial infections which can be treated by local application. The value of this procedure in burns has been demonstrated at the Birmingham Accident Hospital by Jackson and his colleagues.² Secondly, meningitis can be treated by intrathecal injection. And, thirdly, there are the urinary infections, which call for comparatively small doses intramuscularly. It is hence not surprising that clinical reports such as those of Kagen and others³ and of Jawetz⁴ are chiefly on these forms of treatment, the parenteral dosage (if any) being only moderate and the absence of renal toxicity perhaps no guarantee that larger doses would prove equally safe.

It is therefore of some importance that Swift and Bushby⁵ are able to report having treated 53 patients with polymyxin E and 32 with polymyxin B without causing apparent renal damage in any of them. They were mainly children, who were given up to 12,500 units per kg. body weight four-hourly for five days or longer. In one case protein, casts, and red cells appeared in the urine but were apparently attributable to another cause. Other toxic reactions, chiefly pain and induration at the site of injection and fever, were much less often caused by polymyxin E than by B. Nervous effects, such as flushing, itching, and paraesthesiae, were judged to be produced in an equal degree by both, so far as could be ascertained among patients of whom many were too young to describe their sensations.

If these findings are held to prove that polymyxins B and E are not toxic to the kidneys, the conclusion is both important and somewhat unexpected. Hitherto all the polypeptide antibiotics have seemed to suffer from this disadvantage, and fractionation of them has failed to yield a component which retains antibacterial activity and lacks toxicity. Thus, according to Callow and Work,⁶ of three licheniformins, A is the least toxic but nevertheless causes renal damage. Marston and Florey⁷ report very similar findings with proactinomycin, and Newton and others⁸ with bacitracin. Nisin, although it has not been fractionated, is another polypeptide with renal effects which debar its systemic use.⁹ If polymyxins B and E are an exception to this rule, they certainly deserve a place in therapeutics, and it is to be hoped that supplies of one of them—preferably, according to these findings, E—may be made available for further study and for general use in those difficult and sometimes desperate cases where no other antibiotic will serve.

TENDON TRANSPLANTATION IN POLIOMYELITIS

Since the original work of Nicoladoni in 1880, opinion on tendon transplantation has passed through the three phases that usually follow the introduction of any new surgical procedure—enthusiastic optimism, disillusion, and now cold revaluation. To study the effects of tendon transplantation in cases of poliomyelitis is particularly difficult, for seldom is it a question of finding

a substitute for a single paralysed muscle or group of muscles, but rather of readjusting the balance of an incompletely paralysed limb. The procedure is therefore often accompanied by stabilizing operations on one or more joints. While the fixation of a joint results in an economy of muscular effort, and so may free muscle for transference, it makes true assessment of the result more complicated. Because surgery is often carried out in childhood and adolescence, the follow up is long and also made difficult by the migration of patients. The observations of the Poliomyelitis After-Care Programme in Vermont¹ (established by Lovett, co author with Robert Jones of *Orthopaedic Surgery*, after an epidemic in 1914 and continued by Ober), and those of the Poliomyelitis Clinic in Boston,^{2,3} cover not only an unusual length of time but an unusual number of cases which have been systematically treated and observed.

Because the variety of procedures used in treating the upper limb is greater than in the lower, the results of treating the lower limb can be followed up and compared more satisfactorily. Paralysis of the hip and calf inevitably affect the stability of the knee and must be corrected before a transplant round the knee-joint can be undertaken and its results judged. (It might be mentioned that the size of the quadriceps has perhaps led some workers to overrate its importance in the act of walking.) The most commonly used muscles are the tensor fasciae latae and sartorius; the biceps femoris, although an antagonist, is better. It is disappointing to note that even the ability to extend the knee against gravity does not necessarily enable the patient to discard his irons. Objectively the results are disappointing, only 30% of patients regaining active extension, but subjectively the results are good because of the increased feeling of stability at the knee.

The operations performed round the ankle may be grouped together, being designed to restore dorsiflexion, to restore plantar-flexion, or to stabilize the forefoot. The restoration of strong plantar-flexion, the most difficult result to achieve, is desirable, but it is not necessary for a good gait; transplantation of both tibialis posterior and peroneus longus is necessary for success, and in only one case did this enable the patient to balance actively on tip-toe. More helpful to the development of a good gait is the return of dorsiflexion, and it is more easily accomplished by transplantation of the peroneus longus. This, combined with a stabilizing procedure, gave a good result in almost two-thirds of the cases. Tendon transplantations round the forefoot are often combined with a variety of stabilizing procedures and are difficult to analyse. The muscle most commonly transplanted is the tibialis anterior to prevent inversion of the foot.

Surgical technique for transplantation has become standardized. Synergistic muscles are used rather than antagonists, and all transplanted tendons should be anchored to bone. Before the age of 11 the balance of muscle power and bone deformity cannot be accurately

¹ Kuhlmann, R. F., and Bell, J. F., *J. Bone Jt Surg.*, 1952, 34, 915.

² Broderick, T. F., jun., *et al.*, *ibid.*, 1952, 34, 909.

³ *ibid.*, 1952, 34, 900.

estimated, and operative treatment before this will necessarily be uncertain, some 80% of patients requiring further surgery. Stabilization alone will give a good functional result in many cases. Nevertheless, the combination of the two procedures, though suitable only for cases with muscle imbalance, has a valuable place in poliomyelitis aftercare.

TEN YEARS OF "NUFFIELD"

It was in 1943, in the middle of the war, that the Nuffield Foundation was established by Lord Nuffield, and it is now nearing the completion of its second five-year programme. The two programmes have not been greatly different. In the first the emphasis was on normal health, especially child health and industrial health, but also on one specific disease—namely, rheumatism, the work on which was facilitated by a benefaction of £450,000 by Captain Oliver Bird, M.C. Up to the present nearly a quarter of a million pounds have been spent by the Foundation on research into rheumatism, including the financing of a pioneer centre at Manchester and the initiation of a scheme of fellowships. A beginning had been made in fundamental research into causes and in scientifically controlled trials of existing forms of therapy when the work on cortisone and A.C.T.H. was announced from America. Elaborate trials have been made with these hormones, which are described in the recently published review¹ as "certainly not a cure but perhaps a tool." Rational treatment based on a knowledge of causation is not yet possible in rheumatism, and the claims for the many methods of therapy in clinical use are still difficult to assess. Studies are continuing in the hope of throwing light upon the structure of tissues and the processes of rheumatic diseases which involve and damage them.

In its second five-year programme the Foundation has shifted its emphasis to biological and sociological studies. Grants have been made for investigations into cellular biology, microbiology, comparative endocrinology, immunology, and neurophysiology. In these fields, again, the research is recent and the results not yet ready for reporting. Investigations into sociological, economic, and population problems have also been generously assisted. An important object enjoined upon the Foundation by its trust deed concerns the care and comfort of the aged. This review points out, what is often overlooked by those who express alarm at an ageing population, that it is not merely life which is being prolonged but working capacity. Continued and normal activity by the elderly is an important contribution both to their own morale and to the economic well-being of the community. It is from this point of view that the Foundation is proceeding. It is financing research by psychologists at Cambridge into the manner and the rate in which skill declines with age, and into the methods by which the elderly can be helped to continue in work or to change to tasks better designed to take account of any falling off in skill.

Finally, the Foundation has made a major part of its activities the award of fellowships and scholarships both

for residents in the United Kingdom and in other parts of the Commonwealth. Over £600,000 has been set aside for these awards from the income of the Foundation during the past ten years, but the aim has been the creation of carefully selected and often short-term and experimental schemes rather than an omnibus endowment. These ten years have been a preparatory period. Readers of the report may wonder what vast achievements for human welfare will be recorded in a review of the Nuffield Foundation to be published at the end of this century.

THE MIDDLE-AGED MAN

The inevitable changes attending the contraction of life in its second half come gradually and without fuss in well-adjusted people. But the outlook is very different for the maladjusted, who interpret the normal changes as symptoms of disease. Their lives are darkened by hypochondriacal disturbances and depressing reflections. Illness to many people implies an external agent. The unhappy middle-aged woman blames "the change of life," and is thereby blamelessly exonerated from responsibility. The notion of a male climacteric is in a like category. In the literature (and in advertising circulars) the term male climacteric is becoming familiar. Is there any such condition even remotely similar to the female climacteric?

Claims have been made,^{1,2} and denied,^{3,4} that there is a rare syndrome properly described as the male climacteric. The symptoms of the presumed syndrome, briefly, are depression, irritability, lack of concentration, palpitation, weakness, and sexual impotence. All of these are present in the neuroses and in involutional depressive states, hence an objective test is recommended—namely, testicular biopsy and the results of testosterone propionate therapy. These, and chiefly the latter, are thought to provide conclusive evidence. These claims, however, have been refuted by other workers unable to corroborate them. The so-called syndrome, they assert, is a psychiatric illness. One advocate for the syndrome asserts that involutional melancholia has "a definite endocrine origin" and advises injections of testosterone propionate.⁵ Yet doctors who have to treat involutional melancholia in either sex prefer E.C.T., which gives its best results in this condition. Ageing is a complex but normal process, and it might be assumed that all glands of internal secretion take part in it. The menopause is not a disease entity despite its occasional association with nervous and other complaints. No one has described a condition in men with disturbance of hormone secretion as the only symptom of the so-called male climacteric. Landau⁶ and others who regret the use of this inexact terminology believe that the beneficial effects which sometimes accompany injections of testosterone propionate are due to the influence of suggestion on emotionally unstable persons, and that the term should be abandoned.

¹ Heller, C. G., and Myers, G. B., *J. Amer. med. Ass.*, 1944, 120, 472.

² Reiter, T., *Practitioner*, 1953, 170, 181.

³ *Med. Clin. N. Amer.*, 1951, 35, 279.

⁴ McCullagh, E. F., *Cleveland Clin. Quart.*, 1946, 13, 166.

⁵ Werner, A. A., *J. Amer. med. Ass.*, 1946, 132, 188.

⁶ Kinsey, A. C., *et al.*, *Sexual Behaviour in the Human Male*. Philadelphia and London: W. B. Saunders Company. 1948.

¹ *The Nuffield Foundation. Ten-Year Review, 1943-53, 1953, Oxford.*

Evidence has been obtained⁶ that sexual energy falls steadily from the teens to the seventies. The study of spermatozoa counts and excretion of androgenic and gonadotrophic material in urine supports this observation. From this it might be inferred that the changes, which some workers assume to be pathological are part of the normal ageing process in which all functions of the mind and body share. Until an occult deficiency of testicular androgen—provided this can be estimated—is shown to bear a direct causal relation to the multiplicity of symptoms embraced by the term male climacteric, we have no ground for accepting the concept.

TEACHING PUBLIC HEALTH

The report on the work of the London School of Hygiene and Tropical Medicine for the year 1951–2 describes once again the activities of this enterprising institution, with its thirteen separate departments and its farm field station near St. Albans. In their introductory remarks Sir Archibald Gray, the chairman of the board of management, and Dr. Andrew Topping, the dean, refer to the effect of increasing costs on the finances of the school, whose credit balance was unfortunately converted into a deficit during the year. Efforts are being made to reduce expenses, but the tutorial fees, which have not been changed since 1930, will have to be increased for some of the courses beginning next October.

The report of the work of the department of public health is of special interest this year, for Professor J. M. Mackintosh has taken the opportunity to review developments during the past twenty-five years. Before the first D.P.H. course was held an informal committee of Professors Greenwood, Topley, Jameson, and Delafield was appointed to consider the future curriculum, and it was in 1931 that the decision was reached that a course of university standard could not be conducted on anything but a whole-time basis. It was about the same time that the General Medical Council published new rules allowing whole-time students to complete the course in nine months instead of one year. As the years went by the tendency was always to reduce the number of formal lectures and to make the course more tutorial in character. At the present time the greater part of the teaching is based on the study group system, which allows students to choose the subjects to which they would like to give particular attention. At the end of the 1939–45 war the whole curriculum was revised. Demonstrations of bacteriological techniques and of the chemical analysis of water and milk have taken the place of the intensive exercises in practical work which were such a time-consuming part of the diploma courses before the war, and the first term is now occupied with "a general introduction to the scope and character of the public health and social services." During the other two terms the student is brought closely into touch with the practical problems of public health administration by working under the supervision of medical officers of health. In addition, study groups are formed and the students themselves plan and execute investigations into some

problem allied to public health. An "overwhelming" majority of students found that learning through study groups was more interesting than traditional classroom work and 55% thought it to be more effective. The range of studies is gradually being extended, and in the current course the medical aspects of airport control and a discussion of general practice were introduced for the first time. "These various additions to the programme," the report states, "would overburden the course if rigidly enforced on all the students, but they are presented in the spirit of elective studies and are accepted as such by the students whose maturity and experience enables them to be selective in their interests."

These new methods of teaching public health and the swing of emphasis from some subjects to others reflect the present changing views about social and preventive medicine. The London School of Hygiene and Tropical Medicine has always been ready to move with and even ahead of the times. The present report shows that this policy has been fruitful and will continue.

COST OF PRESCRIBING

In the first full year of the Health Service general practitioners' prescriptions cost £35m. It is estimated that in the current year the cost will be about £52m. When the sum of £6.7m. (estimated) is taken off for patients' payments, the net cost to the taxpayer is still £10m. more than in 1949–50. Analysis shows that three-fifths of this total is accounted for by the cost of ingredients and not by chemists' fees.

In the summarized accounts¹ of the National Health Service for 1951–2 the Comptroller and Auditor-General states that in the thirteen months up to December 31, 1952, 282 general practitioners were reported for apparent excessive prescribing. All but eleven of these reduced their prescribing costs after warning from the Ministry and—to quote the Comptroller and Auditor-General—"without detriment to the treatment of the patients." That only a minute proportion of general practitioners were thought to be prescribing excessively gives the lie to any accusations that the size of the nation's drug bill is caused by general extravagance among doctors. Note must be taken, too, of the statement that the reduction in the prescription costs after warning of certain doctors was achieved without detriment to their standards of treatment. This may be true, but we must never depart from the recognition of the right of the doctor to be the sole arbiter of what is best for his patient. To surrender this fundamental principle would cost far more than the few thousands saved on cheaper prescriptions. Yet responsibility for one-eighth of the expenditure on the Health Service is in the hands of general practitioners, though there are reasons for this high cost which do not reflect on the prescriber, and there is no single way to economy, but most general practitioners know that there are many small ways and means of saving. Those who do not know should make it their business to find out. "Many a mickle makes a muckle."

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REFRESHER COURSE FOR GENERAL PRACTITIONERS HYSTERIA

BY

I. R. C. BATCHELOR, M.B., M.R.C.P.Ed., D.P.M.

Deputy Physician-Superintendent, Royal Edinburgh Hospital for Mental and Nervous Disorders;
Lecturer in Psychiatry, University of Edinburgh

Hysteria has been known since antiquity. Its symptoms, often dramatic and apropos to the times, have compelled attention and wonder. It has had many explanations. For our present views we owe a debt to both neurologists and psychiatrists, amongst whom in the past hundred years the contributions of Charcot, Janet, and Freud have been outstanding. Treatments, lay and medical, have been as various as the theories about its aetiology. Physicians and ministers of the traditional religions have relieved many sufferers from hysteria, as also have less orthodox faiths and modes of healing. That many of these treatments have not proceeded along rational lines and have produced symptomatic improvement without insight does not by any means wholly detract from their practical usefulness.

Hysteria may appear in the form of physical or psychological disorder. The patient's emotional disturbance, which is fundamental to the illness, may be more or less completely converted into physical signs or symptoms (conversion hysteria) or it may find more direct expression in episodic mental states of a characteristic type. Overt anxiety or even panic may accompany hysterical symptoms.

The Hysterical Personality

Frequently, though by no means invariably, those who develop hysteria have shown before the onset of the illness an aggregation of traits which has been called the "hysterical or histrionic personality." It is often evident that these people, usually women, though adult in age, are to a great extent dependent still on one or other parent. Their temperaments are quicksilver, over-sensitive, over-responsive. They often fall into passionate attachments, as intense as they are transient; they make excessive demands on others, and, disappointed in their unrealistic expectations, react impulsively in spite and pique; and they attempt continually to dominate others by their whims and moods. Abnormally self-centred and vain, they seem to feel an almost constant compulsion to bolster up their egos by holding the stage and playing out dramatic roles evolved by their too vivid hopes and imaginations. Their capricious and frequent lying has often the fantastic and innocent quality of the child's. Sexually they are superficially excitable but fundamentally inhibited. Behind all this, hidden from the patient's unassisted insight, there seems to be an intense longing and need for attention and love—a need infantile in its exclusiveness and which is as great as their ability to feel deeply towards others is small. It is not surprising, then, that the environment they inhabit is more often than not emotionally on the boil. These people easily provoke antagonisms, are very difficult to live with, and difficult to be patient towards in treatment. It is salutary, therefore, always to consider such a previous personality as an essential part of the illness.

The particular symptom developed depends on one or more of several factors: it has often clearly a symbolic meaning (for example, hysterical blindness may symbolize an inability to contemplate some unpleasant reality); it may be an exaggeration of some physiological reflex (for example, hysterical vomiting) or may utilize some locus of earlier disease or injury; or it may be the outcome of

suggestions derived from the illness of a near relative or friend, or from previous medical examinations. It is advisable always to ask the patient what he thinks is wrong, and to find out if anyone in the patient's environment has suffered from anything similar. All neurotically ill people are suggestible, and, identifying themselves emotionally with others, may imitate their disabilities. The greater the individual's knowledge of special kinds of disease, the nearer his symptoms will mimic those diseases. Gross hysterical symptoms seem now to be less common than formerly, when they were often produced by unskilled and over-enthusiastic examination.

Physical Symptoms

Physical symptoms are usually in the nature of some incapacity, partial or complete, involving the sense organs or voluntary musculature—aphonia, mutism, deafness, blindness, paresis, or anaesthesia. The disability is often of sudden onset, its degree and extent tend to be variable, and its details do not coincide with the signs of neurological disease. For example, the hysterically mute individual can cough normally and may be persuaded to write his replies to questions; the sufferer from hysterical blindness may avoid obstacles in his way; the muscles of a hysterically disabled limb may be used in some movements and not in others; the anaesthesia corresponds in its distribution and in the types of sensation involved to no recognized variety of organic sensory loss.

In other cases movements may, instead of being diminished, be increased in the form of tremors. Hysterical disturbances of gait may be bizarre; other abnormalities of movement or posture—for example, tics and dystonias—may also be hysterical but are more often symptoms of organic involvement of the nervous system. Sensation also may be heightened or perverted, localized areas of hyperaesthesia may be described, and head pains or abdominal sensations complained of. In these cases the paraesthesiae are frequently reported by the patient in hyperbole: they are constant, may even be claimed to be present during sleep, and are intolerable; analgesics have little or no effect on them. All these symptoms become aggravated under observation and fixed by too often repeated examination.

The visceral symptoms of hysteria most often encountered are persistent vomiting and anorexia. Hysterical vomiting, often unaccompanied by nausea, occurs after meals and is effortless. Anorexia nervosa commonly manifests itself in a striking combination of emaciation and continued, even apparently tireless, activity. Found typically in girls and young unmarried women, this condition is not so difficult to distinguish from Simmonds's disease as is often supposed.

Mental Symptoms

The commonest mental symptoms are amnesias, fits, and disturbances of consciousness—fugues, stupors, and so-called twilight states.

Hysterical amnesias may be localized, covering some particular event, or (rarely) very extensive, involving even the whole of the patient's past life and so resulting in loss of identity. A localized amnesia may cover an incident involving guilt, and sometimes a criminal act—for example, amnesia may be claimed for the circumstances of a culpable accident, the patient saying that he suffered a "black-out." The assessment of such a black-out will centre on the

investigation of the possibility of concussion and on the history of previous similar attacks. An amnesia involving the whole of the past life of a young person is invariably hysterical.

Hysterical fits are diurnal. There is usually no typical clonic-tonic succession as in the epileptic fit, and self-injury is unusual. Tongue-biting, incontinence, and transient reflex changes do not occur. The seizures are seldom followed by complaints of headache and confusion. There is always an audience, and if attempts are made to restrain the patient he responds with wild struggling. Atypical faints and vaguely described collapses also occur commonly.

Hysterical disturbances of consciousness of longer duration may be associated with immobility, with dramatic posturings and verbal outpourings, or with wandering (a fugue). These always require expert assessment.

There is in all hysterical reactions a great tendency towards exaggeration, and the patient in his bids for attention may go so far as self-injury. Cases of dermatitis artefacta and other types of minor wounding are allied to the hysterical reactions. Suicidal gestures or attempts may also be made by individuals of hysterical personality when some thwarting produces great excitement. These attempts are usually impulsive: though they may not always be very serious, they are danger signals and urgent calls for help, and should not be dismissed as innocuous.

In sufferers from hysteria the typical mental attitude, *la belle indifférence*, is not always found. In the early stages there is often a good deal of anxiety. It is only when the establishment of symptoms has provided the terms of a truce for the conflicting emotions that a surface calm is achieved and the patient presents an attitude of bland acceptance of his disabilities. The lack of insight is then typical. The hysteric describes at length a number of painful or discommoding symptoms and goes on to state that he is not worried by them: he does not consider his symptoms nervous, declares in a sweeping way that he has had no recent anxieties, and seeks purely physical explanations for his sickness.

Diagnosis

Hysterical symptoms, which are commoner in women than in men, are developed most often around puberty and adolescence and in early adult life. They are uncommon after middle age. When occurring for the first time after the age of 45 they should be regarded as organically determined, unless the opposite has been clearly proved.

A careful physical examination is essential in every case. Hysteria is often mistaken for physical disease, and physical disease is often called hysteria. It would be profitless to attempt a list of the syndromes which may cause confusion. In perhaps the most difficult cases the question of organic neurological disease is at issue: disseminated sclerosis, brain tumour, encephalitis, myelitis, cerebral vascular disease, myasthenia gravis, and many other physical processes may be misdiagnosed. The situation is also complicated by the fact that organic brain disease may itself cause or release hysterical symptoms, and hysterical symptoms may be grafted on to the physical effects of an injury. It is helpful to remember that in a young person organic neurological disease does not usually develop so rapidly as hysteria; that there are no significant reflex changes in hysteria; and that the physically ill individual usually shows some general evidence of physical illness. It is surprising how often the eliciting of a story of some recent emotionally disturbing event leads to the forgetting of the platitude that a physical illness has also to begin some time.

Hysteria must be distinguished from other kinds of nervous and mental illness, but too precise a pigeon-holing of neurotic reactions is impossible, since many of them show an admixture of anxiety, hysterical, and obsessional symptoms. It should, however, be determined whether or not the hysterical symptoms are primary and predominant:

appropriate treatment depends on this. Hysteria mimicking severe mental illness is much less common than is widely believed. Fugues should not be lightly discounted as hysterical: many have a depressive basis and are suicidal equivalents.

The differential diagnosis between hysteria and epilepsy is often difficult. Some of the distinguishing features have been described already. An electro-encephalogram may be helpful, and an accurate description of the attacks by a witness always is.

Close attention to the patient's symptoms and appreciation of the setting of his illness are both equally important. Knowledge of the patient's previous personality and a history of neurotic illness help always in assessing present symptoms. But the diagnosis can never be considered to be on a firm basis until the precise emotionally charged situation or dilemma which has precipitated the patient's symptoms has been identified and his symptoms are seen to be understandably linked to it.

Treatment

The general practitioner, acquainted with the details of the family background and the home circumstances, is strategically in the best position to treat hysterical reactions. Unfortunately, inadequate undergraduate instruction in psychological medicine has caused many doctors to feel that they lack the necessary knowledge. Much depends too on the personality of the practitioner, his insight, the direction of his interests and his sympathies, and the pressure of his work. It is better to refer these patients for specialist opinion too soon than too late; hysterical symptoms, if disabling, should not be allowed to persist. It is pathetic to see women referred for psychiatric treatment after twenty years' history of vague abdominal pains and after "everything's been taken away" by well-intentioned but ill-judged surgery.

The doctor's attitude to this group of people, with their many complaints and clamant demands on his attention, is particularly important. He should be neither censorious nor too kind: if he is the former he will scare people away who genuinely need his help, and if he is the latter he will foster an undue emotional dependence and attachment which may become intolerable to himself. He must be a good listener.

When a current cause of the patient's anxiety can be found his problems must be clearly identified for him, and he should be helped and encouraged to tackle these in a constructive way. This sort of practical guidance, which may have to be repeated often, and the emotional maturation which time may help to bring about lead in a fair number of cases to a satisfactory result. A deeper exploration of the personality and earlier conflicts and traumata, by means of psycho-analysis, may, however, be necessary in some cases. To benefit from psycho-analysis the patient must be young, of at least average intelligence, and willing to co-operate in a long and intensive course of treatment. These requirements limit psycho-analysis to a minority of hysterical patients.

It may be sufficient for cure (particularly in the case of children) to alter the aspect of the environment which has caused the stress: a change of school, removal from danger, more suitable occupation, or the acquisition of a house of one's own may abolish the conflict which was causing symptoms. It is also quite essential for the doctor to promote an understanding attitude in the relatives, and to gain their confidence and co-operation. There is a great tendency for hysterics to adopt in a striking form the social role of the sick person. They are often adept in mobilizing sympathy and notice. They reiterate their desire to get well and back to duty, and are very apt to shift subtly the blame for their lack of progress to aspects of the environment, including the doctor and his treatment. Relatives are thus drawn into the orbit of the illness, come to see the situation entirely through the eyes of the patient, and swaddle him in too much solicitude.

Compensation cases have usually to be referred for a consultant's opinion. Too much hope is often placed in the settlement of a claim; it is in probably the minority of cases that settlement leads to rapid cure.

A thorough physical examination followed by a pronouncement that recovery is imminent may occasionally lead to the prompt disappearance of hysterical symptoms in subjects of low intelligence. But in most neurotic illnesses what is usually called "reassurance" is not enough. The jovial encouragement that there is nothing wrong and nothing to worry about merely convinces the patient that what is wrong has been missed.

Treatment may have quick and even spectacular results, but it may also have to be prolonged, and too great an insistence should not be laid on cures. In most cases, if symptoms are relieved and the patient is helped to function again reasonably happily and efficiently, that should be considered satisfactory. Sedation has a useful part to play in supportive treatment, particularly where there is much anxiety. A mixture containing potassium bromide, 10 gr. (0.65 g.), and chloral hydrate, 5 gr. (0.32 g.), or amylobarbitone sodium, 1 gr. (65 mg.), given three times a day is often sufficient for substantial relief of tension, while in the management of reactions of acute excitement and panic a large dose of a quickly acting barbiturate—for example, pentobarbitone sodium, 3 gr. (0.2 g.), will provide sleep.

It is a mistake to pay too much attention to specific symptoms. Treatment on a purely symptomatic level leads usually merely to the banishment of one presenting symptom and its replacement by another. The disabling nature of a symptom—for example, mutism, deafness—may, however, necessitate a frontal attack on it. In such a case the attempt should be made to eliminate that symptom at a single session. Up to two hours should be set aside, and the doctor's confidence in his success is more important than the method he employs. Firm persuasion and suggestion are usually enough. They may be facilitated by the intravenous injection of a barbiturate (amylobarbitone sodium or thio-pentone). It is doubtful if hypnosis is ever essential; it is never the treatment of choice. A localized amnesia may be resolved under barbiturate narcosis, but probably only if the patient is willing that it should be. Losses of identity clear up spontaneously. In some cases the dramatic intervention of the narcosis is a face-saving situation enabling the patient to relinquish a symptom which is no longer useful to him, and it is not necessarily undesirable to allow him this relief.

If further breakdowns are to be guarded against it is important that the patient should gain insight. But many hysterics reject attempts to give them insight, and recoveries occur without it. Insight should therefore be fostered but not too doggedly insisted upon.

Admission to a mental hospital is never advisable, and admission to a neurosis clinic should be arranged only in certain situations and with definite ends in view. It is often necessary where there is loss of identity, a fugue, gross paralysis, or blindness, and always in cases of anorexia nervosa. Admission may also be necessary when the home environment militates against recovery, but it is essential here to estimate whether after the period in hospital this environment is going to be improved or the patient's resources for dealing with it increased. If these precautions are not taken, when the time comes for the patient's discharge he is apt to jib and to become worse, suicidal threats may be made, recriminations are frequent, and the patient finally returns home disappointed, bitterly critical, and more difficult to handle. Admission to hospital is especially profitable where symptoms have developed on a basis of physical debility and fatigue.

Electric convulsion therapy or other "shock" treatment is not helpful.

The doctor may be asked to advise on marriage and child-bearing. Marriage as a medical prescription might

well be placed on the D.D.A.: it should not always be discouraged, but it is rarely wise to recommend it. Child-bearing should always await the attainment of emotional stability, which it does nothing to promote.

Prognosis

Prognosis depends not on the particular symptoms but on the stuff the patient is made of and the kind of difficulties he has to surmount. If the environmental difficulties are transient or modifiable the symptoms may be expected to clear up. If the trouble lies not so much in the toughness of the demands of the environment as in the inadequacy of the patient's response the outlook is less favourable. With much patience some of these handicapped people may be guided to be more healthy minded and sensible in their dealings with life's problems. Many have numerous relapses and need much propping. The longer hysterical symptoms have lasted the worse is the outlook: there is a great tendency to chronic invalidism, and the mental reaction may become as malignant as a widely disseminated bodily cancer.

Next Refresher Course Article.—"Carcinoma of the Breast," by Mr. H. J. B. Atkins.

EMPIRE RHEUMATISM COUNCIL

LORD HORDER RETIRES

The annual meeting of the Empire Rheumatism Council was held on April 29 in London. At the meeting Lord Horder, who has been chairman of the council since its inception in 1936, announced his resignation. A message from the Duke of Gloucester, the President, expressed his appreciation of the great leadership and wise guidance which Lord Horder had given over many years. Lord Webb-Johnson said that Lord Horder's decision was a matter of regret to them all, but apparently it was irrevocable. To succeed him he proposed Dr. W. S. C. Copeman, who had been for eighteen years honorary medical secretary of the council and had made valuable contributions to rheumatology. Professor R. E. Tunbridge seconded the proposal, which was carried unanimously. Dr. Copeman, in accepting the office, asked for an assurance—which was given—that the council could continue to look to Lord Horder for assistance and counsel.

On the proposition of Sir Henry Cohen, Lord Webb-Johnson was re-elected vice-chairman, and Dr. Oswald Savage and Dr. R. M. Mason were elected honorary medical secretary and deputy respectively. Sir Adolphe Abrahams moved a resolution placing on record the council's great appreciation of Lord Horder's long and distinguished services. He described him as the "W. G. Grace of Medicine"—one who would never be surpassed. Sir George Elliston also spoke to the resolution.

In presenting the financial statement of the council, Mr. W. R. C. Halpin said that there had been an increase during the year of nearly £4,000 received in donations. Donations must form the backbone of their revenue. He was ambitious for an income of £50,000 a year, short of which the council could not open its wings to the full extent. Income last year had amounted to nearly £17,000.

The annual report, which was adopted by the meeting, referred to a generous offer by Merck (North America) Inc. to supply free of charge a quantity of "cortone acetate" tablets sufficient to undertake trials which would keep 50 patients on continuous oral therapy for a year, and after that time to continue to treat *in perpetuo* those of the 50 who still remained on the therapy. Trials were being undertaken to discover the clinical and functional difference between a cortisone-treated group and an aspirin-treated group of patients, and the scheme was coming into operation in nine centres in England and Scotland.

DR. F. PARKES WEBER, 90

On May 8 Dr. Frederick Parkes Weber celebrated his ninetieth birthday. It is just upon 60 years since he became physician to the German Hospital in London. By the later 'nineties he was an ardent participant in the discussions in half a dozen or more medical societies. What has distinguished him during all these years has been his zeal for clinical studies, his search for the more enigmatical signs and symptoms of disease, and the clarity with which he has expounded what he has discovered.

Ten years ago, on his eightieth birthday, his friends at the German Hospital presented him with a volume of his *Collected Writings*—it could be the titles only, for the separate writings ran to nearly a thousand, beginning in



1890 with a contribution to *St. Bartholomew's Hospital Reports* (he was then house-surgeon at St. Bartholomew's) on abnormal foramina in the heart and its valves, and ending in 1943 with a short paper in the *British Medical Journal* on congenital jaundice in a man aged 77. Since then, of course, there have been many further contributions in this and other journals, for Dr. Parkes Weber, who, when he was only 40 or so, wrote for Albutt and Rolleston's *System of Medicine* all there was to say about the physiology and pathology of old age, has always been at heart a youth, and we can confidently hope that the weight of years will not stay his mental activity. Until a year or two ago he was present at almost every meeting of the Section of Dermatology of the Royal Society of Medicine, and it was always refreshing, and in sharp contrast to the mumbling undertone in which the discussions are often conducted, to hear his resonant speech, with no possibility of mistaking a word, as he compared the unusual case then being demonstrated with one which he had seen anything up to 60 years before. Increasing physical disability has in no way impaired his intellectual energy, the vigour and precision of his language, and his enthusiastic interest, especially in the rarer signs of disease. He is an example of the old-time scholar-physician, pedantic perhaps in the use of words—but then, words to him are real things. A rose by

any other name may smell as sweet, but a disease wrongly named may mean a distorted clinical picture. Standing on his feet (later, alas, leaning on a crutch), he would sometimes seem to be coining words and phrases to differentiate and clarify the diagnosis. His paper on naevi, published in the *British Medical Journal* 18 months ago, showed that he was still giving the same careful thought as ever to the classification of pathological conditions.

Dr. Parkes Weber—elected a Fellow of the Royal College of Physicians in 1890—belongs to a generation of medicine which has largely passed away, but the younger generations who have profited from his writings and from the unselfish help he has always given to colleagues and students will acclaim him as a great doctor, a wise philosopher, and a most courteous gentleman. He comes of a long-lived family—his father, Sir Hermann Weber, lived to 95—and his friends will hope that more and happy years remain to him. As he himself put it when he was 80, in speaking of his life as a strenuous holiday like an Alpine walking-tour, "This holiday is not yet over."

HEALTH CONGRESS AT HASTINGS

NEW APPROACHES TO PREVENTIVE MEDICINE

The annual Health Congress of the Royal Sanitary Institute, which was held at Hastings from April 28 to May 1, covered as usual a wide field of preventive medicine and public health services, personal and communal. The subjects discussed in eight sections and four special conferences ranged from building by-laws and modern plumbing to the place of the health visitor in the welfare State, from the control of tuberculosis in Tanganyika to the Middlesex development plan, from a scheme for the part-time employment of ageing persons in Finsbury to the ultra-violet deodorization of the air.

A Disease-proof Nation

The president of the Congress, Lord EUSTACE PERCY, in his inaugural address, posed the question whether the modern human being, artificially immunized against virus diseases, but at the same time carefully protected in childhood against any natural immunization, would prove to be an entirely satisfactory citizen in the future City of Health. The victorious army against the bacillus and the parasite seemed to be exposed to serious flank attacks by other enemies of the constitution whose strength had not been measured—by crippling infiltrations like arthritis, and deadly shock troops like cancer and disorders of the circulatory system. A great Englishman of the last generation had once said to him that he "had never been well enough to be really ill." Was it possible that we were preparing a race of citizens who would never be ill enough to be really well?

"For a disease-proof nation may be a hectic nation, working shorter hours at a more intense and continuous expenditure of energy, mental as well as physical; with a longer expectation of life, but possibly an actually shorter expectation of fitness for work at the new level of intensity; with larger but less reposeful leisure; protected against specific occupational hazards, but more and more exposed to the general hazard of working strain; prone to thrombosis and to nervous or mental breakdown, and making increasing demands on our newly christened science of geriatrics. Such a result, to put it mildly, would not be an 'elegant' solution of our national health problem."

A General Practice Teaching Unit

In the Section of Preventive Medicine, presided over by Mr. FRED MESSER, M.P., chairman of the Central Health Services Council, Dr. RICHARD SCOTT described the work of the Edinburgh University general practice teaching unit. By taking a few selected students into association with family doctor practice it had again been demonstrated that medicine was indivisible. "To the doctor examining the patient in the consulting-room or in his house, curative medicine, preventive medicine, and social medicine are academic concepts. What he practises is medicine."

The Hospital Paediatrician

A more cheerful picture of infant welfare clinics was given by Dr. MAURICE R. WOODS, who found that mothers of all social spheres attended them. Dr. DOROTHY EGAN, principal medical officer for maternity and child welfare, L.C.C., objected to the proposed taking over of child welfare work by the paediatric staffs of hospitals. Experience had shown that even in the atmosphere of a child welfare centre the hospital paediatrician did not find it easy to adapt himself to a purely educational and advisory role, and the change of emphasis to preventive from curative work would be even harder to bring about within the hospital itself. The general practitioner, she said, should ideally combine curative and preventive work, but if he was to do this health centres must be established and group practice become a reality, and he must be prepared to consult and work with the medical officer of health as a specialist in social medicine and epidemiology. Dr. MARY HELLIER, a general practitioner, said that for some time now a group of medical women like herself had been feeling that there was an urgent need for someone like a social worker to be available to the general practitioner.

From the chair of the section Dr. BERNARD SCHLESINGER referred to "quite unjust recent attacks in the medical press" on infant welfare clinics. At the same time he urged close liaison between the medical officer of the clinics and of the hospitals of the district, and the family doctor should not be left out of the picture. If only the family doctor had the time and also the special knowledge and interest, it would be an admirable thing if he would take weekly sessions at such clinics.

In some further discussion on health visiting Dr. JOHN BOWLBY, of the Tavistock Clinic, urged that health visitors should give more attention to mental health, cultivating especially an understanding of the unconscious processes which affected maternal attitudes. The future role of the health visitor in the welfare State was also discussed. One speaker declared the most serious problem affecting the health and welfare service to be not physical but psycho-social breakdowns. The training of the health visitor in the future should be along lines similar to those of the almoner rather than those of the nurse.

The Medical Officer of Health

From the chair of the Conference of Medical Officers of Health Dr. ANDREW TOPPING, as usual, expressed himself vigorously. The contention that the days of public health were over, he said, was completely untenable. He gave an impressive list of community health problems still to be tackled:

- (1) Development programmes for the care and control of mental ill-health.
- (2) Environmental conditions at work and in the home.
- (3) Epidemiology of non-infectious diseases.
- (4) Atmospheric, river, and sea-coast pollution.
- (5) Continuous and increasing health education.
- (6) Co-education and streamlining of the many diverse health agencies.
- (7) The ever growing need for geriatric services.
- (8) The correlation and proper recording of the medical findings of infant welfare clinics, the school medical service, the industrial medical service, and the National Health Service, and the linking up of the work of executive councils, hospitals, and local health authorities.

Dr. Topping had also a word to say about the family doctor:

"We all unite in saying publicly that the family doctor is the keystone of the medical arch, and that he is in the forefront of the battle, and nullify our statements by encouraging the public to bow down and worship the Golden Calf of Harley Street. If a man has the urge and the desire to become, say, an anaesthetist, good luck to him! . . . Why, however, should he be looked upon as a being of superior clay to the family doctor, who, we so consistently agree, is the man of greatest importance in the health service, and who must, if he is the right type, combine good medical knowledge with superhuman industry and know-

The original general practice unit at Edinburgh consisted of a practice comprising some 2,000 patients and staffed by two doctors, a public health nurse, a medico-social worker (almoner), and a secretary, all of whom were university employees. In addition, the services of a dentist, pharmacist, and chiropodist were available. The team afforded instruction to a limited number of voluntary students. As this instruction was to become a required part of university teaching, and in order that more students might be accepted, a second team, with identical staff and facilities, had recently been added, thanks largely to financial support from the Rockefeller Foundation. Some 15 students were accepted by this unit each academic term. They attended a weekly seminar as a group, and each student was also allotted one session a week, when he was the only other person present while the doctor saw patients who attended without appointment. The method of teaching was to manoeuvre the student into a position of clinical responsibility for an individual or a family, and the approach was that of the apprenticeship technique.

In the same section Dr. J. F. WARIN, M.O.H., Oxford, discussing the future of public health services, described himself as "one of the lucky ones," in that while many medical officers of health had lost touch with fever hospitals during the last five years he had been allowed to accept the post of part-time consultant to the United Oxford Hospitals, with clinical responsibility for 36 infectious diseases beds. He was sure that it was just as important as ever for the potential recruit to the public health service to have a good grounding in infectious diseases. A critical review of infectious diseases routine which he had carried out during the last six years in one large and one medium-sized county borough had revealed some "very dusty corners," and he had been amazed at some "prehistoric practices" still in existence. He gave examples of routine procedures of long standing which had served their purpose and might well be discontinued with benefit for all concerned—for example, prophylactic eyedrops for all newborn babies, fumigation of library books, and the like.

Maternity and Child Welfare Services

The integrated service of domiciliary midwifery which was started in Oxford last June, when the health department and the general practitioner went into full partnership, was also described by Dr. Warin. Under this scheme every new patient attending a local authority antenatal clinic is immediately referred to her own doctor for booking in the maternity medical service. She continues to attend the municipal clinic for antenatal care, and then is again referred to her doctor with a detailed report at the 36th week. Most cases are delivered by the midwife, but if necessary the doctor with whom the patient is booked is called in. Post-natal examination is the responsibility of the general practitioner, but the municipal service and health visitors play an important part in encouraging the patient to attend. The scheme was working, said Dr. Warin, to everybody's satisfaction.

In opening a discussion on the future of the maternity and child welfare services, Dr. F. J. W. MILLER, of Durham University, repudiated the idea put forward by some recent speakers and writers that the day of the child welfare service is over, but he felt that a time had come for a frank examination of its problems. He pointed to disappointing figures at child welfare centres in Newcastle; only 30% of the infants were taken to the centre 10 or more times in the year. In health visiting, again, the other pillar of the child welfare service, he found room for improvement; in particular the health visitor should be taken into the confidence of the medical officer of health. Regular visiting in all areas should be replaced by selective visiting, with concentration on the people who did not attend clinics, and in each district, without formal plans being made, the health visitor should be encouraged to get in touch with the family doctors.

ledge of applied psychology? The statement 'He's only a G.P.' is heard far too often, and unless something is done to get things into their proper perspective, the general standard of medical care will be seriously prejudiced."

Expertise in one facet of an almost limitless subject should not connote superiority. But Dr. Topping went on to ask why either the consultant or the family doctor should be considered superior to the doctor who elected to specialize in community health—a field almost as wide as that of general practice. The reason was not far to seek—there was nothing spectacular in removing the conditions which predisposed to tuberculosis, but a successful thoracoplasty or an avoidable tuberculous meningitis cured by streptomycin may qualify for a banner headline.

Occupational Health and Housing

Questions of occupational health took a larger place than usual in the Congress. Dr. ANDREW MEIKLEJOHN, president of the section, suggested that too much emphasis was placed on the contribution of medical service to industrial production. Such a contribution would, of course, come about as a result of efficient medical service, but it was not the primary purpose. He also said that the occurrence of accident or disease in industry was too apt to be ascribed to the human element, often meaning by that term a factor beyond control. In fact, not infrequently the cause was just carelessness, indifference to the welfare of others, or plain laziness. In other instances, important to the industrial medical officer, it arose from physical, mental, and social strains, not necessarily a part of the job, but influencing its working efficiency. Dr. Meiklejohn was a little disturbed by the tenor of some of the advocacy for a comprehensive occupational health service not restricted to factories, but embracing all workers, wherever and however employed. The attainment of an occupational health service need not involve emotion or over-statement. It would come about from the workers themselves, who, enjoying the benefits of proper homes which they alone could provide by more urgent effort, would not tolerate inferior or noxious conditions at work.

Several papers dealt with housing, one of them by the Chief Medical Officer of the Netherlands, Dr. C. BANNING, who said that statistics in Holland had failed to reveal a correlation between tuberculosis and bad housing. On the other hand, it had been shown that the children who came to child guidance clinics were in the main children from overcrowded and shared houses. Bad housing conditions played an important part in the field of mental health, and 30% of Dutch families shared their homes with others. A similar theme was developed by Dr. J. V. WALKER, M.O.H., Darlington, who, discussing housing priorities, said that less damage was done (and less housing priority therefore required) in homes with a distressing case of illness, provided there was family affection, than in the household where everybody was at odds, although superficially all appeared to be in reasonable organic health. Psychological strain, he considered, might be a reason for housing priority.

The Ageing Population

A session was devoted to the problem of the ageing. Dr. BLYTHE BROOKE, M.O.H., Finsbury, reminded the Congress that the number of persons over 65 has increased sixfold during the last hundred years; they now account for 11% of the population, and by 1977 may be expected to account for 16%. The proportion is now higher in Great Britain than in any other country except Belgium, though Switzerland comes close. He also pointed out that what these people stand in need of is more than occupation, it is a share in the life of the community.

Medical officers and executives of industrial organizations described various schemes for employing elderly workers.

The final meeting of the Congress was concerned with tropical hygiene, when Dr. JOHN LOGAN, of the Division of Medicine and Public Health of the Rockefeller Foundation, discussed environmental control in the Tropics, its

problems and opportunities, and Dr. L. D. KHATRI, deputy inspector-general of the Medical and Health Services of the Hyderabad Government, gave a remarkable account of anti-plague measures in Hyderabad State. D.D.T. was introduced as an anti-plague measure towards the end of 1949, first in Hyderabad city, and then in the endemic zone in the State. In that year the number of plague cases had been 6,858, and the number of deaths 2,069. In 1951 the numbers were respectively 464 and 104, and in 1952 they were 17 and 2. It should be stated, however, that 1949 was a year of political disturbance, and the existing anti-plague organization broke down. The figures for some of the previous years were rather lower, but since 1944 the number of cases had always run into four figures, and only in one year was the number of deaths below 1,000. From September to November, 1952, with timely and intensive treatment with D.D.T., not a single case of human plague was reported.

Reports of Societies

ANNUAL CONGRESS OF THE OPHTHALMOLOGICAL SOCIETY

The Annual Congress of the Ophthalmological Society of the United Kingdom was held from April 23 to 25 at the Royal Society of Medicine. On the first day Dr. A. MACRAE delivered his presidential address on "Prognosis in Malignant Melanoma of the Choroid and Ciliary Body." There then followed a number of short papers. After tea Professor Sir Geoffrey Jefferson delivered the Bowman Lecture on "The Syndromes of the Cavernous Sinus." The annual dinner was held at the Trocadero Restaurant in the evening.

Antibiotics in Ophthalmology

The remaining days were devoted to further short papers, some films and demonstrations, and a discussion on "The Scope of Antibiotics and Chemotherapeutic Agents in Ophthalmology."

Professor ROBERT CRUICKSHANK, who opened the discussion, declared that the variations in the sensitivity of bacteria, and the possibility of otherwise sensitive organisms developing resistant variants, made it essential that antibiotics should be used only for the treatment of specific infections and not for the treatment of clinical syndromes. If this was to be done there must be close collaboration between clinician and bacteriologist. Possible toxic manifestations of antibiotics and chemotherapeutic agents must always be remembered: allergic reactions, blood dyscrasias, and secondary effects resulting from elimination of normal flora were among the most important. Local irritation or necrosis was especially important in ophthalmology and might be assessed by the effect of antibiotics on tissue cultures. Drug resistance could sometimes be overcome or prevented by combining two chemotherapeutic agents. Synergetic effect might be obtained by using two bactericidal substances; there was a possibility, however, of antagonistic action when a bactericidal drug was used in combination with a bacteriostatic substance.

Professor ARNOLD SORSBY pointed out that the eye was pharmacologically a double organ. Diseases of the external eye responded to antibiotics in the same way as diseases of other tissues of the body. However, drugs given systemically were prevented by the blood-aqueous barrier from entering the intraocular fluids and cornea freely. Consequently the treatment of infections of the interior of the globe and cornea presented special problems. Small concentrations of antibiotics could be found in the aqueous after enormous systemic doses, but only penicillin was sufficiently non-toxic to allow such dosage. Subconjunctival injection was required if high intraocular concentration was to be obtained. Antibiotics suitable for this method of administration were penicillin and streptomycin in solution and chloramphenicol in micronized suspension. Of the

relatively non-toxic members of the sulphonamides, sulphamerazine was the most likely to be effective in intraocular infection, as it penetrated the blood-aqueous barrier the most readily.

Mr. DEREK AINSLIE then described a hitherto little-used antibiotic, polymyxin, the particular property of which was its powerful bactericidal effect against the Gram-negative bacillary organisms. He had found it suitable for subconjunctival injection, and when given in this way it was effective against both experimental and clinical infections of the cornea due to the destructive *Ps. pyocyanea*.

In the discussion which followed, Dr. G. SAUBERMANN (Switzerland) said that intraocular infections could be treated with aureomycin given intravenously. Dr. H. MILLER (France) had found that the application of antibiotics to a scarified area of the sclera induced intraocular penetration.

Nova et Vetera

PELICANS AND PINCERS

Old Instruments Used for Extracting Teeth. By Sir Frank Colyer, K.B.E., LL.D., F.R.C.S. (Pp. 245; 283 figures. 42s.) London and New York: Staples Press. 1952.

In Britain a separate dental qualification has existed for less than a century; before that teeth were extracted by surgeons, apothecaries, barbers, and quacks, and perhaps even by some physicians. The evolution of the instruments used for the extraction of teeth should therefore interest not only the dental but all branches of the medical profession, and their curiosity will be amply satisfied by the perusal of Sir Frank Colyer's book. The name of the author is sufficient guarantee of the accuracy and thoroughness of the historical research. The book is based on the Wallis memorial lecture delivered in 1938, and the unavoidable delay in publication has enabled much new matter to be added, so that, as now issued, it must be the most complete available account of all the instruments used for dental extraction from the dawn of history until modern times.

We are told there is no evidence that there were any special dental instruments known to the Egyptians, and that extraction of teeth, though practised by the Greeks, was by them confined chiefly to loose teeth, so that one of their writers commented: "As to the pincers for pulling out teeth, anyone can handle them." Yet we have no reliable illustration of dental instruments until the eleventh century in the work of Albucasis. A gap of three centuries then ensued, when Arcoli, in a commentary on a book by Rhazes, also described and illustrated such instruments. From the sixteenth century onwards we meet with many books describing a varied assortment of instruments which can be classed as pelicans, keys, elevators, and forceps, and it is under these headings that Sir Frank has described the multitude of weird and wonderful devices used by ingenious and sometimes misguided inventors. To the uninitiated it would appear that some of the instruments were too cumbersome and complicated, and we felt sympathetic with the remarks of Serre, who wrote of one curious instrument: "Such an invention could only originate from an author to whom the art was not perfectly known. . . . I know of only one dentist who has this instrument and I believe he has it only for exhibition to the ignorant." Let the reader study attentively the numerous well-produced illustrations and judge for himself if he could have told what was the purpose of the instruments pictured in Figs. 258 and 273. Probably everyone will agree with the last paragraph in the book, which reads: "This survey of the instruments used in olden days for the extraction of teeth must leave us with the grateful feeling that the use of anaesthetics and more scientifically constructed appliances has rendered the operation a less terrifying procedure."

The reader will note that many of the illustrations are from instruments in the Odontological Section of the

Museum of the Royal College of Surgeons, a unique collection which should be better known than it is. Let no one be deterred by the fact that the Colyer Museum is housed in a rather remote underground part of the College. It should be visited by every dentist and everyone interested in the history of this branch of surgery.

The most interesting fact in the book occurs on p. 57, where we learn that the oldest dental instrument in this country is housed, of all places, in the Royal College of Physicians. Is this a relic of a surgical past?

V. ZACHARY COPE.

Preparations and Appliances

THE LONG T-TUBE

Mr. RODNEY MAINGOT, surgeon, Royal Free Hospital, writes: The long T-tube, as illustrated, is a modification of the Kehr and the Cattell tubes which are now so often used in the surgery of the bile ducts. The tube is made of pure latex rubber, has a diameter of 10 English gauge (18 French gauge), is strong and durable, and is moulded into a single unit in order to avoid any weakness or defect at the point of union of the two limbs. The cross-limb measures 12 in. (30 cm.), whilst the other limb (which is led to the surface of the abdomen for drainage purposes at the end of the operation) is 13 in. (32.5 cm.) in length.

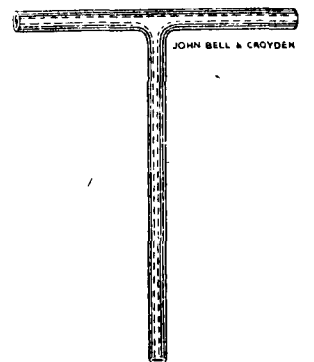
This T-tube may be employed with gratifying results after exploration of the bile ducts for choledocholithiasis; reconstructive operations upon the biliary passages for simple or malignant strictures; transduodenal choledochostomy for impacted stone in the ampulla, papillitis, fibrosis of the sphincter of Oddi, or excision of a small neoplasm of the papilla of Vater; and graduated dilatation of the lower reaches of the duct in cases of relapsing or recurrent pancreatitis. It has also proved most helpful in some difficult and hazardous gastro-duodenal resections for large, oedematous, and deeply penetrating posterior-wall duodenal ulcers.

For the common case of choledochostomy for stone in the bile ducts, after the ducts have been cleared of calculi and debris and after the ampullary region has been adequately dilated with flexible Bakes dilators, it is customary to trim the short arm of the T-tube to the requisite size so that one portion lies in the common hepatic duct whilst the other portion lies in the common bile duct. After the opening in the choledochus has been closed in a watertight fashion the long arm of the T-tube is led to the exterior.

For most of the other lesions which have been mentioned, it is advisable to pass one portion of the short arm of the T-tube downward, through the choledochostomy opening, into the duodenum, whilst the other portion above the "join" is pruned down so that it can be readily placed in the common hepatic duct.

So far as can be ascertained, there is little, if any, reflux of duodenal contents into the biliary tree, whilst the advantages of employing this indwelling tube, for the types of cases I have described, are considerable.

After many trials and adaptations this T-tube, as now made by John Bell & Croyden, Wigmore Street, London, W.1, has proved of inestimable value in the surgery of the bile ducts, and also in the occasional case of partial gastrectomy for the large callous penetrating ulcer of the duodenum.



Correspondence

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

Apnoea in Anaesthesia

SIR,—In your leading article (*Journal*, April 18, p. 875) on apnoea in anaesthesia the sting lies in the tail. The final sentence reads: "Further, the differential pressure changes occurring in the lungs and respiratory tract should not be such as to cause disturbance to the cardiovascular system." I believe that many physiologists will be surprised to learn that positive pressure ventilations can be carried out at all without causing some disturbance in the cardiovascular system. The disturbance is small, no doubt, usually well tolerated, and more than compensated by the other advantages of quiet, full ventilation which perhaps can in the particular circumstances be secured only by positive pressure inflation.

Nevertheless there are still anaesthetists so old-fashioned as to believe that in certain cases the unavoidable slight disturbance of cardiovascular function consequent upon positive pressure inflation may become of critical importance. I believe that there are critically ill patients who do better if they are allowed to breathe for themselves, and it seems to me that it is the anaesthetist's business to balance the risks and pick these cases out. One often has to do a little harm in order to achieve more good, but it seems wrong to lose sight of the fact that the "little harm" is a real thing.—I am, etc.,

Newcastle-upon-Tyne.

E. A. PASK.

Modern Anaesthesia in Prostatic Surgery

SIR,—I was most interested in the letter by Dr. H. W. Loftus Dale and his colleagues on the use of spinal plus regional analgesia for prostatectomy (March 28, p. 727). I have been using this method for several years and my experience covers over 200 cases, including many elderly and poor-risk cases.

The technique I use is briefly as follows. Premedication, morphine $\frac{1}{4}$ gr. (8–11 mg.), atropine 1/100 gr. (0.65 mg.), given one hour before operation. Frequently quinalbarbitone sodium $\frac{1}{4}$ gr. (0.1 g.) is given before commencing the anaesthetic. Ephedrine-procaine 1 ml. solution is injected intraspinally; then, after administering a low spinal anaesthetic using heavy cinchocaine, a field block of the lower abdomen is performed. The anaesthetic solution consists of 200 ml. of 1 in 2,000 amethocaine hydrochloride solution to which 0.5 ml. 1 in 1,000 adrenaline and one ampoule of hyaluronidase are added. The ilio-inguinal and ilio-hypogastric nerves are blocked on each side medial to the anterior superior iliac spine, and a bilateral lower rectus sheath block is carried out. Anaesthetic solution is then infiltrated along the midline from umbilicus to pubis. Finally, a few millilitres of solution are infiltrated into the neck of the scrotum on each side of the division of the vasa. The procedure is a little more difficult in obese patients, but the use of a longer needle with, perhaps, a little more anaesthetic solution will usually provide a satisfactory result.

This form of anaesthesia produces an excellent operating field for the surgeon. There is minimal respiratory muscle paralysis, so that the patient tolerates the Trendelenburg position very well. The fall in blood pressure is rarely very great and is usually adequately controlled by one or two small intramuscular injections of a vasopressor. In our experience reactionary haemorrhage and clot retention are uncommon. I would like to endorse Dr. Loftus Dale's opinion of the value of this method of anaesthesia for prostatectomy.—I am, etc.,

Salford.

MARK SWERDLOW.

Cerebrospinal Fluid Pressure

SIR,—I was interested in Dr. David Bowsher's article (*Journal*, April 18, p. 863) on the C.S.F. pressure, in which there are many important points which must be challenged.

Dr. Bowsher says, "Fluids are virtually incompressible, and so do not obey Boyle's law." For "fluid" surely is here meant "liquid"; according to the *Shorter Oxford English Dictionary*, fluid is "a general term including both gaseous and liquid substances consisting of particles that move freely among themselves so as to give way before the slightest pressure," whereas a liquid is "a material substance in that condition in which its particles move freely over each other (so that its masses have no determinate shape) but do not tend to separate as do those of a gas. Fluids are divided into liquids, which are incompletely elastic, and gases, which are completely so." The use of the words fluid and liquid as synonymous is a common mistake, but should not occur in a scientific statement. It follows from this that Boyle's law has no relevance to the argument, the law being that the volume of a gas varies inversely as the pressure. Although for practical purposes liquids may be considered incompressible, nevertheless under great pressure there is a slight diminution of volume, and up to pressures of 65 atmospheres the compression is proportional to the pressure. It follows that a closed rigid container may be filled to capacity under atmospheric pressure (that is, zero pressure if we choose to call it so for simplicity's sake), or it may be filled under any pressure chosen. In the example given (Fig. 1) extra liquid introduced into the cylinder will rise in the U-tube, by displacement, and will indicate by the height of its new level the pressure within the cylinder. A motor-car could not be raised by a hydraulic jack if pressure were not imparted to the liquid contents.

In Fig. 3 we are not informed of the units of the axes of the graph, but it is clear from visual measurements that there is a considerable alteration of pressure between A and B, whatever units of pressure may be employed. Surely the pressure within the elastic tube necessary to change its cross-section from ellipse to circle will depend also on forces acting outside the tube; if we are dealing with a vein in the subarachnoid space, it will depend on the C.S.F. pressure around the vein, tending to collapse it, as well as on its elasticity (or rigidity) and the intravenous pressure. Applying his argument, Dr. Bowsher states that a volume increase in the tube bringing it from an elliptical to a circular cross-section will cause no increase of pressure—although his graph shows there is an increase of pressure which he contends is small—but will displace liquid into the U-tube, which elevates the height, H, by the additional h_1 . This h_1 is clearly the manometric increase of pressure; his manometer is not only measuring volume, it measures pressure, which he seems to ignore.

"The dura is inelastic." This statement is incorrect, as anyone who has watched a craniotomy in a case of high intracranial pressure can observe for himself. When the bone flap is raised, the dura mater will immediately stretch slightly but unequivocally. And if before the dura mater is opened the bone flap is replaced it will be found to be "riding" in its defect and will need force to be rendered flush with the surrounding cranium, in its former position.

"Partially collapsed veins can be changed from elliptical to circular cross-section without increase in pressure." This misleading statement has been dealt with above, and is disproved by the published graph Fig 3. And if an increase in intravenous pressure does not change them, what does?

Dr. Bowsher later states that "it has hitherto been held" that the rise in the pressure of the C.S.F. (presumably in the lumbar theca) on abdominal compression is due to failure of C.S.F. to be absorbed while its secretion continues. I do not know who has held this view, but it is certainly neither held nor taught in knowledgeable neurological or neurosurgical circles. It has been taught for many years that such a rise is due to the increase of pressure in abdominal veins being communicated to the vertebral plexus of veins and thereby the lumbar C.S.F. In Queckenstedt's test, the compression of the jugular veins leads to distension of the intracranial veins, as Dr. Bowsher correctly states, and they distend (or become circular) because the pressure within them rises inevitably; and there is some displacement of C.S.F. into the spinal theca. The pressure within the cranium rises, and can be measured by a manometer attached to a needle in the ventricle, and the pressure rise can also be measured by lumbar manometry. Dr. Bowsher here puts the word pressure in inverted commas; does he not believe he is measuring pressure with his manometer? Of course, the quantity of liquid filling his manometer vitates to some extent the actual figure of the

pressure; his reading will be slightly less than the actual pressure present before he connected up his manometer. And to render this error as small as possible all spinal manometers should be constructed with tubing of as fine a calibre as is practicable.

"The dura must therefore be looked upon as adhering to the cranium and vertebral canal." Yes, the dura (except for its great partitions) is adherent to the inner surface of the skull; that is an anatomical fact, and for that reason only the dura covering the brain in the intact skull can be considered inelastic. But the dura is not adherent to the spinal canal; that also is an anatomical fact and cannot "be looked upon" as anything else. Weed and others, to whom Dr. Bowsher refers, realized this, and on the presence of this extradural spinal space containing veins and fatty areolar tissue rests their explanation for their various "tilting" experiments to which Dr. Bowsher refers. Indeed, in certain positions this spinal extradural space is under negative, that is, less than atmospheric, pressure. Were the dura not loose in the spinal canal displacement of C.S.F. from the cranium could only occur at the expense of spinal venous blood.

Dr. Bowsher makes other comments concerning the maintenance of the normal C.S.F. pressure, a subject much too large to be dealt with by correspondence, and I have already trespassed excessively on your valuable space. May I suggest that he refers to a summary of this subject in the section on the nervous system in *Recent Advances in Surgery* (Churchill, 1948), where the more important references may be found. Finally, in his summary Dr. Bowsher states that "there has been a fundamental misconception with regard to spinal manometry": I suggest that the misconception lies with Dr. Bowsher.—I am, etc.,

London, E.1.

D. W. C. NORTHFIELD.

SIR,—How comes Dr. David Bowsher to ignore in his article, "The Cerebrospinal Fluid Pressure" (*Journal*, April 18, p. 863), the work of the late Sir Leonard Hill on this subject,¹ the correctness of which, as I have stressed,² is verified clinically by observation of the retinal venous pressure response at the disk?—I am, etc.,

Nottingham.

THOMSON HENDERSON.

REFERENCES

- ¹ *The Physiology and Pathology of the Cerebral Circulation*. 1896. London.
- ² *Principles of Ophthalmology*, 1950. London.

The Training of Physiotherapists

SIR,—A certain prominence has been given lately in medical journals to the training of physiotherapists, and we feel that certain points ought to be clarified for the medical public. Physiotherapists in this country belong to three groups: (1) the Physiotherapists Association, (2) the Faculty of Physiotherapists, and (3) the Chartered Society of Physiotherapy. The Cope Report, drawn up by a committee of nine members, six of whom were in active association with the Chartered Society, whereas the other two bodies were not represented, recommended to hospital authorities to employ exclusively members of the Chartered Society; and the first circulars of the Ministry of Health were drawn in this spirit. The injustice of this Report, however, has been rapidly realized, and the Minister of Health stated in Parliament on March 19 that the Cope Report would not be implemented, and that he would further withdraw the temporary instructions in the Ministry circular referring to the employment of chartered physiotherapists, and make new regulations fair to all associations concerned.

We are at a loss to understand this tendency of the Chartered Society to monopolize physical treatment in this country. Apart from the fact that it goes against the liberal principles that dominate medical work, nothing has demonstrated the superiority of the members of the Chartered Society over those of the other associations of physical treatment practitioners. We must emphasize that hospitals employing members of the Physiotherapists Association and the Faculty of Physiotherapists are perfectly satisfied that the training of members of the Association and the Faculty is not inferior to that of the Chartered Society.

We are astonished at the boosting of the Chartered Society training in the letter by the president and vice-

chairman of the council of that society (*Journal*, March 14, p. 615). The "schools" to which he refers are neither owned nor controlled by the Chartered Society, but are part of State hospitals. Thus the Chartered Society is using publicly owned and publicly maintained hospital facilities to bolster its monopolies. This, by the way, is an anomaly which undoubtedly will be corrected by Parliament. The education plan formulated by the Physiotherapists Association, and supported by education authorities, experienced teachers, and the medical profession, provides for the co-operation of the technical colleges and teaching hospitals. Physiotherapy training schools should be a part of a university and the physiotherapy qualification should be a recognized university diploma. The present standard of the Chartered Society, on whatever level it is assessed, is parochial compared to the real aim of producing a physiotherapist who can take his place as an accepted member of a medical team, receiving alike the support of the medical profession and the confidence of the public.—We are, etc.,

A. P. CAWADIAS,
President.

The Physiotherapists Association,
London, W.1.

S. S. KNIGHT,
General Secretary.

The Metric System

SIR,—I think Dr. J. W. Shackle (*Journal*, April 18, p. 887) has confused the origins of the ml. and c.cm. The litre, as now defined, has no relationship to the metre and is not based on any linear measurement at all. Hence the thousandth part of a litre is not a cubic centimetre. The fact that the new litre has a volume of 1,000.027 c.cm. is a tribute to the skill of our forebears, and means that for practical purposes the thousandth part of the old litre (c.cm.) and new litre (ml.) can be regarded as identical. There is one volume used in medicine, however—namely, that of the haemocytometer chamber—which is still based strictly on a linear measurement. Haematologists are correct in using the term cubic millimetre, and would be wrong to speak of a "millimil."

I think Dr. Shackle may be unaware of the historical basis of all this, and would respectfully refer him to an excellent article on it by Dr. J. M. Hamill.¹

Dr. Shackle rightly mentions the danger of the misplaced dot. May I remind your readers that a misplaced "squiggle" on the drachm sign is also dangerous? There are many published examples of overdosage from this.—I am, etc.,

Enfield.

C. ALLAN BIRCH.

REFERENCE

- ¹ *British Medical Journal*, 1947, 1, 460.

SIR,—So far, no serious arguments have been made against the introduction of the metric system into medicine. The latest one, advocated by Dr. R. A. C. Herron (*Journal*, April 25, p. 938), seems utterly frivolous. If I understand him correctly, the metric system should not be used because "for some reason of habitual usage" no one in Zurich would understand what is meant by 0.5 mg. or half a milligram. Apparently it is necessary to say or write 0.0005 g. If milligrammes were regularly used for small doses, fractions of any sort would only occasionally be used, for, as near as makes no difference, 1 mg. = 1/60 gr., 0.5 mg. = 1/120 gr., and doses smaller than 1/120 gr. are seldom used. If very small doses are employed then micrograms (μ g.) are very convenient—e.g., 50 μ g. of vitamin B₁₂ (= 0.05 mg., or gr. 1/1200).

Dr. John Primrose (*Journal*, April 4, p. 782) says he uses the metric system for his scientific work but prefers to "prescribe opiates in vulgar fractions of a grain." Why is morphine gr. $\frac{1}{4}$ more convenient than 15 mg. of morphine? No one would dream of prescribing pethidine in the old system. It is purely a matter of what one is used to, and there is a lot to be said for getting rid of these fractions of a grain, which sometimes are absurdly small, as the dose of digitaline, which is gr. 1/600 in the old system.

A great deal has been written about the allegedly cumbersome numbers used in the metric system. For instance, Dr. C. Langton Hewer (*Journal*, February 21, p. 450) quotes the pre-anaesthetic dose of paraldehyde as 3.55 ml. per 6.35 kg., but the approximate metric equivalent is 0.5 ml. per kilogram, which has already been pointed out by Professor W. C. W. Nixon and Mr. T. D. Whittet (*Journal*, March 14, p. 619). It cannot be too strongly emphasized that exact equivalents are not required. Doses in the old system are *adjusted* to the convenience of the system, and in general "round numbers" and "simple fractions" are employed—for example, 5 gr., 30 gr., $\frac{1}{4}$ gr., $\frac{1}{100}$ gr., etc. If doses now ordinarily expressed in the metric system are accurately changed into the old system, equally cumbersome figures are obtained—for example, 1 g.=15 $\frac{2}{5}$ gr. and 1 ml.=16 $\frac{9}{10}$ minims. No one has used this argument against using the old system, but it equally applies.

There is no doubt that the metric system is simpler and far less cumbersome than the old system. All medical students would welcome it, and its introduction into medicine would bring our subject into line with all the other sciences all over the world. I have vivid memories of my dismay in having to learn and understand the apothecaries' system after having used and easily understood the metric system for years while doing science at school and at the university. British and American textbooks and journals are extensively read in other countries, and the old system of dosage often employed must be incomprehensible to many readers, even when they have a perfect knowledge of English.—I am, etc.,

Thornton Heath.

G. P. BAKER.

Iron Therapy

SIR,—I have followed the correspondence on iron therapy with interest and await the results of the investigations of Professor P. Larizza and Dr. S. Ventura (*Journal*, April 18, p. 885).

As a general practitioner, my chief worry has always been the tolerability of iron compounds. I decided to carry out a clinical test of ferrous gluconate, the results of which were published in February this year.¹ I found that a ferrous gluconate preparation gave most satisfactory results. Not only is it an adequate substitute for ferrous sulphate, but causes no digestive disturbances whatsoever. I would draw this new preparation to the attention of all general practitioners who have been bothered, as I have been bothered, by the inability of a large proportion of secondary anaemias to tolerate ferrous sulphate and other compounds.

To quote your Italian correspondents, it may be incautious to infer that ferrous gluconate used by itself is a more efficient haematinic than ferrous sulphate, but I am prepared to assert from the results I have obtained that it is every bit as good, and its easy tolerance and absence of side-effects make it by far the most useful preparation that we have available to-day.—I am, etc.,

Cardiff.

W. MERFYN JONES.

REFERENCE

- ¹ *Practitioner*, 1953, 170, 185.

Blood Grouping and Cancer of Stomach

SIR,—Professor Ian Aird and his colleagues (*Journal*, April 11, p. 799) appear to have shown that persons of blood group A have a greater susceptibility to cancer of the stomach than have those of blood group O. Such studies of varying susceptibility to disease should be vigorously pursued because information of immediate practical value may be obtained. For instance, Chevallier and Desoille¹ showed that workers who handle benzene and are of blood group O are much more susceptible to ill-effects than are those of blood group A, while those of blood groups B and AB have a susceptibility intermediate between these two groups. Indeed, these authors go so far as to suggest that the possession of blood group A should be essential for all workers in benzene. Unfortunately, this work has not, so far as I can discover, been pursued either in France or elsewhere. Of less immediate practical importance is the apparent fact that more leukaemics are of blood

group A than of blood group O, while haemorrhagic diseases seem to be most common among people of group O.

Unfortunately the published work has dealt with relatively small series of cases, but if the workers and funds were available it should not be difficult to collect a large series of observations from the records of the hospitals of this country.—I am, etc.,

London, W.1.

A. PINEY.

REFERENCE

- ¹ *Sang*, 1947, 18, 126.

Respiratory Function

SIR,—Dr. K. W. Donald, in Part I of his article on the assessment of respiratory function (*Journal*, February 21, p. 415), remarks that it is still not known why a person should be uncomfortable when exercise causes him to ventilate about half the air that he can shift at rest without distress, by voluntary hyperventilation.

Could the answer be that during exercise the cardiac output is greatly increased from both sides of the heart and the pulmonary vascular bed becomes dilated and even new channels opened up, with a great increase in the quantity of blood in the lungs? This will prevent full alveolar expansion and ventilation, a condition somewhat analogous to the pulmonary congestion of mitral stenosis. Has the blood volume of the lungs during exercise been compared with that during voluntary hyperventilation?

Secondly, during exercise an oxygen debt is built up and there is a temporary anoxaemia not present during voluntary hyperventilation. This will have an additional effect of increasing the dyspnoea.—We are, etc.,

Champion Reefs, S. India.

GEOFFREY FFRENCH.

B. N. KRISHNAMURTHY.

Erythrocyte Sedimentation Rate Irregularities

SIR,—The recent papers on erythrocyte sedimentation rate irregularities by Gilmour and Sykes¹; Goldberg, Glynn, and Bywaters²; Goldberg and Conway³; and Alexander⁴ prompt me to report the findings of my own investigations, which were begun in 1949.

One of the disadvantages of the Westergren method is the difficulty of obtaining at the bedside the exact degree of dilution of blood with sodium citrate solution. It was thought that such dilution errors could be overcome by the use of heparin (solid) as an anticoagulant. Very irregular E.S.R.s were observed by this method—one patient with an E.S.R. of 60 mm. appeared to have an E.S.R. of 5 mm. a week later. It seemed that the change of anticoagulant might be the cause of these anomalous readings, and so the matter was investigated. It was found that irregular (low) one-hour readings were associated with the use of solid anticoagulants such as heparin and the oxalate mixture of Heller and Paul.⁵ These irregularities were found to be caused by an excessive prolongation of the aggregation phase of sedimentation (Cutler⁶) due to an inhibition of rouleaux formation. This inhibition occurred more frequently in deoxygenated blood, and it was found that, if blood known to have a high E.S.R. was equilibrated with carbon dioxide, rouleaux formation was so inhibited that the one-hour E.S.R. reading was reduced to normal limits. This inhibition appears to be a metastable state, for after an interval of 30–50 minutes the *whole column* of blood suddenly becomes coarsely granular (intense rouleaux formation) and very rapid sedimentation then occurs. If this inhibition lasts over 45 minutes and the E.S.R. is read at one hour a falsely low reading will result. This metastable state might be considered to be a hysteresis phenomenon. Such prolonged inhibition of rouleaux formation could not be obtained with blood using a liquid anticoagulant (3.8% sodium citrate solution). E.S.R. irregularities with blood using a solid anticoagulant were eliminated by diluting this blood with 3.8% sodium citrate solution.

This phenomenon appears to be the same as that originally observed by Lundgren⁷ in hirudinized blood. The effect of CO₂ and O₂ on the E.S.R. has in the past been considered

to be unimportant, for, though CO₂ was found to decrease and O₂ to increase the E.S.R., the changes were found to be small (Leendertz⁸ and Ito⁹). These findings were based on experiments using liquid anticoagulant—3.8% sodium citrate solution as originally used by Fåhræus.¹⁰ When the solid oxalate mixture of Heller and Paul began to be employed for the determination of the E.S.R. by the Wintrobe method, it appears that previous work was not repeated to ascertain whether findings related to liquid anticoagulants also applied to solid anticoagulants.

Full details of this work have been submitted for publication.—I am, etc.,

MCD. DUXBURY.

REFERENCES

- ¹ *British Medical Journal*, 1951, 2, 1496.
- ² *Ibid.*, 1952, 1, 202.
- ³ *Ibid.*, 1952, 2, 315.
- ⁴ *Ibid.*, 1953, 1, 433.
- ⁵ *J. Lab. clin. Med.*, 1934, 19, 777.
- ⁶ *Amer. Rev. Tuberc.*, 1929, 19, 544.
- ⁷ *Acta med. scand.*, 1927, 67, 63.
- ⁸ *Disch. Arch. klin. Med.*, 1921, 137, 234.
- ⁹ *Tokoku J. exp. Med.*, 1924, 5, 139.
- ¹⁰ *Acta med. scand.*, 1921, 55, 1.

Subserous Duodenal Haematoma

SIR,—In his medical memorandum (*Journal*, March 28, p. 712) Mr. D. I. Stirk records a case of subserous duodenal haematoma resulting from a "non-penetrating and apparently trivial injury." I should like to record a similar case in which the injury was sustained in an identical manner.

A child aged 6 years was admitted to hospital four days after a blow in the left hypochondrium from the handlebars of his bicycle. After the injury he continued his journey home, but subsequently complained of recurrent bouts of upper abdominal pain, followed in 24 hours by anorexia and vomiting of bile-stained fluid. An enema had been given on the second day with a good result. On admission to hospital the child was found to be slightly pyrexial, had a dry tongue, and abdominal examination revealed rigidity of the left side, maximum in the left hypochondrium. Rupture of the spleen was diagnosed and laparotomy advised. This showed absence of any free fluid in the peritoneal cavity, but revealed a large tense black sausage-shaped swelling about 6 in. (15 cm.) in length in the region of the upper jejunum. This was thought to be gangrenous bowel, but immediately this was touched the tense lesion burst and extruded a quantity of black blood clots. The lesion was then discovered to have been a subserous haematoma. The first 15 cm. of the jejunum and its mesentery appeared to be grossly disorganized and was resected. An end-to-end anastomosis at the duodeno-jejunal flexure was done. The child made an uneventful recovery. Examination of the specimen showed disorganization of most of the tissues by blood clot, but the actual bowel mucosa appeared to be healthy.

It is of interest to note that this injury occurred in the same fashion as the case reported by Mr. Stirk—that is, by a child riding a bicycle. There were no external signs of bruising and the injury at first seemed trivial, its effects being seen only after some hours. This lesion is quite distinct from a traumatic rupture of the mesentery with free intraperitoneal haemorrhage, and its signs are delayed in onset. This is a point well to be borne in mind when one remembers that these types of accidents commonly find their way to casualty departments and are often first seen by a junior member of the hospital staff.—I am, etc.,

Ipewich.

C. I. COOLING.

A Paper Not Read

SIR,—Several most serious issues for the medical profession as a whole are involved in the case of *Crawford v. Charing Cross Hospital*. Having attended the whole proceedings and heard the judgment, the features which cause the greatest concern are the following:

Nothing was done or left undone which in any way departed from widely accepted practice at that time, practice which had indeed never produced a palsy throughout the long professional career of the anaesthetist.

The angle of abduction was within the right angle—to quote the judgment: "an angle of 80 degrees or thereabouts."

Mr. Justice Gerrard expressed the view that he did not think the problem of negligence or no negligence turned upon current practice. He admitted the advantages of abduction of the arm for good blood flow and general observation.

Mr. Ewing¹ had warned against the dangers of abduction. The anaesthetist, never having met a brachial palsy and therefore considering his precautions adequate, did not read the article in spite of being aware of its existence. To quote the judgment: "Nice questions might arise as to how far a medical man could excuse his ignorance of a technical development that he had not met in his reading of his professional journals." It was the anaesthetist's "duty to follow up the writings on a subject which concerned him closely." "I think it was regrettable slackness that left Dr. X in ignorance of the opinions of distinguished men on an important subject so closely affecting his own work at the time he came to administer the drip to the plaintiff."

Does written advice transcend in importance long practice and experience in guiding our actions?

We practise our profession at first largely as we have learnt it from our teachers, and improve as the years go by from our own experience combined with discussion and selective reading from the vast modern output of literature. Current practice is always lagging—and often how rightly so—well behind the pioneers of new methods. This dangerous precedent that such practice can become negligent within a few months of a new paper is one which must be fought in the Court of Appeal and even, if need be, in the House of Lords.—I am, etc.,

London, W.1.

MICHAEL ASHBY.

REFERENCE

- ¹ *Lancet*, 1950, 1, 99.

Dosage of Stilboestrol

SIR,—With reference to recent correspondence regarding the dose of stilboestrol the following observations may be pertinent so far as prostatic cancer is concerned.

In treating this condition the optimum dosage is basically determined by the amount of oestrogen required to control or retard the progress of the growth, qualified by there being no unreasonable risk that this quantity will evoke dangerous side-effects or complications. With regard to the former, objective evidence of tumour control can only be directly adduced from serial histological examination in cases where repeated biopsy is practicable during treatment. At the same time, owing to known variations in the natural course of the untreated disease, indirect information afforded by a study of the survival periods of patients receiving oestrogens will only establish the efficacy of a particular dosage if a large series of cases is reviewed.

Both these aspects have received attention in a recent survey of a personal series of 150 consecutive cases of histologically proved prostatic cancer treated with oestrogens. These cases, extending over the period 1942–52, have been divided into three groups receiving respectively a sustained dosage of 1–5 mg., 15–30 mg. and (more recently) 100 mg. stilboestrol daily. Repeated histological examination of the growth on two or more occasions during treatment was possible in 33 patients,¹ and evidence was obtained to show that, after an initial favourable response to small and large doses alike, many tumours ultimately became oestrogen-resistant. In some instances, however, a tumour which had apparently become resistant showed further evidence of response to oestrogens when the dose of stilboestrol was increased, and a distinction was thus apparent between growths showing a relative and an absolute loss of sensitivity. Although in no case was complete regression of a tumour achieved, it seemed likely that a failure to obtain prolonged retardation of growth in some represented the effect of inadequate dosage rather than a spontaneous increase of biological activity. This view is supported by a study of the survival periods of the entire series of cases, in that the average duration (making appropriate allowance for the comparatively recent introduction of the highest dosage) seems to be significantly increased in those receiving larger amounts of stilboestrol.

It would appear, therefore, from the direct and indirect evidence afforded by these methods of investigation, that,

so far as tumour activity is concerned, sustained treatment with at least 100 mg. daily is advisable. It is frequently alleged that prolonged dosage of this magnitude is more liable to evoke troublesome nausea and vomiting than when smaller quantities are prescribed. In my experience, however, this has not proved to be the case, the few examples encountered having been treated satisfactorily either by subcutaneous oestrogen implants of comparable strength or by supplementary castration. More recently, in instances where the primary growth has responded well to oestrogens but in which metastatic activity has subsequently increased despite sustained therapy, a few advanced cases have been treated by bilateral adrenalectomy and cortisone substitution with gratifying immediate results.—I am, etc.,

London, W.1.

J. D. FERGUSSON.

REFERENCE

¹ Fergusson, J. D., and Franks, L. M. (1953). *Brit. J. Surg.*, 40, 422.

Radioactive Phosphorus in Treatment of Menorrhagia

SIR,—We do not share Mr. D. K. Sambrook's cheerful opinion (*Journal*, April 18, p. 883) of x rays as a method of controlling simple uterine bleeding. In fact, our deep dissatisfaction with irradiation of the ovaries is based on studies of over 200 women who suffered from the side-effects of castration. For instance, the incidence of serious and persistent menopausal flushing and sweating is 50%, three times the normal, while the sudden onset of sexual anaesthesia or, at a later date, of senile vaginal changes must surely be considered as the cost of irradiation.¹ No doubt Mr. Sambrook, like ourselves, has to treat the side-effects of irradiation with oestrogens, but I am sure he will admit that it is a great nuisance to his patients and to himself, especially if his treatment creates a new and worrying symptom, post-menopausal bleeding. Our experiments with P³² were carried out in the hope that bleeding might be controlled without the effects of ovarian irradiation. We do not yet know if certain patients might resume normal menstruation after P³², nor do we know how many patients might reach the normal menopause.

We freely admit Mr. Sambrook's point that P³² cauterization of the endometrium does not attack the cause of the bleeding. In fact, in the vast majority of patients we do not know the cause, although we have discovered the wisdom of avoiding vague phrases such as "unbalanced production of oestrin" and "hyperoestrinism." The Birmingham students have a habit of asking us what we mean by such phrases. Both Mr. Sambrook and ourselves are recommending damage or destruction as therapy; we apply a β -ray "cautery" to the endometrium, he recommends x rays to the ovaries. We disagree with Mr. Sambrook in that we believe the ovaries are of importance at the menopause. It remains to be seen if there are ill-effects and dangers associated with irradiation of the uterus with P³². Lastly, we wish to state that our report was a preliminary one. We do not know if endometrial "cautery" by β -rays will prove itself as an effective therapeutic agent in menorrhagia.—We are, etc.,

HUGH C. McLAREN.
J. C. HEATH.
A. QUINTON.

Birmingham.

REFERENCE

¹ *British Medical Journal*, 1950, 2, 76.

Nikethamide by Mouth

SIR,—Unfortunately, it is letters like the one written by Dr. J. V. Cope (*Journal*, April 18, p. 885) that tend to make us "qualified quacks" in the eyes of specialists, hospital staff, and newly qualified doctors. It makes it difficult for G.P.s to obtain clinical assistantships, and will further remove us from scientific and accurate work demanded in hospital. The letter is entirely uncritical in description and coloured by erroneous subjective observations. We teach our patients

(wrongly) words like "cardiac debility" and in time become so enchanted by this meaningless word that we now try to teach it to each other instead.

Let us forget "subclinical cardiac debility" (which is so easily cured by nikethamide) along with "symptomless avitaminosis," "anaemia" when the haemoglobin is 98%, and "rheumatism of the knees" when the correct diagnosis is probably climacteric arthritis.

It is not the N.H.S. that has lowered our status as G.P.s but merely the fact that we now allow a much larger proportion of our patients to seek hospital advice and thus expose—I tried to avoid the phrase—the skeletons in our cupboards.—I am, etc.,

Luton.

H. JARVIS.

SIR,—May I endorse Dr. J. V. Cope's remarks on nikethamide by mouth and his appeal for further observations (*Journal*, April 18, p. 885), my own being frustrated by a shortage of cases of chronic bronchitis?

I was recently driven to prescribe nikethamide, 15 min. (0.9 ml.) orally in water, for severe paroxysmal dyspnoea in two advanced bronchitics with no clinical signs of heart failure. Both had already been treated with ephedrine, isoprenaline sulphate ("neo-epinine"), watery and oily adrenaline by injection, and "rybarvin" type inhalation. Both claim really dramatic relief and have been using it regularly for three months. This militates against the effect being purely psychological, together with the fact that I only imagined it to be a placebo myself and did not extol its virtue.

It is difficult to see why Dr. J. G. Macarthur (*Journal*, March 7, p. 547) did not start with usual dosages, though easy to appreciate that a patient in the throes of nausea and vomiting might report unfavourably or not very objectively on the agent which had caused it. Before estimating blood nikethamide levels and then consigning a possibly valuable paper and useful therapeutic agent to the dustbin, could he not also ask them how they react after a normal dose given orally—with appropriate controls, of course? This point has received somewhat cursory attention in the present paper, and, from what one can gather, will receive none at all in its sequel.

Whether this drug helps the patient is of rather more interest than its physiology.—I am, etc.,

Staines, Middlesex.

J. A. SINDELL.

Treatment of Ringworm of the Scalp

SIR,—Dr. S. Cochrane Shanks (*Journal*, April 4, p. 780) has written a similar letter on a former occasion.¹ No one doubts that, under the ideal conditions to which he refers, the chances of permanent alopecia following x-ray epilation are virtually nil. It may be that the continued embarrassment of prescribing wigs for the victims of earlier decades results in the over-emphasis of this therapeutic tragedy.

Some doubt exists, however, regarding the choice between an anaesthetic and the restraining couch, and not all radiotherapists, it seems, are in agreement with Dr. Shanks. Beare and Cheeseman,² reporting on 1,004 cases of scalp ringworm, advocate the use of anaesthesia for children between 1 and 3 years, mental defectives, and obstreperous subjects. Even if one encounters a case of *M. canis* infection that is "sufficiently persistent to warrant epilation"—and I have yet to do so—it should not influence one against the simpler and normally successful treatment. Nor would I expect the radiotherapist to abandon his x-ray epilation because of his occasional failure. During the Newcastle epidemic there were 13 "failed x-ray cases" in 1949.³

Without quoting a single reference, Dr. W. A. Dewar (*Journal*, April 14, p. 780) claims that the majority of authorities are in favour of x-ray epilation for *M. canis* ringworm. In fact, the reverse is true, and it would be unfortunate if such an ill-founded assertion were to gain credence. The mycologists, Lewis and Hopper,⁴ state:

"In several publications we have called attention to the tendency to spontaneous cure and to the success of local measures alone when tinea capitis is caused by *M. lanosum*." Muende⁵ writes: "The fact that animal microsporum infections usually respond to such simple treatment should encourage one to conduct careful cultural examinations of infected hairs before resorting to the commoner techniques of x-ray and thallium epilation." I would also refer him to Duncan,⁶ and Schwartz *et al.*⁷

Dr. Dewar considered that, to ensure against missed cases, routine Wood's lamp investigation should have been carried out at the schools involved in the investigation. The frequency of erythema reactions and also of coincident glabrous skin involvement as a means of diagnosing *M. canis* scalp infections renders this unnecessary.

Surely the experiment of waiving the school exclusion rule should be judged by the subsequent incidence of ringworm in the area concerned. Following on the cases reported up to March, 1952, three more cases occurred in March and two in May. All five came from different schools, at which they were of course allowed to continue attendance. From May, 1952, to April, 1953, not one case of *M. canis* ringworm has been reported in the County Borough of Newport.—I am, etc.,

BERNARD A. THOMAS.

Newport, Mon.

REFERENCES

- ¹ *British Medical Journal*, 1949, 2, 1351.
- ² *Brit. J. Derm.*, 1951, 63, 165.
- ³ Annual Report of Principal S.M.O., Newcastle-upon-Tyne, 1949.
- ⁴ *An Introduction to Medical Mycology*, 1943, Year Book Publishers, Chicago.
- ⁵ *Modern Practice of Dermatology*, edited by G. B. Mitchell-Heggs, 1950, Butterworth's Medical Publications, London.
- ⁶ *British Medical Journal*, 1945, 2, 715.
- ⁷ *Publ. Hlth. Bull. (Wash.)*, 1946, No. 294, 1.

Leprosy at Large

SIR,—The photographs I enclose were taken on March 23, 1953, two days after I found this case of leprosy in a rigor, hiding in a farm-labourer's cottage. The patient came to England a known and declared leper in 1947, and was for six months in a hospital for tropical diseases. She was discharged into our population to roam from home to home, hiding, as is the way of lepers, aided by her devoted husband. The condition of the husband, son, and home in the case that I now report was only what you would expect where the mother has no hands and virtually no feet. About a year ago another woman in this district with an unaccountable leonine frontal development was found by her



[A. T. Schofield, A.R.P.S.]



[A. T. Schofield, A.R.P.S.]

G.P. to have unsuspected leprosy. This letter is not intended to report the case clinically at this stage: it is intended to be a reminder of the existence in England of a disease one of the most striking social attributes of which is concealment. Its infectivity is low.

To admit lepers to England and not to follow them up may be followed by concealment, unnecessary suffering, crippling deformity, and thus a small additional burden to the community. This matter has already been vigorously represented by the district medical officer of health to the Ministry of Health and to his Member of Parliament without any alteration to the existing legislation concerning the notification and control of this disease.—I am etc.,

Steeple Ashton, Wilts.

FITZ HAYTHORNTHWAITE.

** The Public Health (Leprosy) Regulations, which provide for the notification of cases of leprosy direct to the Chief Medical Officer of the Ministry of Health, came into operation on June 22, 1951, several years after the discharge from hospital of the patient described by our correspondent.—ED., B.M.J.

West Memorial Lecture

SIR,—The students of the Welsh National School of Medicine have decided to establish a suitable memorial to the late Professor Cecil McLaren West, Professor of Anatomy in the school from 1927 until his untimely death in 1951. It is agreed that the memorial should take the form of a biennial lecture to be delivered in the medical school and designated the West Memorial Lecture.

To endow such a project it is desired to raise not less than £600, the interest on which can be used for the expenses of the lectureship. An appeal for contributions is addressed to all those who came into contact with Professor West. Members of the Medical School staff and past and present students have been approached, but this letter is addressed to all those members of the profession who would like to contribute towards the Memorial Fund. The closing date of the appeal is June 30, 1953. Any further particulars may be obtained from the chairman of the Memorial Committee at the undermentioned address, but all contributions should be sent to the Bursar, University College, Cathays Park, Cardiff. Cheques should be made payable to "The West Memorial Lecture Fund."

It is confidently hoped that the many friends of the late Professor West will help in establishing a worthy memorial to one whose life and work meant so much to so many.—We are, etc.,

JOHN H. HUGHES,
Chairman.

H. HUGHES.
JOHN PRYDE.

West Memorial Committee,
Medical Students' Club,
11-15, Howard Gardens,
Cardiff.

Obituary

Sir DAVID ROCYN JONES, C.B.E., M.B., D.P.H.

We record with regret the death on April 30 of Sir David Rocyn Jones at the age of 80. He was county medical officer of Monmouthshire for nearly forty years, and during the course of time he became one of the best-known and most popular men in the public life of South Wales and Monmouthshire.

David Thomas Rocyn Jones was born at Rhymney on November 16, 1872. His grandfather was famous in his day as a bone-setter in Cardiganshire. His father became a great friend of Hugh Owen Thomas, the pioneer of orthopaedic surgery in Liverpool, and David Rocyn Jones at one time thought of becoming an orthopaedic surgeon, as, in fact, his brother did. From Lewis's School, Pengam, he went on to the University College of South Wales at Cardiff, and later to University College, London. He continued the study of medicine at Edinburgh, where he graduated M.B., C.M. in 1897. Shortly after graduating he set up in general practice in Abertillery, having secured the appointment of surgeon



[Barratts Photo Press, Ltd., London]

to Powell's Tillery Collieries. Being also part-time medical officer of health of the town, he developed an interest in public health and took the D.P.H. of Oxford in 1904. Four years later—one of 97 applicants for the post—he became the first whole-time medical officer of health for Monmouthshire, the county of his birth. In 1908 preventive medicine was in its infancy, and Rocyn Jones built up a service which under his guidance went from strength to strength. Sufferers from tuberculosis had particular reason to be grateful to him, for in 1911 he was one of the founders of the Welsh National Memorial Association for the Prevention and Treatment of Tuberculosis.

David Rocyn Jones was a man of great geniality and wide interests, and he did not confine his activities to public health work. Very few medical officers of health can have played such an active part in public life as he did. Passionately fond of Rugby football, he was president of the Welsh Rugby Football Union at the time of his death, having been first elected to the Union in 1908. He saw the advance of Rugby football in Wales through many years of success, and at the time of his death he was regarded as "the grand old man" of Welsh Rugby. A leading figure in the affairs of the British Medical Association, he was chairman of the Monmouthshire Division in 1923 and president of the South Wales and Monmouthshire Branch in 1930-1. He was appointed a member of the consultative council of the Ministry of Health for Wales in 1919, and in later years he became a member of the Welsh Regional Hospital Board and chairman of the North Monmouthshire Hospital Management Committee. Controller of V.A.D.s for Monmouthshire and a member of the council of the Terri-

torial Army Association, he was appointed surgeon-in-chief of the St. John Ambulance Brigade in Wales in 1936. He was also prominent in the Priory for Wales of the Order of St. John, and was a Knight of Grace of the Order. For many years he was a county magistrate, being formerly chairman of the Bedwellty division of magistrates. He was a staunch Congregationalist, being a member of the Monmouthshire Congregational Union. With all this public work to his credit, it was not surprising that Rocyn Jones received many honours. He was appointed C.B.E. in 1920 and Deputy-Lieutenant of Monmouthshire in 1947. A year later he was knighted.

Always interested in education, Rocyn Jones was determined to strengthen the bonds between Monmouthshire and South Wales. He was a member of the court of governors of the University of Wales and represented the university on the council of the Welsh National School of Medicine. He was also vice-president of the court of governors of the University College of South Wales and Monmouthshire.

He married in 1901 Alla, daughter of Alderman S. N. Jones, of Abertillery. She died in 1950. There were four sons of the marriage, one of whom was killed in Italy during the last war. His son, Gwyn, succeeded him as county medical officer of health of Monmouthshire in 1946, and his eldest son, Nathan, is an orthopaedic surgeon in Cardiff.

We are indebted to Dr. R. M. F. PICKEN, Provost of the Welsh National School of Medicine, for the following appreciation: The death of Sir David Rocyn Jones at the age of 80 was not unexpected, but it leaves a gap in the professional, administrative, and sporting life of South Wales and Monmouthshire which will not be filled. He was a man of very striking personality, strong views, and great courage. Those of us who were concerned both with the organized medical services and with university education saw a great deal of him throughout the past thirty years, especially in the councils of the Welsh National Memorial Association for the Prevention and Treatment of Tuberculosis, of the Cardiff Royal Infirmary, of the University College of South Wales and Monmouthshire, and of the Welsh National School of Medicine. He took a very prominent part in the discussions and negotiations leading up to the establishment of the Welsh National School of Medicine as an independent chartered institution in 1931. Although he was strongly opposed to the separation of the school from the university college—of which he was latterly senior vice-president—he supported its work loyally and vigorously after the severance took place. I look back with great pleasure and gratitude to the friendship and kindness which he always showed to myself, in spite of the fact that I might be regarded as one interested in the school's independence. His knowledge and experience of administrative procedure was invaluable to younger men, and he was sure to pounce on any breach of order or departure from orthodoxy. As president of the Welsh Rugby Union he did much to prevent any departure from clean amateurism and the best sporting spirit in football circles.

He was a strong supporter of everything which is fine in the Welsh way of life, but there was nothing narrow or parochial in this support. Indeed he always looked back with joy and appreciation to his young days as a student in Edinburgh, and for many years was the moving spirit in an association of old students in South Wales of that university. We of the profession in this area have watched the careers of his sons in medicine with great satisfaction, and extend to them our deepest sympathy in their bereavement.

W. P. writes: Sir David Rocyn Jones was a man with a unique collection of characteristics blended together, the sum total of which resulted in what is popularly called a "character." I knew and worked under him for twenty years—not that one ever worked under him; one worked with him. He was never "the boss" in the accepted sense

of the term, but was always referred to affectionately as "the Old Man." The welfare of his medical, nursing, and administrative staffs was always his primary concern, and anyone who attempted to interfere with this welfare did so at their peril. One never hesitated to consult Sir David about professional problems or private difficulties. During his period of office in Monmouthshire he built up a health and school medical service which earned a high reputation; in fact much of his pioneer work helped in the organization of the public health services generally. He was in all senses of the term progressive, and in some ways could be regarded as a visionary. His passing is mourned by countless friends both inside and outside the medical profession.

JAMES THOMSON, C.B., C.M.G., M.B., C.M.

Major-General James Thomson, who served with distinction in the Army Medical Services in the war of 1914-18, died at Aberdeen on April 17 at the age of 90.

James Thomson was born on July 15, 1862, and was educated at the University of Aberdeen, where he graduated M.B., C.M. in 1886. Immediately after graduation he entered the service of the Army Medical Department, becoming captain in 1887. He took part in the Nile Expedition of 1898, being awarded the British medal and the Khedive's medal, with clasp, and in the following year he was promoted major. By the time war broke out in 1914 he had attained the rank of lieutenant-colonel in the R.A.M.C., and thereafter he shouldered many heavy responsibilities. He was appointed C.B. in 1917 and C.M.G. in 1919, in which year he attained the rank of major-general. In 1918, after having been D.D.M.S. of 8th Corps, he was selected to succeed the late Major-General Sir William G. Macpherson as Deputy Director-General of Medical Services of the British Armies in France. After the war he became D.D.M.S. to General Sir Ivor Maxse, who was at that time commander-in-chief of Northern Command. Major-General Thomson, who was a Knight of Grace of the Venerable Order of St. John of Jerusalem, retired from the A.M.S. in 1920. He married Miss Mary E. Marr, daughter of Surgeon-Major G. Marr, I.M.S., in 1897.

We record with regret the death on March 21 from cerebral arteriosclerosis and thrombosis of Dr. W. F. CORFIELD. He was 73 years of age. Walter Francis Corfield was the younger son of the late Dr. W. H. Corfield, professor of hygiene, University College, London. From Westminster School he went on to study medicine at University College Hospital, where he qualified in 1904. After holding appointments as house-physician and assistant in the bacteriological laboratory at U.C.H. he graduated M.B., B.S. in 1907, and took the D.P.H. in the following year. He then travelled with a patient for about a year, and later became medical officer of health and school medical officer at Colchester, a post for which he was well suited and which he occupied with distinction. During the first world war he served in the R.A.M.C., attaining the rank of major. From 1924 to 1930 he served as secretary of the Essex Branch of the B.M.A., and he represented his Division at the annual meeting in Manchester in 1929. When he retired from his post in Colchester he became medical adviser to the Kuwait Oil Company: his capacity for organization and his training as an M.O.H. were most valuable in this work, which he liked and was interested in. During the course of his career Corfield wrote numerous articles for the medical journals covering a wide range of public health subjects. For about 20 years he spent his annual holiday at Lenzerheide, a Swiss ski-ing resort. He excelled at the old-fashioned telemark turn, and his knowledge and experience of the country and of snow conditions was exceptional. An active member of the Ski Club of Great Britain, he was at one time a judge for the second-class test. Corfield

took his ski-ing and everything he did seriously, and was always on the lookout for an opportunity to improve his technique in other sports and games. He was a delightful companion, cheerful, calm, never angry, with a lively sense of humour, and he will be missed by a large number of friends. He leaves a widow.

Dr. ALBERT RILEY died suddenly at his home at Audley, Staffordshire, on December 27, 1952, at the age of 58. Albert Riley was born on October 24, 1894, the elder son of the late Mr. D. W. Riley, and was educated at the Newcastle Middle School, where he was head prefect and sports champion. After leaving school he took a post with the National Provincial Bank at Wakefield, Yorkshire, before joining the Forces and serving overseas with the King's Royal Rifles in the war of 1914-18. He was subsequently commissioned in the Cheshire Regiment and later transferred to the Royal Flying Corps. After demobilization he returned to his pre-war work for a time, and then decided to study medicine at the University of Manchester, where he graduated M.B., Ch.B. in 1924. After working as a ship surgeon for a time he settled in practice at Audley with the late Dr. William Megaw, eventually taking complete charge of the practice. Always a great lover of sport, his chief interest lay in cricket, and after he himself had ceased to play he became president of the Audley Cricket Club. He had all the attributes of the ideal family doctor, and will be remembered for many years in Audley. At the funeral on December 30 the parish church was filled with mourners who wished to pay their last respects to a greatly beloved physician. He is survived by his widow and one son.—J. L. B.

Dr. FREDERICK GILBERT LAUGHTON-SCOTT died at Tunbridge Wells on April 1, aged 66. His devotion to healing was of major importance in his life. From King's College, Canterbury, he went to Merton College, Oxford, with a classical scholarship, and his love of the classics and English literature remained with him throughout his life and gave him a humanity and breadth of vision which endeared him to both patients and friends. He studied medicine at Guy's Hospital, where he won an open scholarship in 1911, qualifying in 1914. During the 1914-18 war he served as a temporary surgeon in the Royal Navy, and on his return to England he did a considerable amount of work for the Ministry of Pensions on the treatment of shell-shock and allied conditions. He had an inquiring and critical mind and early in 1930 became interested in the rheumatic diseases. He cared intensely that his work should bring to medicine something in the nature of a genuine and recognized advance in therapeutics, and to this end he bent all his energies and lived to see his work on fibrositis accepted favourably. But his most outstanding characteristic that will be remembered for the longest time was his loyalty—a loyalty to the ethics of the profession, to his work, his patients, and to his many friends. This loyalty remained with him to the end of his last illness, borne with great courage and thought for others.—C. B. H.

The death occurred at Harrogate on April 5 of Dr. HUGH ROBERTSON at the age of 81, a few weeks after he had completed sixty years in medical practice. Hugh Robertson was born on August 7, 1871, and was educated at the University of Glasgow, where he graduated M.B., C.M. in 1893, proceeding to the M.D. in 1907. He was elected F.R.C.S.Ed. in 1899. After graduation Dr. Robertson was in practice at various places in Scotland, including Airdrie, Rutherglen, and Patna, in Ayrshire, where he was medical officer to the parish of Waterside. He moved to Harrogate in 1914, and for 26 years he was medical officer of Ashville and New College there. He also took an interest in local affairs and was a member of the town council from 1928 to 1935. A founder member and twice president of the Harrogate St. Andrew's Society, he was a great authority on Robert Burns and his work, and he was also an enthusiastic angler. Dr. Robertson, who was twice married, leaves a widow, and a daughter by his first marriage.—G. N. B.

Medical Notes in Parliament

PAY-BED REGULATIONS CRITICIZED

The new regulations relating to pay-bed accommodation in hospitals (S.I. 1953, No. 420) were discussed in the House of Commons on April 29, when Mr. A. BLENKINSOP, for the Opposition, moved a prayer for their annulment.

He said the broad effect of the regulations was to confirm recent increases in charges for amenity beds; to reduce pay-bed charges by sums which would vary even from hospital to hospital, according to very complex calculations that had to be made, but in general amounting to a reduction between 5 and 10%; and to provide for an increase in the maximum fees which could be charged by specialists giving treatment in pay-beds to their private patients.

He argued that pay-beds, although necessary initially to ensure that specialists should be broadly spread throughout N.H.S. hospitals, had always been an anomaly in the Health Service. These regulations, designed to ensure an increased use of pay-beds, would mean an increase in the sense of injustice among those who found themselves pushed further back in the queue for free treatment. They undoubtedly added to the specially favoured position of the part-time specialist in hospitals, as against the full-time specialist, ensuring that he should have more beds at his disposal as well as providing for additional maximum fees. Yet it was the part-time specialist whose service needed to be examined with some care in the Health Service. If there was room for cutting down expenditure it might well be there. It was the full-time specialist who on the whole gave the most economical service in the Health Service.

The pay-beds were not being fully used, and no doubt it would be said that they were too costly and these regulations were intended to ensure that they were more fully used and that the hospitals got more money. But large numbers of the beds were being sterilized for the use of specialists. In Stoke 55% of the pay-beds of the management committee were unoccupied, and the figures from Tyneside suggested a comparable proportion. The Minister, by these regulations, was encouraging the extension of a two-level service, one quality for those who could afford to pay, and a lower quality for others.

Mr. SOMERVILLE HASTINGS said that the Minister wanted these pay-beds used for ordinary patients when they were not occupied by paying patients, but the doctors thought otherwise—and they were on the spot. The doctors knew that only when they could get a patient into hospital at once, instead of having to wait three or four months, could they maintain and increase their private practices.

Mr. ANEURIN BEVAN said that in his initial discussions with the representatives of the Royal Colleges he was told that if he wished to keep the specialists at the hospital he must allow them to have their private patients there; otherwise there would be a direct encouragement to go to nursing-homes. He was extremely reluctant to agree, because he saw in it a grave breach of the general scheme. The medical profession was not entirely exempt from commercialism. Once the specialist was given the opportunity of having private patients in hospital he had a vested interest in increasing the number of private patients, which was exactly what happened. There was no justification, under proper administration, for a waiting-list at a hospital and empty beds in that hospital. The empty beds were kept there so that specialists could offer their patients who could afford to pay a bed at once. It could become a very evil racket.

Government Reply

Mr. IAIN MACLEOD, Minister of Health, replying to the discussion, pointed out that the schedule attached to the regulations remained broadly the same as that to the 1948 regulations, with the addition of certain new operations and procedures—for example, the development of fitting contact lenses. He had recently sent out, in conjunction with the regulations, guidance to hospitals. If the primary desire

*Supplement, March 28, p. 94.

of a patient was for privacy, and it was a non-serious case, he should have his attention drawn to amenity beds if such existed in the hospital. Secondly, if his need for admission was urgent on medical grounds he had a right to be admitted, and there was again no need for the whole charges to be paid. Thirdly, if he desired a Section 5 bed it must be made absolutely clear to him—and there must be undertakings given in writing—that he understood in full the implications of what he was doing.

The object of these regulations was not to reduce the charge to private patients; it might have that result, but the object was to carry out fairly the 1946 Act. The 1948 regulations laid down that a standard daily charge, plus an average daily cost per in-patient representing medical care, plus various percentages, was to be the amount charged. It had been found that the regulations were treble unfair. The percentages were now to be added to a sum which excluded the cost of paying medical staff. Secondly, they had been shown to be unfair because they included certain services which had little or no reference to the private block. Thirdly, they were unfair because the percentages had been found to be too high.

On the question of the new fees, he said that the fees had been unaltered since 1948, and in 1949 Mr. Bevan had agreed that they should be examined. That examination had taken place, and after consultations with the various consultant officers and the professions the new figures represented fairly general agreement. Hospital charges reflected actual costs, whereas medical fees had been subject to rigid ceilings since 1948, in spite of the fact that there had been enormous developments in medical technique since then.

The number of Section 5 beds at the latest count in February this year was 6,113, or 1.2% of all staffed beds. The number of Section 4 beds (part-payment) was 1.3%. So 97.5% of all beds in the Service were absolutely free. Compared with the end of 1950 those figures showed that there had been a decrease of 4.5% in Section 5 beds and an increase of 13% in Section 4 beds, while the free beds had increased by no fewer than 18,156, or 4.1%. In view of those figures no one could say that the present Government had taken advantage of Section 5 to multiply the number of pay-beds beyond what was conceived in the Act, or would do so.

No Word of Approval

It had been said that this was a new policy, and in some respects one in favour of the specialists. The best witnesses to call on that were the specialists. In the *British Medical Journal* of March 28* their joint committee commented on these regulations and his attitude towards them. He regretted to say that there was no word of approval for him throughout their comments. The specialists had wanted to abandon the detailed schedule. He had said, "No." They had wanted not a detailed price ceiling, but a few general ceilings within which they would adjust their amounts to the paying capacity of their patients. He had said, "Whatever might happen in the future, the time is not ripe for that." They had wanted a reduction straight away in the case of pay-beds. He had said, "That cannot be done without legislation, and I see no prospect of that." Those were the only three points on which he had interfered in these regulations, which had been prepared by the consultant officers of the Ministry.

Mr. BLENKINSOP asked what proposals the Minister had in mind to ensure that the empty beds were used for ordinary patients. Mr. MACLEOD said that he had called for a special report on the occupancy of these beds. The details were almost complete, and as soon as he had them he would be happy to discuss the matter.

The motion to annul the regulations was rejected by 261 votes to 233.

BETTER MATERNITY BENEFITS

The National Insurance Bill, for which the Minister claimed that it made the most generous provision for motherhood yet provided, was given a second reading in the House

of Commons on April 29. It was stated during the debate that at the time the National Insurance Act, 1946—which it amends—came into operation there were 18,786 maternity beds in N.H.S. hospitals, and the most recent return was 19,369.

The point which attracted most attention was the introduction of the home confinement grant of £3, making for the first time a differentiation between the allowances to women who went to hospital and those who had their confinement at home. Fears were expressed that this might be an inducement to women who ought to go to hospital to remain at home for the sake of the extra money. Against that was quoted the report of the National Insurance Advisory Committee that representations had been made that the financial advantage under the present scheme of having the confinement in hospital was causing an excessive demand on maternity beds which ought primarily to be used for cases likely to need hospital attention.

Pharmaceutical Goods Prices

Mr. A. BLENKINSOP on April 30 asked the Minister of Health whether he was in a position to make a statement arising out of his discussions with manufacturers of pharmaceutical goods about the prices of proprietary brands. Mr. IAIN MACLEOD said that he could not at present, but added that this was a matter which was under very serious consideration by the Government.

Supplies to China

Mr. JOHN TILNEY on April 30 asked the President of the Board of Trade if he would make a statement in connexion with the supply of certain pharmaceuticals to China.

Mr. PETER THORNEycroft replied that pharmaceuticals were not subject to the embargo which the United Kingdom had maintained on certain exports to China ever since it was imposed by the previous Government after the United Nations resolution of May 18, 1951. Since August, 1951, however, exports to China of certain pharmaceuticals which would be of value to the maintenance of large military forces had been limited to normal civilian requirements. A number of Western European governments had hitherto permitted exports of these pharmaceuticals without restriction and this had tended to frustrate the controls which we have maintained. These governments had, however, now agreed to impose similar restrictions to ours.

Universities and Colleges

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College held on April 30, with the President, Sir Russell Brain, in the chair, the following were elected Fellows of the College: F. B. Byrom, M.D. (Australia); R. Jeremy, M.B. (Australia); A. T. Jones, M.D. (Cardiff); M. McC. Baird, B.M. (Canada); E. B. Brooke, M.B. (Carmarthen); B. B. Bhatia, M.D. (India); T. F. McN. Scott, M.D. (United States); J. S. Harris, M.D. (Woodford Green); J. N. Cumings, M.D. (London); O. F. Thomas, M.R.C.P. (Liverpool); R. Knox, M.D. (London); J. MacD. Holmes, M.D. (Stafford); Mary J. Wilmers, M.D. (London); H. E. Holling, M.B. (London); Beryl D. Corner, M.D. (Bristol); G. Davison, M.D. (Cramlington); J. R. Forbes, M.D. (Flintshire); R. M. Kark, M.R.C.P. (United States); F. H. Kemp, M.B. (Oxford); S. Lazarus, M.D. (Glasgow); J. Smart, M.D. (London); J. F. Bromley, M.B. (Birmingham); Muriel J. L. Frazer, M.D. (Belfast); Sir William P. Mallinson, B.M. (London); H. G. Miller, M.D. (Newcastle-upon-Tyne); A. W. Woodruff, M.D. (London); W. W. Gooddy, M.D. (London); A. G. W. Whitfield, M.D. (Sutton Coldfield); D. I. Williams, M.B. (London); R. A. Henson, M.D. (London); Sir Frank Macfarlane Burnet, M.D., F.R.S. (Australia); J. F. Fulton, M.D. (United States); G. L. Keynes, M.D., F.R.C.S., F.R.C.O.G. (London); and C. Laubry, M.D. (France).

Lord Horder was appointed delegate of the College to the annual cremation conference to be held at Llandudno from June 29 to July 1.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 18 (No. 15) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	18	2	8	0		24	2	9	0	1
Dysentery ..	282	33	88	6		489	63	34	2	1
Encephalitis, acute ..	3	0	0	0		2	1	1	0	
Enteric fever: Typhoid ..	2	0	0	0		1	0	0	1	
Paratyphoid ..	7	0	1(A)	0		13	0	0	0	
Food-poisoning ..	56	9		0		51	6		1	
Infective enteritis or diarrhoea under 2 years ..				21	19				14	10
Measles* ..	18,861	835	550	269	284	5,472	210	587	250	441
Meningococcal infection ..	54	6	11	1	4	44	2	12	1	4
Ophthalmia neonatorum ..	48	1	4	0		32	10	5	0	
Pneumonia† ..	796	57	473	14	8	680	49	291	16	1
Poliomyelitis, acute: Paralytic ..	26	1	0	0	2	14	2	0	2	1
Non-paralytic ..	8	0				3	0			
Puerperal fever§ ..	208	30	23	1		243	56	14	0	
Scarlet fever ..	994	67	151	35	51	1,134	93	158	9	35
Tuberculosis: Respiratory ..			147	27				134	34	
Non-respiratory ..			16	6				25	5	
Whooping-cough ..	2,847	181	374	40	152	2,306	129	183	77	42

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0				1	0			
Encephalitis, acute ..					0		1			0
Enteric fever ..	0	0	0			0	0			
Infective enteritis or diarrhoea under 2 years ..	8	1	1	3	0	15	1	6	0	1
Influenza ..	37	1	1	2	3	38	3	6	0	0
Measles ..		0	0	2			0	1	1	2
Meningococcal infection ..		0	0				2			
Pneumonia ..	300	33	26	19	11	284	42		16	5
Poliomyelitis, acute ..	8	1		0		2	0			0
Scarlet fever ..		0	0	0			0		0	0
Tuberculosis: Respiratory ..	119	19	14	4	6	139	20	19	5	16
Non-respiratory ..										
Whooping-cough ..	3	0	1	0	1	2	0		0	0
Deaths 0-1 year ..	229	30	34	14	22	248	27	34	12	13
Deaths (excluding stillbirths) ..	5,428	731	623	126	209	5,828	823	645	98	173
LIVE BIRTHS ..	8,068	1175	923	235	409	6,887	1122	806	242	344
STILLBIRTHS ..	196	25	20			172	15	20		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

§ Includes puerperal pyrexia.

Vital Statistics

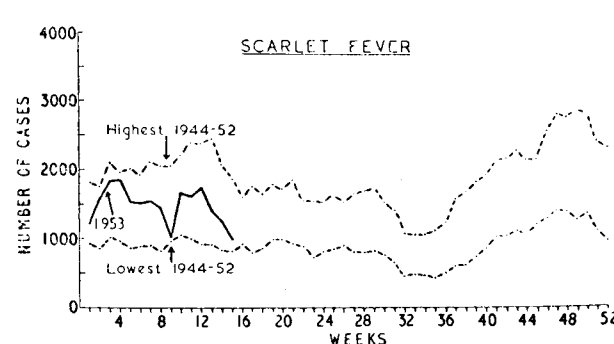
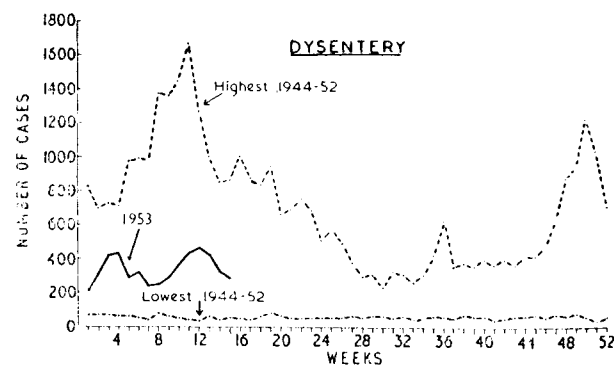
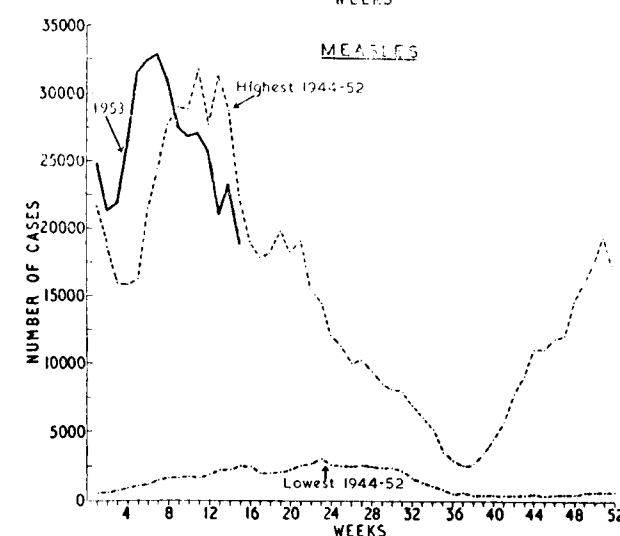
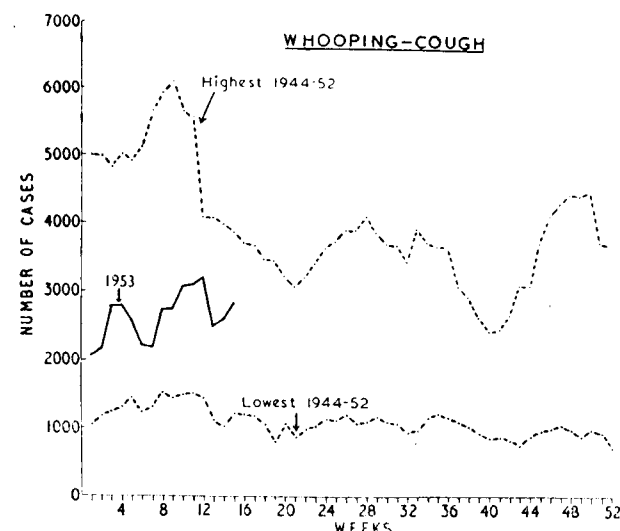
Cancer and Tuberculosis Deaths

In England and Wales the provisional 1952 death rates for all forms of cancer were 2,149 and 1,850 per million population for men and women respectively. The 1951 figures were 2,120 and 1,822. The rise in the rate for men includes an increase from 530 to 567 per million population for deaths assigned to cancer of the lung and bronchus, making a total increase since 1947 of 47%.

The provisional death rate for respiratory tuberculosis in 1952 was 212 per million persons. This is a decrease of 23% from the previous year, and is less than half the figure for 1947. The rate for other forms of tuberculosis was 28 per million persons, compared with 41 for 1951.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest fluctuations in the trends of infectious diseases in England and Wales during the week ending April 18 were falls of 4,527 in the number of notifications of measles from 23,388 to 18,861, and 272 for scarlet fever, from 1,266 to 994, and a rise of 229 for whooping-cough, from 2,618 to 2,847.

The largest decreases in the local trends of measles were 490 in Yorkshire West Riding, from 1,896 to 1,406; 347 in Warwickshire, from 980 to 635; 245 in Essex, from 948 to 703; and 239 in Hertfordshire, from 627 to 388. The largest fall in the notifications of scarlet fever was 42 in Kent, from 70 to 28. The largest rises in whooping-cough were 93 in Lancashire, from 463 to 556, and 57 in Essex from 136 to 193. 18 cases of diphtheria were notified, less than in the preceding week.

34 cases of acute poliomyelitis were notified during the week. These cases were 2 fewer for both paralytic and non paralytic cases than in the preceding week. The largest returns were Surrey 5 (Wimbledon M.B. 2) and Sussex 1 (Brighton C.B. 2).

282 cases of dysentery were notified, 43 fewer than in the preceding week. The largest returns were Lancashire 8 (Liverpool C.B. 36, Manchester C.B. 21, Preston R.D. 14) London 33, Leicestershire 28 (Leicester C.B. 28), and Middlesex 17 (Edmonton M.B. 12).

Week Ending April 25

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,047 whooping-cough 3,206, diphtheria 25, measles 13,731, acute poliomyelitis 41, dysentery 419, paratyphoid fever 8, and typhoid fever 2.

Infant Mortality Record

The infant mortality rate for England and Wales in 1952 fell to 27.6 per 1,000 related live births, the lowest ever recorded in this country. It was 2.0 below the rate for 1950 the previous lowest. Comparative rates in other countries were: In 1952, Sweden 20, Netherlands 23, U.S.A. 29; in 1951, New Zealand 23, Australia 25, Canada 38, France 51 Belgium 66, Italy 67.

On the basis of 1951 death rates, the estimated expectation of life of a male child at birth would be 65.8 years and that of a female child 70.9. These figures compare with 48.5 and 52.4 respectively in 1901.

The birth rate last year was the lowest recorded since 1941. There were 673,559 live births, representing a rate of 15.3 per thousand population. This was 0.2 below the rate for 1951. Of every thousand live births, 46 were illegitimate—5 per thousand fewer than the average for the preceding five years. The births registered in 1952 exceeded the deaths by 176,269; the corresponding excess for 1951 was 130,309 and the average excess for 1946-50 was 281,195.

Deaths during 1952 numbered 497,290, giving a rate of 11.3 per thousand population, compared with 12.5 in 1951 and 11.6 in 1950. This is the second lowest rate recorded in spite of a rate in the last quarter (12.4) which has been exceeded only twice since 1925.—*Quarterly Return for England and Wales*, fourth quarter of 1952.

The provisional maternal mortality rate (excluding abortion) per 1,000 live and stillbirths in England and Wales in 1952 was 0.59, a new low record. The previous lowest rate was 0.66 in 1951.

The provisional neonatal death rate (babies under 4 weeks of age) for last year was 18.9 per 1,000 related live births. In the previous year the rate was 18.8, and in 1939 it was 28.3.

Smallpox in the North Country

Up to noon, May 5, 27 confirmed cases of smallpox had been reported, including 7 deaths. There was 1 new suspected case in a soldier recently returned from Egypt. The new case reported since last week was a man aged 43, vaccinated in infancy.

Medical News

Royal College of Surgeons.—On May 5 the Queen laid a memorial stone to commemorate the first phase of the building operations at the Royal College of Surgeons. The ceremony took place in what will eventually be the Great Hall of the College. Enclosed in the stone is a casket containing copies of the College Calendar and other documents placed there by two postgraduate students from the residential college, Dr. H. Chesterfield Evans, of Brisbane, and Dr. C. B. Walker, of Ipswich. In his speech of welcome to the Queen the President of the College, Sir Cecil Wakeley, said that work was proceeding on the three new floors of museums, a gift from the Wellcome trustees, on the laboratories, and on the library. Work on the College of Surgical Science, presented by Lord Nuffield, was due to begin within a few months. The Bishop of London (Dr. Wand) dedicated the memorial stone and prayed for blessing on the new project. The President then presented the architect and representatives of the contractors to the Queen, who accepted from the architect a gold and tortoiseshell trinket-box belonging originally to George IV. After expressing the thanks of the College to her Majesty for laying the stone, Sir Cecil gave her a copy of Sir John Bland-Sutton's book, *The Story of a Surgeon*.

Minister's Committee on Health Service Costs.—Last week in the House of Commons the Minister of Health, Mr. Iain Macleod, announced the composition of the small independent committee of inquiry which he is asking to look into the costs of the Health Service. The chairman, as already noted (April 11, p. 840), is the Cambridge economist Mr. C. W. Guillebaud. The members are Professor J. W. Cook, F.R.S., regius professor of chemistry at Glasgow; Sir Geoffrey Vickers, V.C., a member of the National Coal Board and previously its legal adviser; Sir John Maude, formerly Permanent Secretary to the Ministry of Health;

and Miss B. A. Godwin, a member of the General Council of the Trades Union Congress. The secretary is Mr. E. Halliday, of the Ministry of Health. The committee's terms of reference are: "To review the present and prospective cost of the National Health Service; to suggest means, whether by modifications in organization or otherwise, of ensuring the most effective control and efficient use of such Exchequer funds as may be made available; to advise how, in view of the burdens on the Exchequer, a rising charge upon it can be avoided while providing for the maintenance of an adequate Service; and to make recommendations."

British Occupational Hygiene Society.—A new society for the promotion of the science of occupational hygiene, the British Occupational Hygiene Society, was inaugurated last month at the London School of Hygiene and Tropical Medicine. The society's first president is Dr. T. Bedford, D.Sc., director of the Medical Research Council's Environmental Hygiene Research Unit, and the founder members include engineers, chemists, and physicists, as well as medical men, concerned with the maintenance of healthful conditions of work. The society will provide a forum where medical and non-medical workers in this field can share their experience. The honorary secretary is Mr. P. C. G. Isaac, lecturer in public health engineering, King's College, Newcastle-upon-Tyne.

Doctors and Sickness Insurance Schemes.—The International Social Security Association is preparing for discussions with the World Medical Association on the question of co-operation between the medical profession and sickness insurance institutions. According to the International Social Security Association, which represents institutions concerned with social security matters in 39 countries, this co-operation is not always as close as might be hoped. The problem is being discussed this week at a meeting in Düsseldorf.

The Radcliffe Infirmary.—Oxford University has reached agreement in principle with the board of governors of the United Oxford Hospitals for a new building plan on the Radcliffe Infirmary site which will strengthen the clinical school in two ways. First, the Nuffield professor of clinical medicine will have all his beds concentrated at the Radcliffe Infirmary instead of half at the Churchill Hospital. Secondly, the board of the faculty of medicine has recently recommended that the next Nuffield professor of surgery, to be appointed in succession to the late Sir Hugh Cairns, should for preference be a general surgeon. This is to be made possible by the provision of a new department, also in the Radcliffe Infirmary, with about 50 beds, operating-theatre, and laboratories. Temporary arrangements for increasing the number of beds at the Radcliffe Infirmary until the new building is complete are now being made by the board of governors.

Refresher Course for General Practitioners.—Some copies of the book, *Refresher Course for General Practitioners*, are still available. It comprises the first 55 articles printed in this popular *Journal* series. Each deals with a common problem of medical practice, and has been written (and fully revised) by an acknowledged authority. The price of the book is 25s. (post free). Orders should be sent to the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Training of the Hospital Matron.—The King Edward's Hospital Fund for London is to run a 10-month residential course for prospective matrons and assistant matrons from the four Metropolitan Regions. The first course will start in September and be limited to 12 candidates. The sisters will live at 22, Holland Park, London, W.11. The course is a preparatory one, being designed primarily for the sister who shows promise of administrative ability, and the emphasis will be on the human aspects of management. The King's Fund already runs courses for ward sisters and for hospital administrators.

College of General Practitioners.—On April 30 the number of Foundation Members of the College was 1,911.

Nuffield Provincial Hospitals Trust.—The Investigation into the Functions and Design of Hospitals has moved from 33, Doughty Street, London, W.C.1, to the Trust's headquarters at Nuffield Lodge, Regent's Park, London, N.W.1 (telephone: Primrose 8871).

Professor W. T. J. Morgan, F.R.S., has been appointed deputy director of the Lister Institute of Preventive Medicine. Professor Morgan, who has been on the staff of the Lister Institute since 1928, is noted for his work on the chemistry of immunology.

Professor Joseph Gillman, head of the department of physiology at Witwatersrand University, has been awarded the South Africa Medal by the South African Association for the Advancement of Science. The South Africa Medal fund was instituted by members of the British Association in commemoration of their visit to South Africa in 1905.

Dr. F. I. Ashton has received the Queen's Commendation for Brave Conduct for his part in rescuing people trapped by the floods at Sutton-on-Sea, Lincolnshire.

COMING EVENTS

Symposium on Virology.—The Institut d'Hygiène et de Bactériologie at Lausanne has arranged a symposium on "Some Present Problems of Virology" to be held at Lausanne on May 22 and 23. Each paper will be followed by a discussion, and the papers will be read in either English or French. The fee for the symposium is 15 Swiss francs. Further information may be obtained from Professor Hauduroy, 19, rue César Roux, Lausanne.

Liverpool Medical Exhibition.—The 1953 Liverpool Medical Exhibition is to be held at St. George's Hall, Liverpool, from May 18 to 22. The exhibition, which will be open from 11 a.m. to 6.30 p.m. daily, will be opened by Dr. E. Noble Chamberlain.

British Empire Leprosy Relief Association.—The annual general meeting of the British Empire Leprosy Relief Association will be held in the Conference Room, Church House, Great Smith Street, London, S.W.1, on May 21 at 3 p.m. The chair will be taken by the Rt. Hon. Oliver Lyttelton, who will deliver the main lecture. Dr. Robert Cochrane will speak on the treatment of leprosy.

Ross Institute of Tropical Hygiene.—The Ross Institute Industrial Advisory Committee will hold an open meeting in the council chamber of the Rubber Growers' Association, 19, Fenchurch Street, E.C.3, on May 21 at 2.15 p.m. The subjects for discussion will include "Tropical Health Problems and Their Connexion with Industrial Relations," "International Health Work," and "Malaria in Malaya."

Cancer and the Viruses.—Dr. Pierre Lépine, Director of the Virus Research Department of the Institut Pasteur, Paris, will speak at the Institut Français, 15, Queensberry Place, London, S.W.7, on May 12 at 6 p.m. The subject of his address, which will be given in French, will be "Le problème du cancer dans ses relations avec les virus."

Bart's Exhibition.—St. Bartholomew's Hospital, E.C.1, is holding an exhibition of its historical documents and other treasures from May 14 to 16. The exhibition will be open to the public each day from 10.30 a.m. to 6.30 p.m., and visitors should enter through the main gate in West Smithfield.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, May 11

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.

MEDICAL SOCIETY OF LONDON.—8.45 p.m., Annual Oration by Sir Russell Brain, P.R.C.P.: Need for a Philosophy of Medicine.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. H. S. Banks: Coliform Infection in Gastro-enteritis.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor H. R. Dew: Post-operative Intravascular Thrombosis.

ROYAL EYE HOSPITAL.—5 p.m., Professor Arnold Sorsby: Diseases of Metabolism and their Ocular Signs.

ST. ANDREWS UNIVERSITY.—At Surgery Lecture Theatre, Dundee, 5 p.m., Sir W. Heneage Ogilvie: Problems of the Gastro-oesophageal Junction.

UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., Sir Rudolph Peters, F.R.S.: Inhibitors and Intracellular Chemical Dissection.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Royal Society of Medicine, 8.30 p.m., Cavendish Lecture by Viscount Simon: The Doctor in the Witness Box.

Tuesday, May 12

CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel, 7 for 7.30 p.m., annual dinner.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Virus Diseases.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Professor J. Chassar Moir: Use of Radiology in Labour.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Moynihan Lecture by Dr. R. B. Cattell (Boston): Extra Hepatic Obstruction of the Bile Ducts.

ROYAL EYE HOSPITAL.—5 p.m., Mr. T. M. Tyrrell: Surgery of Glaucoma and its Complications.

ST. ANDREWS UNIVERSITY.—At Surgery Lecture Theatre, Dundee, 5 p.m., Sir W. Heneage Ogilvie: Pitfalls in Surgical Diagnosis.

WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY, St. Mary's Hospital Medical School.—5 p.m., Almroth Wright Lecture by Dr. J. G. Davis, D.Sc.: Some Public Health Aspects of Milk.

Some Public Health Aspects of Milk.

Wednesday, May 13

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Virus Diseases.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8.30 p.m., Miss Sybil Campbell (Metropolitan Magistrate): A Day in the Life of a Metropolitan Magistrate—With Particular Reference to Problems of Punishment.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor A. Frazer: Disordered Function of the Small Intestine.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. R. J. Ludford: Tissue Cultures—Malignant Growth.

ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Neurology.

Thursday, May 14

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. D. S. MacPhail: Psychotherapy for Criminals.

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., annual general meeting: 8.30 p.m., 32nd Silvanus Thompson Memorial Lecture by Dr. L. H. Gray, Ph.D.: Initiation and Development of Cellular Damage by Ionizing Radiation.

CAMBRIDGE UNIVERSITY.—At Senate House, 5 p.m., Rede Lecture by Professor A. D. Gardner: The Proper Study of Mankind.

● HAMPESTEAD GENERAL HOSPITAL.—3 p.m., Mr. G. Qvist: Vascular Disease of Limbs: 4.15 p.m., Dr. M. Kremer: Epilepsy.

HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. C. F. Rolland: Diabetes in Pregnancy.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Mycology—Structure of Pathogenic Fungi and their Identification.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 4.30 p.m., Mr. A. W. Bourne: Hypertension in Pregnancy and its Prognosis.

LONDON UNIVERSITY.—At Guy's Hospital Medical School, 5 p.m., Dr. N. G. Emmelin (Lund): Secretion of Saliva.

NUFFIELD ORTHOPAEDIC CENTRE, Wingfield-Morris Orthopaedic Hospital.—8.30 p.m., Mr. P. Wiles: Posture.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. G. E. Burch (Louisiana): Vectorcardiography.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Surgeon Commander F. Ellis, O.B.E., R.N.: Desirable and Tolerable Levels of Warmth in Warm Climates (with special reference to the requirements of men in the Royal Navy).

ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: Non-Paralytic Strabismus: Care and Treatment of the Squinting Child.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor G. Gustafson (Sweden): Modern Methods in Dental Histology.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. A. S. Paterson: postgraduate demonstration in neurology.

postgraduate demonstration in neurology.

Friday, May 15

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members.

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 2.15 p.m., Diagnosis Section Meeting. Dr. R. Astley: Triacuspid Atresia; Dr. D. E. Truscott: Radiological Control of Kidney Injuries; Dr. P. G. Keates: Some Physiological Observations Made During Excretion Urography; Dr. W. Horner Smith: Reliability of Excretion Urography in the Diagnosis of Bladder Tumours.

● GUY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Fison Memorial Lecture by Sir Lawrence Bragg, F.R.S.: X-ray Analysis of Protein Molecules.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. T. Brain: Common Skin Diseases in Children.

OSLER CLUB OF LONDON.—At 11, Chandos Street, W., 7.45 p.m., Dr. J. N. Morris: History of Social Medicine.

OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Dr. R. B. Cattell (Boston): Advances in Pancreatic Surgery.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. John Bruce: Hazards of Major Surgery.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor A. Frazer: Disordered Functions of the Small Intestine.

● ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS.—5 p.m., William Blair-Bell Memorial Lecture by Dr. Henry Roberts: Observations on Micturition in the Female.

ST. ANDREWS UNIVERSITY.—At Surgery Lecture Theatre, Dundee, 5 p.m., Sir W. Heneage Ogilvie: Independence and Authority in Medical Practice.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Obstetric and Gynaecological Conference. Mr. H. C. Hanley: Urological Problems During Pregnancy.

Pregnancy.

Saturday, May 16

BIOCHEMICAL SOCIETY.—At Department of Physiology, Medical School, Hospitals Centre, Birmingham, 1.45 p.m., scientific papers.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 11 a.m., Professor W. C. W. Nixon: Disordered Uterine Action.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

A Heavily Furred Tongue

Q.—How should a man of 40 with a persistently and heavily furred tongue be investigated and treated? The condition started 6 months before an operation for appendix abscess 14 years ago, and has only remitted once since—during the month immediately after operation. The patient also suffers from buccal ulcers and flatulence and distension after meals occasionally. There is no evidence of local sepsis. All the teeth have been removed in an effort to cure the condition.

A.—It is not always easy to account for a furred tongue. It only occasionally produces symptoms, and these then seem to be made worse by worrying. It is important to see that the patient is taking a normal diet, not slops, and that he is not smoking or drinking to excess. Nasal obstruction should be excluded, and likewise constipation or the excessive use of aperients. The coexistence of a furred tongue, flatulence, and distension suggests the syndrome of reverse peristalsis. This is usually due to an irritable focus in the alimentary tract or a reflex disturbance from elsewhere. It would be well to begin investigation by an x-ray examination of the gall-bladder, as this may have been infected at the same time as the appendix. If this is normal the patient should have a barium meal and follow-through, with particular reference to the possibility of a lesion in the lower ileum. A test meal may be done to exclude achlorhydria. Finally, a gastroscopy may be performed to look for gastritis, though it will prove difficult to treat it if it is found.

Repeated Failure of Lactation

Q.—A healthy woman of 27, now in her third pregnancy, has with her previous two children had considerable difficulty with breast-feeding. Despite all the usual measures taken after delivery, the supply of milk has been inadequate on both occasions and has had to be supplemented very extensively within the first few weeks. There seems to be no psychological difficulty and she is anxious to feed the new baby. She is now 25 weeks advanced in pregnancy, and, although the breasts are enlarged, no secretion can be expressed from the nipples. Are there any measures which can be taken during the pregnancy to increase the supply after delivery?

A.—There are some women who, despite all treatment, fail to lactate in successive pregnancies, and in these it is assumed that there is a failure of development of gland tissue or some inherent fault which prevents the breast responding to the various factors which determine lactation after childbirth. For this minority little can be done. The majority of women, however, can breast-feed satisfactorily given the determination to do so, proper management, and a lusty child with a good sucking reflex.

In the case described the only treatment necessary at present is to ensure that the woman has a good diet, protein being especially important. As pregnancy progresses attention should be paid to the nipples to see that they project well. Thereafter it would probably be best to follow the scheme advocated by H. K. Waller. This includes daily massage of the breasts with deliberate expression of colostrum during the last six weeks of pregnancy. After labour, engorgement of the breasts should be treated with small doses of stilboestrol for 24 to 48 hours. As lactation becomes established the breasts should be "stripped" after

each feed—that is, they should be completely emptied by manual expression.

Drug treatment to increase the supply of milk is generally unsatisfactory. There would be no harm, however, in giving for five to seven days either thyroid 6 to 10 gr. (0.4 to 0.65 g.) daily, or Lugol's iodine 6 minims (0.35 ml.) twice daily, starting on the fifth day of the puerperium.

Combined Diphtheria-Pertussis Inoculation

Q.—At what age do the experts advise that a combined diphtheria-pertussis inoculation should be given?

A.—It is assumed in this question that a combined diphtheria-pertussis prophylactic is already accepted as safe and effective as well as being administratively convenient. In regard to safety, there is some evidence that the slight risk of post-inoculation poliomyelitis, which may accompany injections in areas where poliomyelitis is prevalent, is particularly associated with an alum-containing diphtheria-pertussis mixture. This risk may be lessened by using a mixture of diphtheria toxoid and pertussis vaccine without alum, although there are as yet no published data on this point. As regards effectiveness, experimental and field studies indicate that the antigenic potency of diphtheria toxoid is not adversely affected, and may be enhanced, by mixture with pertussis vaccine. Whether this mixture affects the antigenic value of the pertussis vaccine is less certain.

If and when the combined prophylactic is shown to be both safe and effective there will be arguments for and against inoculating children either in the first six months or in the second six months of life. In favour of early inoculation, say from three months onwards, is the fact that 5-10% of children develop whooping-cough in the first year of life, and about two-thirds of the deaths from whooping-cough occur in this age group. On the other hand, it is not known if children are as well protected by pertussis immunization in the early months of life as they are when they receive the vaccine rather later. There is the further risk in diphtheria immunization that children of 3 to 6 months of age may still have some diphtheria antitoxin passively transferred from the mother, and this antibody may interfere with the child's response to the diphtheria prophylactic. In view of these considerations it might be advisable to begin immunization with a combined prophylactic around 6 months of age, and give a reinforcing dose 2-3 years later. Until the combined prophylactic has been proved to be safe and effective, pertussis immunization (three monthly doses) could be begun at 3 to 4 months and diphtheria immunization at 6 to 8 months of age. Obviously, no advice can be given about the best combined prophylactic at this stage.

Prognosis in Pneumoconiosis

Q.—What is the prognosis in pneumoconiosis and the likelihood of tuberculosis supervening?

A.—The word "pneumoconiosis" covers such a multitude of differing pathological and clinical conditions that it is impossible to answer the simple question that is asked. In cases of acute silicosis arising in the abrasive soap industry, death has occurred within three years of first exposure,¹ and patients with beryllium and aluminium pneumoconiosis have died 3 years and 18 months respectively from first exposure.^{2,3} At the other extreme, aged miners may be found to have advanced pneumoconiosis which must have originated during their work anything up to 60 years previously, and the milder forms of any pneumoconiosis may be compatible with a normal span of life. Life tables for a miscellaneous group of cases of simple pneumoconiosis and silico-tuberculosis are given by Turner and Martin⁴ and for certified coal-miners by Stewart.⁵ The prognosis of coal-miners with pneumoconiosis is also discussed by Berard, Martin, Ode, and Roche⁶ and that of a miscellaneous group of silicotics by Baldi.⁷ From these papers it emerges that cases of these kinds of simple pneumoconiosis have a prognosis not very greatly different from that of the ordinary

population so long as their pneumoconiosis does not become complicated by tuberculosis, when the prognosis is much worse. The more rapid the onset of pneumoconiosis, and usually, therefore, the younger the man, the greater the liability of conversion at some time to silico-tuberculosis and the worse the prognosis. Cases with "massive fibrosis" have a worse prognosis, and cases with open tuberculosis seldom live more than two years. The liability to develop open tuberculosis appears to be much greater in cases of pure silicosis than in the various forms of mixed dust pneumoconiosis such as those of coal-workers and foundry workers. This is shown by the much higher tuberculosis death rates that have prevailed in the pure silica risk industries than in coal-mining and foundries. Other forms of pneumoconiosis than silicosis—for example, asbestosis, aluminosis, berylliosis—do not appear to predispose to tuberculosis.

The frequency with which tuberculosis is found to complicate pneumoconiosis depends upon the diagnostic criteria and upon the material used for the study. For instance, in post-mortem examinations of coal-miners Rogers¹ found tuberculosis in 75.8% of cases with massive fibrosis, Gooding² found it in 26% of all cases. Theodos and Gordon³ found a positive sputum in 13% of coal-miners admitted to hospital, whereas in a community survey in a coal-mining district Cochrane (unpublished) found that only 1% of all cases of massive fibrosis had a positive sputum. The diagnosis of tuberculosis on the grounds of a positive sputum is the only way of making the diagnosis certain. When clinical and radiological criteria are also admitted, the proportion of cases of pneumoconiosis with tuberculosis will be found to range from about 5% to 75%, depending upon the selection of cases and the diagnostic whim of the observer.

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- ¹ MacDonald, G., Piggot, A. P., and Gilder, F. W., *Lancet*, 1930, 2, 846.
- ² Hardy, H. L., and Travershaw, I. R., *J. industr. Hyg.*, 1946, 28, 197.
- ³ Baader, E. W., *Z. Unfallmed. Berufskr.*, 1949, 2, 79.
- ⁴ *British Medical Journal*, 1949, 2, 1148.
- ⁵ *Brit. J. industr. Med.*, 1948, 5, 120.
- ⁶ *Sem. Hôp. Paris*, 1949, 25, 507.
- ⁷ *Med. d. Lavoro*, 1952, 43, 147.
- ⁸ *Lancet*, 1946, 1, 462.
- ⁹ *Ibid.*, 1946, 2, 891.
- ¹⁰ *Amer. Rev. Tuberc.*, 1952, 65, 24.

Shortening the List of Notifiable Diseases

Q.—Can a local authority shorten the list of diseases notifiable in its area as well as lengthen it?

A.—"Notifiable disease" is defined by section 343 of the Public Health Act, 1936, as any one of nine named diseases, plus any infectious disease which the local authority (with the approval of the Minister) may declare to be a notifiable disease within its area.

A local authority has no power to shorten the list of named diseases, but only those which became notifiable by a resolution of its own council. To remove such a disease from its list a further resolution of the council is required and also the approval of the Minister.

In addition, the Minister has power to make regulations under section 143 of the Public Health Act, 1936, for the treatment of persons affected with any epidemic, endemic, or infectious diseases, and for preventing the spread of such diseases. These regulations include provisions requiring notification of the diseases to which they apply, and may extend to the whole of England and Wales or any part thereof. Regulations made by the Minister may of course be amended or revoked by him.

Eosinophils in C.S.F.

Q.—What are the causes of eosinophilia in the C.S.F.?

A.—Very little is known about the incidence of eosinophils in the cerebrospinal fluid, and less still about their significance. Only rarely are these cells seen, and then mainly in cerebral syphilis and in some cases of acute meningitis, always provided there has been no blood admixture. Eosinophils might also be found in the C.S.F. in allergic conditions.

NOTES AND COMMENTS

Implantation of Hormone Pellets.—Dr. R. P. EDKINS, Ph.D. (Pharmaceutical Research Department, Organon Laboratories, Motherwell, Lanarks), writes: With regard to the previous notes on this matter (February 28, p. 519, and March 14, p. 632) it must, as Mr. A. R. G. Chamings states, be regarded as dangerous to boil these pellets, as most of the hormone substances used soften or actually melt under this treatment, and at the best the pellets will become deformed. A simple and invariably successful method by which either fused or compressed pellets which have been accidentally contaminated may be re-sterilized without fear of melting or distortion consists in keeping the pellets in a solution of phenol (0.5%) or phenylmercuric nitrate (0.002%) or other substance having similar bactericidal activity, at a temperature not below 37° C. or above 80° C. for 24 hours; the addition of a small percentage of a surface active agent such as cetrimide (0.025%) to the phenol solution (or other bactericide, provided there is no reaction between them) is an added advantage, as it promotes efficient wetting of the surface of the pellet. After this treatment, the pellet may then be implanted directly, after preliminary drying, if desired, on a sterile towel. It must be realized that this treatment will sterilize only the external surface of the pellet; but, since it is internally sterile by the process of manufacture, it is only the outer surface which will require re-sterilization if the pellet is accidentally contaminated. It is emphasized that it is undesirable to apply this process to pellets which have already been implanted and which have either been removed intentionally or extruded.

Poisonous Snakes.—Sir HAROLD SCOTT (Braintree) writes: Your expert in his reply on the treatment of bites by poisonous snakes ("Any Questions?" April 4, p. 793) rightly stresses the specificity of antivenins. As the use of such is generally urgent and they may not be immediately obtainable, a first-aid treatment which will delay the action of the poison deserves to be more widely known. Almost 30 years ago (in 1924) the fact was observed that soaps could detoxify snake venoms, and in 1945 Ahuja and Brooks in India showed that local injections, at four or five points surrounding the site of the bite, each of 0.5-1 ml. of 5% emulsion of "lifebuoy" carbolic soap (say to a total of 5 ml.) might delay the action of the poison for some hours, at least two and often more. Carbolic soap is to be found in many houses, and it might be kept made up in a 5% strength at local dispensaries in countries where snake-bites are likely to occur. Bleeding should be encouraged by crucial incisions.

OUR EXPERT writes: I agree that local injection of soap emulsion in the region of the bite might be worth trying in an emergency, but it should be stressed that it is only a first-aid treatment, and should never be regarded as a substitute for antivenin. The idea of using soap suspension in this way arose from some work on the effect of surface-tension suppressants on tissue poisons, including bacterial toxins and certain snake venoms. It has since been shown that soaps, particularly those of the unsaturated fatty acids, have some retarding effect on the venoms of rattlesnake, asp, cobra, krait, and ringhals. This effect has been shown both *in vitro* and *in vivo* in laboratory animals, including pigeons. I believe that the injection of carbolic soap emulsion has recently been used by Ahuja and Brooks as first-aid treatment of snake-bite in man. I am grateful to Sir Harold Scott for raising this point, which perhaps should have been included in my reply to the original question.

Corrections.—The figure for Foundation Membership of the College of General Practitioners given in the legend to the map in the *Journal* of May 2 (p. 990) should have read 1,807.

In the article entitled "Controlled Hypotension in Neurosurgery with Hexamethonium and Procaine Amide" (May 2, p. 961) by Dr. David Aserman, acknowledgment was inadvertently omitted to the fact that the procaine amide used in the investigation was generously supplied by Messrs. E. R. Squibb and Sons.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 23 1953

MEDICINE AND SOCIAL POLICY*

BY

F. A. E. CREW, M.D., F.R.C.P.Ed., F.R.S.

Professor of Public Health and Social Medicine, University of Edinburgh

The name of Sir Charles Hastings is imperishably inscribed in the records that tell of the development of the medical profession and of the ascending social status of the doctor. To him the members of the British Medical Association are deeply indebted. It is but fitting, therefore, that from time to time they should remember him and praise him. To be permitted to act as the channel along which their gratitude may flow is indeed a high honour, and of this I am duly sensible. For this undertaking I possess one qualification that is somewhat rarer than it used to be. It so happens that Sir Charles Hastings was an Englishman who took his medical degree at Edinburgh; so am and so did I, although ninety-four years after the man whose mantle I am momentarily privileged to wear.

Sir Charles Hastings is best remembered for the outcome of his interests in matters political. He was successfully active in the establishment of an improved relationship within the medical profession and between the profession and the society which this served. It is perhaps not inappropriate, therefore, that in this memorial lecture I should attempt to focus your thoughts upon the interconnexion between medicine and politics—two fields of human interest and activity that, in a country such as this, have come to share a common purpose: the achievement of human and social betterment.

This being so, my delight in having in the Rt. Hon. Walter Elliot a chairman with so exceptional a record of high achievement, both in medical science and in statecraft, can readily be appreciated. His presence, for which I am indeed grateful, helps me greatly to make this occasion one when, in the words of Sir John Simon, "statecraft and medical knowledge should sincerely take counsel together for the health of the people."

In the narrow limits of this lecture I propose to speak of medicine as a social science and to restrict myself to a consideration of its uses as an instrument of social policy in this country. That which I have to say, therefore, refers only to the last hundred years or so of this country's history. Medicine could not begin its development as a social science and could not be used by society for the attainment of certain social objectives until many things had come to pass. The population of this country had to grow large and come to live in great aggregates in cities and towns; the dark satanic mills of industry had to be stoked with the health and vigour of the people, to their great detriment; diseases which flourish when great aggregations of people must lead unhealthy lives in most

insanitary conditions and against which no defence is available had to threaten all, so that exposure to a common danger would evoke a demand for common action; a great discontent with things as they were had to develop and the demand that they should be changed had to become clamant; there had to evolve a widespread acceptance of the view that much of the prevalent disease was the product of the conditions which great masses of the people endured, that it was preventable and should be prevented, that it was a barrier standing athwart the road of social progress that must be flung down. Moreover, and especially, there had to come into being an acceptance of the view that to prevent disease and to promote health were sound business propositions.

The role of government had to change from what it was when the policy of *laissez faire* prevailed. It had to intervene actively and creatively in the affairs of the community in response to the pressure of public opinion, and one of its major preoccupations had to become the care of the people's health. A machinery that would enable Parliament to safeguard the public health had to be designed and elaborated.

The interests of medicine had to become greatly enlarged; it had to add to its great store of clinical knowledge new knowledge that could be applied to the preservation of the health of the people as a whole. The concepts and methodology of a new disease-preventive, health-promotive medicine had to be elaborated.

Inquiry into Preventable Illness

My story therefore begins with the appointment by Parliament of a Commission of inquiry into the working of the Poor Laws following the passing of the Reform Bill in 1832. This Commission, in its search for evidence from which firm conclusions might be drawn, engaged the services in 1834 of three medical men to inquire into the prevalence and causation of preventable sickness in the cities and towns of Great Britain. This event is surely to be regarded as being of quite extraordinary significance, for it created a completely new situation. It initiated a system in which recommendations rooted in medical knowledge began to shape social policy and to guide legislative action. The information thus gleaned formed the basis of the Commission's *Report on the Sanitary Condition of the Labouring Population of Great Britain* which was issued in 1842. Recommendations contained within this report determined the direction which developments relating to the use by society of medicine as an instrument of social policy were to take during the next half-century. They made it

*Sir Charles Hastings Lecture given at B.M.A. House, London, on May 6.

perfectly clear that so far as the application of medical knowledge to the affairs of the community as a whole was concerned, whilst diagnosis and prognosis largely remained the responsibilities of medicine, there were many diseases of great social importance of which the therapy, to a very large extent, was to become the accepted responsibility of central and local authority, taking the form of adequate social and political action. The pharmacy of this new disease-preventive, health-promotive medicine was to be the council chamber of local authority and the House of Commons, and its major therapeutic instrument the sanitary engineer.

To these recommendations, quite inevitably, political implications were attached, for they involved very heavy expenditure and even necessitated the institution of a new department of government. In 1843 a Royal Commission was appointed to consider these implications, and, in response to the recommendations contained in its report, a Government Bill for the improvement of the public health was introduced in the House of Commons in 1845, and 1848 saw the passage of the Public Health Act, which provided for a central General Board of Health with local boards to abate nuisances and to deal locally with matters relating to the people's health. Here again an event of great significance occurred. To this Board, after considerable opposition had been overcome, a medical member was appointed, thus ensuring that at the highest level medical advice should be available for the shaping of policy.

In 1854 this Board was reconstituted, and to it an advisory council, which included a number of medical men, was attached. In 1858 this General Board of Health came to its end, but its salaried medical officer and its medical duties were transferred to the Privy Council. Then in 1871 the medical interests of the Privy Council were transferred to a new central board, the Local Government Board, which had a complete medical department. Finally, in 1919, there came into being the Ministry of Health, essentially as we now know it.

Influence of Medicine upon Legislation

This procession from the General Board of Health to the Ministry of Health depicts the very great and steadily progressive expansion of the attention given by Government to problems relating to the preservation and augmentation of the people's health, and it also reveals the steady growth of the influence of enlarging medicine upon legislation.

The extent of this increasing care of the people's health by Government and the consequent expansion of legislation based upon recommendations rooted in medical knowledge can perhaps best be appreciated by reference to the list of Acts of Parliament that relate directly to measures designed to protect the population against the hazards of disease. In 1837, when Queen Victoria ascended the throne, the Statute Book contained but one—the well-intentioned but futile Act for providing quarantine. But between 1848 and 1948 some fifty Acts of major importance, of ever-widening scope, and relating directly to matters affecting the public health, were added. Of these the most recent, the most impressive, and those which most clearly illustrate the growing recognition of the interdependency of health and welfare and the expanding collaboration of politics and medicine in the general field of human ecology, are the National Health Service Act of 1946, the Children's Act of 1946, and the National Assistance Act of 1948.

These Acts indicate overtly that the Government accepts full responsibility for the provision of a wide variety of means whereby the people's health can be safeguarded and augmented. The Minister must now equip himself with the means of knowing what the public needs in political

terms and with the means of satisfying these needs in administrative ways. No longer does governmental action wait on agitation.

During the last half of the nineteenth century medical knowledge and skill were harnessed to the task of sweeping the physical environment clean of the various living and non-living agencies which were shown to be causally related to disease. The expanding medical services of central and local authority dealt not directly with the human population itself but with the conditions and circumstances of the external physical environment in which the community lived. These medical services did for the individual and for the small community those things which they themselves could not do, protecting the individual and the community against dangers that with the passing of the great epidemics came no longer to be generally recognized.

Health-promotive Services

Then, in the first half of the present century, as concepts of disease causation widened, there evolved a completely new kind of medical activity based upon the recognition that the population was divisible into categories, biological and social, and that each of these presented different medical problems which demanded different methods of disease prevention and health promotion. To serve their various needs there came into being special medical services designed to care for such categories as the mother and child, the school-child, the industrial worker, the pensionable, and the variously handicapped; and new branches of medicine—for example, paediatrics and industrial medicine—made their appearance and developed. The importance of this development lies in the fact that the concepts underlying it and the methodology that was elaborated in connexion with it pertained to what was tantamount to an entirely new kind of medicine, group medicine as contrasted with the medicine of the individual, disease-preventive and health-promotive medicine, and applied to the affairs not of individuals but of communities and the categories within them.

Possibly the greatest value of this later development was to be found in the education of the people in the ways of healthy living, in the changing group patterns of behaviour, in securing the co-operation of great numbers of citizens in endeavours directed toward health promotion, and in bringing to their awareness the existence and scope of the medical services of central and local authority and the philosophy of health-promotive medicine.

The education of the general public concerning the nature and causes of health, and concerning also its personal and social value, is undoubtedly a prerequisite to all successful endeavour by governmental agencies and by the medical profession towards the augmentation of the public health. Only when people ardently desire health can the benefits that medicine has to offer be enjoyed to the best advantage; only then can Government translate this desire into project and scheme. During the nineteenth century on the continent of Europe it was made abundantly clear that a Government, no matter how benevolent in intent, could not impose a regimen of health upon a disinterested people. Thus it was that this development of what may be called the category health services and their indirect education of the general public made the further development of the health-promotive services generally both necessary and inevitable as the appetite of the people for health continued to grow.

Changing Pattern of Morbidity and Mortality

The effects of this employment of medicine as an instrument of social policy are best revealed in movements of such rates as the crude death rate, the infant mortality rate, the survival rate, and in the shift in the life expectancy. They are revealed also in the changing pattern of morbidity and mortality and the changing age structure of the population. It is not suggested that the intervention of medicine in social affairs alone was responsible for these changes; for other and very powerful agencies were at work. There had been occurring during the course of the century under

review a gradual but definite uprising of the general standard of living, in the level of education, of nutrition, of housing, of the conditions of work, and of social security. It is difficult, if not impossible, to disentangle the separate effects of any one of these factors. Nevertheless, it is essentially reasonable to postulate that in the production of the changes that occurred medical intervention played a by no means unimportant part. In saying this I am but repeating what Sir Charles Newman in this Sir Charles Hastings Lecture of the year 1928 stated so much more elegantly: "Health," he said, "is Everyman's duty. It must be every man's Quest ere it can become a national Conquest. . . . The vastly improved health of the people in our generation has no doubt been partly due to the fuller application of medicine and sanitation, but still more to the forces of education, sociology, and biology."

In 1948 the crude death rate was but half of what it had been a hundred years before and the infant mortality rate only a quarter. To the life expectancy of the individual, which in 1848 was about 40 years, 25 and more years had been added. Of the total mortality at all ages at the beginning of the century almost half was recorded as being due to the infectious diseases; at the end of the century these diseases were responsible for only about one-sixth of all deaths. In 1948, of the diseases formerly exceedingly prevalent, some, such as cholera and typhus, were no longer to be found in the list of the causal agencies of death in this country. Typhoid and smallpox had become rarities and diphtheria had lost its importance. Scarlet fever and rheumatic fever were no longer to be feared and the venereal diseases were rapidly passing under control. The pneumonias, though still common, had become far less lethal than formerly, for the case fatality rate had fallen almost to nothingness even amongst the old. The mortality among children under 10 years of age had so greatly diminished that it was only one-sixth of what it had been in 1900. These are indeed triumphs in the achievement of which medicine can rightly claim to have played no little part.

In this successful rebellion against untimely death the weapons that medicine used were of two kinds—those that belong to the armamentarium of the new preventive or health-promotive medicine and those that are the instruments of the older and far more evolved clinical or curative medicine. The former kind took the form of measures for the control of the causal agency of the disease and for the increase of the resistance of the individual to the attack of the disease-evoking agent—for example, sanitation, the encouragement of hygienic personal and public habits in the community, vaccination, and immunization. The weapons of curative medicine consisted for the most part of specific measures taken to modify the action of the causal agency or to mitigate its effects—for example, the introduction of the serum treatment for pneumonia in the 1920s was directly responsible for a steep fall in the death rate from this disease. A similarly dramatic fall later followed the introduction of the sulphonamide drugs, and yet another was directly due to the introduction of penicillin. The introduction of insulin brought continued life to thousands of diabetics. Improvements in surgical, anaesthetic, blood transfusion, and radiotherapy techniques all made their contributions.

Principal Causes of Mortality

But as great as the powers of preventive and curative medicine had become, disease had not been conquered. Great victories had been won, but the war was by no means ended. Diseases that formerly claimed but a lowly place in the list of the causes of disability and death came to occupy a position of dreadful prominence. First among the great killers to-day stand diseases of the cardiovascular system, responsible for rather more than one-third of the total deaths at all ages. Close on their heels come cancer, violence, and tuberculosis. High among the causes of morbidity are peptic ulcer and nervous disorders and, among the elderly, diabetes.

There are relatively far more old people in the population now than there were a century ago. The diseases of the cardiovascular system and malignancy occur far more commonly in the old than in the young; it is to be expected, therefore, that as the age-structure of a population changes as ours has changed their incidence will rise. But this does not explain the sharply rising incidence of cancer of certain sites, of the lungs for example. The great increase in the habit of cigarette-smoking and the increasing vitiation of the atmosphere are under suspicion as contributory factors, but as yet the evidence is not completely firm. An increase in the number of deaths from violence was to be expected as the population grew older and became increasingly urbanized, as mechanization became introduced to augment the power of labour, and as the speed of multiplying transport continually mounted. To-day, in the 5-14 age group, violence, taking the form of an accident, is the major cause of death in the male.

Tuberculosis continues to hold its high place among the enemies of achievement because its causation is multifactorial. Though there is a micro-organism which is the prime causal agent, genetic and socio-economic factors are also involved. The therapy that is demanded, therefore, must consist in a combination of medical and social intervention, and as things are at the moment the power of medical therapy, though great, is to a considerable extent made impotent because of the inability on the part of society immediately to provide those environmental conditions which would segregate the infective sufferer and protect the rest of the community from the hazards of infection.

Into the causation of gastric ulcer possibly genetic and certainly social factors enter. The mental strains of modern life, the widespread unhappiness among such as are not sustained by simple and firmly held religious faiths or their equivalent, the complexity of human interrelationships and the uncongenial and even unhealthy nature of many occupations, the carelessness of many concerning personal habits, have all been blamed for the rising prevalence of this complaint.

Mental illness has a higher incidence in the older age groups than in the younger. Thus its incidence in the over-70 age group is more than twice that in the population as a whole. The figures showing the number of admissions into mental hospitals can be misleading, since not uncommonly they include readmissions. Moreover, it is probable that a far higher proportion of the mentally ill in the population are admitted to hospital than formerly. Not so long ago lunatics were segregated in asylums; now the mentally ill are cared for in mental hospitals. Nowadays psychiatry offers several kinds of therapy, and in many forms of mental illness there is a hope of cure. It is not possible to make an accurate comparison between the incidence of mental illness now and a hundred years ago, but it is by no means unlikely that an actual increase has occurred. Be this as it may, the load constituted by the chronically and hopelessly mentally ill is exceedingly heavy and is an impediment to social advancement.

In very general terms it can therefore be concluded that the conquest of infectious diseases, of the diseases that formerly decimated the young, and of the diseases of privation is fairly complete, and that, as a consequence of this, certain diseases formerly relatively infrequent in their incidence have come to assume a considerable prominence. The diseases of plenty have come to be more common and the chronic diseases of the mature and senescent—genetic, metabolic, degenerative, and malignant—have now become so prevalent as to command the attention not only of the medical profession but of society as a whole. Furthermore, and again in very general terms, it can be concluded that the diseases which have passed or are passing rapidly under control are those in which the causal agencies have their existence in the external physical world of the community, whilst the diseases that have now come to figure so prominently among the causes of chronic disability and death are those in the causation of which a variety of factors operate—a few

genetic and some which relate to personal habits, but in the main those which exist in the external *social* world of the community.

Social Adjustment

The diseases that have passed under control are, for the most part, the diseases of biological man. Man shares his external physical world with a multitude of other living things with which, if he is to flourish, he must establish an equilibrium. In this physical environment there are the micro-organisms that cause disease; these must either be eliminated or, alternatively, between them and the human subject there must become established by natural or artificial means a harmonious relationship. As a consequence of advancing knowledge in such fields as sanitary science, parasitology, and entomology, and especially bacteriology, such elimination has become possible and harmony between biological man and many of the pathogenic micro-organisms in his external physical world can be established.

Man elaborated that aggregate form of living which we know as a human society in order, presumably, to facilitate his dominion over a hostile environment and to make easier the satisfaction of certain fundamental human needs. He is a gregarious animal, and it may be assumed that he found by experience that living in aggregates made the production of food and shelter more certain, gave greater protection, satisfied his yearnings for companionship, and secured the continuance of his kind. The early forms of human society certainly seem to have conferred much advantage upon their individual members. Their kinship relationships and their rituals did much to shift the load of emotional difficulty from the individual on to the broader back of the group as a whole. It would seem that man's elaboration of this social organization from the primitive to the modern has produced an external social world that at many points is violently in disharmony with human needs, and also that the speed of this societal evolution has exceeded man's ability to adjust.

To great numbers of purposeless, bewildered, and perplexed individuals in our society who feel that they have a right to be healthy, since adjustment is beyond their unaided ability, the conditions that exist are intolerable, and in their attempts to escape from the uncongenial there would seem for them to be an easy and respectable route, that of vague, ill-defined, and symbolic illness. Such illness, in no sense a display of malingering, is a common excuse for masochistic sloth, for those who delight in mortification for its own sake, and for the inefficient. Much sickness of this kind is to be regarded as dramatized discontent born of disharmony, as a malaise of maladjustment, and the profession of medicine, therefore, being forced by circumstances to restrict its activities to dealing with the symptoms rather than with the cause, is largely employed in perpetuating the conditions that are primarily responsible for such sickness. Indeed, with the world as it now is nothing could be more calamitous than to rob the people of this kind of sickness, for as things are there appears to be no escape from perplexity and uncongeniality for thousands amongst us other than through the narrow neck of the bottle of medicine. To a large extent one of the major social functions of medicine has thus unfortunately become the provision of comfort for the inefficient and of support for those who, because of their own inadequacies, cannot cope with circumstance.

The nature and causes of health are as yet but imperfectly comprehended. Certainly health is more than biological efficiency, much more than the smooth working of a multitude of interdependent component parts of a machine: it is partly a thing of the spirit of man, a by-product of the exercise of human aspiration and of the satisfaction of attempting or of achieving the worth-while in life. It is a state of harmony, within oneself and between oneself and the external world.

Attitude towards Health

The different income groups within the population and

by significant differences in respect of the incidence of a variety of illnesses. Many of these are undoubtedly true reflections of differences in the conditions and circumstances of their environments and occupations. Though the benefits of medical care have latterly been made available to all, not all of those to whom they are available are in a position to profit therefrom. The different social categories are not so much to be distinguished nowadays by differences of income as they were in former times, as by differences in their modes of spending the money that is earned. It can be spent in ways that are conducive to the maintenance and augmentation of health or otherwise, and much depends upon the attitude towards health and to the desirability of securing it that prevails in the different groups. And even though the desire for healthiness were equal throughout society the chances of securing it are by no means equally distributed. Thousands of the population are still imprisoned in the hideous squalor of the legacy that was left to us by the nineteenth century. Others are bound by the shackles of tradition, ignorance, and superstition. Such imprisonment, such bondage, are not compatible with the maintenance of health, and under such circumstances there is very little that purely medical therapy can do.

Society for its continuance requires that a vast variety of tasks shall be undertaken. Some kinds take the form of strenuous physical labour, others are sedentary; some are in the open air, others in the vitiated atmosphere of office and factory; some are creative and emotionally and intellectually satisfying, others are dull routine drudgery. Very many of these occupational categories have their own peculiar health hazards, some being positively dangerous. In general terms the amount of minor illness occurring among those undertaking a particular kind of work is an index not only of the danger to health but also of the uncongeniality of the work that is demanded. It is small among those who are doing work that is satisfying to them and which is regarded as important by others; it is considerable among those who are called upon to perform work from which they derive no contentment. Here again purely medical therapy is largely impotent and only social therapy can hope to eradicate the causes of such sickness.

The great disparity between the numbers now marrying each year and the number of houses that are available to them is undoubtedly an indirect cause of much discomfort and distress that often leads to actual illness, both mental and physical. In the establishment of that micro-environment which is the home, if this is to be health-promoting in respect of its general conditions and atmosphere, the family grouping can claim an exceptional importance. Evidence that has been accumulated shows beyond all doubt that the interrelationships between the individuals constituting the family play a most important part in determining the state of the mental health of the component individuals. Yet the kind of society that we have developed so far has imperilled the very continued existence of the family group and has made the achievement of a harmonious interrelationship among its members difficult of achievement.

An Urgent Need

Though these developments undoubtedly have their repercussions in the medical field, medicine itself has no therapy which can be applied to the resolution of the problems they create. It would seem, indeed, that the great and urgent need of the day is that the encouragement thus far given by society to the medical scientist shall be given with the same readiness and in the same magnitude to other social scientists also from whose studies it can be expected that there may emerge knowledge that could be transformed into the power to repair the present disease-evoking qualities of society and its institutions.

This is of importance also because of the complexity and social importance of the problem of the progressive increase of the proportion of the aged within the population that has resulted very largely indeed from the success

evoking agencies resident in the external physical world. The proportion of the aged has risen because the birth rate has fallen and because the survival rate, especially amongst the younger age groups, has risen. Though the net reproduction rate of the population has fallen, of those that are born fewer now die in infancy, childhood, and early maturity, and so live on to die in late maturity and old age. Since the reproduction rate has fallen to half of what it was a century ago and since the survival rate has risen so dramatically, it follows that there are now relatively far fewer young in the population than there used to be and relatively more old, and so the mean age of the population has steadily risen, and indeed is still rising. At present the life expectancy among those aged 65 and over is not substantially greater than it was a hundred years ago. But should the ardent quest for the power to control the cardiovascular and malignant diseases be successful, then the life expectancy of the individual would at once leap to become far greater than it now is.

Since in great numbers of instances death at present amongst the old is not the gentle end of a long and progressive waning but is a last phase in the progress of some particular disease, it follows that in increasing measure the patients of the physician will be those in the older age groups of the population and that the commonest of the most serious diseases with which he must attempt to deal will be the malignant and the cardiovascular diseases, chronic in their course and disabling in their effects.

That branch of medicine which is now becoming known as geriatrics will assume an importance both in medical education and in practice equal to that of paediatrics in the early decades of the present century. But sickness in old age differs from sickness in youth or maturity in that, since in a large number of instances the old either live alone or inconveniently with relatives or others, the attention, domestic and nursing, that the patient requires is not readily available. The social aspects of such disease are no less important than are the purely medical, and therefore social as well as medical therapy is demanded.

A Growing Economic Burden

As things are in our society the economic burden constituted by those of pensionable age and over within the population is already heavy and must grow heavier still if the present trends continue. It is society's will, in accordance with the prevailing social ethic, that life shall be preserved and prolonged; the ethic of medicine binds the physician to the same obligation. In the medical sciences the quest for the knowledge that will give power to control the degenerative and malignant diseases eagerly proceeds; yet in the social structure as we know it there is no place for the old, and much illness among them would seem to derive from a sense of sudden extrusion from the community. Disease of this kind is the reaction of the total personality to the uncongenial circumstances to which the individual is suddenly exposed. Feeling unwanted, many amongst the old do not exercise their skills and to their own hurt futilely rebel against the conditions that imprison them.

Since it is not improbable that the life expectancy of the individual will become further, and perhaps greatly, extended, it behoves society to ensure that the problems thus created do not lead to crisis and catastrophe. The life span being thus extended and healthiness being assured to the senescent, the relation between the chronological and the physiological age of the individual will need to be reviewed. Manifestly the school-leaving age and the age on retirement in a population in which the life expectancy is 75 years might well be much higher than in one with a life expectancy of 45 years. But there will be much need for knowledge on which the education of the middle-aged in the art of growing old can be based, for guidance clinics for the senescent, for the development of a system whereby the process of withdrawal from society and from work as the power of adjustment and

into society by the infant. Medicine as a social science must be heavily involved in these matters, but its role must remain a subordinate one to that of the statesman, whose policies are shaped by advancing knowledge in all those scientific disciplines which deal, directly or indirectly, with those features of a human society which affect the public health.

Problems of Colonization

Medical intervention of the same kind has created even more acute and serious problems in other and relatively undeveloped countries. During the course of the period of the phase of colonization in which we as a people indulged, we introduced into many parts of the world the medicine that is part of our own culture, proclaimedly using it with benevolent intent to improve the lot of the indigenous peoples whose cultures differed greatly from our own. We inserted nineteenth- and twentieth-century Western European scientific medicine into the cultures of peoples who, according to our own standards, were still living in the equivalent of our own Middle Ages. By doing so we have largely helped to destroy those cultures and have created problems of far greater complexity than those which we attempted to solve.

In India, for example, the population has been increasing at the rate of four and a half millions every year, and that this is largely the result of the introduction during the period of British rule of our standards of sanitation and medical care is beyond doubt. India is at present quite incapable of feeding from her own resources her immense and rapidly growing population, and so, quite inevitably, much poverty and even more misery are the lot of millions. The major task facing the Indian statesman is that of finding solutions to the social and economic problems thus largely created by medical intervention.

In Africa the introduction of modern European medicine for the benevolent purposes of saving life and of eradicating disease from the indigenous populations has been largely and directly responsible for the magnification of a cluster of problems that relate to the interrelationship of the different ethnic groups. In South Africa the policy which the medical services have there pursued seemingly has been in discord with the policies of the presently predominant political party.

In many parts of the Empire it has been shown that the effects of medical intervention far outpace those of the other services which are directed towards social amelioration, and that in so doing create problems that threaten to bring all such betterment to an end. The eradication of many and prevalent diseases responsible for much death, disability, and inefficiency—malaria, venereal diseases, yellow fever, and the like—has become a relatively simple matter, but their elimination can result in a complete disruption of the prevailing economic system so that famine can threaten to become the regulator of population growth unless wise statecraft intervenes.

Perhaps the lesson that is to be learnt is that medicine is but one of many activities that are directed to human and social amelioration; that medicine can bring under control the environmental factors causing the major diseases of a native people far more speedily than the other services can create the conditions that are necessary if those thus saved and made healthy are to flourish, and that possibly in all projects for social amelioration of this kind what is needed is a time-table of intervention so that the medical services are timeously introduced as part of a complete and comprehensive project which does not neglect the educational, economic, and other aspects of the problem.

Repercussions

Thus, both in this country and overseas, medical action has given rise to repercussions that take the form of grave and serious social problems, problems unlike those which medicine has so far solved in that it

the supporting and the supported categories within a population, and with the increasing disparity between the number of mouths to be fed and the available food resources of the world, the problem that the *bouche inutile* creates gains in importance. In this country within the National Health Service it is already being found that the existing facilities cannot cope with newly discovered and enlarging needs. The authorities concerned are being forced to give serious consideration to the construction of a calculus of priorities. Great, therefore, becomes the need for the provision of the means whereby greater and more detailed knowledge concerning the variety and the needs of the public for those services can be secured. The changing age-structure and the changing pattern of morbidity are prominent among the factors that are creating the demand for the expansion of medical and hospital services at a time when the financial resources of the nation are strained.

It is to be remembered that in their beginning the medical services were encouraged because it was thought that such medical intervention would prove itself to be a sound business proposition. It would certainly seem that the reasons for the encouragement of medical research and of the practice of preventive and of curative medicine have changed, though not completely, since then. It would be difficult to maintain that the medical care of the old, permanently disabled by chronic illness, or of the idiot and imbecile beyond all human aid is economically desirable. Such matters are not to be considered in economic terms, for moral principles are involved. They do not create difficulties within the medical profession, for this is governed by an explicitly stated code; but they do constitute problems of profound difficulty and complexity for society as a whole. There is to be discerned a growing interest in such matters as the sterilization of the unfit and euthanasia, which can be regarded as an indication that the gravity of the problem is becoming recognized and that the search for a possible solution has begun. I refer to this matter only to attract your attention to the possibility that in the future the social ethic may come to be in conflict with the ethic that at the moment prevails within the profession of medicine.

Changing Needs

The medical ethic in its origin and development was associated with the development of the profession of medicine as a body concerned with the diseases of individuals. It regulates the relationship of physician and patient, often as intimate a relationship as that of the confessional. Like the Church, the medical profession would seem to claim that it is concerned with matters outside the province of the State, that its obligations are to the individuals that seek its aid, and that it is not in any way concerned with the social consequences of its benevolence. Concerning many matters of interest and importance to society—contraception, sterilization, euthanasia, divorce, for example—there are medical aspects. But concerning them there would seem to be no purely medical opinion, but merely the conflicting views of medical men and women whose attitude towards such matters as these is moulded by their sincerely held religious faiths, so that the opinions expressed derive their strength therefrom.

Yet it is with such matters as these that those medical men and women who serve in the field of population medicine, of medicine as applied to the affairs of the population as a whole, are becoming increasingly involved. They are required to present to the departments of government or to committees of local authority a purely medical opinion concerning them and to relate this to the action that is being considered. Such expert opinion commands the serious attention of those whose responsibility it is to consider and weigh all relevant knowledge and opinion and translate this into scheme and project.

It is not improbable that public opinion in this country concerning the value of the individual life, beginning at the moment of conception, will change. Indeed, there is plentiful evidence that both among the general public and within

the medical profession it is already changing fast. The social ethic, like the law that sustains it, is mutable. It may come to be regarded as ethical by the great majority of the general public to terminate the life that from birth is imprisoned in a body without a brain or to bring to a peaceful ending a life that flickers fitfully in a body that is tortured by agony beyond endurance. Should this happen, will the ethic of medicine remain inviolate or will it become modified as the social ethic changes?

If not, then it is not improbable that in the future the ethic of the medicine of the individual and that of the medicine that is applied to the affairs of society as a whole may come to differ, to make even greater the divergence in respect of their philosophies that even now distinguishes them. The ethic of the former belongs to an age that is swiftly passing and is becoming inappropriate to the circumstances of a world in which the major quest is for social amelioration rather than for personal continuance.

The major obligation of medicine in increasing measure will be towards society, and medicine will continue to be one of the most potent instruments that society will use for the achievement of its aims. It will be for medicine, along with the other social sciences, continually to examine and to define the changing and enlarging needs of socialized man, in respect of health conservation and augmentation, and for politics to design and to provide the means whereby society can be so shaped that these needs are satisfied.

But all such endeavour must remain barren unless the citizen, knowing its value, desires health and, seeking it, eagerly and intelligently makes use, in the conduct of his private and public life, of the knowledge and of the facilities thus made available.

TREATMENT OF POLYCYTHAEMIA RUBRA VERA*

BY

RONALD BODLEY SCOTT, D.M., F.R.C.P.

Physician to H.M. the Queen; Assistant Physician,
St. Bartholomew's Hospital; Physician to Woolwich
Memorial and Surbiton General Hospitals

The cause of polycythaemia rubra vera remains unknown; indeed, the very nature of the disease is still debatable, although perhaps a majority would favour its inclusion with leukaemia in the group of unexplained, and apparently purposeless, mesenchymal proliferations. Our ignorance limits treatment to the empirical and the symptomatic. In general the therapeutic aim has been to maintain a normal blood count. It is therefore pertinent to inquire whether its achievement relieves the patient's symptoms or prolongs his survival, and in what manner the disease terminates.

Associated Diseases in Polycythaemia Vera

There are symptoms, such as a sense of fullness in the head, vertigo, flushing, dizziness, and pruritus, which can be attributed without question to the changes in the blood and which disappear when the erythrocyte count falls to normal. They need to be separated from those of vascular degeneration, arterial hypertension, gout, peptic ulcer, renal calculus, and other common companions of polycythaemia vera. Videbaek (1950) has shown that the disease, as treated in the past, shortens the expectation of life; in his patients the mean survival from the time of diagnosis was six years for men and nine for women (Fig. 1). Whether maintenance of a normal erythrocyte count prolongs

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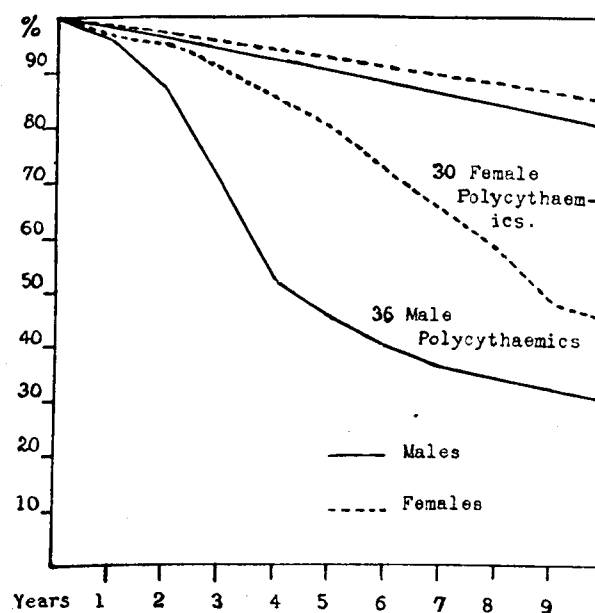


FIG. 1.—Percentage of patients with polycythaemia vera surviving at the end of each year compared with the survival for the general population of the same age (Videbaek, 1950).

survival is unknown, because no series of untreated cases is available and because satisfactory control has been exceptional. Videbaek's figures will provide a useful yardstick for measuring the efficacy of newer methods of treatment, but they show that a long period of observation is required before any conclusions are justifiable.

The causes of death in polycythaemic patients are relevant to this question of survival. It is a disease of middle and later life, and it is not surprising to find it accompanied by the degenerative states common in these epochs. Table I

TABLE I.—Associated Conditions in 36 Patients with Polycythaemia Vera

Arterial thrombosis:		
Cerebral	..	4
Mesenteric	..	3
Coronary	..	2
Limb	..	1
Thrombophlebitis	..	2
Peripheral arterial disease	..	2
Hypertension	..	8
Duodenal ulcer	..	2
Gastric ulcer	..	3
Intestinal haemorrhage	..	2
Renal calculus	..	2
Pyelonephritis	..	1
Diabetes mellitus	..	3
Gout	..	1
Various	..	3

shows the frequency of complicating disease in the present series of 36 patients, and is representative of the larger experience of other authors. Vascular disease occupies the first position; but peptic ulceration, renal calculus, and gout are all more common than in patients of like age without polycythaemia.

The causes of death reveal the importance of these associations (Table II). It is rare for death to be immediately attributable to the progress of the polycythaemic process; perhaps the examples of leukaemia and the even less

TABLE II.—Causes of Death in Polycythaemia Vera (from Lawrence, 1949; Videbaek, 1950; Stroebel, Hall, and Pease, 1951)

	Not Treated with P ₃₂		Treated with P ₃₂		S.E. of Difference
	No.	%	No.	%	
Vascular accidents ..	56	52	17	39.5	8.87
Leukaemia ..	6	5.6	10	23.3	6.8
Other causes ..	46	42.4	16	37.2	—
	108		43		

common instances of secondary myelosclerosis fall into this category. More than half the deaths are due to vascular accidents, most frequently thrombotic; calculous pyelonephritis accounts for as many as 18% in one series (Videbaek, 1950), and leukaemia for 6%, while causes apparently unrelated to polycythaemia are responsible for the remainder.

Aims of Treatment

There is no evidence that vascular degeneration is more common in the polycythaemic patient than in others; it is logical, therefore, to attribute the frequency of thrombosis to the increased viscosity of the blood, and reasonable to hope that maintenance of a normal count will diminish, or at any rate defer, the incidence of such catastrophes. Renal calculus depends on the increased excretion of urates, a product of the bone marrow's overactivity, rather than on the elevated erythrocyte count; its control by measures which discourage this activity might be anticipated.

Restraint of the hyperplastic bone marrow seems, therefore, to be a rational treatment. It would control the erythrocyte count and relieve the "true" polycythaemic symptoms. The restoration of normal levels, both for erythrocytes and for platelets, might be expected to diminish the risk of thrombosis. Uric acid excretion, the increase in which is probably a function of bone-marrow hyperplasia, should fall to normal, lessening the danger of stone and renal infection. It must be stressed, however, that, although these effects can logically be anticipated, there is as yet no incontrovertible proof that, excepting the relief of true polycythaemic symptoms, they do in fact occur.

Methods of Treatment

From what has been said it will be clear that treatment of patients with this disease is often a matter of complexity: arterial or venous thrombosis, dyspepsia, gout, or renal calculus may dominate the picture, and the management of these disorders against a background of polycythaemia may call for many difficult decisions. This communication, however, concerns itself only with methods of controlling the polycythaemic process and not with these problems of general management.

Until recent years the two therapeutic measures in common use were venesection and the haemolytic agent phenylhydrazine, either alone or in combination. By these means many patients have been kept free from symptoms for long periods, but both methods have practical and theoretical disadvantages. Repeated bleedings and the haemolysis occasioned by phenylhydrazine are bone-marrow stimulants, and, although the erythrocyte count may be kept within bounds, there is no like effect on the leucocytes or the platelets. The dosage of phenylhydrazine is difficult to control and its action is sometimes unexpectedly abrupt. More important is the iron deficiency which results from continued venesection; in many patients treated in this way chlorotic polycythaemia (Rosenthal and Bassen, 1938) appears, the haemoglobin reading falling below normal although the erythrocyte count remains high. An impasse is reached in which the increased viscosity of the blood and its attendant perils demand further bleeding, which will inevitably reduce the haemoglobin level enough to cause anaemic symptoms.

During the past decade, chemical and radiotherapeutic methods of treatment have been devised which meet our theoretical requirements better than the two already discussed, in that they aim to abolish the bone-marrow hyperplasia. Nitrogen mustard is representative of the first group and will certainly procure remission in many patients. Its action is short-lived, and relapse usually occurs within six months (Spurr, Smith, Block, and Jacobson, 1950); moreover, its side-effects are often unwelcome. The folic acid antagonists have been used, but results are indifferent (Bell and Davis, 1950). Radiotherapy is undoubtedly more satisfactory. It is best applied by total body irradiation (Richardson and Robbins, 1948), and the results are excellent. Only three patients of the present series were treated

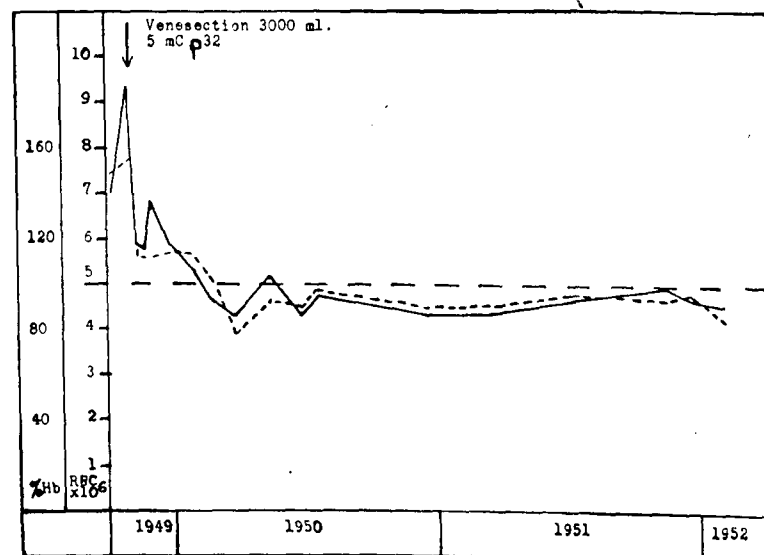


FIG. 2.—Polycythaemia vera in a woman aged 50. Satisfactory control with venesection and radioactive phosphorus.

in this manner, and good remission was obtained in all; one of them remains well after more than three years. The method is, however, cumbersome, and treatment may take several weeks.

Radioactive Phosphorus

A more convenient means is by the administration of the radioactive isotope of phosphorus, P^{32} . This was first employed in 1940 by Lawrence, and the results in several large series have been published in the United States (Erf, 1946; Reinhard, Moore, Bierbaum, and Moore, 1946; Lawrence, 1949; Stroebel, Hall, and Pease, 1951; Wiseman, Rohn, Bouroncle, and Myers, 1951). The following remarks are based largely on these reports.

P^{32} is prepared from red phosphorus by one of several methods; it decays at a constant rate, emitting only beta rays, and has a half-life of 14.3 days. Its radioactivity is measured in millicuries, one millicurie being that amount of radioactivity produced by the disintegration of 37,000,000 atoms per second. When administered, P^{32} is incorporated in the nucleoproteins, particularly of rapidly dividing cells, and finds its way mainly to the bone marrow, liver, spleen, lymph nodes, bones, and teeth. Given intravenously 5–25% is excreted, chiefly in the urine; by mouth the loss is 15–50%, largely in the stool. About 75% of an oral dose is absorbed. In the average adult, 1 mC of P^{32} emits on the first day radioactivity equivalent to about 0.6 roentgen unit given by total body irradiation, or 12 roentgens during the time required for complete decay. In healthy monkeys its effect is shown by a reduction in the number of circulating leucocytes, with a lesser fall in the erythrocyte count; the lethal dose is about ten times that judged to be the equivalent of the human therapeutic dose (Scott and Lawrence, 1941).

The results of the American workers are all in close accord: in 80% of patients satisfactory remission, lasting for at least a year, is obtained; in about 20% the result is

poor or treatment has to be abandoned because of a precipitous fall in platelet or leucocyte count. These last haematological complications are rare, and fatal in less than 1%. Remission does not, of course, imply more than restoration of a normal blood picture and freedom from true polycythaemic symptoms; insufficient time has elapsed to know whether patients receiving P^{32} live longer than those treated by other methods.

There is little doubt that acute myeloblastic leukaemia occurs more commonly after the use of P^{32} . The incidence of chronic myeloid leukaemia remains the same, and may perhaps be regarded as one normal termination of the polycythaemic process. The figures in Table II include patients dying of both forms. Even so, the increase is unlikely to be due to chance; if only the acute variety is included the increase is undoubtedly significant. In one paper reports of 453 patients treated with P^{32} were reviewed, of whom only 40 (8.8%) had died; yet of these deaths, 12 (30%) had been due to acute myeloblastic leukaemia (Wiseman *et al.*, 1951).

The present series is so small compared with those from America that detailed analysis would be impertinent. Of 35 patients seen during the past five years, only 20 were treated with P^{32} ; of these, 16 have been observed for more than a year. In 13 patients (80%) satisfactory remission lasting a year or longer followed treatment; one of the treated patients has died from calculous pyelonephritis.

The technique employed has been developed with Mr. I. G. Williams, Director of the Radiotherapeutic Department at St. Bartholomew's Hospital, and closely follows those described by other authors. The initial erythrocyte count is reduced to 6,000,000 per c.mm. and the haematocrit reading to 55% by daily venesections, not exceeding 1,000 ml. in volume; patients have been bled of as much as 6,000 ml. in a week without ill effect. After venesection P^{32} is given intravenously in doses varying from 3 to 5 mC; the dose is judged by the initial erythrocyte, leucocyte, and platelet counts and by the size of the patient. Patients are seen at intervals of six weeks, and no further P^{32} is given for at least two months; further venesection is avoided. Few patients have required a second dose. A leucocyte count below 5,000 per c.mm. or a platelet count below 150,000 per c.mm. has been taken to contraindicate this form of treatment (Figs. 2 and 3).

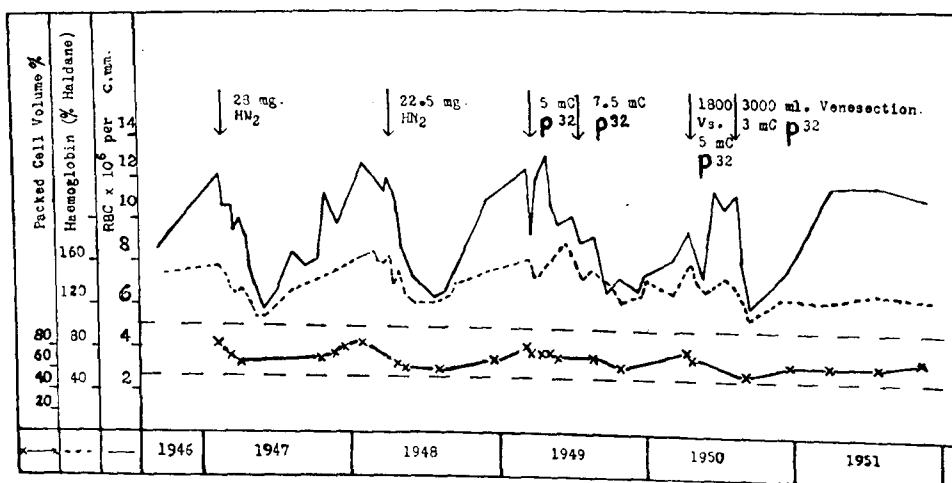


FIG. 3.—Polycythaemia vera in a man aged 36. Unsatisfactory control with nitrogen mustard, followed by venesection and radioactive phosphorus. Further treatment with radioactive phosphorus was withheld because the platelet count fell to 90,000 per c.mm.

Conclusion

Our experience, although diminutive, has confirmed the published opinions that radioactive phosphorus offers the most convenient means of controlling the haemopoietic exuberance of polycythaemia rubra vera. In 80% of patients the blood count is restored to normal for at least a year, and the symptoms immediately attributable to its previous perversion are relieved; the remainder are either resistant to this form of treatment or show leucopenia or thrombocytopenia sufficient to make it dangerous.

Acute myeloblastic leukaemia is a more common termination in those given P^{32} than in those not so treated. The size of this risk remains to be assessed, and it will be some years before we can be certain that the mean survival is increased or the incidence of vascular and other complications lessened by treatment with radioactive phosphorus.

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OBSERVATIONS ON PROGNOSIS IN HYPERTENSION

BY

A. W. D. LEISHMAN, D.M., F.R.C.P.
Consultant Physician, United Sheffield Hospitals

Lumbo-dorsal sympathectomy for hypertension is no longer a novelty, although in this country experience of this method of treatment is perhaps only now maturing. Reports of success from this operation have been criticized by Platt and Stanbury (1950) on the grounds that the prospects of many of the patients chosen for operation may well have been favourable in any case. Such criticism, indeed, cannot easily be refuted, since it exposes an unfortunate gap in our knowledge.

Follow-up studies such as those of Janeway (1913), Blackford, Bowers, and Baker (1930), and Bechgaard (1946) have helped to give us a fair conception of the overall prognosis in hypertensive disease, yet probably most of us would agree that, though we could recognize the malignant type of case and perhaps the obviously benign case, we are seldom in a position to predict with any confidence the future of a hypertensive patient, at least at the first examination. So long as we lack this facility unnecessary operations may be inflicted upon hypertensive patients, while in others the decision to operate may well be left too late. It seemed that this situation could be remedied only by acquiring a wider experience of short-term prognosis in hypertension, and this was the object of the present study.

The observations were begun in 1946 at a clinic for hypertensive patients. In addition to the selection of cases for sympathectomy it was proposed to follow the progress of every patient by full examination at regular

intervals; the hope being that when eventually each individual course or fate came to be related to the original clinical findings these would establish the guiding principles by which even at the first examination a hypertensive patient's future might be predicted.

Patients were not accepted for this study unless their diastolic pressure was 100 mm. Hg. or above (the systolic pressure has been largely ignored), or if their age exceeded 60; later, with interest becoming centred on the younger group, the age limit was lowered to 50. The period of observation ranged between two-and-a-half and five years and the patients were examined at intervals of twelve months, six months, and in a few cases three months, according to the severity of their disease. The clinical examination and investigation were strictly standardized, and a progress sheet incorporating the main features in graph form was maintained for each patient.

Since blood pressures were often found to differ considerably in the two arms, the average of a number of readings in both arms was recorded, the final figures being taken after 20 minutes' undisturbed rest. The blood pressure was also taken with the patient standing, and in the leg as well at the first examination, lest coarctation of the aorta be missed. Retinal changes were classified in the conventional five grades as initiated by Wagoner and Keith (1939): grade 0, normal; grade I, spastic retinal arteries with or without variations in calibre; grade II, compression of veins at arteriovenous crossings; grade III, the presence of exudate or haemorrhages; and grade IV, papilloedema. The investigations included intravenous pyelography; 6 ft. (1.8 m.) chest x-ray film for record of heart size in terms of cardio-thoracic ratio; 12-lead electrocardiography; chemical, microscopic, and culture examination of urine; urea-clearance test; modified urine-concentration test; and standard blood biochemistry.

The review is based on the study of 151 hypertensive patients (93 women, 58 men) who fulfilled the necessary criteria. These were first examined during the period October, 1946, to June, 1949; they were treated conservatively, and their fate or condition was known at the end of 1951.

Mortality

During the period of observation 51 patients (34%) died as a consequence of hypertension. The death rate for men alone was 44%: the male mortality was higher in each of the main causes of death, with the exception of cerebral vascular accidents, in which proportionately the sexes were equally represented. Even this slight difference may not be fortuitous, since Frant and Groen (1950) showed an actual preponderance of women dying from strokes.

The age at which the 51 patients died and the individual causes of death are shown in Fig. 1. As would be expected, most of the deaths occurring before the age of 45 were due to uraemia, whilst most deaths from other causes occurred in the sixth decade. The height of the diastolic pressure has obviously an important bearing upon mortality, particularly in the case of hypertensive men (see Table).

Percentage Mortality in Relation to Diastolic Blood Pressure at First Examination

	Diastolic Pressure					
	100–119 mm. Hg		120–129 mm. Hg		130+ mm. Hg	
	No.	Deaths	No.	Deaths	No.	Deaths
Men	18	1 (5.5%)	16	7 (43.8%)	24	19 (79.2%)
Women	39	4 (10.3%)	17	5 (29.4%)	37	15 (40.5%)

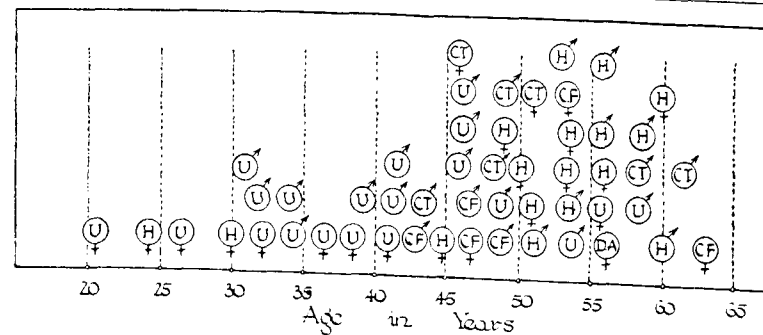


FIG. 1.—Age at death of 51 patients dying from hypertension. Cause of death: U=uraemia; H=cerebral haemorrhage; C.T.=coronary thrombosis; C.F.=congestive heart failure; D.A.=dissecting aneurysm.

For example, at the end of this comparatively short period of observation, only 5 men were alive out of 24 who had a diastolic pressure of 130 mm. Hg at their first examination.

Analysis of Clinical Findings

There were 100 survivors, and in Fig. 2 these have been divided into two groups according to the diastolic pressure at their first examination; in 73 it was below 130 mm. Hg and in 27 it was 130 mm. Hg or over. This chart shows the percentage incidence of certain of the main clinical features when these patients were first examined. While percentages of relatively small groups are obviously open

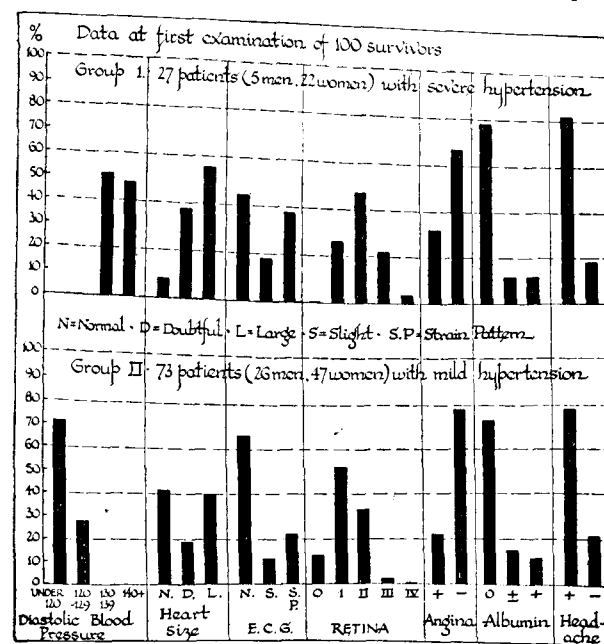


FIG. 2.—Data at first examination of 100 survivors.

to criticism, as a method of comparison they seem unavoidable. Since the object of this form of presentation is essentially to show trends, it was thought that on this basis they could be accepted.

It will be seen that in the severe group more hearts are enlarged, more electrocardiograms are abnormal, more retinæ show advanced changes, and there is a greater incidence of angina. On the other hand, albuminuria is no more frequent and headache occurred equally in the two groups.

Searching next for some indication of why one patient is more liable to a cerebral vascular accident than another, the presenting clinical features of 30 patients who later had strokes of one sort or another are compared with those of a group of 17 severely hypertensive patients who survived without such disasters (Fig. 3). By selecting severe cases

for comparison it was considered that any differences found would have increased significance. Despite the fact that in the former group blood pressures were not uniformly severe, there seems little doubt that these patients for the most part had the more advanced disease: not only were there more enlarged hearts and abnormal electrocardiograms among the patients who developed cerebral vascular accidents, but the incidence of retinal changes of grades III and IV and of true albuminuria was also notably higher.

A similar clinical analysis of the patients destined later to die from uraemia is presented in Fig. 4. It will be seen that little more than half of these patients had diastolic pressures in the severe range when first examined, and that enlarged hearts and abnormal electrocardiograms were the exception. Hypertensive headache was almost universal, but the outstanding feature of this group is the remarkable frequency of advanced retinal changes and of true albuminuria. No less than 90% of the cases had retinal changes graded as III or IV, and 75% had albuminuria in excess of a trace.

If now Figs. 2, 3, and 4 are considered together some interesting trends can be recognized. For example, the incidence of severe retinal changes (grades III and IV)

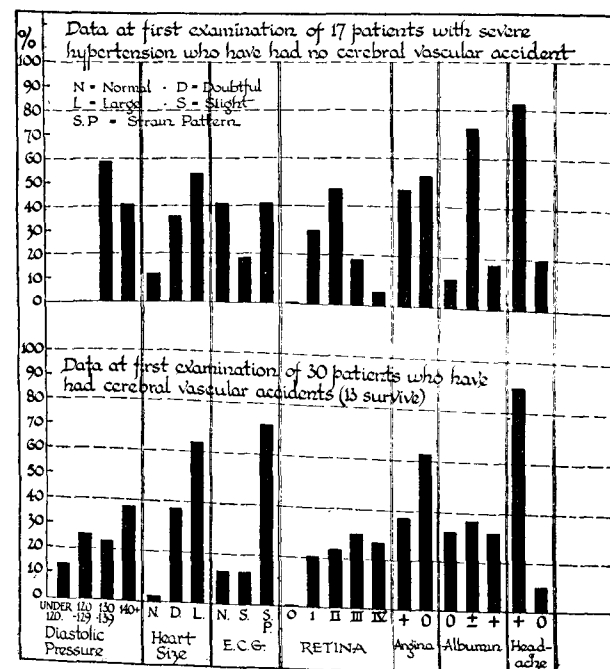


FIG. 3.—Comparison, at first examination, of 17 patients with severe hypertension who have had no cerebral vascular accident with 30 patients (13 survivors) who have had cerebral vascular accidents.

and of true albuminuria when related to the four groups of patients (Fig. 5) shows a remarkably progressive pattern. The parallel behaviour of these distinct features with its suggestion of a single pathological process should also be noted.

Enlarged hearts and abnormal electrocardiograms show a similarly progressive incidence in three of the groups of patients. These changes, however, were not a feature of the fourth group who died from uraemia; this is not surprising, for many were young and their disease was probably of relatively short duration. While from these figures it may be inferred that a high diastolic pressure increases the chances of developing an enlarged heart or an abnormal

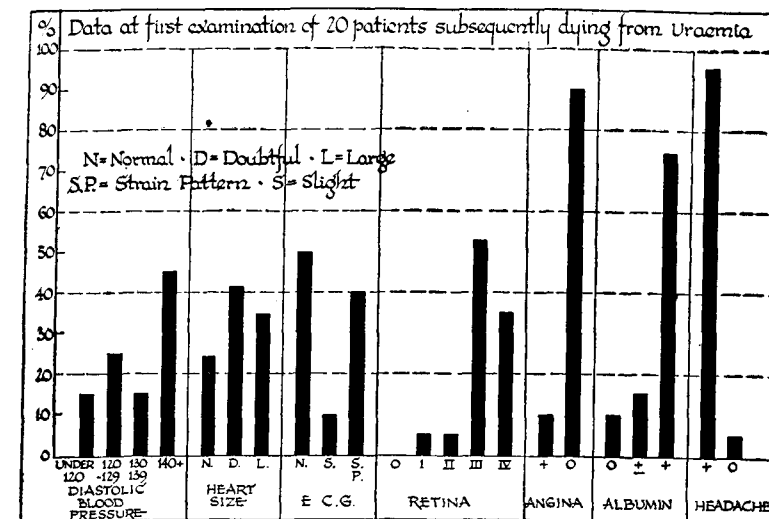


FIG. 4.—Clinical analysis of 20 patients subsequently dying from uraemia.

electrocardiogram, other factors are clearly involved, for it will be seen that these changes were encountered most often of all in a group (30 patients who developed cerebral vascular accidents) in which severe blood pressures were not consistently found.

Thus far, at least one conclusion seems inescapable: that regardless of the height of the blood pressure the stage which the hypertensive disease has reached may best be judged on the presence or absence of these four clinical features—

namely, advanced retinal changes, albuminuria in excess of a trace, cardiac enlargement, and abnormality of the electrocardiogram.

Secondary Hypertension

A primary cause was possibly responsible for the hypertension in 21% of the 151 cases in this study (and 25 others submitted to sympathectomy). In all but three cases the primary cause was renal; the exceptions being re-

spectively cases of pheochromocytoma, Cushing's syndrome, and periarteritis nodosa. A primary cause was recognized in 32% of the fatal cases, but, rather surprisingly, of the 20 patients dying from uraemia only 7 at most were thought to have primary renal disease.

Familial Incidence

Inevitably any estimate of the familial incidence of vascular renal disease which relies upon information supplied by the patients themselves is likely to be inaccurate. But, making every allowance for this, the figure of 35% obtained in this group seems surprisingly low. A familial tendency, however, has not appeared to influence prognosis, for among the fatal cases the incidence was no higher, and it was perhaps rather surprising though comforting to find that, so far as the 15 deaths from strokes were concerned, history had repeated itself in only three instances.

Obesity and Prognosis

Obesity and hypertension have proved a favourable combination, for 50% of the 100 survivors were overweight, compared with 14% of the patients who later succumbed. Yet apparent objective improvement may follow substantial weight reduction. It was found, for example, that 11 patients out of 18 showed an average fall in diastolic pressure of 17 mm. Hg after reducing their weight by 21 to 56 lb. (9.5 to 25.4 kg.); in seven cases the heart appeared to decrease in size as well. Though at first sight a paradox, the probable explanation is as Wood (1950) suggests, that obese patients are not as severely hypertensive as they appear; certainly the benign course pursued by these patients despite high diastolic pressures would support this view. The exaggerated sphygmomanometer reading obtained in a fat arm seems likely also to account for the apparent fall in blood pressure after weight loss; and even reduction in size of the cardiac silhouette does not necessarily indicate objective improvement, since loss of abdominal fat with lowering of the diaphragm will of course alter the position and contour of the heart.

Progress of Surviving Patients

At the end of the observation period three-quarters of the 100 survivors were still leading unrestricted lives, but in at least 60% there was evidence that the disease had advanced. This was shown mainly by enlargement of the heart, deterioration of the electrocardiogram, or advance in retinal grading; blood pressures showed little tendency to rise. Albuminuria to the extent of a trace or light cloud made its appearance in the urine of more than half of the cases with severe hypertension, and here also there was a tendency for the specific gravity of the urine to become fixed. Broadly speaking, however, the severe cases behaved little differently from the milder ones, with the exception that cerebral vascular accidents occurred six times more often among the former.

Discussion

Hypertensive disease must be regarded as inevitably progressive, but the rate of progress, and therefore the prospects, of each patient are infinitely varied. Prognosis is essentially concerned with estimating the rate of advance. A full study of each hypertensive patient along the lines adopted in this investigation will reveal the extent of the damage already caused by the hypertension, and if this is then related to the patient's sex, age, and build, and above all to the height of his diastolic blood pressure, it should generally be possible, even when first seen, to assign a case to one of two categories: benign hypertension or "accelerated" hypertension.

Benign or Slowly Progressive Hypertensive Disease

The patients in this group, fortunately the largest in the hypertensive community, are likely for the most part to survive at least to 65. The most common cause of death is from congestive failure (Goldring and Chasis, 1944); uraemia is extremely rare except as a complication of heart failure, and cerebral vascular accidents are not to be expected until a reasonably advanced age. It is true that on occasion a patient who initially appears to qualify for this group will unexpectedly develop signs of an accelerated process, though this seems to be uncommon: within the period of this study not more than two patients from the 100 survivors appeared to alter course in this manner.

Recognition of this form of hypertensive disease presents little difficulty, for most of the patients

diastolic blood pressures consistently nearer 100 mm. Hg than 120 mm. Hg; but, since many of them are obese, some allowance for this must be made when higher pressures than these are recorded. Retinal changes observed in these cases never exceed grade II. The urine rarely contains more than a trace of albumin, and loss of concentrating power is the only indication of impaired renal function. The heart enlarges progressively, but the electrocardiogram as a rule becomes abnormal only when the enlargement is considerable (Leishman, 1951).

"Accelerated" Hypertensive Disease

At the opposite end of the scale the most rapid form of the disease, which usually terminates in uraemia below the age of 45, is also easy to identify. Unfortunately, however, such cases are often encountered only in the pre-terminal phase, when symptoms such as failure of vision compel attention for the first time. The age, the advanced character of the retinal changes—that is, grade III or IV—and the presence of a dense cloud of albumin distinguish this type of hypertensive case from all others. Most of these patients are men, and they are rarely, if ever, obese. Diastolic blood pressures tend to be high, of the order of 130 to 150 mm. Hg, though this is not invariable. At the first examination renal function may have failed to the point that urea retention is already established, but so rapid is the disease process that the heart, on the other hand, may have enlarged little and may still be maintaining good function. It seems a rather profitless endeavour to attempt to decide whether a case of this character is primarily due to renal disease or not. Indeed, the only practical question is whether or not the disease is too advanced for sympathectomy.

Malignant hypertension is still regarded in some quarters as a disease of its own unrelated to other forms of hypertensive disease. In the light of clinical experience, however, this seems improbable, for there is no sudden transition between the clinical picture conventionally described as "malignant" hypertension and that of other cases of longer survival which run an abnormal and unfavourable course. It seems more likely that the difference is not in the nature of the vascular disease but rather in its speed of development, and the one clinical type therefore merges gradually with the other. In its most rapid form the kidneys are quickly overwhelmed and death is from uraemia, but if the tempo is slower the kidneys survive and time allows other forms of disaster to overtake the patient. However, the most convincing evidence in favour of a single disease process comes from experience of sympathectomy for hypertension, for there is no doubt that even the malignant form of the disease can on occasion be arrested by sympathectomy.

One result of this five-year study is to suggest that, given the opportunity of examining hypertensive patients before they reach the age of 50, it ought to be possible to identify not only the malignant type of case but also this other type which, while not rapidly fatal, is nevertheless unlikely to survive, at least without incapacity, much beyond the age of 60. The commonest interrupting factor in the less rapid though unfavourable case is of course a cerebral vascular accident, and by the age of 60, or scarcely beyond, about one-fifth of the patients in this study had experienced some type of stroke. Others developed premature congestive failure either as a consequence of coronary thrombosis or independently of this. The three deaths from uraemia at a relatively late stage were in each case associated with cardiac failure.

While, of course, we are here on less familiar ground, there seems to be some chance of foreseeing the possibility of these disasters. In the first place, as a generalization it seems certain that, regardless of all other features of his case, a male of average build with diastolic blood pressure of the order of 130 mm. Hg or above has an unpleasantly slender chance of surviving unscathed to the age of 60. Coronary thrombosis can scarcely be foreseen, except that

the risk of this is obviously greater in a patient already anginal, but the premature development of congestive failure may perhaps be anticipated if the heart has early become enlarged or, on the other hand, if the strain pattern has appeared in the electrocardiogram before enlargement of the heart is obvious (Leishman, 1951).

The fate of a hypertensive patient seems to be largely determined by vascular changes which are still imperfectly understood. Oedema of the optic nerve, exudation and haemorrhage into the retina, and leakage of albumin into the urine are recognized as sinister developments; all of these suggest loss of vascular integrity, yet experience of sympathectomy has shown that these changes are reversible. It is not unreasonable, therefore, to assume the development of a biochemical lesion, possibly from anoxia, or perhaps owing to some other metabolic poison. The observations here reported have suggested that the speed with which these vascular changes develop is principally governed by the height of the diastolic pressure. The critical level, indeed, appears to be in the neighbourhood of 130 mm. Hg (as recorded in an average-sized arm), and with pressures at or above this figure the process is likely to accelerate.

While the particular liability of hypertensive patients to cerebral vascular accidents is presumably a further expression of this vascular vulnerability, it is not of course suggested that a stroke is likely to occur only when the retina shows advanced changes and the urine contains much albumin. Examination of the patients who subsequently suffered cerebral vascular accidents at a premature age has, however, generally indicated that all systems were reacting unfavourably. The impression has often been gained that changes which in a benign case might take 10 to 15 years to develop have here appeared in half that time, and for this reason the designation "accelerated" hypertension seems appropriate for this form of the disease.

Conclusions

The character or severity of a hypertensive patient's symptoms, other of course than those which point to cardiac or renal failure, give little clue to his subsequent fate. Headache, for example, has occurred as often in mild as in severe cases. Again, it might well have been expected that the transient cerebral attack ascribed to "angiospasm" would prove to be a curtain-raiser for the subsequent full-length drama of a stroke; but this has not been the case, and the incidence of such cerebral episodes was no higher among patients who subsequently had strokes than in those who did not. Since in addition neither a family history of hypertension nor the existence of a renal basis for the hypertension appears to influence prognosis unduly, assessment of a hypertensive patient must rest fundamentally upon objective findings.

Early recognition of the accelerated form of hypertensive disease is particularly desirable, since it is in this type of case that sympathectomy has most to offer, and operation performed in time may completely transform its character. Appropriate cases, however, will not be selected for sympathectomy unless the practice is adopted of submitting every hypertensive patient under the age of 50 to a systematic assessment with the object of establishing how far the disease has already progressed, for only by relating this to the age of the patient can it be decided whether or not the speed of advance has been excessive.

Summary

The selection of appropriate hypertensive cases for lumbodorsal sympathectomy presents difficulties which can be resolved only by a wider knowledge of prognosis in this disease.

In the hope of acquiring this knowledge 151 hypertensive patients below the age of 60 have been studied by regular examination over periods ranging from two-and-a-half to five years.

During the period of observation 51 patients died as a result of hypertension, giving a mortality rate of 34%. The mortality for men alone was 44%. The height of the diastolic blood pressure had an important influence on the mortality rate.

A familial tendency has not appeared to prejudice a hypertensive patient's prospects, and the existence of a primary cause for the hypertension had only a slight adverse influence.

It is probable that the combination of obesity with hypertension appears favourable only on account of the misleading sphygmomanometer reading.

The progress or fate of these patients has been related to the main clinical features which presented at their first examination.

It is suggested that the stage reached by the disease can best be judged on the presence or absence of four features—namely, advanced retinal changes, albuminuria in excess of a trace, cardiac enlargement, and abnormality of the electrocardiogram.

If the present stage of the disease is recognized the rate of its advance can be estimated, and thus to a large extent the prognosis may be foreshadowed.

Even at the first examination it should generally be possible to classify the type of hypertensive disease as "benign" or "accelerated."

Sympathectomy is principally justified in patients with the accelerated form of hypertensive disease.

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PULMONARY EMPHYSEMA TREATED BY PNEUMOPERITONEUM

BY

R. D. C. BRACKENRIDGE, M.D., F.R.F.P.S.
Senior Medical Registrar, County Hospital, Whiston, Lancs

AND

A. THELWALL JONES, M.D., M.R.C.P., D.P.H.
Assistant Physician, United Liverpool Hospitals
Senior Consultant Physician, County Hospital, Whiston

Emphysema is a rather vague appellation given to patients suffering from dyspnoea, cough, and in some cases congestive cardiac failure. The term usually means the chronic hypertrophic vesicular emphysema with the "large lungs" described by Sir William Jenner.

A severe disability results from progressive dyspnoea, and all clinicians recognize the common clinical features of a life made wretched and too often hopeless. The breathless existence of the patient is prolonged to some extent by the control by antibiotics of episodes of acute pulmonary inflammation.

Emphysema occurs more commonly in men than in women, and this incidence seems pronounced enough to raise the suspicion of an occupational factor. There is no conclusive evidence on this point, but the inci-

dence does not seem to be higher in occupations where "blowing" is a feature. The effect of hard manual work is doubtful, but the importance of attacks of bronchitis and the effect of a chronic cough is recognized. Asthma is also recognized as an important predisposing factor, and bronchospasm in childhood may be followed by years of good health to be succeeded by the development of emphysema.

The essential pathological feature is a loss of elasticity in the lungs, which are voluminous but not truly distended. The lungs are pale, and the blood is supposedly pressed out of the capillaries. The alveolar walls are atrophied, bullae develop, and the intrapleural pressure is raised. Expiration is thus impaired, being largely a passive process produced by recoil of the elastic tissues of the lung. The changes result in an inability to ventilate the lungs, and the oxygen saturation of the arterial blood falls to 85%. The carbon dioxide in the blood and alveoli rises and the patient is unable to compensate by increasing the pulmonary ventilation. The inspired air tends to be drawn into avascular and dilated alveoli which form a large pathological dead space.

The clinical picture in the established case is one of misery. Dyspnoea is caused by the increased blood carbon dioxide and cyanosis is largely central. Polycythaemia is fairly common and clubbing of the fingers is sometimes present even in uncomplicated cases. The movement of the chest is poor and expansion often less than 1 in. (2.5 cm.); the antero-posterior diameter is widened and the shape sometimes "barrel"; the accessory muscles of respiration are fully employed; and hyperresonance obscures the hepatic and cardiac dullness. Air entry is poor, rhonchi and rales are widespread, and bronchospasm is often present.

Points in Diagnosis

Christie (1944) and others have stressed the importance of associated conditions. The diagnosis is not to be based on isolated symptoms and signs: it is established by the development of insidious dyspnoea on exertion which is not due to bronchospasm or left ventricular failure, together with some of the characteristic signs, and chronic bronchitis or asthma. The long duration and seasonal aggravation of the dyspnoea distinguishes it from cardiac dyspnoea, and there are no nocturnal attacks unless asthma is present. X-ray features are not diagnostic, but several abnormalities are common. Whitfield *et al.* (1951) found that the most constant radiological abnormalities were depression and flattening of the diaphragm, with poor respiratory excursion, the relative brilliance of the lung bases, and the translucency and area of the retrocardiac and anterocardiac windows. The ribs are widely separated and transversely placed, and there is rotation and elongation of the heart shadow associated with prominent pulmonary arteries.

In many cases of emphysema associated with severe dyspnoea it is difficult to determine and assess the influence of myocardial failure. McMichael and Sharpey-Schafer (1944) showed that the cardiac output is normal or increased in cases of heart failure secondary to lung disease. Cardiac catheterization in cases of emphysema reveals that the right ventricular systolic pressures are normal but become raised with the development of cardiac failure. The pressure returns towards normal with recovery from failure, proving that the pulmonary hypertension cannot result solely from fixed anatomical changes in the vascular bed of the lungs (Mounsey *et al.*, 1952).

The clinical details of the cases under review are given later, but the electrocardiograms do not seem to help in diagnosing or in selecting cases. Seven cases had normal electrocardiograms, one case had cor pulmonale, and one had right axis deviation, and no difference was apparent

in the electrocardiograms taken before and after the institution of treatment by pneumoperitoneum. The criteria for the diagnosis of chronic cor pulmonale were taken from Katz (1946).

In 40 consecutive cases of emphysema admitted to the County Hospital, Whiston, the electrocardiograms were interpreted as follows: normal, 20; cor pulmonale, 2; right axis deviation, 6; left axis deviation, 6; myocardial insufficiency, 6.

The above brief review of the aetiology and diagnostic features of emphysema provides a basis for consideration of methods of treatment. A loss of lung elasticity is the basic disability, and this seems to be progressive and uninfluenced by treatment.

The correction of abnormalities in the nose and sinuses, postural drainage, and the control of infection by antibiotics are helpful. A cough can be reduced sometimes by sedatives; ephedrine relieves bronchospasm; and oxygen is a successful measure of therapy, especially in the presence of congestive failure, when the usual treatment is given. In spite of these measures numbers of severe cases are improved but little, and dyspnoea renders life so intolerable that any means of giving relief is to be welcomed.

Treatment

The treatment of pulmonary emphysema by pneumoperitoneum was introduced by Reich (1924) and used by Monaldi (1937) in the treatment of asthma. Sisti (1936), Piaggio-Blanco and Sayagues (1938), and Rubin and Gass (1948) have also reported on the use of pneumoperitoneum in asthma. New interest was aroused in the use of pneumoperitoneum in a preliminary report by Furman and Callaway (1950), who studied its effect on seven emphysematous patients, five of whom received impressive symptomatic relief.

The rationale of pneumoperitoneum is to increase the intra-abdominal pressure enough to cause elevation of the diaphragm during expiration and yet not to impede its contraction during inspiration. Increased excursion of the diaphragm is thus obtained, with consequent improvement in pulmonary ventilation.

Other better-known measures in use have a similar rationale—namely, breathing exercises and the use of an abdominal binder, advocated by Christie (1934), Gordon (1934), and Alexander and Kountz (1934); but with neither of these methods does the elevation of the diaphragm compare with that obtained in pneumoperitoneum.

Nine cases of severe pulmonary emphysema were selected for treatment by pneumoperitoneum and have been studied for varying periods.

The patients were selected because of their severe disability. As a preliminary, active bronchial infection was treated with antibiotics to which the organisms in the sputum were sensitive, after which the following control procedures were carried out: (a) the diaphragmatic excursion in full inspiration and expiration was measured radiologically; (b) the vital capacity was measured on a "British" Benedict spirometer, the readings being taken at three seconds and also with no time limit; the three-second reading was used by Furman and Callaway (1950) because, given enough time, an emphysematous subject can record quite a high vital capacity by prolonged muscular effort; (c) haemoglobin and red cell count; and (d) electrocardiogram.

It was also intended to record the intrapleural pressures before and after treatment, but experience of this procedure on the first two patients, who were already orthopnoeic, was so alarming that it was abandoned. The above investigations were repeated at various intervals during treatment.

The pneumoperitoneum was induced with a Kjer-Petersen needle, the point of entry being roughly midway between the umbilicus and the anterior superior iliac spine, in either the right or left side: 400 c.cm. of air was given initially, and the volume was increased gradually twice a week until

800 to 1,000 c.cm. could be given without discomfort. Thereafter, refills were given at weekly or two-weekly intervals. When the pneumoperitoneum was established the final intra-abdominal pressure usually lay between 9 and 12 cm. of water.

Complications

Minor degrees of ascites occurred, and in one case existing inguinal herniae were aggravated. Abdominal discomfort was complained of by a few patients for the first 24 or 48 hours after a refill, and was usually caused by injecting too much air, but one patient (Case 6) had persistent abdominal pain, which led to the abandonment of treatment. The proper amount of air for the individual patient can soon be determined.

Free abdominal fluid was detected clinically during the course of treatment in four patients. This seemed to cause no inconvenience except for the splashing noise as the subject turned over in bed or stooped to tie his shoe-lace.

Other complications of pneumoperitoneum are listed by Banyai (1946), and include air embolism, mediastinal emphysema, subcutaneous emphysema, umbilical and scrotal pneumocele, aggravation of existing herniae, and accidental perforation of the intestine. The latter is extremely rare, and is an unlikely complication unless a loop of bowel is fixed to the anterior abdominal wall by adhesions.

Results

Of the nine patients treated by pneumoperitoneum, six have stated that they have obtained definite benefit. This was mainly shown by the disappearance of dyspnoea and an increase in the amount of exercise which could be taken. Three patients obtained no benefit after three months' treatment.

Vital Capacity.—The changes in vital capacity are recorded with the individual case histories. On the whole there is a significant increase during treatment, but not so striking as that reported by Furman and Callaway in their patients.

Diaphragmatic Excursion.—The range of movement of the diaphragm between inspiration and expiration was measured radiologically on a film taken by the double exposure technique (see Table).

Diaphragmatic Excursion

Case	Before Treatment		After Treatment	
	Right Side (cm.)	Left Side (cm.)	Right Side (cm.)	Left Side (cm.)
1	0.8	0.9	2.1	1.0
2	0.8	0.9	2.7	2.6
3	0.6	0.9	2.4	3.0
4	1.0	0.5	3.2	3.7
5	1.8	1.2	2.8	3.0
6	2.3	2.6	2.1	1.6
7	0.2	1.5	2.1	3.0
8	2.1	2.1	2.3	2.5
9	0.3	0.5	3.0	3.2

Haemoglobin and Red Blood Cells.—No significant alteration from the original levels of haemoglobin and the red-cell counts could be demonstrated in any case after treatment by pneumoperitoneum had been established.

Case Histories

Case 1.—A man aged 45 had had asthmatic attacks for 17 years. He developed pneumonia two years ago, which further aggravated his poor exercise tolerance. His convalescence was prolonged and he has remained very cyanosed since. Before beginning pneumoperitoneum treatment he rarely ventured out of his house. There has been no congestive cardiac failure. His blood pressure was 110/80 mm. Hg. A pneumoperitoneum was induced on October 24, 1951, and was maintained with fortnightly refills of air varying between 800 and 1,000 c.cm. There was evidence of a small amount of free abdominal fluid

about four months after treatment began, but this disappeared spontaneously in six weeks. His vital capacity before treatment was 2,300 c.cm. and at three seconds 1,300 c.cm. Seven months later the readings were 2,650 and 1,900 c.cm. respectively. Although still cyanosed, he could get about for walks in good weather, and maintained that he could not do without his refills.

Case 2.—A man aged 57 dated his incapacity to an attack of pneumonia seven years previously, since when he has suffered shortness of breath, sufficient to cause him to give up all work. His case notes show, however, that he had been subject to winter bronchitis for several years before that. Before treatment he was completely incapacitated, and even slight exertion in the house made him breathless. He has never had congestive cardiac failure. His blood pressure was 150/100 mm. Hg. A pneumoperitoneum was induced on October 24, 1951, and was maintained with refills of 800 c.cm. of air every fortnight. The vital capacity before treatment was 2,400 c.cm. and at three seconds 1,150 c.cm. During treatment the vital capacity has averaged 2,600 c.cm. and at three seconds 1,250 c.cm. Ascites developed about

five months after treatment began, but was negligible in amount and disappeared spontaneously. Improvement in exercise tolerance was remarkable in this patient, so much so that he developed intermittent claudication of the right leg two months after the beginning of treatment.

Case 3.—A man aged 65 had suffered from bronchitis for many years, and had severe pneumonia two years ago, after which congestive cardiac failure developed. Convalescence was prolonged, and he was

always extremely breathless, even at rest, and his ankles became swollen in the evenings. His blood pressure was 155/80 mm. Hg. An x-ray film confirmed the presence of gross emphysema. A pneumoperitoneum was induced on December 14, 1951, and was maintained with an average of 800 c.cm. of air every fortnight. The vital capacity before treatment was 1,900 c.cm. and 1,750 c.cm. at three seconds. During treatment the readings were 2,150 and 1,500 c.cm. respectively. This patient admitted to no improvement during treatment, and he continued to show signs of mild congestive cardiac failure. The pneumoperitoneum was abandoned four and a half months after it was begun.

Case 4.—A man aged 73 had suffered from chronic bronchitis and shortness of breath for 27 years. Since 1946 he has been an inmate of the chronic sick section, and could move only short distances with help. He was orthopnoeic and extremely cyanosed. An x-ray film of the chest confirmed the presence of gross pulmonary emphysema with practically no diaphragmatic movement. No episodes of congestive heart failure had been reported during his eight-year stay in hospital, but he was confined to bed most of the day. His blood pressure was 140/80 mm. Hg. A pneumoperitoneum was induced on December 14, 1951, and thereafter refills of 500 c.cm. of air were given once a week. The vital capacity before treatment was 1,500 c.cm. and with a time limit of three seconds 850 c.cm. The

readings two months later were 1,450 and 1,000 c.cm. respectively. There was no subjective or objective improvement in this case; he remained bedridden and very dyspnoeic, and, as the intra-abdominal pressure rose, bilateral inguinal herniae became aggravated, and treatment was abandoned after nine weeks.

Case 5.—A man aged 60 gave a 16-years history of shortness of breath and attacks of bronchitis. He contracted a severe suppurative pneumonia a year ago, which resulted in some fibrosis in the right upper lobe. Breathlessness became notably worse after this episode, but he could walk slowly for about half a mile. He has never had congestive cardiac failure. His blood pressure was 150/90 mm. Hg. A pneumoperitoneum was induced on January 14, 1952, and thereafter refills were continued every fortnight, the average volume of air given being 700 c.cm. A moderately large ascites developed ten weeks after the start of treatment but seemed to cause no discomfort. The fluid was turbid, containing polymorphonuclear cells, and a growth of a coagulase-negative staphylococcus was obtained. The fluid disappeared within a week after the patient was put to bed

and given a course of penicillin. The vital capacity before treatment was 1,500 c.cm. and with a time limit of three seconds it was 1,250 c.cm. These figures became 1,950 and 1,500 c.cm. respectively two months after the start of treatment. Improvement in exercise tolerance was moderately good.

Case 6.—A man aged 54 had remained well up to six years ago, when attacks of bronchitis and asthma developed. These attacks became more frequent, and after an attack of pneumonia one year ago his dyspnoea was much worse. For some time before admission to hospital he had been severely incapacitated and confined to his home. He was cyanosed and orthopnoeic, and an x-ray film of his chest revealed gross emphysema. It was evident that the severity of his dyspnoea was due in part to bronchospasm. There was no history suggestive of congestive heart failure. His blood pressure was 120/70 mm. Hg. A pneumoperitoneum was induced on January 14, 1952, and after it was established refills averaging 700 c.cm. were given once a fortnight. The vital capacity before treatment was 2,000 c.cm., and at three seconds 1,150 c.cm. Two months later, during treatment, the figures had not changed appreciably, being 1,850 and 1,100 c.cm. respectively. There seemed to be much improvement in exercise tolerance during the initial stages of treatment in hospital, but after discharge the attacks of asthma returned and he relapsed into his previous dyspnoeic condition. After persisting with the pneumoperitoneum for three months it was considered that there was going to be no improvement, and treatment was discontinued.

Case 7.—A man aged 47 had been troubled with shortness of breath and asthmatic attacks for the past 17 years. He was admitted to hospital two years ago, having sustained a spontaneous pneumothorax on the right side, presumably due to rupture of an emphysematous bulla. His exercise tolerance had become very poor during the past four years,

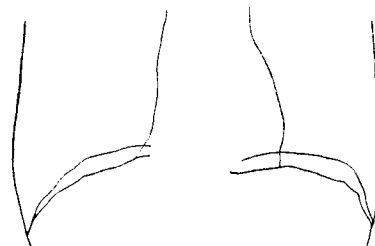


FIG. 1.—Case 3. Diaphragmatic excursion before treatment.

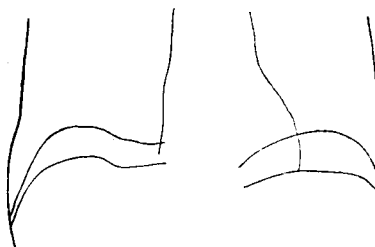


FIG. 2.—Case 3. Diaphragmatic excursion during treatment with pneumoperitoneum.

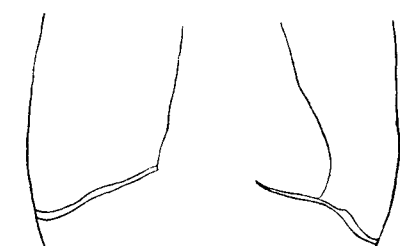


FIG. 3.—Case 4. Diaphragmatic excursion before treatment.

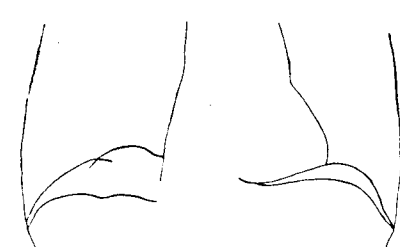


FIG. 4.—Case 4. Diaphragmatic excursion during treatment with pneumoperitoneum.

and he could walk only a few yards without becoming breathless. An x-ray film of the chest showed the typical features of emphysema. There has been no congestive cardiac failure. His blood pressure was 140/90 mm. Hg. A pneumoperitoneum was induced on January 14, 1952, and subsequent refills have amounted to 900 c.cm. a fortnight. A small amount of free peritoneal fluid was detected ten weeks after the start of treatment, but this disappeared spontaneously two weeks later. The vital capacity before treatment was 1,900 c.cm. and with a time limit of three seconds 1,030 c.cm. These figures had improved two months later to 2,100 and 1,300 c.cm. respectively. The improvement in general well-being and exercise tolerance was most gratifying. He can walk about outside with less dyspnoea than previously and he also sleeps more comfortably owing to improved breathing.

Case 8.—A man aged 52 was admitted to hospital in April, 1952, because of severe breathlessness and cough. He gave a history of having had chest trouble for 20 years, including frequent attacks of bronchitis, and hay-fever. His breathlessness was such that he was able to climb a flight of stairs at home only once a day, and even that amount of exertion disabled him for fifteen minutes. There was no history suggestive of congestive cardiac failure. His blood pressure was 160/80 mm. Hg. An x-ray film of his chest confirmed the presence of marked pulmonary emphysema. The vital capacity was 1,750 c.cm., and the reading with a three-seconds limit was the same. After induction of a pneumoperitoneum on April 21, 1952, refills were carried out twice a week while in hospital and then fortnightly after discharge, an average of 700 c.cm. of air being given. The vital capacity during treatment became 1,900 c.cm. and with a time limit of three seconds 1,500 c.cm. Symptomatic improvement was good; he was able to take much more exercise than before admission to hospital, and his exercise tolerance continued to improve.

Case 9.—A man aged 46 first noticed that he was becoming breathless on exertion when he was 22. He continued to work at a cotton mill, but his cough and dyspnoea became worse and he had to give up all work in 1941. He

has had pneumonia three times, the worst attack being in 1936. Before treatment he could walk about half a mile very slowly and with a great deal of effort. He does not give a history suggestive of congestive cardiac failure. His blood pressure was 130/90 mm. Hg. An x-ray film of the chest confirmed the presence of pulmonary emphysema with very little diaphragmatic movement. A pneumoperitoneum was induced on April 29, 1952, and while in hospital refills were given twice

weekly until it was established. An average of 800 c.cm. of air was given once every two weeks as an out-patient. The vital capacity before treatment was 1,450 c.cm., and with a time limit of three seconds 880 c.cm. Seven weeks after the start of treatment the readings had become 1,950 and 1,200 c.cm. respectively. He has improved tremendously; his exercise tolerance is better than previously and he can walk longer distances without becoming so breathless.

Discussion

After several months' experience of this particular treatment it was possible to select more accurately the type of case that would derive benefit from it, and exclude those showing certain features now known to be contraindications. The latter may be best illustrated by the three cases which showed no improvement. Case 3 had signs of congestive cardiac failure for two years before treatment was instituted; this was not gross, and was manifest by congestion of the veins in the neck, some swelling of the ankles after exercise, and a little engorgement of the liver. Case 4, practically bedridden for six years in the chronic ward because of exertional dyspnoea and considered to have myocardial failure, made no response to treatment. We believe that any benefit which pneumoperitoneum might have is not enough to overcome the effects of established failure of the myocardium.

A feature of Case 6 was the frequent attacks of severe asthma. Despite the favourable reports on the treatment of asthma by pneumoperitoneum made by others, we found that it had not the slightest effect; in fact, the violent muscular efforts during an attack of asthma seemed to cause considerable pain in the abdominal muscles, which were already stretched by the pneumoperitoneum. We would exclude those cases, therefore, in which asthma is a marked feature.

The emphysematous subject is particularly liable to attacks of bronchitis, which have the effects of almost complete disablement. Several patients under treatment with pneumoperitoneum developed bronchitis during the winter months, and we found that any good effect of the treatment was nullified until the infection was controlled and the sputum again became scanty. Some of the fluctuations in the vital capacity might be explained by the presence or absence of bronchitis at the time the records were made.

On the other hand, it is necessary to examine why there was no great increase in the vital capacity in our patients despite the fact that the diaphragmatic excursion had been improved.

Banyai (1946) found that in a group of tuberculous patients undergoing pneumoperitoneum treatment the vital capacity showed an average decrease of 14.7%, while Furman and Callaway reported a dramatic increase in vital capacity in their emphysematous patients—two, indeed, having double their pre-treatment values.

Meakins and Christie (1934) pointed out that, whereas the normal functional residual air amounted to 35–40% of the total lung volume, in severe emphysema the figures might reach 70 to 80%. And, since the vital capacity is also reduced, the resting tidal air and vital capacity may approach equality.

We think that in those of our cases in which the exercise tolerance improved and yet was not reflected in a greatly increased vital capacity the effect of the improved function of the diaphragm was to decrease the residual air in proportion to the total lung volume, thus allowing improved aeration.

Antispasmodics such as ephedrine and aminophylline were found to be a valuable adjunct to pneumoperitoneum in cases in which there was a tendency to bronchospasm. In patients who are not subject to such attacks ephedrine is probably of little value, since Whitfield *et al.* (1950) showed that this drug produced no alteration in the subdivisions of lung volume in emphysematous subjects without bronchospasm.

Finally, the psychological effects of a new form of treatment on patients who have been incapacitated for years must be remembered. There is no doubt that the enthusiasm of the operator is often reflected in the patient, at least during the first few weeks, and certainly many of the glowing testimonials from some of our patients could be attributed to this. After due allowance has been made for this, however, we believe that there has been a genuine

improvement in most of the cases treated by pneumoperitoneum, which warrants its use in a larger series of patients.

A pneumoperitoneum may be continued indefinitely, refills being given at weekly or, more usually, fortnightly intervals, although in Reich's experience the high position of the diaphragm was maintained for long periods after the pneumoperitoneum was discontinued. This he attributed to the fact that during treatment the patient performed an unconscious respiratory exercise, relaxing the diaphragm and contracting its antagonists, the abdominal muscles, and continued to do so without the aid of a pneumoperitoneum.

Summary

A brief review of pulmonary emphysema and methods of accepted treatment is given.

The progressive nature of the disease and the misery which is the lot of those severely affected warrant exploration of all new avenues of treatment.

Nine severe cases of pulmonary emphysema treated by pneumoperitoneum are presented, with results encouraging enough to justify further study. The rationale of pneumoperitoneum is to increase the intra-abdominal pressure sufficiently to cause elevation of the diaphragm during expiration, and yet not to impede its contraction during inspiration. Increased excursion of the diaphragm is thus obtained, with consequent improvement in pulmonary ventilation.

The vital capacity was increased in seven cases and the excursion of the diaphragm, measured radiologically, was improved in all cases. No improvement was evident in two cases with a history of congestive cardiac failure and in one case with asthma.

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In his preface to the annual statistical report of the Middlesex Hospital for 1952, Colonel the Honourable J. J. Astor, chairman of the board of governors, points out that, while in the past the main function of the report was to persuade the public to subscribe to the hospital's funds, its present task "is to say whether public money, assigned by Parliament for the upkeep of their hospitals, has been used to the best advantage." During the year under review there were 633,000 out-patient attendances at the hospital and its constituent institutions, compared with 582,000 in 1951. The physiotherapy clinic accounted for 219,000, of whom 10,000 were new patients; 117,000 attended the rheumatism clinic, and 40,000 attended for radiotherapy. In-patients numbered 14,800, a slight increase on the previous year. Good progress is reported in converting Latimer House, acquired in 1951 to serve as an institute of clinical research and experimental medicine, and the institute will be in action later this year.

SENSITIVITY STUDIES ON SHIGELLA SONNEI

BY

G. B. FORBES, M.D.

Pathologist, Kent and Canterbury Hospital

This report concerns a study of the antibacterial activity of streptomycin, chloramphenicol, aureomycin, and terramycin against *Shigella sonnei*, together with observations on the suitability of these antibiotics for the treatment and control of Sonne dysentery.

Seventeen representative strains of *Sh. sonnei* were collected from separate outbreaks and isolated cases of Sonne dysentery which occurred in East Kent and Hertfordshire. The identity of the strains was confirmed by biochemical tests and agglutination to titre with specific typing serum. In addition the strains were grouped according to their bacteriophage reactions (Hammarström, 1947) and fermentative behaviour towards xylose (Bojlen, 1934) to ensure that the collection included a variety of types. Dr. Mayr-Harting, of Bristol, kindly performed the bacteriophage tests, and found that most strains belonged to phage type 3, a type commonly encountered in this country (Cooper and Mayr-Harting, 1951); five other phage types were represented (Table I). One of the strains fermented xylose; the others were xylose-negative and gave the usual biochemical reactions of strains isolated in this country (Carter, 1937).

TABLE I.—Xylose Fermentation and Bacteriophage Reactions

Strain	Xylose Fermentation	Phage Type
1, 2, 4, 7, 8, 9, 10, 11, 14, 15, 16, 17	—	3
3	—	85
5	—	32
6	—	66
12	—	23
13	+	? 17b

In-vitro Experiments

I. Tube Sensitivity Tests

Method.—Graded concentrations of each antibiotic were prepared in nutrient broth and tubed in 1-ml. amounts; 0.02 ml. of 1:100 dilution of an overnight broth culture of each strain was added to the appropriate set of tubes, which were then incubated at 37° C. The lowest concentrations of antibiotic required for growth suppression as judged by complete absence of turbidity and bacterial deposit were noted after 12, 18, 24, 36, and 42 hours' incubation.

Results.—The results of these tests, expressed as the average sensitivity of the 17 strains to each antibiotic, are given in Table II. It will be seen that the end-points increased progressively with prolongation of the incubation period beyond 12 hours. With the more stable antibiotics (streptomycin, chloramphenicol, and terramycin) the inhibiting concentrations rose slightly, to give readings at 42 hours approximately twice as high as those obtained at 12 hours.

TABLE II.—Mean Sensitivity of 17 Strains After Varying Periods of Incubation

Antibiotic	Hours' Incubation				
	12	18	24	36	42
Streptomycin	4.94*	6.23	7.29	7.76	8.47
Chloramphenicol	5.52	7.41	7.88	8.47	8.58
Aureomycin	1.01	2.00	4.00	7.53	9.06
Terramycin	2.06	2.94	3.76	3.88	4.35

* Minimal inhibiting concentration in µg./ml.

In the case of aureomycin, which is notoriously unstable at 37° C., there was a ninefold increase during the period of observation. In fairness to aureomycin, the readings obtained after the shortest workable incubation period—namely, 12 hours—were regarded as being most suitable for comparative purposes. These results are set out in Table III,

TABLE III.—Range of Sensitivity of 17 Strains After 12 Hours' Incubation

M.I.C. at 12 Hours (µg./ml.)	Streptomycin	Chloramphenicol	Aureomycin	Terramycin
8	4	7		1
4	13	9		15
2		1	1	1
1			12	
0.8			4	
Range	4-8	2-8	0.8-2	1-4

and may be summarized as follows: (1) all strains were naturally sensitive to all four antibiotics, being inhibited by 8 µg./ml. or less; (2) the strains exhibited a narrow range of tolerance to each of the four antibiotics; (3) on a weight-for-weight basis aureomycin and terramycin were slightly more effective as growth inhibitors than streptomycin and chloramphenicol.

II. Mode of Action of Antibiotics

Tests were carried out in order to compare the speed and mode of antibacterial action of the four antibiotics on *Sh. sonnei* in the presence of faecal matter.

Method.—A gramme of faeces from a healthy subject was suspended in physiological saline and the suspension distributed in four equal amounts. The specimens were seeded with approximately 100,000 *Sonne* organisms, and, after thorough shaking with beads to ensure an even distribution of the organisms, 0.02 ml. was withdrawn from each specimen and subcultured on plates of desoxycholate medium. The antibiotics under test were then added to the inoculated specimens, so that each specimen contained one of four antibiotics in a strength of 10 µg./ml. in one experiment and 500 µg./ml. in a second experiment. The specimens were incubated at 37° C., and at hourly intervals up to eight hours, and again at 24 hours, subcultures were made as described above. After overnight incubation the subcultures were examined and colonies of *Sh. sonnei* were identified and counted.

Results.—The results of these experiments are given in Tables IV and V. At a concentration of 10 µg./ml. streptomycin exerted a bactericidal action on *Sh. sonnei*, killing all organisms in less than five hours, while the other antibiotics were essentially bacteriostatic in their mode of action. At

TABLE IV.—Survival Time of *Sh. sonnei* in Presence of 10 µg. of Antibiotic per Gramme of Faeces (pH 7.4)

Antibiotic	Hours' Exposure									
	0	1	2	3	4	5	6	7	8	24
Streptomycin	56*	50	23	15	2	0	0	0	0	0
Chloramphenicol	57	46	60	39	50	56	37	30	33	10
Aureomycin	60	52	48	45	60	60	25	46	25	3
Terramycin	50	40	43	53	50	30	30	33	26	2

* Number of colonies of *Sh. sonnei* on subculture.

TABLE V.—Survival Time of *Sh. sonnei* in the Presence of 500 µg. of Antibiotic per Gramme of Faeces (pH 8)

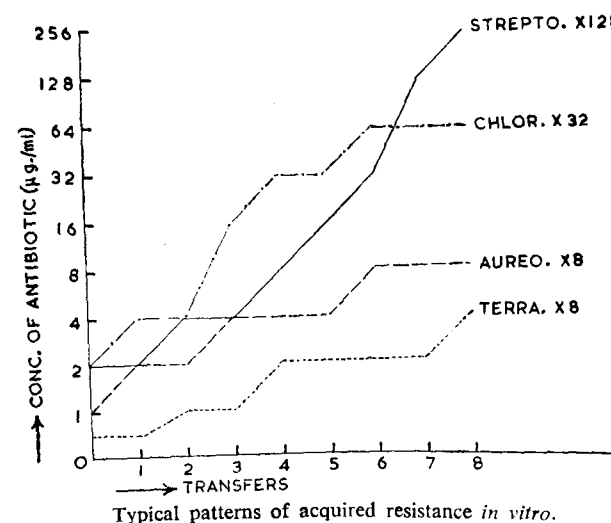
Antibiotic	Hours' Exposure									
	0	1	2	3	4	5	6	7	8	24
Streptomycin	500*	0	0	0	0	0	0	0	0	0
Chloramphenicol	500	400	128	18	4	10	16	15	9	0
Aureomycin	500	0	0	0	0	0	0	0	0	0
Terramycin	500	0	0	0	0	0	0	0	0	0

* Approximate number of colonies of *Sh. sonnei* on subculture.

a concentration of 500 µg./ml. streptomycin, aureomycin, and terramycin were highly bactericidal, killing all *Sonne* organisms within one hour. Chloramphenicol effected a reduction in the population of *Sonne* organisms, but a number remained viable while in contact with 500 µg./ml. for as long as eight hours. These experiments were repeated several times with close reproduction of results. The tests were also carried out using nutrient broth in place of the faecal suspension, and again the results were comparable, although terramycin in this medium was slightly less bactericidal at the higher concentration.

III. Acquisition of Resistance

Method.—Sensitivity tests were carried out on three strains by the conventional tube-dilution technique as described in experiment I. After 18–24 hours' incubation at 37° C. the highest concentration of antibiotic which permitted distinct visible growth was noted, and the culture at this end-point was used to inoculate a fresh set of concentrations on a slightly higher range. This procedure was repeated daily for eight consecutive days.



Results.—*Sh. sonnei* acquired resistance to streptomycin more readily than to the other antibiotics. The rate of acquisition of resistance, however, varied not only with different strains but also when the tests were carried out in duplicate on any one strain. But at least it can be stated that the lowest increase in resistance to streptomycin (a 64-fold increase) was equal to the highest rate of increase acquired to the other antibiotics. The strains developed an eightfold increase in resistance to both aureomycin and terramycin, and the results of repeat tests were quite consistent. Chloramphenicol did not favour the development of resistance to the same extent as streptomycin, the average increase on testing three strains being $\times 35$. Typical patterns of the development of tolerance to each of the four antibiotics are given in the Chart.

Clinical Experience with Streptomycin

Of the four antibiotics, only streptomycin has been used in enough cases of *Sonne* dysentery to allow an assessment of its clinical value.

Sixteen acute cases and one carrier were treated with this antibiotic in a dose of 0.5 g. twice daily for two to three days. The drug was given orally, mixed with flavouring agents.

Clinical cure was achieved within 24 hours of beginning treatment in all acute cases, and bacteriological cure, as judged by repeated negative stool cultures (an average of 4.3 per patient), was prompt and complete in all but one case. A sample of faeces from this patient yielded four colonies of *Sh. sonnei* on the sixth day after treatment.

although two earlier post-treatment specimens had been negative. Three subsequent specimens from this patient gave negative results. No case relapsed clinically or bacteriologically during the follow-up period, which in some cases was as long as six months.

In addition, two cases of *Sonne* dysentery which relapsed one week after treatment with a sulphonamide were promptly cured clinically and bacteriologically with streptomycin. Another patient was treated with chloramphenicol for five days, with good clinical response, but a very heavy growth of *Sh. sonnei* was obtained from specimens of faeces sent during treatment and on the day after treatment. Streptomycin was then given, and the infecting organism disappeared from the faeces within 48 hours.

A female member of the staff of a residential nursery was found to be a symptomless carrier of *Sh. sonnei* during investigations following an outbreak of *Sonne* dysentery which had occurred in the nursery two months earlier. She was sent on leave, and a specimen of faeces submitted to this laboratory confirmed that *Sonne* organisms were being excreted in very large numbers. Streptomycin was given orally for two days, and three post-treatment specimens of faeces received at weekly intervals were negative for *Sh. sonnei*. The patient returned to work, and a specimen submitted five months later was again free of *Sonne* organisms.

Discussion

Specific treatment in *Sonne* dysentery should aim not only at effecting a prompt clinical cure but also at rapidly clearing the intestinal tract of *Sh. sonnei* in order to reduce the period of infectivity to a minimum. As the disease is usually mild and of short duration, it is difficult to assess the value of specific remedies on the basis of clinical response alone; the rate and completeness of clearance is probably a more reliable index of therapeutic efficiency and adequate control. The sulphonamides, particularly sulphadiazine and the poorly absorbed sulphonamide preparations, are of undoubted value in the management of bacillary dysentery, but *Sonne* organisms often persist or reappear in the faeces during convalescence (Fairbrother, 1944). Moreover, in certain parts of the world, for example Japan, the majority of strains of *Sh. sonnei* are naturally resistant to sulphonamides (Tateno, 1950).

Oral therapy with antibiotics is an obvious alternative to sulphonamide medication in *Sonne* dysentery, and the experiments described above help to predict which antibiotics are likely to be most useful in this disease.

Welch (1950) assayed the faecal excretion of chloramphenicol, aureomycin, and terramycin after the oral intake of 1 g., and obtained levels of approximately 500 µg. per gramme of faeces with each antibiotic. Streptomycin, which is not absorbed from the bowel, was found in even higher concentrations in the faeces (at least 9,000 µg./g.) by Zintel *et al.* (1945). These levels greatly exceed the concentrations which were required to inhibit the growth of all 17 strains of *Sh. sonnei* used in this study, and from this it is apparent that all four antibiotics are potentially effective in the treatment of *Sonne* dysentery. However, streptomycin, aureomycin, and terramycin were found by experiment to exert a rapid bactericidal action at concentrations obtainable in the faeces following oral administration, and in the case of streptomycin the lethal effect was evident when the concentration in the faeces was reduced to 10 µg./g. It is likely, then, that these three antibiotics, especially streptomycin, would effect a complete and permanent eradication of *Sonne* organisms from the faeces of clinical cases. On the other hand, chloramphenicol exerted only a weak bactericidal action at a concentration of 500 µg., and in theory it should be less efficient at ridding the faeces of *Sonne* organisms.

The efficacy of streptomycin in *Sonne* dysentery has been confirmed by clinical experience, both in the present study and by others, notably Ross *et al.* (1949). In fairness to chloramphenicol it should be added that Ross *et al.* (1950) obtained equally good results with this antibiotic, and it

would seem that the theoretical objection to chloramphenicol mentioned above is probably not of significance in clinical practice.

Certain other factors would influence one in favour of streptomycin for the routine treatment of *Sonne* dysentery. It is relatively cheap and is readily available. It is non-toxic when taken by mouth, and, unlike chloramphenicol and aureomycin, does not irritate the gastric and intestinal mucosa—a point of some importance when treating an infection which itself produces gastro-intestinal upset. Moreover, it is palatable if flavoured, and is well tolerated by children. There are, however, two minor disadvantages peculiar to streptomycin: (1) the results of experiment III indicate that *Sh. sonnei* develops resistance slightly more readily to streptomycin than to the other three antibiotics, but it is unlikely that this disadvantage will prove of any consequence in clinical practice, since the duration of treatment will not normally exceed two or three days; and (2) an acute fulminating type of *Sonne* dysentery is occasionally met with in young children (Lewis and Claireaux, 1951), and Tatham *et al.* (1951) succeeded in isolating *Sh. sonnei* from the blood of such a case. Obviously an antibiotic which is absorbed from the bowel is to be preferred to streptomycin for the treatment of the septicaemic type of infection, or, if streptomycin is chosen, it should be given parenterally as well as orally.

Summary

Sh. sonnei was highly and almost equally sensitive to streptomycin, chloramphenicol, aureomycin, and terramycin *in vitro*, all test strains being inhibited by 8 µg./ml. or less.

All four antibiotics exerted a bactericidal action on *Sh. sonnei* in a concentration of 500 µg./ml., but the lethal effect of chloramphenicol was weak compared with the other antibiotics. Streptomycin alone was bactericidal at both low and high concentrations.

Sh. sonnei acquired resistance *in vitro* slightly more readily to streptomycin than to the other antibiotics.

Streptomycin, given orally, has proved a highly effective therapeutic agent in the management of *Sonne* dysentery.

My thanks are due to Dr. B. A. Thompson, Watford, for providing me with a few of the test strains, to Dr. A. Mayr-Harting for typing the strains, to Miss P. Reeves for technical assistance, and to the Wright-Fleming Institute of Microbiology for the supply of terramycin.

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Owing to fatalities amongst children, a meeting of branch representatives of the Pharmaceutical Society has requested the Ministry of Health to give publicity to the importance of tablets and other medicines being kept out of reach of children. It was also suggested that, in addition to advertisements, the Ministry should approach the B.B.C. and television authorities to produce a documentary to educate the public in the extreme potency of many of the medicines being dispensed nowadays.

CONTACT DERMATITIS DUE TO
AMINOAZOTOLUENE

BY

R. H. MEARA, M.B., M.R.C.P.

Senior Registrar, St. John's Hospital for Diseases of the
Skin, London, W.C.1

AND

I. MARTIN-SCOTT, M.D.

Dermatologist, Luton and Dunstable Hospital, Beds

Recently we have encountered, quite independently, three cases of contact dermatitis due to the yellow aniline dye aminoazotoluene. This dye, which is readily soluble in fats and waxes, is a constituent in the red and green semi-solid inks used in a popular ball-pointed pen. It is also used in certain popular shoe polishes. We have been unable to trace any previous reference to cases of dermatitis caused by exposure to aminoazotoluene.

Case 1

A hospital nurse aged 21 suffered from an irritant rash on the ulnar aspect of both forearms, but worse on the right, for three weeks. It consisted of an irregular area of erythema with papules and papulo-vesicles. The appearances suggested a dermatitis due to something contacted during her work. When she stopped work for a week the rash improved considerably, but recurred during a period of study when she was not doing any ward work. This second attack showed similar features, except that there was a raised erythematous linear lesion on the left forearm. The patient readily remembered that this was where she had scratched herself with the point of her red-ink pen. She had been using this ball-pointed pen for about six weeks before the eruption started.

In view of these findings patch tests were done using various colours of semi-solid ink of the same make. It was found that, while the red and green inks gave a positive result in 24 hours, there was no reaction to the blue and black inks. The manufacturers of this pen kindly supplied the information that the only substance common to the red and green inks, and not used in any other of their inks, was the yellow dye—aminoazotoluene. A further controlled patch test, using 0.01% aminoazotoluene in yellow soft paraffin, gave a positive reaction after 24 hours' contact.

From these results it appeared that the patient's eruption was due to skin sensitization to aminoazotoluene. The dermatitis healed within four weeks of ceasing to use the red-ink pen, and has not reappeared.

Case 2

A clerk aged 24 stated that she had suffered from a rash on her hands for five weeks, and was advised by her doctor to stay off work. Under his care the rash disappeared in two weeks, but returned on the evening of her first day back at work. She attended hospital four days later.

On examination she was found to have a dry papulo-vesicular eruption along the ulnar border of the right hand and little finger, and on the medial aspect of the tips of her third and fourth fingers. The skin around the left eye showed slight oedema and fine superficial scaling. The clinical picture suggested a contact dermatitis of occupational origin.

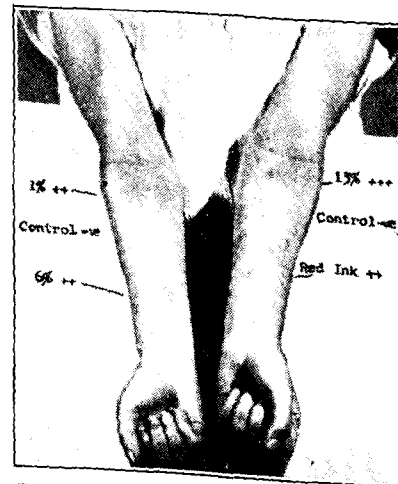
It was learnt that she was in contact with green semi-solid ink and carbon paper during her work, and before the second attack had accidentally smudged some green ink on her right upper eyelid. Whilst convalescing from the first attack at home she had used without mishap a similar ball-

pointed pen containing blue ink. She had used a green-ink pen for six weeks before the initial skin eruption developed.

Patch tests to blue semi-solid ink and carbon paper were negative after 48 hours, but there was a brisk response to the green ink.

The manufacturers kindly sent a sample of the yellow dye present in green and red semi-solid inks but absent in the blue ink. The illustration shows the results of different strengths of this dye (aminoazotoluene) diluted in arachis oil and left on the skin for 48 hours. After these results a patch test of aminoazotoluene 0.01% produced a distinct erythema

after only 24 hours' contact. The patch tests, which were all controlled, did not cause any exacerbation of the original dermatitis.



Dermatitis caused by aminoazotoluene. Percentages indicate strength of dye used.

Case 3

A lady clerk aged 52 had suffered from an itching eruption of the anterior aspect of the right wrist for over a year. A few weeks before attending hospital it had spread up the forearm and also appeared on the eyelids. She had used a red-and-blue ball-pointed pen for about two years, and her work involved contact with accounts written in these same inks.

Patch tests read after 24 hours showed she, too, was sensitive to the red and green but not to the blue semi-solid ink. Subsequently a positive reaction was obtained after 24 hours' contact with 0.01% aminoazotoluene in yellow soft paraffin. This eruption cleared up 10 days after she stopped using the red ink, and had not recurred eight months later.

Special Investigations on Case 1

As this patient appeared to be extremely sensitive to this azo dye, further investigations were carried out to determine the critical levels of concentration and exposure time for the skin reaction to occur.

Determination of Threshold Concentration.—The following patch tests were done with decimal dilutions of aminoazotoluene in yellow soft paraffin. The patches were removed after 24 hours, and the sites of contact subsequently examined at regular intervals.

0.1%	..	..	..	Positive at 24 hours
0.01%	..	..	..	" " 28 "
0.001%	..	..	..	" " 72 "
0.0001%	..	..	..	No reaction noted

Determination of the Threshold Period of Contact.—Aminoazotoluene (0.1%) in yellow soft paraffin was used in each case. Patches were removed after differing periods of

Test No.	Patch Contact Time	Reactions Observed After Certain Intervals of Time Recorded in Hours					
		9	12	21	37	45	72
1	5 minutes	—	—	—	—	—	—
2	10 "	—	—	—	—	—	—
3	30 "	—	—	—	—	—	—
4	1 hour	—	—	—	—	—	—
5	3 hours	—	—	—	—	—	—
6	6 "	—	—	—	—	—	—
7	9 "	—	—	—	—	—	—
8	12 "	—	—	—	—	—	—

contact with the skin and the sites examined at regular intervals (see Table). Further investigations showed that a longer exposure time was necessary to produce a reaction when lower concentrations of the dye were used. It would thus appear that, within certain limits, there is an inverse relationship between the critical levels of exposure time and concentration.

Summary and Conclusions

Three female cases of contact dermatitis due to the aminoazotoluene component in green and red semi-solid inks are described. In each case the distribution of the rash and history of the case suggested an exogenous dermatitis, and this was proved by subsequent patch testing.

The time taken to produce epidermal sensitivity was closely comparable in the first two cases—six to eight weeks: in the third case the interval may have been longer.

A high degree of epidermal sensitivity to the dye has been shown in each case. An attempt was made to demonstrate critical levels of concentration and exposure times in Case 1.

The dye seems, however, to have a low sensitivity index, as only these three cases have so far been published, and yet about two million red and green ball-pointed pens are sold annually in Great Britain. Furthermore, in the manufacture of the ink there have been no cases of dermatitis among the 70 workers who are exposed each day.

We are indebted to Dr. W. N. Goldsmith for permission to publish Case 1, and to Dr. P. J. Hare for drawing our attention to Case 3. Messrs. Biro Swan Ltd., and their chemists, Dr. Rosin Industrial Research Co. Ltd., have been most helpful throughout the investigations, and to them we proffer our grateful thanks.

APLASTIC ANAEMIA OCCURRING
EIGHT YEARS AFTER T.N.T.
POISONING

BY

F. G. J. HAYHOE, M.D., M.R.C.P.

Lecturer in Medicine, University of Cambridge

Among the commoner clinical manifestations of trinitrotoluene intoxication are dermatitis, cyanosis, and gastritis. Toxic jaundice is less common and the incidence of aplastic anaemia is very small (Hunter, 1943). Despite the rarity of anaemia in T.N.T. workers a good many cases were reported in this country and in America during the two world wars. While most of these cases have had their onset during or immediately after a fairly long period of exposure, anaemia occasionally develops after a latent period free from exposure. Panton (1917) described the clinical onset of aplastic anaemia in a patient whose exposure to T.N.T. had ceased nine months previously. Both toxic jaundice and aplastic anaemia may develop in the same patient, and Evans (1941) reported the occurrence of aplastic anaemia nine weeks after recovery from an attack of toxic jaundice.

The present communication concerns a patient who suffered from toxic jaundice after two months' exposure to T.N.T. in 1943, and developed a fatal aplastic anaemia early in 1951.

Case Report

The patient, a man aged 45, was employed as a maintenance engineer in a large motor works. Until 1943 he had worked as a builder and his health had always been good. In that year he started work in a filling factory, taking the usual precautions in handling T.N.T. and wearing a respirator. After two months' exposure he suddenly became ill with nausea, vomiting, and constipation which lasted for three weeks. He became jaundiced and the icterus persisted for two weeks. After full recovery he was employed in other departments of the same factory for a further two and a half years. During this period he worked with ammonium nitrate for six months, with aluminium dust for six months, on machine cleaning and maintenance for four months, and with ammonium nitrate again for six months.

After the war he worked for short periods in a brewery and an ice-cream factory before joining the motor works where he had been employed for the five years preceding his admission to hospital. His duties here involved much contact with machine-lubricating oils, and early in 1951 he suffered from an occupational dermatitis of his hands which lasted for two months. At this time he began to feel tired and lifeless, and anaemic symptoms of dyspnoea on exertion, lassitude, headaches, and muscular pains became increasingly severe during the next six months.

In July, 1951, a blood count was carried out with the following result: Hb, 7.3 g. per 100 ml.; red cells, 2,200,000; white cells, 5,200 (13% neutrophils, 84% lymphocytes, 3% monocytes). The smear showed considerable anisocytosis. The patient was admitted to Bedford General Hospital under the care of Dr. J. L. H. Easton. At this time there were no physical signs other than pallor, a few petechiae on the thighs, and hepatic enlargement to about 1 in. (2.5 cm.) below the costal margin. Investigations showed a normal bleeding-time but the platelets were scanty. The stools did not contain occult blood. There was a histamine-fast achlorhydria. The plasma protein levels and hepatic-function tests were within the normal range. A sternal marrow examination revealed aplasia of red cells and granulocytes; with some 60% lymphocytes. Treatment with iron, vitamin B₁₂, and "plexan" did not produce any reticulocytosis or haematological improvement, and transfusions of 5 pints (2.8 litres) of blood were given.

On August 17 the patient was transferred to Addenbrooke's Hospital under the care of Sir Lionel Whitby. He was very pale but not jaundiced or cyanosed. There was some sacral oedema but no oedema of the ankles. Lymph nodes could not be felt. There was a diffuse purpuric rash on both legs, with occasional purpuric spots on the trunk. The sternum was not tender on pressure. There was no koilonychia or clubbing. Cheilosis, sore tongue, and mouth ulceration were absent. Hess's capillary resistance test was positive. No other positive findings were encountered; the liver and spleen could not be felt. A blood count now showed: Hb, 7.4 g. per 100 ml.; red cells, 2,400,000 per c.mm.; P.C.V., 20.4%; M.C.H., 31 γγ; M.C.V., 85 μ³, M.C.H.C., 36.4%; M.C.D., 7.1 μ; reticulocytes, 0.1%; leucocytes, 1,700 per c.mm.; differential count, neutrophils 67 (stab cells 50, segmented 17), lymphocytes 1,600, monocytes 34 per c.mm.; platelets, 1,000 per c.mm.; E.S.R., 68 mm. in 1 hour, corrected to 18 mm. in 1 hour. Bleeding time was seven minutes and clotting-time 12–20 minutes on several occasions. Clot retraction was poor. The prothrombin content was 62% of average normal (Quick's one-stage method).

A sternal marrow examination on August 20 showed that the marrow was hypoplastic, with many lymphocytes and plasma cells, occasional tissue mast cells, and large numbers of degenerate cells. The differential count figures were: neutrophil polymorphs 2.4%, eosinophils 0.6%, metamyelocytes 3.6%, myelocytes 4.2%, promyelocytes 1.4%, lymphocytes 66.8%, plasma cells 7.4%. Normoblasts 12.2% (early 1.2%, intermediate 4%, late 7%), proerythroblasts

0.4%, tissue mast cells 1.2%. The degenerate cells were not included in the differential count, but they often contained phagocytosed pigment and may have been chiefly reticulum cells.

In view of the suggested relationship between tissue mast cells and marrow aplasia (reviewed by Fadem, 1951), the possibility that the prolonged clotting-time might be due to hyperheparinaemia was considered, and it was found that the clotting-time could be returned to normal by the addition *in vitro* of a suitable quantity of protamine. Protamine sulphate was given intramuscularly to the patient in doses of 40 mg. four times daily for three days, but had no effect on the clotting-time, and was discontinued.

The haemoglobin level fell steadily at the rate of 1 g.%, every five to seven days, and there were several severe epistaxes during the first two weeks after admission. A small abscess under the chin developed, and the cervical glands enlarged, but this was controlled by systemic penicillin. Small transfusions were given at frequent intervals, but no evidence of marrow activity was evinced. The leucocyte count fluctuated between 750 and 3,000 cells per c.mm., with neutrophils from 10 to 150 per c.mm. The platelets varied between 1,000 and 20,000 per c.mm.

On September 8 a course of A.C.T.H. was started, 100 mg. daily in divided doses being given for 10 days. No effect was produced on either the clinical condition or the haematological state.

On September 22 severe frontal headache developed, accompanied by nausea and vomiting. Slight neck rigidity and a small retinal haemorrhage in the right fundus occurred, but no other abnormalities were found in the central nervous system. Within 12 hours the breathing suddenly became stertorous and unconsciousness followed. Both pupils were contracted to pin-points and did not react to light. The arms were flaccid, but with tendon reflexes still present and equal. After a short period of coma the patient's respiration failed completely and he died.

Post-mortem Examination.—A large spreading haemorrhage was found extending throughout the left cerebellar hemisphere and breaking through on to the surface. The meninges appeared normal. There was evidence of sub-mucosal haemorrhage throughout the small intestine and in the renal pelvis and ureter on the right side. The haemopoietic marrow of the femur was completely replaced by yellowish fat, and the marrow of the sternum and vertebrae was also very pale and suggestive of hypoplasia. The spleen and liver were congested and gave a positive Prussian blue reaction. Histologically the bone marrow contained very few cellular elements, and these were mostly lymphocytes and normoblasts. The liver showed a few scattered areas of large droplet fatty change, but there was no sign of fibrosis. Apart from congestion and scattered haemorrhages there were no other striking abnormalities in any organs.

Discussion

This case history presents an unusual combination of facts. There is no doubt that the patient was exposed to T.N.T. and developed a toxic jaundice in 1943, that he was later subject to an occupational dermatitis of the hands after working with machine oils in 1950, and that he died in 1951 from an aplastic anaemia. The relationship between these episodes is largely a matter for conjecture. There seems to be no known association between exposure to oil and the development of haematological disorders, and it is difficult to believe that T.N.T. could still exert a delayed effect after eight years. The most likely explanation of the circumstances in the light of present knowledge is that the anaemia was a coincidental primary marrow aplasia, unconnected in any causal way with the toxic agent to which the patient had previously been subjected. It is not impossible, however, that other cases of long-delayed anaemia may have occurred after T.N.T. poisoning and been dismissed as coincidental primary disorders, and it is hoped that this report may stimulate publication of such case histories if they exist.

Summary

The case is reported of a patient who suffered from toxic jaundice after exposure to T.N.T. in 1943, who developed an oil dermatitis in 1950, and who died from aplastic anaemia in 1951.

The possible relationship between these episodes is discussed.

I am grateful to Sir Lionel Whitby, regius professor of physic in the University of Cambridge, for permission to report this case.

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HAEMOPHILIA WITH RESPIRATORY OBSTRUCTION

BY

A. C. MACDONALD, M.B., Ch.B., F.R.F.P.S.
M.R.C.P.

Senior Medical Registrar, Western Infirmary, Glasgow

J. G. ROBSON, M.B., Ch.B., D.A.

Senior Anaesthetic Registrar, Western Infirmary, Glasgow

AND

H. WAPSHAW, M.D., F.R.C.S.Ed., F.R.F.P.S.

Assistant Surgeon, Western Infirmary, Glasgow

Among the more serious hazards of the haemophilic patient's life is haemorrhage into the tissues of the mouth, pharynx, and larynx. Fortunately, this seems to be an uncommon site for bleeding to occur; indeed, we have been able to trace only 14 cases in the literature since 1910. Of these, 11 suffered from respiratory obstruction of varying degree. A survey of the records of the Western Infirmary, Glasgow, makes us wonder, however, if this is not a more common complication of haemophilia than that number of published cases leads one to believe. During the period 1936–51 34 haemophiliacs were treated: as so often happens, many had to be admitted more than once with haemorrhages at different sites, the total number of episodes being 112. Three instances of oral bleeding each associated with respiratory obstruction were found, and it was noted that blood transfusion and other medical measures were enough to bring the condition under control.

The following report concerns another case which came under our care at the same hospital. The problem that confronted us was to decide how best to combat the threat of suffocation. It was the feeling of all who saw the patient that surgical intervention was imperative, and a relief incision was made under the chin. As we hope to show, however, the maintenance of a clear airway by means of an indwelling endotracheal tube was probably the measure that really saved the patient's life.

Case Report

A youth aged 16, a known haemophiliac, was admitted to hospital on September 11, 1951. On the previous day he had complained of pain and a swelling under his tongue, and the swelling had gradually increased in extent. No injury or sepsis had been present to account for the lesion, though one molar tooth was carious and roughened.

When first examined the patient was pale, anxious, and moderately cyanosed. There was gross bleeding into the tongue, which practically filled the buccal cavity, and the submandibular and submental regions were also much swollen. At first there was only a slight degree of respiratory embarrassment, though swallowing was very difficult and his speech was painful and almost unintelligible. A haemarthrosis of the left knee was also present. The temperature was 97.4° F. (36.3° C.), the pulse 105, and the respiratory rate 22. The blood pressure was 125/70. The haemoglobin was 13 g. %.

Shortly after his admission a transfusion of fresh blood was begun, but this appeared to have little immediate effect on the local condition. The coagulation time was not estimated before the transfusion. Within three hours of admission the condition had advanced to such an extent that speech and swallowing became impossible and respiratory stridor was pronounced. The tongue had turned a deep purple colour and lay immobile, projecting between the teeth. The gums were bleeding and the cervical swelling had extended uniformly around the neck down to the level of the hyoid bone. Crepitations were heard at both lung bases.

In order to give more immediate relief a wide-bore needle was inserted in the midline below the chin into the base of the tongue. This met with no success even though the needle was moved in different directions and planes. It was therefore decided to resort to the more radical procedure, which we now describe in detail.

Operative Treatment

Premedication in the form of atropine sulphate, 1/100 gr. (0.65 mg.), was administered intravenously into the drip tubing, 10 minutes being allowed for its action.

The mouth, nose, and throat were prepared by spraying and painting with 5 ml. of 2% amethocaine hydrochloride containing 7 minims (0.42 ml.) of adrenaline 1:1,000. A well-lubricated No. 6 Magill nasal tube mounted on a Magill suction T-piece was passed blindly through the left nostril into the trachea. This tube was well tolerated, the relief to respiration being immediate. General anaesthesia was then induced with 10 ml. of 5% thiopentone and continued with nitrous oxide and oxygen, using a trace of trichlorethylene.

A vertical midline submental incision $\frac{1}{2}$ in. (1.9 cm.) in length was made. The deep fascia was incised and the base of the tongue and both submandibular fossae were explored, using both dressing forceps and a finger, but no clot or localized collection of blood was found. It became obvious that the haemorrhage was interstitial in type.

The wound was temporarily packed with gauze soaked in a solution of "thrombin topical," which controlled, for the time being at least, the bleeding from the wound margins. Penicillin tablets were then inserted and a small wick of gauze was left in. After operation the endotracheal tube was left in place, the T-piece being securely strapped to the face with adhesive plaster. An endobronchial suction catheter was passed and a large quantity of watery mucus removed. The patient made a rapid recovery from anaesthesia.

Post-operative Course

It was decided that the endotracheal tube would be better left *in situ* until the danger of asphyxia had passed. To relieve the discomfort caused thereby 2% amethocaine was sprayed down the tube from time to time during the first day. A clear airway was ensured by the passage of an endobronchial catheter, and suction was applied every 15 minutes for the first few hours and whenever necessary during the next four days. Penicillin was administered parenterally to reduce further the risk of a pneumonic complication. The patient received in all 3 pints (1.7 litres) of blood followed by an intravenous glucose drip.

During the next 36 hours the tongue became even more swollen and the question of tracheotomy was reconsidered. Dr. Gavin Young, oto-rhino-laryngologist to the Western

Infirmary, was consulted, but he advised strongly against further surgical intervention. By the second day we decided that the endotracheal tube had been in long enough, but on its removal it immediately became apparent that the patient still required an artificial airway. Accordingly, a fresh tube was inserted, again through the nose, using the same anaesthetic technique. At the same time a Ryle tube was introduced via the mouth in order to replace the infusion therapy with a gastric milk drip. Crepitations persisted at the lung bases, but no more serious chest complication supervened. A persistent tachycardia of 140 to 160 a minute gave some anxiety. The submental wound continued to ooze for seven days. The coagulation time during the post-operative period remained about eight to nine minutes (capillary tube method).

By the fourth post-operative day the patient's condition was materially improved. The swelling of the tongue had diminished to a size which permitted the endotracheal tube to be replaced by a nasopharyngeal tube. With anaesthesia as before, a cut-down No. 6 Magill tube served the purpose, and it was placed so that its end lay just beyond the back of the tongue. Some eight hours later this too was removed, as the patient demonstrated his ability to breathe with the tube occluded.

Five days later he was given a further blood transfusion, consisting of 1 pint (570 ml.) of fresh blood and 1 pint (570 ml.) of packed red cells, since the haemoglobin level had fallen to 5.7 g. % and the red cells to 1,800,000 per c.mm. Thereafter convalescence progressed satisfactorily, and by the fifteenth day the swelling of the tongue and the floor of the mouth had completely subsided. He had also fully recovered his speech, which, incidentally, betrayed no hint of damage to the vocal cords.

It must be admitted that the haemarthrosis of the left knee received scant attention, though we are pleased to report that it had absorbed fully, without impairing function, by the time the patient left hospital.

Discussion

With this emergency it is a matter of surgical importance to know whether the haemorrhage is a localized collection of blood or a diffuse extravasation among the soft tissues of the mouth and throat. The case reported was an example of the latter type. The following also describe interstitial lesions: Lesné, Powilewicz, and Récamier (1921), Voit and Paus (1933), Endicott, Mitchell, and Qvist (1942), and Edmonds (1951). It is noted that Wintrobe (1946) and Davidson, Epstein, Miller, and Taylor (1949) merely refer to the formation of a haematoma. The paper by Endicott and his co-workers (1942) should be read for an appreciation of the anatomical aspects of the problem.

Early transfusion is obviously indicated and would appear to have provided adequate treatment in 6 of the 14 reported cases, as it also did in those which we found in the past records of our hospital. Of the remainder, seven received surgical attention. Six of these patients underwent tracheotomy, four of them dying (Lesné *et al.*; Voit and Paus; Endicott *et al.*; Edmonds). The two patients who recovered (Baird and Fox, 1943; Fox, Spencer, and Tocantins, 1946) caused considerable anxiety in the post-operative period, a major concern having been a persistent ooze from the tracheotomy wound. Troutt (1931) reported a case of a patient who recovered after a local incision of the tongue. In our case the incision that was made under the chin may have afforded an outlet for the blood and serum, but it is more likely, considering the nature of the lesion, that the exploration did more harm than good. It is questionable, in fact, whether or not surgical intervention is necessary in this condition.

We agree with the recommendation of Boyd (1950) that an attempt should be made to intubate the trachea before resorting to a tracheotomy or relief incisions. He chose the oral route in his case, and apparently to good effect. In our case the lingual swelling only just allowed the passage of a laryngeal swab carrier, and laryngoscopy would have

been impossible. Nasal intubation under local analgesia does not seem to be unduly difficult in these circumstances. The precaution was taken not to give thiopentone until the respiratory obstruction was overcome. Davidson *et al.* (1949) have stated that the local swelling tends to diminish in 24 to 36 hours. The critical phase in our case lasted four days, and no deleterious effects seemed to result from intubating the trachea for that period of time. There is no doubt that the absence of chest complications was largely due to the post-operative nursing care and to the assiduous bronchial toilet.

Summary

A case of respiratory obstruction in a haemophilic patient is described. This complication was due to a spontaneous interstitial haemorrhage into the tongue and the floor of the mouth. Three other cases from the same hospital are cited.

The management of the case reported consisted of blood transfusion, a submental incision, and nasotracheal intubation.

It would seem that intubation presents certain advantages over, and may be preferable to, tracheotomy in the treatment of this medical emergency. A Magill nasotracheal tube left in place for four days caused no obvious damage to the vocal cords.

We wish to thank Dr. J. A. W. McCluskie and Mr. E. G. Gerstenberg, in whose wards the patient was treated, for permission to publish this case.

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A CASE OF TALC GRANULOMA SIMULATING CARCINOMA

BY

F. BAAR, M.D., F.R.C.S.Ed.

Senior Surgical Registrar, Maelor General Hospital, Wrexham

Post-operative complications arising from the use of talc as dusting powder for surgical rubber equipment were first described by Antopol (1933). Experimental talc granulomas were produced in dogs by Lichtman *et al.* (1946), and many cases of post-operative adhesions have been attributed to the use of talc in the last decade. Mackey and Gibson (1948) described a talc granuloma which was found 13 days after laparotomy. Walker (1948) reported a death from general peritonitis following small-bowel obstruction due to talc adhesions following the repair of strangulated femoral hernia. Swingle (1948) recorded another fatal case of post-operative intestinal obstruction due to talc adhesions. Ross and Lubitz (1949) reported a similar case. Postlethwait, Mason, and Morehead (1950) also reported seven cases of talc granuloma found partly in persistently draining post-operative sinuses, partly causing intestinal obstruction, and partly present in operation scars. Kidd and Wilson (1951) described a case of recurrent intestinal

obstruction following appendicectomy at which adhesions containing crystalline material were found under polarized light. The value of modified starch as a substitute for talc has been recommended by Graham and Jenkins (1952).

The following is a report of a case of talc granuloma combined with an old-standing diverticulitis of the sigmoid colon which simulated carcinoma.

Case Report

A married woman aged 63 attended the surgical out-patient clinic on October 2, 1951, with 15 years' history of vague abdominal discomfort, constipation, some recent loss of weight, and poor appetite. She had also lately suffered from frequency and some discomfort on defaecation, together with a constant bearing-down sensation and backache. Cholecystectomy for gall-stones had been performed in Liverpool in 1946.

On examination her appearance was that of a middle-aged rather obese woman in moderately good general condition. There was a suspicion of an ill-defined mass in the L.I.F. Rectal examination revealed a fairly large, fixed, slightly tender mass in the pouch of Douglas which seemed connected with the uterus and suggested a uterine fibroid. On vaginal examination the mass seemed to lie behind and to the left of the uterus. The patient was referred to the gynaecologist, and an examination under anaesthesia was carried out on October 9, when the above clinical findings were confirmed.

Operation.—On the same day a laparotomy was carried out and a tumour was found which apparently originated in the sigmoid colon and which was densely adherent to the uterus. The affected part of the sigmoid colon was mobilized fairly easily and a provisional diagnosis of either carcinoma or diverticulitis of the sigmoid colon, leading to the formation of an inflammatory mass with subacute obstruction, was made. The colon proximal to the tumour was greatly distended. In view of the subacute obstruction a transverse colostomy was carried out with the intention of resecting the affected part of the sigmoid colon at a later date. The patient was transferred to the general surgical ward, and the colostomy was opened on October 15.

Second Operation.—On October 31 the affected part of the sigmoid colon was resected with end-to-end anastomosis. No secondaries were found anywhere in the abdomen apart from enlarged glands in the immediate neighbourhood, which were easily included in the resection.

Convalescence was uneventful and the patient was discharged from hospital on November 29 to return at a later date for closure of her colostomy. A barium enema carried out on November 22 showed the barium flowing to the colostomy without delay. The x-ray report mentioned a few diverticula in the lower pelvic colon with some inflammatory changes.

Third Operation.—The patient was readmitted for closure of her colostomy, which was carried out on February 2, 1952, and she was discharged healed and having normal bowel actions on February 21. She has been seen in the surgical out-patient clinic repeatedly since, and her condition is quite satisfactory.

Pathology

The specimen consisted of 4 in. (10 cm.) of thickened sigmoid colon with 3 in. (7.5 cm.) of normal colon on each side, together with a sector of resected mesocolon which contained several enlarged glands in the immediate neighbourhood of the tumour-affected part of the colon. The macroscopic appearance of the tumour suggested either carcinoma or Crohn's disease. The part of the colon proximal to the tumour was hypertrophic and distended. The lumen of the affected part was considerably narrowed, but the mucosa of the entire specimen seemed intact. As a third possible diagnosis diverticulitis with peridiverticulitis

probably the result of a healed perforation of a diverticulum, had to be considered. There was a good deal of inflammatory oedema present.

Microscopical Examination.—The specimen was sectioned and the provisional report stated the lesion to be of an unusual inflammatory nature. The sections showed normal colonic mucosa, oedema and fibrosis of the submucosa, considerable hypertrophy of and some collagen deposits in the muscularis, and chronic inflammatory infiltration and fibrosis of the serosa. The lesion was stated to resemble Crohn's disease.

The specimen was also sent to Professor W. D. Newcomb, of St. Mary's Hospital, London, W.2, who confirmed the inflammatory nature of the lesion. He considered it to be a granulomatous condition due to small anisotropic particles (Fig. 2), probably from glove powder. He confirmed the presence of diverticula, and the hypertrophied muscularis

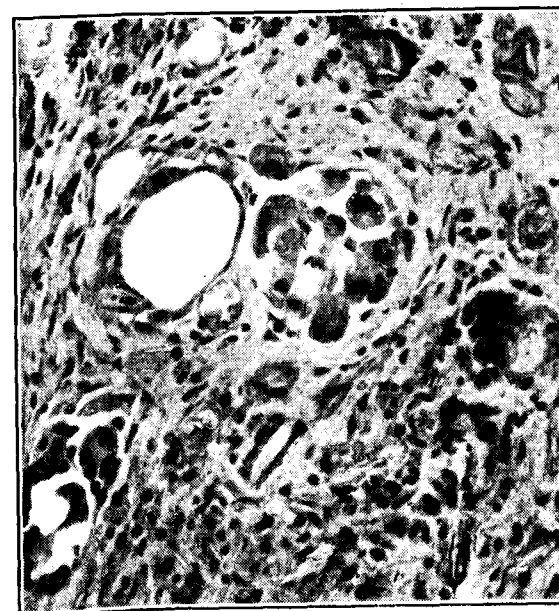


FIG. 1.—Showing the granulomatous nature of the condition, hypertrophy of the muscularis, oedema and fibrosis of the submucosa, and chronic inflammatory infiltration and fibrosis of the serosa. (x260.)



FIG. 2.—The same section under polarized light (x260), the talc particles appearing as birefringent crystals.

was thought to be the result of chronic obstruction due largely to the adhesions and partly to the diverticula. Professor Newcomb reported: "There is no question that she has had some ruptured diverticula in the past which go as far as the fat round the colon. It is very interesting that some of the faecal material has gone out into the fat and has caused a foreign-body reaction rather similar to the type on the surface, but I think there are two separate conditions. She first had a diverticulitis which has largely healed and then has had a talc granuloma which has stuck the material to the uterus."

As previously mentioned, the patient had undergone a cholecystectomy in 1946, when the powder was probably introduced into the abdominal cavity. Fig. 1 shows a section through the granuloma and Fig. 2, taken under polarized light, shows the talc particles as birefringent crystals.

Comment

Talc is a hydrous magnesium silicate which can produce a pseudo-tuberculous non-caseating granulomatous lesion in the form of a chronic granuloma or foreign-body reaction. The talc particles can be seen under polarized light. The talc may originate from the outside of gloves, from perforated gloves, or from rubber drains which had been powdered with talc for autoclaving. The particles are visible under the polarizing microscope as birefringent crystals.

The lesions described in the past have been post-operative adhesions which have caused obstruction, tumour masses which have simulated carcinoma, Crohn's disease and tuberculosis, persistently draining sinuses, or single or multiple masses in operation wounds. Periods of years may elapse between talc contamination and the production of symptoms, but Mackey and Gibson's talc granuloma was found 13 days after laparotomy. Cornstarch is now recommended in various modified forms as a dusting powder for use on surgical gloves and drains.

Summary

A case of talc granuloma following cholecystectomy, combined with diverticulitis of the sigmoid colon, and simulating carcinoma, is described. The various lesions which can follow the use of talc as dusting powder for surgical rubber equipment are discussed.

I wish to thank Mr. R. S. Ninian for permission to treat and publish this case, Professor W. D. Newcomb for the interpretation of the microscopical sections, and Professor J. Gough for the preparation of the photomicrographs.

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The London fog of December, 1952, and the initiation of the second smokeless zone in this country (in Central Manchester) are two points noted in the 1952 Annual Report of the National Smoke Abatement Society which is published in the Society's 1953 Year Book, now available from the offices of the Society, Chandos House, Buckingham Gate, S.W.1, price 1s. The report expresses concern at the calm acceptance of the incapacity caused by the fog, and the Society has urged the Government to undertake a comprehensive investigation into the disaster. The Year Book also contains articles on laws relating to smoke, investigation of air pollution, and domestic and national fuel policy. There is also information about the Society and its services to members, as well as a directory of organizations concerned with air pollution, and a list of recently published papers on the subject.

ISHIHARA TABLES: COMPARISON OF
THE NINTH AND TENTH EDITIONS

BY

R. A. WEALE, M.Sc., A.Inst.P.

(From the M.R.C. Group for Research in the Physiology
of Vision, Institute of Ophthalmology, London)

The assessment of the quality of isochromatic tables can only be empirical. Since their principal use, however, is for the detection of grossly colour-defective individuals who, by confusing red and green, are a danger to, and endangered by, modern traffic, a merely superficial test may provide a sufficiently valid result. But when a detailed answer is desirable, as when a certain amount of colour confusion can be tolerated, it will be found that clear-cut answers are obtained but rarely.

Criterion for Comparison

In the comparison of two different editions of the Ishihara tables it is necessary to test a given patient with both sets of tables in a random order so that the effect of memory becomes unimportant. Some sort of criterion must obviously be developed in order to evaluate the answers numerically. In the present instance, adequacy (A) and inconsistency (I), which are defined below, were chosen to compare the ninth and tenth editions of the Ishihara tables. All tables show at least one figure which the patient can or cannot read according to his colour vision. Some of them provide an alternative reading: thus Table 4 is designed to elicit the answer 29 or 70. If neither of these answers is given, and the patient reads 20 or 79 or any other number, this is considered to be a failure (F). The total number of F is subtracted from the number of tables (24, if the sample No. 1 is omitted) to yield the adequacy, A.

In itself, however, the adequacy is not a sufficient criterion. It may happen that the patient is diagnosed as normal following one table, red-green blind following another, and totally colour-blind according to a third. Again, another man may be completely red-blind by Table 22 and completely green-blind according to Table 24. Such diagnoses are not self-consistent. If, for example, the first patient gives six "normal" replies, then there are six inconsistencies (I=6), since if he were normal he would have shown it more than six times. Similarly, in the second case I=1, as one of the answers is unsuitable for an adequate diagnosis. A perfected diagnosis consequently requires A=24, and I=0—that is, all the answers must have been foreseen by the author and the 24 separate diagnoses must not contradict each other. The theoretical reason behind values of A different from 24 and values of I larger than 0 is that most colour defects are of an intermediate nature—that is, the patients are neither completely red-blind nor completely green-blind—and it is impossible to design a set of tables all of which would detect the defect. There are, moreover, individual variations in the spectral sensitivity which vitiate any attempt to standardize the tables in detail.

Results

In the present test, standard illuminating conditions were observed and 10 subjects examined. Of these, No. 1 was normal, No. 3 a deuteranope, and No. 5 totally colour-blind (a cone-monochromat, v.i.). The other defects were not identified. Patients 9 and 10, who do not occur in the accompanying Table, were also cone-monochromats and could not read any of the tables except the first. The results obtained were as shown in the Table.

The two editions thus provide equally self-consistent answers, but the later set appear to be more adequate. It is uncertain whether the difference in this respect is statistically significant.

Patient	Adequacy		Inconsistency	
	9th Ed.	10th Ed.	9th Ed.	10th Ed.
1	24	24	0	0
2	16	11	4	7
3	21	20	0	0
4	18	18	1	2
5	18	18	1	1
6	17	20	1	0
7	15	21	7	6
8	18	18	2	0
	147 (76%)	150 (78%)	16	16

Both sets of tables seem inadequate for the detection of total colour-blindness. If the patient suffers from rod-monochromatism an Ishihara test is generally superfluous because he will probably suffer also from photophobia, nystagmus, and reduced visual acuity. But such patients (not listed above) were not found to follow the Ishihara key: they were invariably successful with Tables 6 to 9. The reason for this is no doubt that the rod-monochromat's sensation of light is limited to the response mediated by the rods: this will allow blue-green figures on a background, isochromatic for the normal photopic sensitivity, to stand out as light numbers on a dark background. Although patients 9 and 10 failed on every table, patient 5 would not have been detected as being totally colour-blind had more reliable tests not been available. Again, another patient who would have been classed as totally colour-blind on the strength of the tables was found to be a protanope when tested more severely. These findings reaffirm the opinion that the Ishihara tables can be relied on to discover red-green defects: as regards total colour-blindness, however, the reliability of the answers they provide is much less.

Medical Memoranda

Congenital Syphilis of the Lungs

The following case of what is now a rare disease is reported because, despite knowledge of all the significant facts, difficulty was experienced in establishing the true nature of the lesions.

CASE REPORT

A woman aged 26 gave birth to a stillborn female infant. The mother alleged that the infant had been born some five weeks prematurely. She had had a miscarriage four and a half months after her marriage, but since that time had had one normal pregnancy and no further miscarriages. Prior to her confinement she had not attended an antenatal clinic, and it was only after the post-mortem examination on the infant had been completed that it was discovered that both the mother and father had positive Wassermann and Kahn reactions. There was no significant family history.

Post-mortem Findings.—The body was that of a female infant of 5 lb. 11 oz. (2.68 kg.) and apparently full maturity. There was gross oedema of the face, chest wall, and neck. A quantity of clear straw-coloured fluid was found in the pericardial sac. The heart was normal in structure and size. The ductus arteriosus and the foramen ovale were patent, the latter being very large and showing no valve. Both pleural cavities were full of clear straw-coloured fluid. Both lungs were atelectatic, and scattered throughout their substance were numerous globular tumours varying from about 2 mm. to 1 cm. in diameter. These tumours were yellowish white in colour, and, on section, rubbery and uniform in consistency. A number of the more superficial tumours caused bulging of the lung surface, and were quite sharply defined. The only other abnormalities discovered

were clear straw-coloured fluid in the peritoneal cavity, gross oedema of the brain, and suprarenals which were smaller than usual.

Histology.—Liver: numerous spirochaetes were seen, but the usual unicellular fibrosis was absent. Portal fibrosis, oedema, and excessive haemopoiesis were present. Pancreas, placenta, and kidneys: these appeared to be normal. Lungs: considerable numbers of spirochaetes were present in both the tumour and the non-tumour areas. A chronic interstitial pneumonia was present. In the nodules of solid tissue the bronchi showed up well and in some places the alveoli were lined with cubical epithelium.

COMMENT

The gross lesions in this case of congenital syphilis were exclusively in the lungs. Although microscopically spirochaetes were found in the liver the reaction to them appeared to be minimal in this organ. The gross lesions found at necropsy and the H. and E. sections presented a puzzling picture, and it was only the presence of spirochaetes in the sections stained by Levaditi's method which finally established the diagnosis.

The classical diffuse pneumonia alba was absent, and reference to numerous modern textbooks of pathology gave little information on discrete congenital syphilitic lesions in the lungs; they usually confined themselves to such remarks as, "Gummata may occur." The histological appearances of the tumours in this case were not those of gummata. It would seem that this form of congenital syphilitic lesion of the lungs is now so rare as not to merit description, in the standard textbook at least. However, on reading the older textbooks it is obvious that such lesions as have been described here were frequently seen by the pathologists of former days. An example of their descriptions, which tally in almost all respects with the lesions here recorded, may be quoted (Lancereaux, 1869): "The pathological product in the lungs always showed itself in the form of tumours, more or less numerous, of the size of a pea or a walnut, and these tumours were perfectly circumscribed, firm or softened at their centre and usually of a yellowish colour." Syphilis is still capable of presenting atypical lesions, and its presence must always be borne in mind when unusual pathology is encountered.

My thanks are due to Drs. R. D. Reid and A. B. Bratton for their help with the histology, to the department of pathology, Essex County Hospital, and to the Medical Director-General of the Royal Navy for permission to publish this case.

P. W. EDMONDSON, M.R.C.S., L.R.C.P.,
Surgeon Commander, R.N.

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A Finger Bud

I first saw the patient, a man aged 59, warming his hands by an old-fashioned grate, fingers outstretched, with the red glow of the fire showing through them. After a pause he saw me counting and proceeded to give the following story.

The swelling started, without pain, as a small pink, smooth elevation of the skin. He has no remembrance of injury. It grew slowly, and a long time passed before it became an embarrassment to him at whist drives, before all of which he would ask his wife to bandage the finger. Finally, the point was reached when his social life was jeopardized and he determined to be rid of it. Various suggestions made by his workmates were acted on. First, he rubbed it down regularly with the business edge of a matchbox. Next he plucked a hair from a horse's tail (there is a drayman's yard of a local brewery near by) and tied it round the base of the offending swelling. Finally, acting on the advice of his 90-year-old mother-in-law, he buried a part of the meat ration (beef) at the bottom of his garden and awaited results.

One day, while the swelling was still fairly small, he accidentally cut it at its base with the edge of a tin. It bled

only a little, but afterwards its growth was fairly rapid, and it took on the angle shown in the photograph. By the time he came to the surgery (June, 1951) he had had the appendage for 10 years.

On examination the swelling was a little more than an inch (2.5 cm.) long, solid, and sausage-shaped. It was attached to the volar aspect of the middle finger, near the distal interphalangeal joint. The skin crease of that joint was obliterated, and the middle segment of the finger was thicker than that of the corresponding digit of the other hand. The grey-pink skin over it was thick and horny, particularly at its tip. In the acute angle it made with the finger the skin was dry and not infected. A small amount of painless movement was possible at the junction of bud and parent stem. A curious feature was the continuation for a short distance of the normal "whorl" pattern at its



base, but these characteristic markings rapidly gave way to a few short shallow linear creases, reminiscent of the "striae gravidarum." Although it was a cumbersome attachment the patient said he played darts and dominoes with ease.

A skiagram of the hand as a whole showed that there was no generalized or local bone disease, and that the tumour was in fact composed of soft tissue only. A tentative diagnosis of an implantation dermoid was made.

Benign tumours of the hand are uncommon. Mr. Norman Lake gives the following: lipoma and fibroma, cutaneous myxomatous cyst, implantation cyst, glomus tumour, enchondroma, exostosis and osteophyte, and osteoclastoma.

After a preliminary photograph the base of the finger was infiltrated with 2 ml. of 1% procaine hydrochloride on each side of the bone—"ring" block anaesthesia, as described so succinctly by members of the hand clinic at University College Hospital. The skin at the base of the swelling was incised elliptically; the swelling was transfixed by a ligature and retracted by the patient, using his other hand. It was seen that the tumour had a pearly white capsule. Gauze dissection was enough for its separation, and bleeding was slight. Separation of the proximal part in the substance of the middle segment gave no difficulty. Little dead space was left at the end of the enucleation, and after dusting the wound with sulphonamide-allantoin the skin edges were brought together with three interrupted nylon sutures without packing.

Healing was rapid and by first intention. The sutures were removed on the tenth day and movement at the distal interphalangeal joint became rapidly normal. Meanwhile, a section of the tumour revealed that it was a fibroma.

I thank Mr. John Hadland for the photograph; Dr. Jamison, of Watford, for his pathological report; and my senior partners, Dr. R. Fisher and Dr. D. Brown, for their encouragement.

RICHARD MAWSON, M.R.C.S.

Reviews

CANADIAN SURGERY

Textbook of Surgery. Edited by H. F. Moseley, M.A., D.M., M.Ch.(Oxon.), F.A.C.S., F.R.C.S.(Eng.), F.R.C.S.(C). With foreword by G. Gavin Miller, M.D., C.M., M.Sc., F.R.C.S.(C), F.A.C.S. (Pp. 896; 460 text illustrations and 46 colour plates. £5 10s.) London: Henry Kimpton. 1952.

This fine volume has been conceived and produced for the assistance of students undergoing a five-years course in surgery at McGill University with a view to specializing as surgeons. It may be taken to represent surgical practice in Canada at the present day on the highest level. It contains an immense amount of information in a small compass and in a very compressed form, as is suitable for those for whom it was written. It is not a book for a beginner, but the advanced student will find it invaluable, since it will enable him both to expand and to classify his knowledge.

It is impossible to review in detail a work by some 30 authors, but it is at once obvious that everywhere it reaches a high level. The various subjects have been treated all on a similar plan, resulting in a uniformity and a balance which are remarkable and a great credit to the editor. The volume is profusely illustrated, and the line and half-tone drawings are superb and add greatly to its value. Each section carries a short bibliography of recent work, providing easy access to the literature.

HENRY SOUTTAR.

CHANGING HEALTH SERVICES

Trends of Opinion about the Public Health, 1901-51. University of London Heath Clark Lectures 1951. By Professor J. M. Mackintosh, M.D., LL.D., F.R.C.P. (Pp. 202. 12s. 6d.) London: Geoffrey Cumberlege (Oxford University Press). 1953.

In these lectures Professor Mackintosh, out of his long and ripe experience both as a public health administrator and as a holder of professorial chairs in two great universities, traces the rise of personal health services, the growth of National Health Insurance, the advent of the Ministry of Health, the zenith of local government, and the steps which led to the establishment of the National Health Service in Great Britain.

As one who has promoted and seen the growth of health and hospital services by enlightened and progressive local authorities, he is unable to approve of the course that subsequent events have taken. As far back as 1909 Mr. John Burns, then president of the Local Government Board, was pressed by his medical adviser, Sir Arthur Newsholme, to take legislative action not only to carry out the recommendations of the Poor Law Commission but also to establish a national health service which would link up the public health work of local authorities with specialized and general medical practice. Administratively such a service would have been logical and sound. Mr. Burns hesitated, and meanwhile Mr. Lloyd George brought in the National Insurance Act, which created an *ad hoc* central authority in the National Insurance Commission. This mistake was rectified to some extent by the merging of the Commission in the Ministry of Health in 1919.

In 1929 a great step forward was made by the passing of the Local Government Act, which made a way for the abolition of the Poor Law, enlisted the co-operation of the voluntary hospitals, and created a hospital service under the major local authorities. Some administrators hoped that, by extending the provisions of the National Insurance Act to dependants and integrating the specialist services already provided by local authorities, a national health service could be provided economically by progressive stages.

Instead, the National Health Service Act of 1946 established a national medical service in which the hospital

services and other services, hitherto administered by local authorities, were placed under regional hospital boards. Professor Mackintosh deplores this and also the creation of a special Children's Department of the Home Office. Referring to the making of separate, sometimes competing, occasionally conflicting services under local and central control, he adds: "It is hard to understand why we go on making the same mistake only to regret it when it is too late to mend."

Not everyone will agree with Professor Mackintosh's point of view, but all will appreciate the clarity and vigour with which he defends his thesis in the "Physic Act," his plea for greater attention to the preventive aspect of medicine, and the admirable literary style of these lectures.

ARTHUR S. MACNALLY.

OCULAR SURGERY

Ocular Surgery. By Hermenegildo Arruga, M.D. Translated from the third Spanish edition by Michael J. Hogan, M.D., and Luis E. Chaparro, M.D. (Pp. 936; 1,293 illustrations in text, 127 in colour. £15 6s.) London: McGraw-Hill Publishing Co. 1952.

Arruga's book first came out in his own language (Spanish) in 1946; the second edition, translated by Blum, of Geneva, was published in France in 1950; this translation into English has now appeared; and each successive edition has incorporated the advances which have appeared since the publication of its predecessor. The translations of this work indicate its unusually large appeal to ophthalmologists all over the world.

The plan adopted is not a comprehensive description of the innumerable types of surgical procedures and their minor variations; rather, the author confines his attention to those techniques which he himself considers best and which have been adopted by most leading ophthalmologists. The whole of ophthalmic surgery is systematically discussed, each section being of a standard so high that it is difficult to distinguish any one as outstanding. The section on the surgery of the eyelids includes not only an account of operative procedures for all the ordinary conditions so familiar to ophthalmologists, but also a useful account of plastic surgery of the lids. In the section on the cornea the various techniques for corneal grafting figure largely, and there is a more than usually interesting discussion on the technique of tattooing corneal scars in various colours. The chapter on the lens is a classic. As would be expected in a book written by Arruga, the discussion of detachment of the retina is lucid and elaborate, and in the section on the surgery of glaucoma, in addition to a description of the standard operations with their many variations, a most useful feature is the attention paid to the difficulties and complications which may arise. In the chapter on the surgery of the muscles the description of the numerous mechanical techniques which may be adopted is made interesting by the space given to the theoretical considerations which should determine the choice of the many techniques available. The author fully discusses that most difficult surgical problem, the treatment of intraocular foreign bodies.

Each section is written with great clarity, and the excellent illustrations make the descriptions in the text so clear that even readers who have little acquaintance with ophthalmic surgery can readily follow every step in the most elaborate operations. The descriptions of the minutiae in technique, and of the difficulties expected and unexpected which may arise, provide the best index of the vast experience and unusual surgical skill of the author. The book is extremely well produced, the illustrations are lavish and excellent, and the translators are to be congratulated in carrying out a responsible task with great fidelity to the original text without sacrificing the rhythm of the English language. It is a book which should be read and studied by anyone who practises ophthalmic surgery.

STEWART DUKE-ELDER.

MODERN TREATMENT

Modern Treatment Year Book 1953. Edited by Sir Cecil Wakeley, Bt., K.B.E., C.B., LL.D., M.Ch., D.Sc., F.R.C.S., F.R.S.Ed., F.R.S.A., F.A.C.S., F.R.A.C.S. (Pp. 348; illustrated. £1 1s.) London: Baillière, Tindall and Cox. 1953.

This book contains 38 articles by different contributors on a variety of subjects. The general practitioner is interested in three kinds of treatments: first, those he will carry out himself; secondly, those applied by specialists; and, thirdly, a group which overlaps the first and second according to the severity of the disease and the temerity of the practitioner. In which group a particular patient is placed depends largely on the judgment of the practitioner, so that he has not only to learn modern methods but also to pass judgment on them.

First, his own practice will be improved by reading Sir Cecil Wakeley ("Modern Treatment of Hydrocele"), Dr. Douthwaite ("Medical Treatment of Peptic Ulcer"), Dr. Gwyn Griffith ("The Modern Treatment of Rheumatic Fever"), and Dr. Thomas ("The Modern Treatment of Eczema").

Secondly, Mr. Stallard ("The Treatment of Glioma Retinae"), Mr. Barrett ("The Treatment of Carcinoma of the Bronchus"), and Dr. Phyllis Wade ("Modern Treatment of Cancer of the Thyroid") show the possibilities and limitations of surgery and radiotherapy in these conditions. Professor Strachan ("The Investigation and Treatment of Carcinoma of the Body of the Uterus") is refreshingly forthright in his opinion of the limitations of the general practitioner in this disease.

In the third group it is interesting to note how specialists differ about the proper range of the general practitioner. Whereas Mr. Ross Smith ("Treatment of Fractures of the Knee-joint") is prepared to leave quite serious injuries of the knee to the general practitioner, Mr. Plewes ("Modern Principles in the Treatment of Fractures") would bring his fracture clinic into the factories.

Obstetrics and gynaecology are well served, especially the treatment of infertility, although no one is willing to tackle artificial insemination very firmly. In this specialty I liked best Mr. Linton Snaithe ("Modern Views of Treatment of the Menopause"). He treats the woman's mind as well as her hormones. Dermatology is not neglected. It is noticeable that here old methods are replacing new.

There are plenty of good illustrations and photographs. Reproductions of x-ray negatives are clear, of positives indistinct. I wonder why the negatives are not always used.

C. W. WALKER.

DENTAL ANAESTHESIA

A Manual of Dental Anesthesia. By Professor W. Harry Archer, M.A., D.D.S. (Pp. 192; 146 figures. £1 7s. 6d.) Philadelphia and London: W. B. Saunders Company. 1952.

The first half of this book, devoted to local analgesia, is admirable. The bold illustrations and the text have that stamp of the master which makes their meaning clear and their teaching helpful. The remaining 66 pages on general anaesthesia bear evidence of wide reading, but lack the touch of authority.

This second section opens with a timely warning against playing the dual role of dentist and anaesthetist, but Dr. Archer then appears to overlook the dangers of a dental surgeon advising his fellow practitioners in anaesthetic techniques which are a full-time study. Amputation has resulted only too often when thiopentone has been given by mistake into an artery instead of a vein. On two occasions the author injected it inadvertently into an artery, producing characteristic pain: "The injection of the anaesthetic solution was stopped and the pain disappeared. When a moment or two later a few more cubic cm. were injected, the same pain was provoked." Curare and thiopentone have been used on occasions by experienced anaesthetists to relieve laryngospasm. The suggestion that these drugs

might be of value to dentists for the same purpose is asking for trouble. In Britain the anaesthetist will read with surprise, and the dental surgeon with concern, the nine pages of tests to which the patient should be subjected before being anaesthetized for a dental operation. Many of the views on general anaesthetics in this book are out of date, and some of the practices advocated cannot but be dangerous in the hands of the average dental surgeon.

R. R. MACINTOSH.

ALLERGIC DISEASES

A Manual of Clinical Allergy. By Professor John M. Sheldon, M.D., Robert G. Lovell, M.D., and Kenneth P. Mathews, M.D. (Pp. 413; illustrated. £2 2s. 6d.) Philadelphia and London: W. B. Saunders Company. 1953.

This illustrated manual reflects the outlook and methods used in the allergy clinics of the University of Michigan, Ann Arbor. It is not an ordinary textbook of allergic diseases, and not much space is devoted to the clinical description of such diseases. As the authors state, the book is "primarily for the physician interested in devoting part of his time to the treatment of allergy patients, or in establishing an allergy practice." It satisfies this demand extremely well, and I am sure that no such physician should be without this book. There are 20 chapters and 5 appendices. Evidence of wide experience and common sense appears on every page. Almost all the chapters deal in considerable practical detail with the methods used to establish an exact diagnosis of the cause or causes of a particular allergic condition, and give a reasoned and reasonable approach to treatment. One large illustrated section is on the identification of individual pollens, fungi, and moulds.

This book is beautifully printed and produced, reasonably priced, and singularly free from typographical errors. It may be highly recommended to all doctors interested in the practical investigation of allergic diseases as a companion to clinical texts on the subject.

C. J. C. BRITTON.

Those who enjoyed Dr. Richard Gordon's *Doctor in the House* will not be disappointed by the same author's *Doctor at Sea* (Michael Joseph, 10s. 6d.). The central character is a prim young assistant in general practice who takes a job as a ship surgeon on the advice of a psychiatrist, who thought this would be the best treatment for headaches induced by the seeming inevitability of a marriage arranged by the principal's wife. The voyage of a rather seedy cargo boat to South America gives the author even more scope for picaresque adventure than the life of a medical student. The young doctor, who gradually loses his primness, and his dissolute steward are very down-to-earth descendants of Bertie Wooster and Jeeves, and such stalwart stand-bys of British humour as sea-sickness, false teeth, Christmas dinners, D.T.s, corpses, and of course sex are all given a bright and breezy new look befitting a book about the sea. Dr. Gordon's crackling epigrams, sure touch, and slightly outrageous cynicism combine to make this an uproariously funny book.

Although the name of Abraham Trembley must be known to very few to-day, during his lifetime he made some of the greatest contributions to experimental morphology. His memoir on freshwater polyps (1774) demonstrated for the first time that certain animals could be artificially reproduced by division. He was the first to make permanent grafts of animal tissue, to prove that asexual reproduction by budding occurs in animals, and to witness cell division. Biography written too close to the life of its subject suffers certain disadvantages. Such a biography was prepared by Trembley's nephew three years after his death. Since then a considerable correspondence between Trembley and Réaumur has come to light. Full use has been made of this in a new biography by Dr. John R. Baker (*Abraham Trembley of Geneva: Scientist and Philosopher, 1710-1784*. Edward Arnold, 1952. 35s.). Dr. Baker puts the discoveries of Trembley in proper perspective against present-day biological knowledge. His admiration for Trembley and his painstaking study of his life and work have resulted in a fascinating and authoritative book, skilfully written and lavishly illustrated.

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DEBATE ON THE GUILLEBAUD
COMMITTEE

Mr. Iain Macleod, Minister of Health, on Monday this week ably and convincingly defended the Government's decision to inquire into the Health Service through the Guillebaud Committee. Mr. Aneurin Bevan, in his attack on this decision, thought that the Central Health Services Council, which could act on its own initiative as well as on the stimulus of the Minister, was the right body to detect defects in the Service and advise the Minister on changes to remedy them. The Central Health Services Council could not advise the Minister to curtail the N.H.S., and this, according to Mr. Bevan, was the reason why the Minister was trying to side-track it by setting up an independent committee of inquiry. "What the Minister is anxious to do," said Mr. Bevan, "is to obtain an alibi in order to cut the Health Service." On the question of cost, Mr. Bevan made great play with the fact that where the initiative lay with the patient, that is in using the dental and ophthalmic services, the cost had gone down. The demand had begun to fall, he claimed, before the imposition of charges. But in the pharmaceutical services the initiative came from the doctor in making his prescriptions, and it was here that expenditure was going up. Mr. Bevan asserted that prescribing was too free and that general practitioners needed disciplining because they had not been as co-operative as they should have been. Another point made by Mr. Bevan was that the cost of the N.H.S. did not present the Exchequer with something that was unpredictable. The cost of the hospital services was entirely within the Minister's control; at this point Mr. Macleod observed that two-thirds of the hospital costs are governed by nationally negotiated or other agreements over which no one had control.

Mr. Macleod pointed out there were two questions to be answered: Is there anything to inquire into? and, if there is, What sort of body should make the inquiry? There was more disagreement on the second than on the first question. The first point he made against using the Central Health Services Council for this purpose was its size, consisting as

it does of 41 persons. Secondly, as all these members had special interests in the Service he did not think they were the right persons to conduct the inquiry, but that it should be done by experienced persons independent of the professions and of the political parties. He wanted an impartial assessment made. Speaking on block grants, he observed that the financial system in this country was not designed to cope with such a problem as the hospital service. The case made for the block grant was that the present system was a disincentive to wise spending in the last months of the financial year, and that there would be greater economies if hospitals were allowed to plan three or five years ahead. On the other hand, the two-thirds of the cost of the hospitals related to salaries was outside the control of the Minister and the hospital authorities, and so was something to which the block grant could not apply. Nevertheless, he said subsequently that it would not be possible to control expenditure in the Health Service until they could control manpower. At the end of 1951 there were 328,000 full-time and 90,000 part-time staff in the hospitals—an increase over 1948 of 15% and 33% respectively. "We want," said Mr. Macleod, "a national manpower policy in the hospital field." He hoped it would be possible to get more staff into sanatoria, and particularly into mental hospitals, by limiting to some extent those hospitals which were already up to general staffing ratio.

The Government, said Mr. Macleod, viewed with the very gravest concern the present cost of the pharmaceutical services. This was a part of the Health Service which was not under financial control. The average cost of prescriptions had risen from 38d. in 1949-50 to 50.5d. in 1952-3, and for his estimates for the current year he had taken the figure of 52d. The number of prescriptions in England and Scotland ran into the figure of 241 million a year. The increased expenditure was due to a general rise in the cost of ingredients, to the increasing use of new, valuable, and expensive drugs, and to the increase in the proportion of proprietary remedies, now accounting for 25% of prescriptions and in money for about half the whole drug bill. He intended to notify doctors in a month or so of the two schedules laid down by the Cohen Committee which referred to drugs of no proved therapeutic value. The Government had decided to inquire into the cost of certain proprietaries which seemed to be specially expensive. Mr. Macleod was critical of firms "who are merely wrapping up standard preparations in pretty packages and forcing them on the notice of doctors by salesmanship." The pharmaceutical industry was producing about one-third of its product for export, one-

third for the N.H.S., and roughly one-third went over the pharmacist's counter without prescription. It may be noted that Mr. Macleod paid a deserved tribute to the research done by some of the firms which had to be paid for by their proprietaries. On the effect of charges Mr. Macleod gave some interesting figures which showed that dental charges had had the effect of increasing the services given to school-children. But it seems that he has set his face against further charges, saying, "The difficulty about a policy of successive charges is that in time it must destroy the Health Service." Towards the end of his speech Mr. Macleod said: "What we want to achieve is a system whereby the Service itself has an interest in economy which is as natural and rewarding as is its interest in medical efficiency. That is the essence of the problem which the Guillebaud Committee are trying to solve."

The terms of reference of the Guillebaud Committee are so wide that they do not exclude any approach to the numerous problems that beset the N.H.S.; so wide, in fact, that the Committee's investigation could amount to that of a Royal Commission, which Colonel Stoddart-Scott advocated subsequently in the debate. But it seems certain that the Committee will look closely into the question of block grants to hospital authorities—a subject referred to in a previous leading article¹—into the needs of certain hospitals, especially mental institutions, for staff, and particularly into the cost of the pharmaceutical service. It looks as if the pharmaceutical industry will be subjected to a searching inquiry—an inquiry which may be extended to the prescribing habits of the medical profession. We suggested some twelve years ago that the industry needed some form of rationalization,² but the medical profession is deeply sensible of the great contributions made to pharmacology by a large part of the pharmaceutical industry, apart from its indispensable services in the manufacture and distribution of drugs. Mr. Bevan would of course blame general practitioners for the rising cost of the pharmaceutical service; that is the sort of thing we have come to expect from him, and he does not disappoint us. But much of the trouble is due to the fact that many patients equate a free Health Service with an abundant supply of free pills and potions. Consumer demand is still at full tide. Doctors have done their best to stem this. They will co-operate with the Guillebaud Committee and the Minister of Health in any rational attempt to introduce order where disorder is shown to exist. But the medical profession will at the same time have to watch

carefully lest any restriction should be imposed which will prevent or hinder the practitioner from prescribing what he thinks is best for his individual patient. This cannot be dictated to him.

SEXUAL REPRODUCTION IN VIRUSES

The distinctive feature of sexual reproduction in general was formerly considered to be a fusion of different types of gamete. Now it is held to consist in meiosis and nuclear fusion. The presence of sexually differentiated organs or cells is not of the first importance: the primary significance of sex lies in the opportunity it provides for genetic recombination—that is, for fresh combinations of genes. Hence any organism having mechanisms for genetic recombination between different individuals may be said to show sexual reproduction. This is the basis for the claim that sexual reproduction occurs in viruses.

In 1946 Delbrück and Bailey¹ and Hershey² observed genetic recombination in the type of virus known as bacteriophage—that is, new strains showed mixtures of characters from two parental strains. Since this discovery the evidence for a hereditary mechanism in viruses, in several respects like the chromosome mechanism of higher forms of life, has been greatly strengthened. Luria³ had previously demonstrated that viruses undergo mutation, and Hershey² showed that different mutations occurred independently at different genetic loci. Subsequently, Hershey and Rotman⁴ demonstrated partial linkage of certain phage characters. Moreover, the linkage data fitted a linear map, suggesting that certain genes in phage are disposed in a line, and that there was an interchange of genes comparable to the crossing-over that occurs between homologous chromosomes during meiosis in higher organisms. Later Hershey and Davidson⁵ established in one instance the existence of multiple alleles. Furthermore, Hershey and Chase,⁶ in a study of plaque formation by bacteria, have demonstrated that heterozygous phage particles are often produced when bacteria are infected with two virus strains differing in plaque formation.

Despite this apparently normal hereditary mechanism in viruses, there is other evidence

¹ *Cold Spr. Harb. Symp. quant. Biol.*, 1946, 11, 33.

² *Ibid.*, 1946, 11, 67.

³ *Genetics*, 1945, 30, 84.

⁴ *Proc. nat. Acad. Sci. (Wash.)*, 1948, 34, 89.

⁵ *Genetics*, 1949, 34, 44.

⁶ *Ibid.*, 1951, 36, 667.

⁷ *Cold Spr. Harb. Symp. quant. Biol.*, 1951, 16, 471.

⁸ *Proc. nat. Acad. Sci. (Wash.)*, 1947, 33, 253.

⁹ *Science*, 1950, 111, 507.

¹⁰ Dulbecco, R., *J. Bact.*, 1952, 63, 209.

¹¹ *Cold Spr. Harb. Symp. quant. Biol.*, 1951, 16, 463.

¹² *J. gen. Microbiol.*, 1951, 5, 67.

¹³ *Nature (Lond.)*, 1953, 171, 163.

¹⁴ *Aust. J. exp. Biol. med. Sci.*, 1952, 30, 447, 459, 469.

¹⁵ *Schweiz. Z. Path. Bakt.*, 1948, 11, 395.

¹ *British Medical Journal*, 1953, 1, 825.
² *Ibid.*, 1940, 2, 875.

which conflicts. First, the heterozygotes observed by Hershey and Chase⁷ have some puzzling features: most appear to be heterozygous at only one locus, even when parental strains differ at two loci. This suggests that the heterozygotes may not be diploid, but rather haploid with the addition of one or more extra pieces of genetic material. Secondly, viruses seem to differ from other organisms in their method of multiplication. There is no evidence, from electron microscope studies or elsewhere, that virus reproduction is by binary fission. Furthermore, the finding that viruses cannot be re-isolated from host tissue for a definite time after inoculation has led to the suggestion that the virus particles break down in the host into a number of smaller units, which are then reduplicated before assembly into new virus particles. If this is in fact how the virus multiplies, then there would be abundant opportunities for recombination during mixed infections of the host. Indeed Luria,^{8,9} in order to account for certain effects of phage on bacteria, put forward a hypothesis that genes multiply independently and subsequently reassemble into virus particles. However, it now appears¹⁰ that an alternative explanation for these effects is necessary. Nevertheless, the hypothesis will explain genetic recombination in viruses. Indeed, several observations support the hypothesis that reproduction of the genetic material of viruses takes place mainly by reduplication of elements that are not yet in the form of mature virus particles, and that recombination occurs late in reproduction of the genetic material. Thus, Luria¹¹ has shown that gene reproduction in phage is exponential—that is, one gene produces x genes, each of which then produces x genes, and so on. The initial genes, brought in by the infecting virus, give rise to copies which are themselves copied, giving a clonal distribution of any mutants which may have appeared. This is in contrast to the nearly random distribution of recombinants from mixed infections.

Whatever the nature of the hereditary mechanism in viruses, it is certain that genetic interaction occurs between different strains. This is a finding of great significance, for it means that new and more virulent strains may arise whenever a host is infected by more than one strain of virus. Burnet and his colleagues Lind and Fraser found^{12,13,14} that recombination occurred when mixed strains of influenza virus were inoculated into mouse brain and chick embryo, and it seems possible that genetic interaction always follows infection with two or more strains of virus. This undoubtedly supports the suggestion made by Pontecorvo¹⁵ in 1948 that virulent influenza epidemics may arise by the simultaneous double infection of hosts by two non-virulent forms.

SURPLUS REGISTRARS

The statement of agreement reached between the Minister of Health and the Joint Consultants Committee on the subject of surplus senior registrars in England and Wales which appears in this week's *Supplement* (page 243) is good news. It is the outcome of considerable pressure upon an adamant—albeit sympathetic—Ministry by the Joint Consultants Committee ably backed up by the registrars. In fact, the measures now proposed are largely those of the Registrars Group of the B.M.A.

The Minister has authorized hospital boards to retain senior registrar posts in excess of the establishment laid down in 1951¹ for a period not beyond 1955 in cases where the retention will avoid extra staff having to be employed in other grades, and provided suitable candidates are forthcoming. Posts which are to be retained will be advertised as they become vacant. The present holders, other senior registrars whose appointments are nearly at an end, and, in certain circumstances, former senior registrars will be able to apply. The term of appointment will be for one year, but boards will be able to extend it to a second year where other employment has not been obtained by the end of the first year. Holders of these posts will still be free to compete for higher appointments, but they will do so without priority and on equal terms with other candidates. In addition to the opportunity of applying in open competition for a post which he has just vacated, there will be nothing to prevent a senior registrar from applying as at present for any other post within the training establishment. These proposals are fair, and bring to an end a long period of anxiety and uncertainty. They allow for open competition, which will be good for the hospital service, and those who lose may do so with grace and without bitterness against the politicians. Too long has the registrar establishment and the hospital service to which it belongs been the victim of *ad hoc* decisions based on political expediency. A crisis of unemployment among future consultants and a staff shortage in hospitals have been averted. The time gained should be devoted to some creative thinking undisturbed by political clamour so that eventually some order may be created out of the muddle which at present clouds the hospital service.

MUSCLE FIBRILLATION

Traditionally muscle fibrillation² has been the term used for involuntary contraction of groups of muscle fibres without actual movements of the limb, a phenomenon seen most often in patients with motor neurone disease. In 1938 Denny-Brown and Pennybacker³ suggested that fasciculation would be a preferable term, since contraction of a group of muscle fibres supplied by a single motor unit causes the involuntary contraction. The term fibrillation, they suggested, should be used for the involuntary contraction of single muscle fibres which occurs in denervated muscle and which gives a characteristic record on the electromyogram. This denervated

¹ *British Medical Journal Supplement*, 1951, 2, 47.

vation fibrillation cannot be seen through the skin, and in man the only place where it can sometimes be seen is the tongue after a lesion of the hypoglossal nerve or nucleus. Since then the two terms have been used somewhat indiscriminately, traditionists favouring fibrillation, purists fasciculation, in spite of the fact that the involuntary movement does not involve a whole muscle fascicle but only the fibres innervated by one anterior horn cell.

Clinically the most frequent cause of muscle fibrillation is chronic disease affecting the spinal anterior horn cells, of which the various types of motor neurone disease are the most common, but it may also be seen in syringomyelia and with spinal compression at the level of the compression. It may occur in acute disease affecting the anterior horn cells, as in the pre-paralytic stage of anterior poliomyelitis.⁴ Then the muscles showing extensive fibrillation are likely to be involved by paralysis within the succeeding twenty-four hours, but fibrillation does not indicate whether the muscle weakness will be slight or severe. Fibrillation may occasionally occur in diseases of the lower motor neurone with no definite pathological evidence of anterior horn cell involvement, such as polyneuritis,⁵ peroneal muscular atrophy, and thyrotoxic myopathy.⁶ But it must be emphasized that muscle fibrillation may occur without any disease of the central nervous system or of the muscles, and long-continued fibrillation in the absence of muscle wasting or weakness is usually a trivial disorder. But when it afflicts doctors it not unnaturally may cause considerable anxiety about its possible significance,⁷ and this may in itself aggravate the fibrillation.

The pathology of fibrillation is of interest. Its occurrence most frequently in chronic disease of spinal anterior horn cells suggested that it was due to some disturbance in these cells, but the old observation⁸ that physostigmine or its analogue neostigmine, which act predominantly at the myoneural junction, may cause intense fibrillation, was in favour of a more peripheral mechanism; and this theory was supported by its occasional appearance without disease of the anterior horn cells. Forster and his colleagues^{9,10} have demonstrated that it can occur when impulses from the anterior horn cells to the muscles are interrupted either by spinal analgesia or by injection of procaine into the common peroneal nerve with resultant muscle paralysis. As a final demonstration they divided the left axillary nerve in one patient with severe amyotrophic lateral sclerosis and the femoral nerve in another, and found that fibrillation persisted for about seven days after nerve section. They thus conclusively proved that conduction of impulses from the anterior horn cell to the muscle was not necessary in the production of muscle fibrillation, which they suggested originated at the myoneural

junction. These experiments show without a doubt that the source of muscle fibrillation is peripheral, and it is not at present clear why it should be such a conspicuous sign in certain disorders affecting the spinal anterior horn cells.

AN UNWISE RISK

In sending samples of drugs through the post manufacturers and distributors normally exercise the care expected of them. Some of these medicaments are toxic, especially to children, but they are usually well packed up. An exception to the rule has been brought to our notice by a correspondent, to whom samples of a new hypnotic were recently delivered by post. A small box with a transparent top and bottom containing four exceptionally brightly coloured capsules was sent to him unsolicited in an unsealed, unregistered envelope. He found it on the doormat together with an identical package addressed to a doctor who had inhabited the house some time previously. While the preparation is not a scheduled poison and can be bought over the counter by the public, it nevertheless deserves to be treated with greater respect than that. A suicidal death has been reported¹ in the U.S.A. from taking the drug (there given a different name). Certainly a gross overdose was then taken—about 12 times the recommended dose. But quite a small quantity of any such drug may constitute a fatal dose to a child aged 1 to 2 years, which is the age when the chance of dying from accidental poisoning is exceptionally high. Nor must the dispatch of these samples only to doctors' addresses be thought a sufficient safeguard, for the addresses are often out of date—as indeed in the case reported to us. Pharmaceutical firms should surely consider it a duty to seal securely the packages of potentially dangerous drugs that they send through the post, for the danger to children of medicaments that are relatively non-toxic to adults should not be overlooked.

ADOPTION

Social legislation places high in its scale of values the rights of children to a normal home life, and the practice of adoption is one of the ways by which these rights are secured. We are told in *The Golden Bough* that when Hera adopted Hercules she went through the ritual of a mock confinement, and that similar rites were in fact practised not long ago among primitive peoples when a child was "adopted." Less picturesque but doubtless safer and more orderly procedures are now laid down by the law. In this country legislation was at first resisted, for it was said that legalized adoption would encourage illegitimacy and child neglect. However, unsupervised and unregulated adoption, often associated with baby-farming, was recognized as the greater evil, with the result that after cautious deliberation and the presentation of a series of reports to Parliament the first Adoption Act was passed in 1926. The great increase in the numbers of illegitimate children and orphans during the first world war pointed

¹ Cares, R. M., et al., *Amer. J. clin. Path.*, 1953, 23, 129.

² Gowers, W. R., *Diseases of the Nervous System*, 2nd ed. London: J. and A. Churchill, 1892.

³ *Brain*, 1938, 61, 311.

⁴ Russell, W. R., *Poliomyelitis*. London: Edward Arnold, 1952.

⁵ Worster-Drought, C., and Sargent, F., *Brain*, 1952, 75, 595.

⁶ McEachern, D., and Ross, W. D., *ibid.*, 1942, 65, 181.

⁷ Schwab, R. S., et al., *British Medical Journal*, 1951, 2, 209.

⁸ Langley, J. N., and Keto, T., *J. Physiol. (Lond.)*, 1915, 49, 410.

⁹ *Arch. Neurol. Psychiat. (Chicago)*, 1944, 51, 264.

¹⁰ *ibid.*, 1946, 56, 277.

the need for official action. The more recent Acts, the last of which was passed in 1950, reflect the pressure of increasing numbers of adoptions during and after the second world war. In England legal adoptions rose from 2,967 in 1927 to 21,280 in 1946, the peak year so far, for numbers have tended to fall since then.¹

Earlier this year the Home Secretary appointed an interdepartmental committee, under the chairmanship of Sir Gerald Hurst, to consider the present laws relating to the adoption of children, and in the *Supplement* this week (p. 240) we print the memorandum of evidence which will be submitted by the Council of the B.M.A. to the committee. The views of medical men and women on this question will be received with attention, for they are in a better position than most to assess the success or otherwise of adoptions. Some of the adoption societies forbid official inquiries to be made about how an adoption is working out once the adoption order has been made, and many of the social workers employed by the courts and local authorities tend to see only the unsatisfactory results. Health visitors, of course, are also in a good position to watch the progress of adopted children, for they can visit them in the ordinary course of their duties.

There is a tendency in official circles to frown on adoptions arranged by individuals (so-called third-party adoptions) as opposed to those arranged by registered adoption societies and local authorities, but the Council of the B.M.A., while admitting there is a greater risk of failure with third-party adoptions, comes out firmly in favour of preserving this method, provided safeguards are introduced. Such safeguards should include notification to the local authority and full investigation before the placing of the child with the proposed adopters. The mother also should be under an obligation to make a request to the local authority for permission to place the child for adoption. Another recommendation contained in the memorandum of evidence is that child adoption should be controlled by the Ministry of Health rather than the Home Office, and, further, that the health committee of a local health authority should delegate to a special adoption subcommittee the responsibility of investigating cases. This of course raises the thorny question of the responsibility of the health committee *vis-à-vis* the children's committee of the local authority, and on this point the memorandum of evidence states, "It is realized that active co-operation with the local children's committee would still be essential." Another interesting recommendation is that the proposed adopters of a child should be medically examined by their family doctor, who should also give to a medical referee appointed for the purpose an opinion on their personality, probable adaptability to family life, and reasonable expectation of survival. This proposal may lead to some controversy, but it is both sensible and practicable. A final point of some importance is that a child attending the juvenile court for the purposes of the Adoption Act should not have to mix with those attending the court for other reasons.

¹ *Adoption Trends in England and Wales*. A report of the Standing Conference of Societies Registered for Adoption.

CULDOSCOPY AND CULDOTOMY

In gynaecology, as in other fields of medicine, a carefully taken history is a first step to diagnosis, but the evaluation of the presenting symptoms may be difficult, and bimanual pelvic examination, even under anaesthesia, is not without its limitations. If there is no response to simple treatment, or if the diagnosis remains in doubt, laparotomy may be undertaken, particularly when pelvic pain persists or the possibility of an ectopic pregnancy cannot otherwise be excluded. Operation may reveal unsuspected disease or a more extensive lesion than was expected, but on the other hand no abnormality may be found. In the latter case, although the opportunity may be taken to carry out ventro-suspension of the uterus or to remove the appendix, the surgeon might well wish there were lesser procedures available whereby the uterus and appendages might be inspected. In fact, gynaecologists have performed coelioscopy by two different routes. Transabdominal peritoneoscopy, introduced by Kelling in 1902, was developed by Ruddock,¹ and Palmer,² in France, still champions its use in the study of sterility, especially in assessing whether salpingostomy is likely to be successful. In 1944 Decker and Cherry³ described the use of a special endoscope for introduction through the posterior vaginal fornix into the pouch of Douglas (cul-de-sac in American terminology), and gave the name culdoscopy to the inspection of the pelvic contents by this route. In a monograph⁴ reviewed in this *Journal*⁵ a few months ago Decker showed that if the operation is performed with the patient in the knee-elbow position the difficulties and dangers, the chief of which is perforation of the rectum, can be avoided. He found culdoscopy particularly useful in the diagnosis of endometriosis and ectopic pregnancy and in the study of infertility, and he pointed out its value for research into tubal and ovarian function.

More recently Doyle⁶ has extended this procedure into one of "exploratory culdotomy," which gynaecologists will appreciate is none other than posterior colpotomy in a new guise. After palpating the pelvic organs through the peritoneal opening, a magnifying "pelviscope" is introduced and the pelvic contents are inspected. The telescope can be removed, leaving a retractor in place through which adhesions may be cut or biopsy sections taken. According to Doyle the main indications for culdotomy are to find the cause of pelvic pain, to diagnose endometriosis, ectopic pregnancy, and ovarian neoplasms, and to study the uterus and appendages in cases of sterility. In all these cases palpation and observation through the pouch of Douglas constitute an alternative to laparotomy and may demonstrate that the major procedure is unnecessary. In contrast to Decker, whose claims are moderate, Doyle might be thought to have overstated his case. Certainly his advocacy of denervation of the uterosacral ligaments by transection for the relief of pelvic pain in dysmenor-

¹ Ruddock, J. C., *Surg. Gynec. Obstet.*, 1937, **65**, 623.
² Palmer, R., and Palmer, E., *La Stérilité Involontaire*. Paris: Masson et Cie, 1950.
³ Decker, A., and Cherry, T. H., *Amer. J. Surg.*, 1944, **68**, 40.
⁴ *Culdoscopy*. Philadelphia and London: W. B. Saunders, 1952.
⁵ *British Medical Journal*, 1952, **2**, 1030.
⁶ Doyle, J. B., *J. Amer. med. Ass.*, 1953, **151**, 605.

rhoea and dyspareunia will be challenged. Nevertheless culdoscopy, experience of which is apparently so far slight in Britain, may have something to offer the gynaecologist both in practice and in research.

THE DUTIES OF A NURSE

In the debate on the nursing services in the House of Lords last week (see p. 1172) several speakers referred to the technical work which in some hospitals was apparently thought to be within the range of duties of student nurses. Lord Amulree, for instance, thought there was a danger of getting too many nurses too highly trained, so that they would become not very good doctors instead of good nurses. The council of the Royal College of Nursing is also worried about a possible confusion between the functions of nurses and doctors, and has recently sent a memorandum to governing bodies and regional hospital boards. This draws attention to the increasing tendency for nurses, particularly in hospitals, to carry out duties which do not lie within their field of training—for instance, the giving of intravenous injections and the withdrawal of blood from veins. This may expose the nurse to the risk of charges of professional negligence, though in the opinion of the Royal College of Nursing the responsibility is the doctor's. "The only professional negligence for which the nurse should be held liable should be failure in regard to nursing procedures." Another matter of concern to the College is the practice in some hospitals of leaving it to a nurse to explain to the patient "the nature and effect of the operation" when obtaining the patient's signature on the revised form of consent. Although nurses can properly undertake part of this routine work the College believes that the doctor must at all times retain full responsibility, and should enter the type of operation on the form himself, explain it to the patient, and obtain his signature.

The performance of duties outside her professional scope also makes inroads into the time which a nurse should spend in the nursing care of the patient. Though younger nurses are often enthusiastic to undertake technical procedures, the College maintains that senior members of the profession realize the possible disadvantages and believe that a trained nurse in hospital should have more than enough to do in teaching, caring for her patients, and administering her department. Although the General Nursing Council does not control a nurse's actions when she is trained, it would deprecate the delegation of extraneous duties to ward sisters and staff nurses in nurse-training schools. Busy ward sisters, when asked by the Working Party¹ appointed to inquire into these matters whether they would welcome extra technical responsibilities if pressure of work were lessened and the element of risk removed, replied that this temptation should be resisted on account of the loss of time which they should be giving to their nursing duties.

These doubts and difficulties of the nursing profession will have to be carefully considered by the medical profession, and it will be interesting to hear the reaction of the hospitals to the Royal College of Nursing's memorandum.

¹ *The Recruitment and Training of Nurses*, 1947, H.M.S.O., London.

ENDEMIC SYPHILIS

Endemic syphilis, which has been present in Bosnia since, and perhaps even before, the sixteenth century, is not usually acquired venereally, affects children mainly, is particularly prevalent where standards of living are low and social and economic conditions poor, and is found in rural rather than urban communities. Clinically and pathologically it differs in no important respects from sporadic venereal syphilis; though primary lesions are rare, secondary ones and gummata are common. Contrary to what has been stated, neuro- and cardiovascular syphilis do occur, though not often. Congenital syphilis is very rare, and this is explained by the fact that infection usually takes place in childhood, and by the time the patients reach adult age they are no longer likely to transmit the disease. But this is probably not the whole explanation, since it is not uncommon for a mother to be infected by her child when suckling. Efforts to eradicate endemic syphilis from Bosnia were made in 1905–11 and again in 1926–33, but they had little success. In 1948¹ an organized campaign was started under the aegis of W.H.O. The objects were to examine, both clinically and serologically, the whole population and treat compulsorily all infected persons and their contacts, to improve standards of hygiene, and to repeat the surveys at appropriate intervals. Serum was tested by the Kahn and Meinicke reactions, and the only drug used for treatment was procaine penicillin G in oil with 2% aluminium monostearate (P.A.M.). The usual dosage was 3.6 to 4.2 mega units spread over six to twelve days, and 1.2 mega units as abortive treatment for contacts. In the first survey 85% of the population was examined, and this figure rose to 95% at the second survey. The people proved co-operative. Complete eradication of the disease should be possible, but the difficulty in achieving this is due to a few infected persons remaining untreated, to the entry into the area of infected persons from outside, and to symptomless cases in the incubation period being missed. Infectious relapse is considered to be rare. Repeat surveys should in time reduce the reservoirs of infection to negligible proportions. Animal experiments and penicillin sensitivity tests showed that spirochaetes obtained from cases of Bosnian endemic syphilis differ little from those found in venereal syphilis acquired elsewhere.

Theoretically there seems no reason why any treponemal disease in any part of the world should not be eradicated by mass treatment, provided the campaigns are carefully followed up. In fact such treatment has already had great success in the treatment of yaws in Haiti, Indonesia, Thailand, and the Philippines, and in the treatment of bejel in Iraq.² The value of the follow-up is shown by the results of treating yaws in Sierra Leone, where between 1941 and 1946 mass treatment alone reduced the infection rate from 13.7 to 5.8, mass treatment plus permanent treatment facilities to 1.3, and both those plus home visits to 0.

¹ Grin, E. I., Turner, T. B., and Hollander, D. H., *Bull. World Hlth Org* 1952, **1**, 1.
² Grin, E. I., *Epidemiology and Control of Endemic Syphilis*, 1953, Geneva.
³ Guthe, T., Reynolds, F. W., Krag, P., and Willcox, R. R., *British Medical Journal*, 1953, **1**, 594.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

APOPLEXY

BY

F. J. NATTRASS, M.D., F.R.C.P.

Professor of Medicine, University of Durham; Physician, Royal Victoria Infirmary, Newcastle-upon-Tyne

The term "apoplexy" is a very general one meaning a sudden severe cerebral illness of vascular origin, and as such is a common emergency of general practice. The disaster may be due to haemorrhage ploughing up brain substance or flooding the subarachnoid space or to extensive softening resulting from arterial obstruction. Of the latter the chief causes are thrombosis and embolism, but in some fatal cases no actual block can be demonstrated, and it is probable that vascular spasm has been responsible for the damage. Limited softening causing local or general disturbances of brain function of a more insidious character are not included under the term apoplexy. Recognition of the nature of an apoplectic seizure is important from the point of view of prognosis and increasingly so from the point of view of treatment.

Generally speaking there are clear pathological and clinical differences between intracerebral and subarachnoid haemorrhage, but the distinction is far from absolute. Blood from a primary intracerebral haemorrhage often reaches the subarachnoid space from the ventricles; and haemorrhage from a surface vessel may produce its chief effects by destroying cerebral tissue.

Intracerebral Haemorrhage

The underlying pathological cause in the great majority of cases of intracerebral haemorrhage is atherosclerosis accompanied by hypertension. There is little evidence clinically of sudden increase of tension, and it is not clearly known why the arteries, so long under strain, suddenly give way. Most of the patients are elderly: exceptions are the subjects of malignant hypertension or chronic nephritis, who may be younger, and patients with aneurysms which rupture into the brain (see below).

Haemorrhage may occur in any part of the cerebral hemisphere or in the pons, rarely elsewhere; much the commonest site is into the internal capsule and the adjacent basal ganglia, an area supplied by the small perforating arteries (lenticulo-striate and lenticulo-optic) arising from the middle cerebral artery.

The accident may occur at a time of physical or emotional strain, but more often there is no known exciting factor. The patient may cry out with pain in the head or may complain of dizziness, but if such symptoms are present they are very brief. Unconsciousness may be immediate or there may be a rapid onset of hemiplegia succeeded in a few minutes by coma. The face is flushed, the breathing noisy, sweating copious, the pulse usually slow and tense; at the outset there may be vomiting. There is soon incontinence of urine and often of faeces.

Signs of the location of the lesion are often lacking in deep coma, but there may be some signs of hemiplegia. Deviation of the head and eyes may be present and is usually away from the side of the lesion; the pupils dilate as coma deepens, and more on the side of the lesion; but these indications of laterality are unreliable. Paralysis of the limbs on one side may be revealed by their greater flaccidity and by their falling more heavily when released. An extensor plantar response accompanies other signs of hemiplegia, but otherwise the plantar reflexes do not help in comatose patients. In pontine haemorrhage it is characteristic to find pin-point pupils and high fever from the onset.

Differential Diagnosis

If the whole story is known this clinical picture is almost diagnostic of a severe intracranial vascular lesion. Lumbar puncture should be performed. A small amount of blood is very commonly present from a primary intracerebral haemorrhage, and if this is accompanied by the clinical picture described the diagnosis is established and recovery virtually excluded. If the cerebrospinal fluid is clear other possibilities have to be considered. Capsular haemorrhage of lesser degree may be followed by recovery, as is known from pathological studies revealing the results of old haemorrhage, but clinically is not distinguishable with certainty from softening. Other causes of coma require consideration if the mode of onset is unknown, but are not usually difficult to distinguish. A patient suffering from head injury shows signs of shock rather than stertorous coma, or, if shock is not profound, restlessness and resistance—these apart from direct signs of injury. After an epileptic seizure the patient is often stuporous, but the problem is soon resolved by recovery of consciousness or recurrence of fits.

Persons suffering from narcotic poisoning are usually cold, with depressed respirations, the skin dry or lightly sweating; the state of the pupils may help in opium or belladonna poisoning, though not in the barbiturate poisoning so common to-day. There is usually clear circumstantial evidence. The comatose diabetic is flushed, with distinctive sighing respirations, and has abundance of acetone in the breath and urine, and sugar in the latter. Spontaneous hypoglycaemic coma is rare and paroxysmal: the latter is true of the much commoner hypoglycaemia occurring in a known diabetic under insulin treatment. Terminal uraemia may resemble cerebral haemorrhage, but is not likely to present primarily as unexplained coma, and the evidence of chronic nephritis and a high blood urea is decisive.

Patients with malignant hypertension are liable to attacks associated with sudden elevation of the blood pressure and cerebral symptoms (hypertensive encephalopathy), but the appearances are rather those of status epilepticus than of apoplexy, and the retinal and other signs of this disease are present.

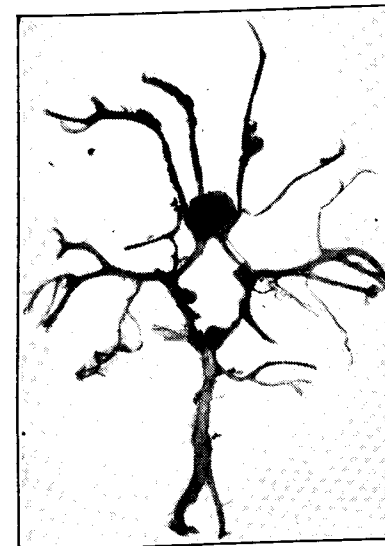
Subarachnoid Haemorrhage

Symonds in 1924 reviewed 124 published cases of subarachnoid haemorrhage and showed clearly for the first time that the rupture of an intracranial aneurysm is by far the commonest cause of this form of apoplexy. Later authors have estimated the percentage due to this cause at 70 to 80. Of the remainder it is now recognized that most are due to bleeding from arteriovenous angiomas or other vascular malformations. Subarachnoid haemorrhage is common, possibly not much less frequent than primary intracerebral haemorrhage.

These aneurysms are formed by a bulging of the outer and inner coats of an artery through a developmental defect in the muscular and elastic wall. Such a defect is common in arteries, cerebral and other, without aneurysm formation, and there is little doubt that further factors involved are arterial degeneration and the strain of increasing blood pressure. This view is borne out by the age incidence. Developmental defect alone probably accounts for the occasional cases of rupture in childhood, and the condition is relatively common in early adult life, but the maximum incidence is between 40 and 60 years, little lower than that of intracerebral haemorrhage.

The majority of these aneurysms are situated on the anterior part of the circle of Willis and the vessels arising therefrom (see Figure), and receive their blood supply from the internal carotid artery; a small percentage occur further back on vessels derived from the basilar artery.

Physical strain as an immediate exciting factor is commoner in subarachnoid than in capsular haemorrhage; nevertheless, any such factor is absent in most cases. Sudden intense pain in the head is also a much more constant and dramatic initial symptom: it may be masked by almost immediate unconsciousness, but more often impairment of consciousness is less complete than in the intracerebral form, and the headache may be accompanied



Aneurysm on anterior part of circle of Willis. Reproduced from *A Textbook of Medicine*, edited by E. Noble Chamberlain, by permission of Messrs. John Wright and Sons.

only by giddiness and confusion, and often by vomiting. In the severest cases coma deepens and death follows in a few hours. Most patients make a partial recovery from the initial collapse, but continue to complain of severe headache, now tending to be occipital, and remain confused and restless. Within a few hours such a patient presents a picture of meningitis, due of course not to infection but to severe meningeal irritation by effused blood and the reaction aroused thereby. He lies curled up and resistant, groaning with pain, with neck stiffness and Kernig's sign, and the picture is completed by moderate fever. Lumbar puncture reveals a diffusely blood-stained fluid. On standing, the blood does not clot and the supernatant fluid is yellow; this xanthochromic change is not immediate but is usually present within four hours of the onset.

Such is the typical picture, but it may be modified, particularly by two factors—the rate of rupture and the situation of the aneurysm. Occasionally the onset of headache is gradual, or there may be intermittent occipital and back pains suggesting small leaks before the ultimate apoplexy. Paralysis of ocular muscles, especially of those supplied by the third nerve, may appear shortly after rupture of an aneurysm situated on or near the internal carotid artery. Local signs of brain injury may result from rupture of an aneurysm on the middle or anterior cerebral artery beyond the circle of Willis; the finding of a hemiplegia following a subarachnoid haemorrhage, which may not itself have been extensive, is strongly suggestive of the intracerebral rupture of an aneurysm, for the bursting of a primary intracerebral haemorrhage into the subarachnoid space is incompatible with recovery from coma.

Prognosis of Subarachnoid Haemorrhage

The outlook in subarachnoid haemorrhage is much less grave than in the primary intracerebral form, but the immediate mortality rate has hitherto been about 45%. Of the patients who die, about a third do so in the first 24 hours, and a further considerable proportion during the next 14 days. Great importance therefore attaches to the possibilities of surgical treatment, for the basis of these cases is a local anomaly rather than a general arterial disease.

Surgical treatment depends upon demonstration of the site of the aneurysm by arteriography; this is not always possible, and when it is possible surgical treatment is by no means always applicable. In a group of 70 cases treated by Falconer during or soon after haemorrhage the mortality rate was 17%: allowing for some probable selection of cases, this is still very impressive when compared with conservative treatment. What seems to emerge clearly is that a decision on surgical treatment is required early, not longer than a few days after the initial bleeding, as the chief role of surgery seems to be the prevention of early recurrence. The decision on method—carotid ligation and/or some form of intracranial operation—is a highly individual problem.

The matter of late prognosis is also of great importance. What happens to the 50% or more who survive an attack of subarachnoid haemorrhage even under purely conservative treatment? The most recent and largest follow-up (from 1 to 12 years later) is reported by Walton (*British Medical Journal*, 1952, 2, 802), and it shows that fatal recurrence of bleeding occurred in 20.6%, but that almost half of these recurrences took place within the first six months. Of 120 surviving patients 115 were able to pursue some useful activity, although 49 were moderately disabled. The causes of disablement include headaches, paralysis, and epilepsy, but the greatest cause is anxiety due to fear of recurrence. Walton emphasizes that after six months the patient should be encouraged to live a perfectly normal life and to do heavy work and play games if he so desires: to warn him against these things is to create anxiety without any evidence that recurrence will be prevented. With this view I am in full agreement.

Cerebral Thrombosis

Cerebral thrombosis is commoner than haemorrhage. The clinical picture of thrombosis is also much more varied; often the lesions are limited and the effects fall short of the major disturbances usually described as apoplexy. Sudden occlusion of the main trunk of the middle cerebral artery may cause loss of consciousness with appearances and course indistinguishable from those of cerebral haemorrhage. More often paralysis comes on quietly and painlessly without loss of consciousness, or is found on waking from sleep. Occasionally indications arise first of involvement of branches of the cortical division: thus an aphasia of motor or sensory type may occur first, or attacks of Jacksonian epilepsy, to be followed in the course of a few hours or days by hemiplegia as the thrombosis spreads to the main trunk. The paralysis is more severe in the arm than in the leg, since the leg area of the cortex has an additional blood supply from the anterior cerebral artery.

Cerebral thrombosis has a much lower immediate mortality than haemorrhage. Repeated strokes are due to thrombosis—or possibly to arterial spasm—and a final stroke is often due to haemorrhage into a softened area. There is always this danger of sudden termination, but most patients survive and are left with paralysis of varying degree. As is well known, a proportion of such patients recover completely.

While, as in cerebral haemorrhage, the middle cerebral is the artery most commonly involved, major disturbances of apoplectic type may arise from occlusion of other vessels. The picture of anterior cerebral thrombosis may be distinguishable by the character of the hemiplegia, which affects the leg more than the arm, and by the presence of sensory loss of cortical type. Occlusion of the posterior cerebral artery seems mostly to arise insidiously: its main manifestation is partial or complete blindness on the opposite side, but it may be accompanied by transient paralysis or aphasia. Sudden softening of the brain stem gives varied and alarming symptoms, including paralysis of speech and deglutition, and intense vertigo from involvement of labyrinthine and cerebellar fibres; nevertheless, recovery is often satisfactory.

Cerebral Embolism

These cases are not usually difficult to recognize, as the source of an embolus is apparent in the heart. Mitral stenosis, especially with auricular fibrillation, is the common lesion. Subacute bacterial endocarditis may give rise to embolism causing either an uncomplicated hemiplegia or a mycotic aneurysm of which the first manifestation is a subarachnoid haemorrhage. Detachment of intramural clot following myocardial infarction is an occasional cause of cerebral embolism.

The main clinical feature suggesting embolism is the absolutely sudden onset without premonitory symptoms. As with thrombosis, consciousness is retained unless the occlusion is unusually large; if unconsciousness occurs the prognosis is correspondingly grave.

General Treatment

The aim in comatose patients is to maintain the best conditions for possible recovery. To this end care of the skin endangered by pressure, by soaking with urine, or by burning with hot bottles is important. Special care should be taken to see that apparent incontinence is not retention with overflow; if this is the case catheterization may be needed, with prophylactic sulphonamide. Most patients recover consciousness or die before nutrition becomes a problem. In subarachnoid haemorrhage, the intense headache calls for morphine with such frequency as is judged necessary; as the often protracted illness proceeds, milder analgesics should be substituted. It is justifiable to repeat lumbar puncture if pain is unusually persistent, but it does not always give relief. Rest in bed for several weeks is indicated after a haemorrhage.

While it is of little use moving helpless patients from bed to chair, it is a mistake to keep patients with cerebral thrombosis in bed for any longer than is necessary. It is most important that from the earliest days simple and full passive movements of all parts of the paralysed limbs are made, and unless instruction to do this several times daily is given to the relatives painful contractures develop which greatly impede restoration of function.

Next Refresher Course Article.—"Treatment of Accidental Poisoning," by Professor John Glaister.

The birth of a new kind of chemistry is heralded by Professor C. D. Darlington, F.R.S., in a special supplement to *Heredity*, 1953, volume 6, which records a symposium on chromosome breakage held at the John Innes Horticultural Institution last year. The breakage of chromosomes is of outstanding interest to biologists, because it is a nuclear change that can be studied microscopically and in relation to its effects on the organism. Its causes can also be subjected to experimental investigation. These include various chemical treatments and ionizing radiations, of which latter, as Professor Darlington says, "atomic radiation is in some danger of becoming the most important." He goes on to say that chromosome breakage "is the most effective experimental agent of the death of cells. It is therefore the chief means of cancer treatment. It is also, as a spontaneous event, characteristic of many types of tumour development. Jointly with gene mutation, it is, although we are still only beginning to understand their connexion, the agent of all genetic and evolutionary change." The new kind of chemistry he sees is one in which the actions of very large molecules in the cell—the nuclear structures—can be observed directly by means of a microscope. This symposium contains 23 papers on many different aspects of the experimental and natural breakage of chromosomes. It is published by Oliver and Boyd (45s.).

Reports of Societies

LABORATORY FACILITIES FOR THE GENERAL PRACTITIONER

A joint meeting of the Sections of Pathology and General Practice of the Manchester Medical Society discussed "Pathological Facilities for the General Practitioner" on May 13.

Dr. F. B. SMITH (Kendal), in opening the discussion, said that a service in clinical pathology should be available to the family doctor. The general practitioner was the first person on call to the sick, and he had a clear right to the assistance of those of his colleagues who could help him with techniques beyond his own compass. Dr. Smith said that he had practised clinical pathology for more than thirty years in departments that had also served family doctors, almost entirely in combined urban and rural areas. Family doctors had provided 15 to 20% of his work, which was rather less than he had expected, but they had valued the service and did not wish to be without it. A proper co-operation of pathologist and family doctor could reduce the pressure on both other services and bed-space provided by hospitals. But, to be effective, the pathologist must have had a sound training in clinical medicine; he must keep in constant contact with family doctors, and must maintain close touch with current advances in pathology. This would reduce abuse of the facilities offered.

The Advantages

Dr. MILES PARKES (Crewe) spoke from the point of view of the general practitioner who accepts ultimate responsibility for the patient. The medical student was trained to use laboratory facilities, but if he was denied these when he entered general practice he became a mere signpost to the nearest overloaded out-patient department. The cases with which the general practitioner needed the pathologist's help could be grouped together as those which for the safety of all must be nursed in hospital—typhoid, diphtheria, tuberculosis; those which, with a satisfactory domestic situation, could and should be nursed at home, such as septic throats (where with certainty in diagnosis blunderbuss therapeutics could be avoided), intractable diarrhoea and bladder infections, glandular fever and pyrexias of unknown origin; and those cases not yet bedfast which need not encumber hospital out-patient departments—for example, anaemias, disorders of metabolism, etc. Patients requiring treatment with drugs such as the anticoagulants and "butazolidin" could be given domiciliary treatment, granted adequate laboratory control. In the maternity service no woman should approach delivery without her blood state being known.

The provision of laboratory facilities would maintain the interest of general practice and relieve pressure on hospitals, and it would be cheaper than providing more beds. It was said that the facilities would be abused, but the greatest present abuse was the amount of treatment that had to be given as a result of guesswork, brilliant though that guesswork might often be.

Outline of a Service

Professor FRASER BROCKINGTON (Manchester) thought that the chief need was for a direct relationship between the general practitioner and the pathologist. This would allow the fullest development of pathological services consistent with economy. Misuse, which might easily ruin such a scheme, was less likely when the pathologist consulted directly with the general practitioner in the use and interpretation of tests. Properly used, pathology in general practice was bound to effect a saving in hospital accommodation.

The second most important need was for this general-practice pathology to be done in fully equipped and staffed

laboratories. Health centres could with advantage have side rooms, but it was important that any side rooms or health centre units should be attached to and part of the main pathological unit. The exact location of the main laboratory was not of paramount importance, given good transport; it was probably most conveniently sited in the grounds of a hospital.

The third most important need was for unity between public health and clinical pathology. This was of universal application, but from the viewpoint of the general practitioner it had special meaning. An extension of the present tendency to link together the different types of laboratory would help in the development of general-practice pathology along logical lines.

The fourth consideration concerned the mode of contact between general practitioner and pathologist. This should not entail the visiting of patients by the pathologist. Consultation should be at laboratory level, for it was always time-consuming. General-practice pathology would be difficult to develop sufficiently with patient lists of more than 2,000–2,500. The general practitioner who wanted to do research (in which pathological techniques were often indispensable) should have the pathologist readily available for advice and guidance. In short, Professor Fraser Brockington thought that pathology in general practice would raise general practice to higher levels and economize in hospital care, but as a mere technical aid general-practice pathology would not be good. The secret of success lay in securing a direct and personal relationship with the pathologist, who must be regarded in any such scheme as a member of the "home-care team."

The Difficulties

Dr. T. BLENCH (Manchester) said that some of the difficulties now were due to the wide horizons: it was impossible for one person to be completely comprehensive. The general practitioner was the pathologist to the family and had to label the disease. He would like to know when this general pathology became a specialty.

Dr. J. G. O'SULLIVAN (Manchester) was sure that the advice and help of the pathologist were most needed and could best be obtained in the laboratory and not at the bedside. Costs could be kept down by the general practitioner taking the specimens necessary for the required tests, but time and expense could also be saved if specimens could be sent to one laboratory rather than to several laboratories, as might occur now. A simple set of instructions on the methods of collecting specimens for the tests would be most helpful to the general practitioner.

Dr. R. W. FAIRBROTHER (Manchester) said that, while all agreed that a pathological service for the general practitioner should be developed, the need for accuracy in the investigations necessitated a first-class laboratory service and personnel. At the present time the laboratory service was grossly inadequate, for there was a shortage of adequately trained pathologists and technicians, of facilities and money for development. These deficiencies could not be remedied easily, for the hospitals also suffered from them besides being affected by the latest "cuts" and having other greater priorities. The hospital pathologist must obviously devote his services primarily to the hospital demands. He thought that the College of General Practitioners should make urgent and repeated demands for this service.

Dr. MILES PARKES (Crewe) said that the most highly organized section of the profession—the general practitioners—was continually presenting the problem to the Minister, who was unfortunately restrained by the financial controls.

Dr. J. I. McKANE (Pendleton) referred to the successful debut recently of the pathology service to general practitioners in Salford. This now enabled simple pathological investigations to be done. He thought that in consequence fewer patients were being referred to hospital. Dr. G. J. CRAWFORD (Salford) said that with his new laboratory the new service was meeting all the demands made upon it so far, but they were receiving only about 30 requests per week.

Correspondence

Registration of Medical Auxiliaries

SIR,—The need for a reasonable guarantee that those who profess to look after the health of the people should have received an adequate training and attained a sufficient qualification has led to the statutory registration of doctors, dentists, nurses, and midwives, but this guarantee is still lacking in the case of the increasingly important group of medical auxiliaries. In 1936, largely on the initiative of the British Medical Association, the Board of Registration of Medical Auxiliaries was formed to undertake the keeping of a register on a voluntary basis. Since that time the Board has helped to maintain the necessary standards, though the defects of a voluntary registration have been apparent.

Four years ago the (then) Minister of Health set up a series of committees to "consider the supply and demand, training, and qualifications of certain medical auxiliaries in the National Health Service and to make recommendations." These committees issued their reports two years ago. One of the recommendations, agreed to by the majority of every committee, was the setting up of a statutory body, under the aegis of the Privy Council, one of whose functions should be "the maintenance of registers of medical auxiliaries qualified for employment in the National Health Service." It was thought that this machinery could be established on a more representative basis than was possible within the confines of a Government department.

On March 19 this year the present Minister of Health announced in the House of Commons that "there is insufficient agreement on fundamental matters to proceed with statutory registration on the lines proposed in the reports," and he added that it was proposed to make regulations prescribing the qualifications for medical auxiliaries for the purpose of employment in the National Health Service. We must hope that this is but a temporary expedient and but a prelude to the establishment of a statutory register, but we have no guarantee of this. Meanwhile it behoves everyone concerned carefully to scrutinize any regulations which may be issued so that no lowering of standards may result, and constantly to keep in mind and to press for the establishment of a statutory register which would bring medical auxiliaries into line with the other professions which deal with the maintenance of health.—I am, etc.,

London, N.W.3.

ZACHARY COPE.

The Premenstrual Syndrome

SIR,—The articles on premenstrual tension in the *Journal* of May 9 are of very great interest. In 45 consecutive cases of migraine in women of the child-bearing age I found that attacks occurred in the premenstrual phase in 16, at the onset of the menses in 7, and after the onset of the menses in 5. The others had attacks of migraine precipitated by other factors which were not obviously related to the menses. Some evidence that migraine is associated with disturbance of sodium metabolism was given by Dr. Dorothy Adams Campbell and myself and Miss Eva M. Tonks in the *Journal* of December 15, 1951 (p. 1424). The other factors which will precipitate migraine, such as tension states, physical fatigue, and infections (after the acute stages), will all exacerbate symptoms of premenstrual tension, and should be taken into account in the treatment.

In the migraine clinics of the Birmingham Eye Hospital premenstrual migraine is treated with diuretics such as ammonium chloride, urea in large doses, and with either ethisterone or with methyltestosterone in the doses given by Dr. Linford Rees (*Journal*, May 9, p. 1014). The tendency to relative hypoglycaemia and hunger, which incidentally can also precipitate true migraine, can be dealt with to some extent with a high protein diet.

I feel that further study of these questions will give valuable information as to the nature of the essential

constitutional background of many of those complaints which are labelled as being "psychosomatic."—I am, etc.

Birmingham.

K. M. HAY.

SIR,—Dr. Raymond Greene and Dr. Katharina Dalton (*Journal*, May 9, p. 1007) suggest that water retention may be the link between the menstrual period and attacks of migraine, bronchospasm, nasal congestion, "rheumatic" pains, and various dermatoses. Two dermatoses which commonly flare up at period time are rosacea and neuro-dermatitis. When this list is reviewed it will be seen that all the disorders named belong to the "stress disorder" group, and their association with emotional tension is well established. Thus it may be that the period sets off attacks of these disorders only when it provokes conflict and emotional excitement. It is a familiar clinical observation that a woman who has migraine attacks each month will lose them when her conflicts over sex feeling and the female role in life are dealt with by psychotherapy. The same is true of vasomotor rhinitis, tension pain (Hench's "psychogenic rheumatism"), and the stress disorders of the skin. Water retention, of itself, could not be the whole explanation of these cyclic reactions. It is, perhaps, one of the mechanisms through whose agency mental tension effects physical changes.—I am, etc.,

London, W.1.

DESMOND O'NEILL.

SIR,—I am most interested in the two papers in the *Journal* of May 9 on the premenstrual syndrome and its treatment, because the condition is a personal problem and my solution to it is different from that given by Drs. Raymond Greene and Katharina Dalton (p. 1007) and by Dr. Linford Rees (p. 1014).

In my own case premenstrual tension became increasingly incapacitating from about the age of 20. It lasts 10–14 days and is at its height in the last seven days. In addition to the general anxiety and depression there are outbursts of irrational irritability occurring most frequently in the early morning during sleep, which is interrupted by them. When these outbursts occur in the daytime they are preceded, and sometimes followed, by various distortion phenomena, feelings of unreality, etc. Some years ago depression became so marked a symptom that advice was sought, and dextroamphetamine sulphate, 15 mg. daily, was prescribed. This was effective in relieving depression and anxiety, but after 10 days produced an outburst so violent that the treatment was considered dangerous and discontinued. Pregnancy affords protection from all symptoms from the fourth month to almost two years after confinement.

Within recent months I have been interested to notice the increase in weight from ovulation to menstruation and the sharp decrease of 2–3 lb. (0.9–1.35 kg.) immediately after menstruation. Before I realized the cyclical nature of the increase I started a dietary regime and took 0.25 mg. dextroamphetamine sulphate to reduce appetite. The increase in weight is unaffected by this (despite reduced food intake), but the other symptoms—irritability, anxiety, depression—are, and the half-tablet is now taken daily from ovulation to menstruation.

I would be interested to know if other doctors have used this drug for this condition. It would seem to have none of the unpleasantness of the dehydration regime, and in this very low dosage none of the disadvantages of the hormone treatment. I would also like to know if the outbursts of irritability have been encountered by other doctors. It has been suggested by a psychiatrist friend that these are similar in nature to the so-called psychomotor attacks of epilepsy.—I am, etc.,

WOMAN DOCTOR.

SIR,—In the "Premenstrual Syndrome," by Drs. Raymond Greene and Katharina Dalton (*Journal*, May 9, p. 1007), it is stated that the condition is due to abnormal deviation of the oestrogen/progesterone ratio. One can only ask how such a ratio can be considered abnormal if it admittedly occurs in nearly half the population. If it be conceded

that the "abnormal" ratio is indeed the "cause" of the undoubted symptoms, one again asks what is the real cause of the "cause"? Is it an indictment of our present way of life?—I am, etc.,

Ilford.

R. N. C. SMITH.

Subcostal Pain Following Controlled Respiration

SIR,—Dr. T. T. Currie (*Journal*, May 9, p. 1032) should not dismiss so lightly the transient excitation produced by succinylcholine as a cause of the chest pain which sometimes follows its use. If he will take the trouble to have himself injected with 10 or 15 mg. of the drug I think he will find, as I did, that the muscular contractions which precede paralysis can be quite painful and leave a feeling of stiffness which lasts a day or two; mine was chiefly under the sternum and in the back of the neck. As the amount of twitching seems to vary with the speed of injection he may help his patients by giving succinylcholine slowly.

The two patients who had pain but no succinylcholine must be explained otherwise; by all means let Dr. Currie inflate with less vigour, but I doubt if this alone will eliminate the complaints. It will be interesting to know.—I am, etc.,

London, W.C.1.

CYRIL SANGER.

Long-delayed Rupture of Spleen

SIR,—Mr. C. G. Attenborough (*Journal*, February 14, p. 380) gives an interesting account of two cases of long-delayed rupture of the spleen, and refers to the arrest of haemorrhage by perisplenic haematoma. This was the commonest means of arrest of haemorrhage found at operations or necropsy in my experience when I practised general surgery in India, where rupture of the spleen is a common emergency. It is usual to find a damaged spleen surrounded by clots while the blood which is free in the peritoneal cavity remains fluid.

In 1945¹ I published a case of a very grossly damaged spleen in which haemostasis was complete in a patient who had succumbed to other injuries. Haemorrhage which is delayed a few days indicates failure of efficient clotting, while long-delayed haemorrhage is due to autolysis of the clot, and therefore comes within the category of secondary haemorrhage. I have never seen a case where the rupture of a subcapsular haematoma was an obvious explanation of delayed bleeding, and this phenomenon, if it occurs at all, must be uncommon, and it is difficult to imagine that "tamponade" by slippery serous-covered structures such as omentum or stomach can be an important feature favouring cessation of bleeding.—I am, etc.,

Melbourne.

FRANKLYN STONHAM.

REFERENCE

¹ *Indian med. Gaz.*, 1945, 80, 547.

Test Strips for Dry Sterilized Syringes

SIR,—Failure in the human element in a syringe service may result in the occasional issue of unsterile syringes. This is especially liable to occur in hospitals where the syringe service is too small to warrant the use of a special department and staff, and where it is run as a subsidiary function of the theatre or laboratory. Having experienced two local infections probably due to contamination introduced by syringe or needle (one a chronic muscle abscess, the other a thrombophlebitis), the need was felt for a device to ensure that every syringe and needle had been heat-treated.

The following simple test strip has been in use in this hospital for over five months, during which time it has on several occasions indicated inadequate sterilization or omission of sterilization. Filter paper is soaked in saturated sodium bicarbonate solution and dried at gentle heat. A dried strip is added to each syringe and needle assembly. After a few minutes at 160° C. the strip assumes a brown colour. While the colour change does not prove adequate sterilization, it does indicate that the syringe has been subjected to a sterilization procedure. Inadequate sterilization

has on occasions been found to be due to uneven heat distribution in a well-filled sterilizer. The sterilizer thermometer has at such times given a fallacious sense of security. The strips have been found satisfactory after three months' storage.—I am, etc.,

Penzance.

T. D. S. HOLLIDAY.

Importance of Post-mortem Examinations

SIR,—The importance of post-mortem examinations, not only for research but also especially for raising the standard of medical practice, has been stressed by the late Dr. C. O. Hawthorne (*Journal*, 1935, 1, 616) and others, but is still not sufficiently appreciated.

The National Health Service could, without much cost, provide facilities for post-mortem examinations on patients dying at home and thus help the general practitioner to improve his education and efficiency as well as enlist his co-operation for clinical research. After decease of any patient the doctor in charge should, with consent of the relatives, be able to arrange for admission of the body to the nearest hospital, or any hospital where the patient may have been under treatment. Transport could be by ambulance and further procedure as if the patient had died in hospital. The doctor should receive a full report on the necropsy and perhaps also a small fee for attendance.

If the necessary facilities were granted, a good deal of propaganda would certainly be required to bring their importance to the notice of the medical and lay public before necropsies cease to be an exception and become the rule—as they should be.

The rapid introduction of new and potent remedies makes careful check on our failures more than ever necessary, and the general practitioner must be enabled to obtain the true facts for his own enlightenment as well as for the progress of medical research.—I am, etc.,

London, W.1.

F. E. LOEWY.

The Metric System

SIR,—I had intended to take no further part in this correspondence, if only because none of the points made in my letter in the *Journal* of March 14 (p. 619), wherein I ventured to criticize Dr. C. Langton Hewer's letter (*Journal*, February 21, p. 450), were answered by him. Further, I thought that a chuckling silence was the best possible retort, as well as the most space-saving, to his highly entertaining final paragraph. However, having been soothed by Dr. Langton Hewer, I have again been roused into protest by Dr. J. W. Shackle (*Journal*, April 18, p. 887), who, after a mystifying reference to goose and gander, accuses me of saying that "we are wickedly inaccurate in talking about 'ccs.'" I challenge him to find any such statement by me at any time or in any place. What I did insist was that the issue as between cc. and ml. had nothing whatever to do with that between the metric and any other system of weights and measures. Dr. Langton Hewer presumably now agrees, because he is silent on the matter.

Apparently Dr. Shackle does not, for he goes on to ask that I should tell him "what is the exact difference between a 'cc.' and a 'mil.', and whether the difference is enough to be of the slightest significance." I propose to do nothing of the sort, for two good reasons. The matter was given detailed discussion from 1924 to 1929; any good scientific library must contain the publications in which the difference was explained. One reference is to an article called "The Millilitre" in *Nature* (1929, 124, 622). Those of us with a scientific training have always preferred to use the more, rather than the less, precise of the two units, even when the difference had no practical effect, for this helped to inculcate in ourselves good habits against the occasions when the difference did really mean something—for example, in some microchemical work.

As to Dr. R. A. C. Herron (*Journal*, April 25, p. 938), why does habitual usage prevent his saying "half, or 0.5 mg.," instead of "nought comma nought nought nought five" gramme, without making confusion worse confounded?

I have seldom heard such nonsense. And, to use his own dialectical technique, who indeed would argue that the difference between (a fig for his "mental pictures") 0.45 and 0.65 mg. is not more quickly appreciated than that between 1/150 and 1/100 gr.? If Dr. Herron is still confused by "those damned dots" I would suggest that he ought to find it no more difficult to remember the difference between 1/24 and 1/16 mg. than that between 1/150 and 1/100 gr. Dr. Herron has managed to introduce yet another red herring into this discussion by implying that the use of fractions is incompatible with the adoption of the decimal system. Since when? Has he never heard pharmacists talk of one-tenth of a mg. or a quarter of a gramme, or himself never referred to the running of a half-kilometre race? The amusing end to Dr. Langton Hewer's last letter is, need I point out, an impish exploitation of the same fallacy, to be welcomed on the grounds of its impishness, but hardly as a serious contribution to this discussion. Not, as he would say, for 0.00027 hr.—I am, etc.,

London, N.W.3.

A. L. BACHARACH.

SIR,—I can assure Dr. C. Allan Birch (*Journal*, May 9, p. 1049) that I am acutely aware of the origins of "mils." and "cc.s" and of the highly pedantic distinction between them. A matter of some five—or is it six? (there, how easy to be wrong in this system)—places of decimals. How well Dr. W. Edwards (*Supplement*, May 9, p. 217) describes the metric system as "designed for those who can only count on their fingers."

Dr. Birch counters the dangers of the misplaced dot with those of the malformed drachm sign. I hold no brief for this sign, which I have always thought idiotic, but errors in this are surely safeguarded by the dispenser. For this sign indicates the dose, and the dispenser is trained to know when this is poisonous. If it is excessive he should (a) look for an exclamation mark after the dose, or (b) ring up the doctor and verify the amount. Errors with the decimal point, however, more commonly occur when the dispenser is making up the bulk medicine, neglecting to make a rough check to establish the position of the point—a horribly easy mistake to make during rush hours. I can think of two deaths as a result of such errors in making up thallium for depilation; and an anaesthetist was mulcted in heavy damages because he followed out exactly the directions in an expert's paper but had not seen a correction made a week later altering the position of a decimal point and reducing the dose by a tenth.

But an additional point about the old system is that it was adjusted to allow the patient to measure his dose in teaspoons, dessertspoons, or tablespoons. Must every family now purchase measures graduated in "mils."?—I am, etc.,

London, W.1.

J. W. SHACKLE.

Controlled Hypotension in Neurosurgery

SIR,—Dr. David Aserman's article on controlled hypotension (*Journal*, May 2, p. 961) raises several controversial points. First, let me protest most vehemently against the technique being labelled a "form of anaesthesia," which it most certainly is not. Hypotension can be produced with one of the hexamethonium drugs, supplemented if one wishes with procaine amide, in almost anyone without any nearer approach to anaesthesia than the syncope that is likely to happen if the victim sits up too quickly.

Dr. Aserman admits the possibility of cerebral anoxia, but distinguishes it from the interesting condition he has described and which he has named "retractor anaemia." In fact, these two conditions obviously spring from the same evil—inadequate pressure in the intracranial arteries. The only difference between the conditions is that the former has more or less general effects and the latter has more or less local effects. What is certain is that cerebral anoxia, whether local or general, can produce both physical and psychical sequelae. One wonders how many of our enthusiastic bloodless phlebotomists are carrying out properly controlled investigations, which of course must include

not only the incidence of the immediate mortality (investigation of this has provided sufficient material for some papers already published) and the almost immediate morbidity (investigations sufficient for all other articles published so far), but it must also include investigations of the quite possible remote psychic affects causing various behaviour changes. Dr. Aserman is batting on a good wicket, as he is able to say that the results of anoxia "may possibly have been masked by surgical trauma." The surgeon also seems to be in an enviable position. But it seems somewhat unscientific that a brilliant operation may have been ruined by the anaesthetist or a brilliant anaesthetic may have been ruined by the surgeon and no one is quite sure of the real answer.

No doubt controlled hypotension has its place in surgery, and it would seem that in intracranial surgery its immediate advantages considerably outweigh its immediate dangers, but let us hope that somewhere someone is really investigating the very possible and quite likely horrific remote consequences of the cerebral anoxia caused by this technique.—I am, etc.,

Chesterfield.

H. E. POOLER.

SIR,—I have some experience of arteriotomy for hypotension in neurosurgery, and was therefore particularly interested to read Dr. David Aserman's article (*Journal*, May 2, p. 961) on the use of hexamethonium and procaine amide in this field.

Dr. Aserman mentions that during an operation for removal of a meningioma a big vessel was accidentally opened and a profuse and rapid loss of blood resulted. The condition of the patient was fairly satisfactorily maintained by rapid replacement of blood and levelling of the table. I have had a similar experience during arteriotomy, when severe haemorrhage accompanied the fractional removal of a meningioma in an otherwise bloodless field. Control of the blood pressure was easily retained by intra-arterial transfusion of the blood already removed from the patient, followed by stored blood. It seems probable in this type of case that permanent loss of blood pressure control may follow haemorrhage during methonium hypotension, in spite of a faultless technique; whereas the ease with which intra-arterial transfusion can be performed in arteriotomy is a safeguard, and surely one of the great advantages of this method. Is it Dr. Aserman's view that in the "failures" he mentions bleeding is more severe than if the methonium drugs had not been used?

Unless the "convenience" of the surgeon is regarded as an indication for hypotension, the technique is only occasionally required, for in the majority of neurosurgical cases cerebral congestion can be avoided by strict attention to the essentials of this branch of anaesthesia—a perfect airway, adequate spontaneous respiration, and correct posture.—I am, etc.,

London. E.C.1.

ROBERT I. W. BALLANTINE.

Modification of the Foley Catheter

SIR,—Mr. Paul Houghton (*Journal*, May 2, p. 994) may be interested to know that the three-way Foley catheter, for which he makes a plea in the final paragraph of his letter, already exists as Alcock's modification of the Foley catheter, and is marketed by William Warne & Co., Ltd.—I am, etc.,

Barnet.

V. J. DOWNIE.

Endemic Goitre

SIR,—Repetition does not make a statement true. Sir Charles Harington's quotation from a memorandum of the Medical Research Council and Kimball's retelling of the results of the Akron experiment referred to in your annotation (*Journal*, March 21, p. 665) do not nullify the criticisms of both of these that have been made by me and by others.¹ The facts are as follows.

Goitre has never been produced by simple deprivation of iodine: whenever purified foodstuffs were used, with the greatest possible exclusion of iodine, no goitre was pro-

duced.² The postulated differences in the content of iodine in soils, water, and food between goitrous and non-goitrous regions have not been established. Noteworthy exceptions are to be found in South Africa³ and in Danzig.⁴ (Several authors have listed Danzig as goitre-poor, whereas it was precisely the high incidence of goitre in iodine-rich Danzig that led Liek to deny the "iodine-lack" hypothesis in the very paper from which his data have been erroneously copied.) Diminutions in the incidence of goitre more marked than those reported by Kimball, without any known change in iodine intake and without any reason for supposing that there had been any, have been reported.^{5,6,7} In many places there was complete disappearance of goitre, with, in some, reappearance after a lapse of 50 years or more. Epidemics of goitre have been observed repeatedly, and are still being reported.^{10,11} Goitre was not reported in England until the eighteenth century and in the Americas and in New Zealand until after the coming of white men, and in most of Africa, including Egypt, until quite recently.¹² The information regarding all of these is sufficiently extensive to enable us to conclude that goitre was unreported because it was absent.

Anyone who studies the history of goitre with an open mind will, I believe, come to the conclusion that the disease is due to a biological agent, and that such prophylactic or curative effect as iodine may have is due to a pharmacological action and not to its making good a nutritional deficiency.—I am, etc.,

New York.

ISIDOR GREENWALD.

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Nicotinic-acid Deficiency

SIR,—I am greatly interested in Dr. Jonathan Gould's letter (*Journal*, April 25, p. 935), which followed Dr. G. H. Collins's case note (*Journal*, March 28, p. 731), and welcome the broader application of the use of vitamins in confusional states, a therapy used successfully since 1939.¹

Everyone will agree with Dr. Gould that the parenteral use of nicotinamide is to be preferred to nicotinic acid, not only because it is not associated with the unpleasant vasodilator effects of the latter, but also because of its quicker action. I am also in complete agreement with him that deficiency of one single member of the B group of vitamins is improbable even if the symptoms and signs are highly suggestive of nicotinic acid or another single vitamin deficiency. I find, however, some difficulty in accepting Dr. Gould's "mixed barrage of vitamins" and also in considering the vitamins "as metabolic reagents having metabolic cycles of their own."

Dr. Gould was most successful in using intravenously 1,000 mg. aneurin (better thiamin), 200 mg. nicotinamide, 200 mg. pyridoxin, and 1,500 mg. ascorbic acid in 10% dextrose solution, but it is interesting that Dr. V. P. Wordsworth (p. 935) had in a case of an admittedly mild alcoholic intoxication dramatic results within three minutes after intravenous use of only 100 mg. pyridoxin. Moreover, intravenous application of only 30 mg. of thiamin in a case of Wernicke's encephalopathy was found to be sufficient for the patient to regain consciousness and to abolish temporarily most of the neurological signs.² While intravenous application of high doses of vitamins are certainly advisable in severe cases at first, the continuation of the treatment by intramuscular route is not only more efficient owing to the slow excretion but also less fraught with danger.

It is to be expected that in the near future the advocated "mixed barrage of vitamins" will be used on a large scale in psychiatric practice. Whilst I would welcome this step, I may perhaps be allowed to make two comments. First,

large doses of a single vitamin, especially of the B group, or an unbalanced mixture of these vitamins may easily precipitate latent deficiencies of other vitamins and may cause most unpleasant side-effects.³ In my limited experience Dr. Gould's formula could be better balanced by reducing the amount of thiamin and by adding at least 50 mg. of riboflavin to the mixture. Secondly, it should be borne in mind that untoward effects like anaphylactic reactions with circulatory collapse, occasionally followed by death, have been described after intravenous application of several members of the B group of vitamins, especially if massive doses were given repeatedly.⁴—I am, etc.,

London, W.1.

Z. A. LEITNER.

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Trichlorethylene in Labour

SIR,—I have read the letter of Dr. R. P. Robertson (*Journal*, April 18, p. 884) on this subject with interest. I can confirm from my own experience that his routine of pethidine, followed by gas and oxygen and later by trichlorethylene, is most satisfactory for analgesia in normal labour.

I differ from him, however, in the use of chloral. I have not found pethidine a substitute for chloral by any means, and think that the old-fashioned "mother's mixture" still has a valuable place in the early stages of labour. It allays anxiety and is well tolerated if bromide is not mistakenly added to it. Moreover, it never stops the labour pains. My experience of pethidine, when used before the pains are coming at regular intervals of not more than five minutes, has been that it stops the pains just as effectively as morphine used to do. Consequently, I have found that sufficient comfort can be obtained by one or two doses of chloral mixture, so that I rarely need to give pethidine until the cervix is two or three fingers dilated and well taken up. Others may not agree that any analgesic is necessary before this stage, but, as niggling pains can and do last as long as 24 hours and prevent the patient resting, I feel it is helpful to secure a few hours' sleep then without the risk of arresting the progress of labour.—I am, etc.,

St. Asaph, N. Wales.

A. H. HOLMES.

Reduction of Post-operative Pain

SIR,—We must be grateful to Mr. D. Lincoln Lewis and Dr. W. A. L. Thompson (*Journal*, May 2, p. 973) for their reiteration of the principle that when a pain arises from a localized area and gives rise to reflex complications it is more logical to relieve it by blocking the afferent nervous pathway than by administering analgesic drugs which act systemically and so depress other vital functions. Although apparently simple, the method described involves the administration of three-hourly injections over a period of three days—that is, up to 24 injections into each of two tubes—which must be very time-consuming to the nursing staff and disturbing to the patient, apart from the risk of introducing infection. The result that "all the cases had considerable relief from pain a few minutes after the injections were given" implies that even with three-hourly injections pain returned before the next dose was due.

At the cost of adding five minutes to a two-hour operation, a more continuous analgesic effect can be obtained by the use of depot anaesthetic solutions which make unnecessary any subsequent disturbance of the patient, his wound, and the nursing staff. At least two effective preparations have already been described by the writer¹ and Rutter²: "efocaine" (1% procaine base and 5% butyl p-aminobenzoate in glycols) and Rappaport's solution (2% benzocaine base in 40% urethane in water). Both act by precipitating the anaesthetic base at the site of injection. This crystalline deposit exerts a prolonged analgesic effect which may last for up to three weeks or more. The solvents are strongly hypertonic and should not be injected superficially or into inflamed tissues, as an osmotic reaction will result, as described by Howell (*Journal*, April 4, p. 285).

although this has no permanent ill effects. I have used up to 20 ml. after 46 upper abdominal operations without unfavourable reactions.

The technique is all-important, because once the anaesthetic has precipitated it does not diffuse appreciably. More effective than infiltration into the wound or on each side of it is an intercostal block of the seventh to the eleventh thoracic nerves, carried out posterior to the midaxillary line so as to include the lateral cutaneous branches. At least 1.5 ml. must be injected into each space, and if the incision is near the midline both sides must be injected. Although accurate intercostal nerve-blocking requires a little practice, the results are most rewarding. For instance, following repair of perforated peptic ulcers, 11 patients required between them a total of only six injections of analgesics. Breathing is easier, cough is free, and even chronic bronchitics comment on how little their chests trouble them. It would appear that these depot solutions, or others based on similar lines, hold more promise than the use of water-soluble salts, which have only a transient effect and so require tedious or cumbersome methods of administration.—I am, etc.,

London, W.1.

HENRI ROUALLE.

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Magic, Medicine, and Religion

SIR,—Sir Sydney Smith (*Journal*, April 18, p. 847) is to be congratulated on his masterly analysis of such various therapeutic methods as medicine, magic, and religion throughout the ages. His conclusion that "all of them are directed towards the restoration of the harmonious relationship in the functions of the body through the removal of some source of disharmony in the mind" is most apt in this present age not peculiarly noted for its equanimity or serenity.

It is unfortunate that the main thesis is marred, but by no means invalidated, by references to the mediaeval period which are inaccurate. These inaccuracies are not singular, but in a letter to the editor it seems more advisable to correct the most important of them—that is, the statement that science was discouraged by the Roman Catholic Church. This statement is not supported by either the teaching or the practices of the Church in those days. The Church's attitude to science is best summarized by the writing of Cardinal Borromeo, who officially interrogated Galileo at the time of the controversy over the Copernican theory. He wrote as follows: "I say that if a real proof be found that the sun is fixed and does not revolve round the earth, but the earth round the sun, then it will be necessary very carefully to proceed to the explanation of the passages of Scripture which appear to the contrary, and we should rather say that we misunderstood these than to pronounce to be false that which is demonstrated." Thus to reconcile the interpretation of Scripture with a really demonstrated and proved fact of science is surely no discouragement of the sciences. In practice also the Church encouraged and patronized the physical sciences, for was not the university of Bologna, the first of the universities as we know them, founded under papal charter?

It is difficult in a short letter to expound on these historical problems, so I would recommend to Sir Sydney a recent book on the history of science from A.D. 400–1650. It is entitled *Augustine to Galileo*, by A. G. Crombie, of the department of history and philosophy of sciences, University College, London, and is a more serious study than the popular bibliography quoted by Professor Smith.—I am, etc.,

Dublin.

J. BARNES.

SIR,—May I make a short comment on references to Christian Science in the report of the Finlayson Memorial Lecture by Sir Sydney Smith (*Journal*, April 18, p. 847)?

In the lecture Christian Science treatment appears to be identified with mental suggestion. But the method of Christian Science treatment is essentially that of prayer.

based on a spiritual understanding of the nature of God and His creation. The discoverer and founder of Christian Science, Mary Baker Eddy, indicates this in the first sentence of the Christian Science textbook, *Science and Health with Key to the Scriptures*: "The prayer that reforms the sinner and heals the sick is an absolute faith that all things are possible to God—a spiritual understanding of Him, an unselfed love."—I am, etc.,

London, W.C.2.

COLIN R. EDDISON.

SIR,—Many years ago when I began research about ancient Egyptian medicine I went to see Sir Gaston Maspero—the greatest Egyptologist—and asked him his opinion of the subject. He gave it readily. It was: "What the ancient Egyptians knew about medicine is not worth knowing." I am now in entire agreement with that authoritative statement. Yet we frequently see eulogistic statements concerning their "wonderful knowledge" based largely on myths and legends.

I cannot now go fully into the matter, but I would like to draw attention to a few statements made by my old friend the illustrious Sir Sydney Smith (*Journal*, April 18, p. 847) under the above heading. With regard to the Ebers Papyrus he makes the extraordinary statement that it shows a "remarkable standard of knowledge." It does nothing of the sort. Every ache and pain is subject to supernatural influence, and disease was held to be caused by entry into the body of evil spirits who produced psychological changes according to their malignity. No serious attempt was made to define a disease, or to describe it as a separate entity. It is merely a haphazard collection of recipes mingled in an indescribable hodge-podge. All this looks ludicrous, and much popular writing based on such translations has professed to give us some account of Egyptian medicine—without value and very misleading.

Now as regards the Edwin Smith Papyrus, we are told by the eminent jurist that it indicates a "fairly high degree of medical knowledge." It is a surgical treatise and deals in a "common-sense way" with fractures and other lesions of traumatic origin, but is in no way an improvement on the methods employed by the witch-doctors and fiki at the present day. In the treatise, to be sure, great emphasis is laid on the state of the pulse and the origin of sepsis, of which condition they must have had wide experience, as hygiene is not mentioned—indeed, they had no word to signify cleanliness. Fractures of the skull were naturally very frequent. A puncture of the skull is likened to "a broken hole in a pottery jar." Yet there is no mention of trepanning, although this operation was practised by other ancient peoples, especially the Chinese, and this omission is quite sufficient in itself to prove that the treatise does not display a "high degree of medical knowledge." Instead the routine treatment for head injuries was fresh meat for one day followed by grease and honey.

There are other serious defects which cannot be discussed now. In the treatise there are 48 cases, 14 of which were left untreated, and there is no indication to show the final results in those treated. Yet Professor Breasted, the translator, in his grossly exaggerated eulogism suggests that the papyrus should be considered the standard work and all the other papyri scrapped. He even "hazarded a guess," according to Sydney Smith, that the original work was by Imhotep himself. But there was more. In his exaggerated enthusiasm for the papyrus the professor seems to consider the claims of the immortal Hippocrates as secondary to "our scientific surgeon," and makes the remarkable statement that the Hippocratic school was far more interested in the human body when it was sick than when it was well, and furthermore was evidently more inspired by a desire for knowledge than by the hope of curing the patient. Such exaggerated and erroneous statements should be considered when we come to consider the value to be placed on the claims made by him as translator on behalf of his "scientific surgeon." In extenuation it might be said he was a layman writing on a medical subject.

Lastly, I wish to refer briefly to Imhotep, whom Professor Smith considers "the earliest physician we know by name," as many others do also. There is not the slightest evidence in support of this claim. We know nothing of his early history, of his birthplace, or his childhood, or of his appearance in the flesh. There is no record of any sort in support of his medical qualifications. His name does not appear in the medical papyri, in any of the ancient monuments or texts, and even in the Theban recension of the *Book of the Dead*, although in certain aspects the god (for he was a god) had a funerary character; neither is he mentioned by any of

the contemporary sages, many of whose sayings survive. The omission of his name in connexion with any work or discovery or text is very remarkable when we know the names of many others who have been associated from the very earliest times with the practice of medicine.

At the International Medical Congress in Cairo in 1934 I read an exhaustive paper on Imhotep. The paper can be seen in the form of a pamphlet at the Wellcome Historical Medical Museum by anyone interested in this controversial subject.—I am, etc.,

Englefield Green, Surrey.

T. GERALD GARRY.

Treatment of Threadworms

SIR,—I was interested to read the letter of Mr. W. Ivon Hayes (*Journal*, February 28, p. 510) about threadworms and the means of eradicating them by altering diet.

It may be of interest to report a case of an adult female who had had threadworms practically all her life. She reported that her faeces were sometimes "alive with worms." She suffers from rheumatoid arthritis and has a very bad sinusitis. At one time she was given a course of aureomycin. She reported to me that since that course she has never seen any sign of threadworms, nor has she had any symptoms suggesting their presence. I do not know whether aureomycin would interfere with the life cycle of the threadworm, or whether the antibiotic in some way affected its food supply by altering the bacterial flora in the large bowel. So far as I know, there was no alteration in diet in this case.—I am, etc.,

Melbourne, Australia.

FRANK MAY.

Uterine Tension

SIR,—Green *et al.*¹ have advanced the theory that ischaemia of the uterus is a major aetiological factor in eclampsia. According to them pre-eclampsia shows a rise in plasma pentose levels. The substance derived from muscle adenosine is a result of muscle ischaemia, and the uterus was the only site for such a change. Increased uterine tension must be associated, and I expressed the opinion² that the data must prove of great value in support of the thesis that increased uterine tension was responsible for the toxæmic syndrome.

Now Corner and Csapo (*Journal*, March 28, p. 687) have shown that the isometric tension of the myometrium is related to the actomyosin content therein, and that the myosin component breaks the terminal phosphate linkage of adenosine triphosphate present in the muscle releasing adenosine. Thus adenosine comes to provide as well an indirect measure of the isometric tension of the myometrium. The levels of actomyosin in the various periods of pregnancy bear relationship in time to the incidence of toxæmia. Uterine ischaemia (Green) and uterine tension (Corner) are both referable to adenosine production evidently, and become equivalent.

There is a further advance. Arising from these fresh researches is the relationship of the potassium-sodium ratio to the isometric tension of the myometrium. A potential avenue for therapeutics is thereby provided. The practical value of the utero-renal reflex (Franklin³) and the Trueta mechanism cannot fail to emerge.—I am, etc.,

Salisbury, S. Rhodesia.

JOHN SOPHIAN.

REFERENCES

- ¹ *British Medical Journal*, 1951, 2, 571.
- ² *Ibid.*, 1951, 2, 797.
- ³ *Lancet*, 1952, 2, 1141.

The Judet Operation

SIR,—I would agree with Mr. A. Webb-Jones (*Journal*, April 25, p. 935), that pain does recur in certain cases following the Judet operation for osteoarthritis of the hip. His explanation for this is not, however, satisfactory. To suggest that the recurrence of pain is due to mechanical wear resulting from the fact that no prosthesis accurately matches the removed head is to ignore the fact that when the same

operation is carried out for subcapital fracture of the femoral neck the results, as regards freedom from pain, are uniformly good. Mr. Webb-Jones stresses the painless range of movement in these latter cases, although the same incongruity between the bearing surfaces must be present as when the operation is done for osteoarthritis.

In osteoarthritis of the hip the disease process affects not only the articular surfaces but also the capsule and peri-articular structures, and from the evidence available it would appear to me that herein lies an important cause not only of the pain which may recur but also of the limitation of movement which may persist despite operation.

Mr. Webb-Jones does well to draw attention to the fact that indifferent results can follow the Judet operation. But, if there is no reason for complacency, still more is there none for despondency. While far from being the final solution, it does, I think, represent an advance. To go back to displacement osteotomy for osteoarthritis must surely be a retrograde step.—I am, etc.,

London, W.1.

T. M. HENNEBRY.

Litigation Against Doctors

SIR,—Now we have seen the National Health Service Act and Legal Aid and Advice Act in action, many are wondering about the future of medicine. The State-treated patient can so easily become the State-aided plaintiff; costs mean nothing to him, and he can readily use or abuse both these Acts, as is shown by the increasing litigation against all medical practitioners on allegations of negligence in treatment, with and without just cause. If clinicians are forced to cover themselves against all possible criticism, and are obsessed with this need, then indeed we will become careful Civil Servants, and good clinical medicine will die and with its passing the cost of the Health Service will become prohibitive. Are the minority of our patients going to force us into this approach to medical practice?

But the matter does not end there. As I write I have before me a letter from the secretary of a hospital management committee: "The points raised in your letter," he writes, "are of extreme importance to the hospital management committee, who are the ultimate authority held responsible for any matter concerned with the treatment of patients and the legal consequences thereof." Is this really true? Have consultants, in their contract of service to the national hospitals, really handed over their responsibilities in the treatment of their patients to lay committees, the large majority of whose members have no medical experience at all? Is this the meaning of the National Health Service Act? My legally minded surgical colleagues tell me that there is a world of difference between a contract for service (which we believe we have agreed to) and a contract of service (which apparently some believe we have signed). The Hon. Justice Hilberry summarized the distinction in this way: "... In a contract for service the master can order or require what is to be done, while in the other case (a contract of service) he can not only order or require what is to be done but direct how it shall be done."

If the real objectives of the National Health Service are to be achieved, then the individual members of the profession must carry the full weight of their clinical responsibility and pass no part of this responsibility to any lay committee, nor share it with them. Yet can it be clearly stated now that our contract is for service? If this is so, have we any guarantee that some future negotiating body or some future legislation without negotiation will not change this apparently important little word?

Concerned as I have been for many years in the treatment of accidents, I am well aware that this field of surgical practice is open to litigation. The injured often do not honestly understand why they should suffer a permanent disability or a lengthy convalescence. Was the splint left on too long, taken off too early? Was it too loose or too tight? Why, after a week's effort to save a limb, was it eventually necessary to amputate it? Was this the surgeon's fault, or the house-surgeon's, or the nurse's? "Well," says the minority, "it will cost nothing to find out, and there may be a good financial return if the hospital did make a mistake."

And so litigation is started. The hospital case notes are called for, and, because by law they are the "property of the Minister," they can be, and to my knowledge have been, impounded by the Minister's lay officers, and the surgical staff as a consequence have been unable to

examine them. Often the case is defended jointly by a regional board and a hospital management committee. Perhaps the plaintiff succeeds and a member of the medical staff, in the judgment of the Court, has, in fact, been negligent. So a regional board and a hospital management committee can now claim damages against the unfortunate doctor, for such is the law. Medical men now find themselves open to attack not only by their patients but by their hospital authority.

Is it any wonder that there is now a great shortage of junior medical men applying for appointments to the casualty departments of all hospitals of this country, and is there any likelihood, if these conditions continue, that inadequately staffed casualty departments will attract medical men in the future? The situation is about as serious as it could be, for to the 1,000-odd hospitals of this country over 1½ million accident cases go for treatment each year. The organization generally available for treatment of accidents in our hospitals is already poor, but over it a medico-legal cloud has cast a very dark shadow.—I am, etc.,

Birmingham.

WILLIAM GISSANE.

SIR,—Your medico-legal correspondent stated that the judge in cases of malpraxis weighed up the evidence of the medical experts on the two sides before giving judgment. I know of two cases, and there must be more, in which the plaintiff was awarded damages without medical evidence to support his claim, the judge making up his mind on his own on the question of the exercise of skill, care, and diligence.

It is this new development which agitates us all.—I am, etc.,

London, W.1.

A. DICKSON WRIGHT.

The Floating Spleen

SIR,—In the *Journal* of August 23, 1952 (p. 446), Dr. H. W. Wyile reported a case of a movable spleen. I should be glad if you would afford me the space to report on a case I had in British Honduras in 1949.

A Maya Indian woman, of about 55 years, came to the out-patient department complaining of discomfort and pain for a period of years in the left hypochondriac area and inclined to become more severe. As the patient was slim it was not difficult to detect in the left iliac fossa a swelling which could be moved fairly freely in any part of the left abdomen up to the costal margin. The diagnosis made by my colleagues varied from a pedunculated fibroid to a floating kidney. I, too, thought the swelling to be a movable kidney.

A laparotomy was done, using an upper midline incision, and I was easily able to bring into view the swelling, which was a spleen about four times the normal size. Its removal proved quite a simple matter. Ligation of the long pedicle between two clamps was all that was necessary. On section the lymphatic tissue was permeated with areas of cystic degeneration. I think I am right in stating that a movable spleen is a rarity in the surgical field.—I am, etc.,

Tumatumari, British Guiana.

A. H. BARTLEY.

Flood Appeal

SIR,—No doubt it will be of interest to all members to know that as a result of our recent appeal to the Essex Branch of the Association we raised a sum of £486 18s. 10d. Generous as our subscribers were, this amount would have been quite inadequate for the needs of our fellow practitioners in distress, and we owe a great deal to the assistance of the Sir Charles Hastings Fund, which enabled us to fulfil all the demands made upon us.

Our fund is now closed and the whole amount subscribed has been used for the purpose intended. May we, through you, Sir, once again offer our grateful thanks to all who subscribed?—I am, etc.,

Westcliff-on-Sea.

G. T. FOSTER-SMITH,
Honorary Treasurer,
South-east Essex Division.

POINTS FROM LETTERS

Unit System of Prescribing

Dr. DAVID HALER (London, W.1) writes: I was very intrigued to read Dr. Bruce Williamson's suggested unit system of prescribing (*Journal*, March 14, p. 620). It was perhaps a little unfortunate that this important letter became embedded into a discussion on the metric system. I am sure that this has led to the overlooking of this important contribution. Speaking as a practitioner of more than 20 years' experience, and one with considerable experience of a coroner's work, I would like to add my plea to the adoption of some such system as that advocated by Dr. Bruce Williamson. I am sure that students in general would also welcome such a simplification of the burden of learning that they have to carry.

The Medical Practitioner and the Law

Dr. HENRY CHURCHILL (London, N.W.8) writes: It is not difficult to find a professional expert witness who, after the event, will say: "Yes, I would have operated at once" (although sometimes we know he is not really such a bad surgeon as that), but it is not easy to find an expert who has a big enough and convincing enough witness-box personality to say, and get away with: "I don't know what would have been my line of treatment, because I was not there." Might the judge have sitting with him a medical assessor of his choice, from a panel? The panel could be formed from a representative selection approved by the whole profession, possibly nominated by the Royal Colleges. One can think of quite a number of names which should be acceptable. The alternative, it seems, is an increasing expense in every kind of investigation and consultant opinion as an additional insurance. This the country simply cannot afford.

Magic, Medicine, and Religion

Dr. GEORGE V. BOYLE (Glasgow) writes: I have read Sir Sydney Smith's Finlayson Memorial Lecture on magic, medicine, and religion (*Journal*, April 18, p. 847) with amazement. . . . Professor Smith states that the Roman Catholic Church in the early centuries discouraged science, etc. In all fairness why does he not mention that in the Middle Ages 81 universities were founded by the Catholic Church, mostly by papal authority? The chief among these were Oxford, Cambridge, Glasgow, Paris, Vienna, Bologna. Where would science be without the work of the following Catholic scientists: Schwann (histology), Müller (physiology), Vesalius and Fallopius (anatomy), Copernicus and Laplace (astronomy), Ampère, Volta, Lavoisier, Galvani, Foucault, Roger Bacon, H. Fabre, J. Fabre, Gutenberg (inventor of printing), Roentgen, Agricola, Marconi, and the man to whom medicine must be for ever grateful, Pasteur, who died embracing his crucifix? Again he states that radio and television are outstanding examples of things "accepted as commonplace today" which "would have been considered miraculous not so many years ago." By whom, and why? The results of giving thyroids to cretins, quinine for malaria, and opium for pain would have appeared miraculous 100 years ago. Maybe our ancestors knew that a miracle is a supernatural event, a sensible (that is, perceived by the senses) fact, extraordinary and divine (Tanqueray, a theologian), or, as the *Oxford Dictionary* states, an event due to supernatural agent, act of supernatural power. The Medical Bureau at Lourdes, which has thousands of medical men as members, openly invited doctors from every country in the world to visit Lourdes and offered every facility to enable them to inquire fully into the complete history of the cases recorded as miraculous cures. Hundreds of these cases are recorded and none have ever been proved to be false.

Dosage of Penicillin

Dr. W. A. BELLAMY (Aylesbury) writes: Most therapeutic agents appear to have a standardized dose which has remained constant for years. Not so penicillin. I am not at all sure that the enormous doses given now produce better results than the smaller ones given seven years ago, but I presume that the pathologists will refute this by statistics on blood concentrations. I have recently been advised to give a patient (now up and about, convalescent from pneumonia, with one slight relapse) 4 million units twice a day for 28 days. My own experience, for what it is worth, is that cases treated in practice (and many of the authors of refresher courses for general practitioners will be amazed to learn that cases are treated in general practice), cases of pneumonia, acute otitis media, carbuncles, cellulitis, tonsillitis, whitlows, etc., do very well, at all ages, on 1 million units, twice a day intramuscularly for five or six days. I get nothing like the same results with penicillin by mouth.

Obituary

E. D. PULLON, M.D., F.R.C.S.Ed.

Dr. E. D. Pullon, of Christchurch, New Zealand, died suddenly at his home from coronary thrombosis on April 23 at the age of 62.

Edwin Douglas Pullon was the second son of the late Dr. Henry Pullon, of Huddersfield, and was educated at the Leys School, Cambridge, and Edinburgh University, where he had a brilliant career, the promise of which was belied to a considerable extent by ill-health, which was the prime reason for his going abroad. At Edinburgh he took the B.Sc. degree and then graduated M.B., Ch.B. with first-class honours in 1912, later proceeding to the M.D., with gold medal for his thesis, in 1920. After qualification and the usual resident appointments he went out to South Africa on account of his health, and lived in Capetown, being appointed assistant professor of anatomy at Cape University in 1914. On the outbreak of the 1914-18 war he joined the South African Medical Corps and served in the German South-west African Campaign with the rank of major. He returned to Capetown in 1917 as assistant Government bacteriologist and then came back to Edinburgh for a time, worked at his M.D. thesis, and took the diploma of F.R.C.S.Ed. in 1922. Leaving Edinburgh again, he went out to New Zealand, his wife's home country, and settled in practice in Christchurch, where he served as assistant surgeon on the staff of the Christchurch Hospital. Ill-health still haunted him, but after recovery from a long illness he took a great interest in the activities of the New Zealand Branch of the British Medical Association and its campaign against the Government's social security proposals there. In 1947-8, when he was chairman of the Canterbury Division of the Association, he represented the South Island on a joint committee of four members in consultation with the New Zealand Government. These discussions were presided over by Judge Cleary, and it was through adoption of the Cleary Report that Section 8 of the Social Security Act of 1941 was repealed, the civil rights of the medical profession being thus reinstated at last. Dr. Pullon had always advocated the "refund system" of payment for medical practitioners, which enables a direct relationship to exist between patient and doctor. At the time of his death he was actively engaged on the executive council of the New Zealand Branch of the B.M.A.

Dr. Pullon came of a family of musical enthusiasts, wrote music and played the piano in his youth, and all his life took the greatest pleasure in music and the theatre. He missed the theatre very much in New Zealand, but loved entertaining touring companies there, whether they were Gilbert and Sullivan, Shakespearean, orchestral, musical or otherwise, and his house was always filled with travelling celebrities of one kind or another. Only a few weeks before his death he had been entertaining Anthony Quayle and the Stratford-on-Avon players. Like so many of his colleagues in New Zealand, he was a great Edinburgh enthusiast and never missed visiting his alma mater when he came to Britain. Dr. Pullon had a most unselfish, charming, and altogether delightful personality, and will be greatly missed. He was twice married, and leaves a widow and four children, with whom he had enjoyed a gracious, full, and understanding family life.—R. S. S.

Sir ROBERT G. ARCHIBALD, C.M.G., D.S.O., M.D.

B.N.S. writes: A wide circle of friends will have heard with sorrow of the death of Sir Robert Archibald, whose obituary notice was published in last week's *Journal* (p. 1112). Long before the end of the thirty years he spent in the service of the Sudan Government "Archie" had attained a unique position in the community. Living in Khartum, the clearing-house of the Provinces, he came into contact sooner or later with everyone who served in the Sudan. To few men is it given to become so universally admired and respected as he was, and to be so warmly regarded by all who knew him intimately. And no man ever more richly deserved the popularity he enjoyed or made less conscious effort to achieve it. It was the homage willingly paid to a wise and gifted man, endowed with great charm, good manners, a genial sense of humour, and a hospitable nature. The knighthood bestowed on him towards the end of his career in the Sudan was a fitting reward for a life of selfless devotion to duty. He was a tireless and most conscientious worker in his chosen field of medicine, and the services which he rendered as director of the Wellcome Tropical Research Laboratories in Khartum were of inestimable value to the Sudan, where his name will long be remembered and honoured. Absorbed though he was in his work, he still found time to play his part in the social life of Khartum. He was fond of all games and sports such as tennis, golf, fishing, and shooting, and loved nothing better after the day's work was over than one of those unforgettable evenings duck shooting on the Nile.

Dr. CHARLES A. MACKENZIE died at Winnipeg on April 6 at the age of 83. Born in Ontario, he was educated at Upper Canada College and graduated in medicine at McGill University in 1899. Going to Winnipeg, he served for many years as chief medical officer of the Canadian Northern Railway (later incorporated into the Canadian National Railway), of which his uncle, Sir William Mackenzie, was a founder. In 1930 he was president of the Manitoba Medical Association, and as such was the official host for the British and Canadian Medical Associations which held a joint meeting at Winnipeg in that year. He was a close friend of Dr. W. Harvey Smith, who served as President of the British Medical Association in 1930, and with Dr. Harvey Smith he was largely responsible for the erection of the Medical Arts Building in Winnipeg, owned and operated by the tenant doctors and dentists. For 25 years, from its opening in 1923, he acted as president of the building and administered its finances with singular ability.

The sudden death of Dr. W. A. MAGILL on April 22 at the age of 72 came as a great shock to his patients and friends. William Arthur Magill was born on April 1, 1881, and was educated at the Methodist College and the old Queen's College, Belfast. His parents intended him for the Church, but after matriculating at the former Royal University of Ireland he took up the study of medicine and was a prize-man at Queen's and an exhibitor at the Royal Victoria Hospital, Belfast. He qualified by taking the Scottish triple qualification in 1904, and then, before starting in general practice in Belfast in 1909, he was an assistant in Yorkshire and Portsmouth. At Belfast, where he soon built up a large practice, he was a keen and extremely conscientious worker, and his quiet and kindly manner endeared him to his patients and professional colleagues. He died in harness, as he hoped he would. Outside his profession his main interest was reading. He had a good knowledge of six or seven modern languages, and kept up his knowledge of Latin and Greek. He was also fond of motoring and gardening. His wife, formerly Miss Constance Spence, of Douglas, Isle of Man, predeceased him a short time ago, and he is survived by a son and daughter.—W. R. E. W.

Dr. A. E. THOMPSON, who died at Birkdale, Southport, on April 15 at the age of 82, had previously been in practice for 49 years at Barrow-in-Furness, where he was well known and greatly liked. He retired to live at Birkdale in 1949. Arthur Edward Thompson was born on April 21, 1871, and was educated at the University of Durham, where he was a student of outstanding merit. He gained the Charlton Scholarship and first-class honours in medicine in 1893, the year in which he graduated M.B., B.S., and three years later he took the degree of bachelor of hygiene. His first appointment was that of assistant visiting surgeon to the Newcastle-upon-Tyne Dispensary, but the war in South Africa at the turn of the century saw him on active service as a medical officer, and he became assistant district surgeon at Estcourt, in the Natal Province. When he returned to this country he settled in practice at Barrow-in-Furness, becoming known as "the doctor on the motor-cycle," a mode of transport he used for many years, and his quiet, friendly manner and cheery word endeared him to all. A member of the British Medical Association for fifty years, Dr. Thompson was honorary secretary of the Furness Division in 1922, and president of the North Lancashire and South Westmorland Branch in 1926-7. A staunch churchman, he was a regular attender at divine service until three weeks before his death.

Dr. A. N. FELL, one of the best-known medical practitioners in North-east Essex, died at his home at Colchester on April 19 at the age of 75. Alfred Nolan Fell was born at Nelson, New Zealand, on January 17, 1878, and was educated at Nelson College and at Otago University, continuing his studies at the University of Edinburgh, where he graduated M.B., Ch.B. in 1902, proceeding to the M.D. in 1906. In 1905 he became a Member of the Royal College of Physicians of Edinburgh, a distinction which he relinquished when he settled in general practice at Colchester in 1907, because at that time Members of the College were forbidden to dispense their own medicines. It was characteristic of the man to practise medicine as he thought best. In recent years he was reinstated at Edinburgh, an honour which modesty prevented him from mentioning even to his closest friends. After graduation Dr. Fell held house appointments at the Royal Infirmary, the City Fever Hospital, and at the Corstorphine Convalescent Hospital, Edinburgh. His distinguished academic career was matched by his brilliance as a Rugby footballer and as champion "miler" of the Scottish universities in 1901-2 and of Edinburgh University in 1901-2-3. While at Edinburgh he built up and led one of the finest Rugby sides in the history of the game. The record of his first season as captain read: matches played, 16; won, 15; drawn, 1; points for, 425; points against, 6. He was "capped" for Scotland in 1901, 1902, and 1903, and only injuries prevented him from playing in the two following years. He was the great wing three-quarter of his day, with a tremendous swerve and speed and a determined dash for the line. He retained a keen interest in the game until his death, and was the first president of the Colchester Rugby Club. As a past president of the Colchester Medical Society and through his long membership of the Essex Panel Committee Dr. Fell exerted a valuable influence on the general-practitioner services throughout the country—an influence he exerted also as a member of the British Medical Association. He was honorary secretary of the North-east Essex Division from 1915 to 1917 and again in 1920-1; honorary secretary of the Essex Branch from 1921 to 1924; chairman of the North-east Essex Division in 1927-8; and president of the Essex Branch in 1930-1. In 1918-19 he served as a temporary captain in the R.A.M.C. in Macedonia, Bulgaria, Serbia, and in the Caucasus.

We are indebted to Mr. RONALD REID for the following appreciation: The death of Dr. A. N. Fell will be lamented by all who knew him, for he was beloved and respected, and his patients were his friends. To many of his colleagues who have witnessed the changing scene in medicine it is like the end of an era, for he was one of the great general practitioners. Not

only was he highly skilled in his profession and devoted to the welfare of his patients, but he was a man of great wisdom and kindness, a true family doctor and adviser. In him, character, education, and experience were blended and matured to a degree not often encountered in the world of medicine to-day. He was a man of high ideals and modest to the point of self-effacement; at first meeting his sensibility might make him seem austere and distant, but suddenly his kindness and impish sense of humour would break through, and the warm smile and the twinkle in the eye would show the real man below the surface. He had a liberal outlook on life, for his interests were not confined to medicine, as those who were privileged to sail in the family yacht will remember. He was one of those rare human beings who had an innate knowledge of what is right and enduring; his self-discipline and his determination carried him through life as they carried him through the opposing team on the football field fifty years ago. When still in active practice he learned that he had not long to live. Pondering on the prospect of retirement, he remarked, "I shall play to the final whistle"; and that is exactly what he did. He will always be remembered for his devotion to ideals, his courage, and his humanity. He leaves a widow, three sons, and a daughter; another son died of wounds in North Africa in 1942.

Medico-Legal

ACTIONS FOR NEGLIGENCE

[FROM A SPECIAL CORRESPONDENT]

Anxiety undoubtedly exists among members of the medical profession because, as the medical correspondent of the *Daily Telegraph* has put it,¹ "what is classed as negligence is not negligence as understood by them." He submitted that some legislation was necessary to clarify the position. This was followed by a letter from Dr. R. W. Cope,² who stressed the fact that accidents do occasionally follow "simple procedures when there has been absolutely no evidence at all of any careless or ignorant practice carried out by the operator and the nursing staff concerned." He supported the desire for new legislation and suggested a Select Commission.

The law concerning the liability of a professional man has not changed. His duty is, as it has always been, to bring to bear upon all his professional activities the degree of skill and care possessed by an ordinarily competent practitioner of comparable standing to himself. Judges have repeatedly stressed that he does not, in the absence of very special circumstances, guarantee either the success of his treatment or the perfection of his technique; but he is liable for the consequences if he fails to apply that skill and care defined above. While the law has not changed, its application by judges and juries in individual cases in recent years has revealed a trend to the disadvantage of the doctor and the hospital.

Discovering the Facts

In the first place the judge (and jury, if there is one) has to discover the facts. Often there is a direct conflict between the witnesses on vital points—for example, on whether some particular examination was carried out. Every system of law has to provide a machinery for ascertaining the truth in such a case, and ours is the familiar procedure whereby witnesses give their evidence orally and are questioned. No better has yet been devised, nor is likely to be. The judge then makes up his mind about whom he believes. If the evidence of the doctor does not impress him, he will not believe his version of the facts: so with the patient and his witnesses. More cases are won or lost on this score than on any other. It is seldom that one can discover from reading a newspaper report whether any witness has been believed or not: and it is obviously fruitless to criticize a verdict that there has—or has not—been negligence without

knowing what the judge believed to have happened. Only after he has resolved the facts can the judge decide whether there has been negligence, and in reaching this conclusion he is guided by the views of the expert witnesses called. Again, when there is conflict between the expert witnesses, it is for the judge to choose the one whose views he accepts.

Lord Justice Denning is reported to have said³ that before the National Health Service Act the courts had been "very kind" to voluntary hospitals. The report suggests that Lord Justice Denning was implying that the great increase both in the number of cases brought against hospitals, and the number of successful cases, was at least in part attributable to the application of the strict rule of law to those cases now for the first time. It is the writer's view that this is a part only of the truth, and some additional suggestions are hazarded below.

The Changing Times

The taking over of hospitals under the National Health Service has brought about a radical change in the whole attitude of the patient towards hospitals. Many in the past have grumbled if they were not treated at hospital in every way as they would have wished, but yet respected the hospital and its staff. Some of this respect has now gone. With it has gone an inherent unwillingness on the part of patients and their legal advisers to institute proceedings against local hospitals. The attitude nowadays is that they are suing the "State." The jury, too, are members of the public, and, just as the patient is less hesitant to allege negligence, so are they less hesitant to believe it.

The passing into law of the Legal Aid and Advice Act, 1949, has made it possible for many people to bring actions which they could not previously have afforded. Who can blame a plaintiff for instituting proceedings in respect of injuries which he had undoubtedly received, when he thinks, as many do, that he is suing the State at the State's expense?

The public has in every aspect of life become increasingly "compensation-minded." It is not only claims against doctors and hospitals which have increased. There has been a steady rise in the number of all classes of case in which damages are claimed for personal injuries, whether these are sustained in road traffic accidents, at work, or otherwise. Many readers will remember in this connexion the increase in their motor insurance premiums.

The law of negligence has been seriously affected by the internal combustion engine. The lay public do not usually realize that a very high proportion of the time of the civil courts is taken up with claims for personal injury arising from road traffic accidents, and it is inevitable, therefore, that the influence of these cases on the law of negligence should have been marked. In most Continental countries a motor vehicle is treated as inherently dangerous, and if a driver injures someone it is for him to show that he was not negligent if he is to escape liability. In England this is not the law: the burden of proof of negligence is on the plaintiff, but if he can show that the driver has made an error the court will then hold that there has been negligence unless the driver can disprove it. Day after day, therefore, judges and barristers are concerned with cases in which error and negligence are closely approximated. It is hardly surprising that when they deal with another type of negligence case their application of the law will be influenced by this state of mind. Twenty-three years have passed since third-party insurance for motorists became compulsory: it will be seen, therefore, that this factor has had enough time now to have a significant effect.

New Potential Dangers

To venture on more controversial fields: few will deny that medicine and surgery have developed apace since, say, 1939. It is by no means impossible that this development has outstripped the improvement in the teaching of medical students and young doctors. To-day the practitioner in all spheres has a much wider and potentially more dangerous

range of treatment than his colleagues of 15 years ago. There is therefore much more scope for the occurrence of "inadvertent" results, which are really only the logical consequences of some procedure adopted by the doctor which he has not foreseen or been taught to avoid. The smallest mistake is now harder to retrieve or to counter than formerly, and its consequences are apt to be much more dire to the patient.

In medicine, as in all walks of life, there have always been a few who are careless. It would be surprising, after a world war and a social and medical revolution, if those inevitable few were not slightly less few. Nor would it be surprising if the very newness of the N.H.S. had put a few such people into the wrong jobs or had failed to weed them out. The newness of the N.H.S. organization appears in some cases to have also contributed to this problem in another way—namely, that the hospital machine has not always worked with complete smoothness. Situations of doubt and difficulty have arisen in which mistakes (mostly of inexperience) have been made.

The cause of the present circumstances lies not in the law but in its application, and its cure in the social and not the legal field. There can be no justification for the medical profession to ask for special protection beyond that which the law gives to others. What need is there for a Select Commission? If doctors continue to do their best at all times, if they uphold the traditions of the past, if they can manage to do their work without looking over their shoulders at the law, secure in the support of their defence organizations, the causes which are tilting the scales against them will vanish in time and the equilibrium will be restored.

Medical Notes in Parliament

INQUIRY INTO HEALTH SERVICE

The National Health Service was debated on May 18 on a Vote for the Civil Estimates.

MR. ANEURIN BEVAN said that the Opposition took the gravest view of the decision of the Minister of Health to appoint a committee of inquiry into the Service. Why had not the Minister made use of the Central Health Services Council, which had an unsurpassed pool of knowledge?

The terms of reference made it clear why the Minister had not used the council. It would not be possible for the council in its own terms of reference to advise the Minister on the limitation of the Service. It would only be possible for them to advise on any defect in the administration and on any changes that should be made to repair those defects. The Minister was setting up an independent committee not because he was anxious to improve the administration but because he was anxious to obtain an alibi to cut the Service.

Stiffer Discipline

Demands on the Service in the two sections—dental and ophthalmic—where the patient initiated the expenditure had already begun to decline before charges were put on. The pharmaceutical side of the picture was slightly different. This was where the initiative on the expenditure lay mainly with the doctor. It was the doctor who, by his prescription, attracted money from the Exchequer. Here the expenditure had been and still was going up in spite of the prescription charge. But in this case there was disciplinary action open to the Minister, and there were administrative pressures which might be increased more severely than they had been. It surely was a reflection on the medical profession that in the case of "dextrodine" £400,000 was spent on it last year when the equivalent in the official formulary would have cost only £158,000. It was a reflection on the doctors, and what was required was not action to penalize the patient, who was not responsible, but to make an investigation into the profits made by the big drug houses and to stiffen more severely the discipline over the general practitioners.

The hospital organization should be looked at from the point of view of the treatment of the chronic sick with a view to relieving some of the charges on the hospitals.

Minister's Reply

MR. IAIN MACLEOD, Minister of Health, said that two questions in relation to the inquiry had to be decided: Was there anything to inquire into, and, if so, who should undertake it? On some matters within the area of dispute he wanted advice, though he agreed that the decisions could be taken only by the House of Commons. One matter was the block grant. It was one view that the central accounting system of this country was never designed for the burden the Health Service had put upon it in the management of several thousand hospitals. That money unspent at the end of the financial year had to be returned was not an incentive to wise spending in the last few months of the year. By planning three or five years ahead, the hospitals could make great economies.

Ambulances were a hospital service in Scotland and a local authority service in England. Which system was the better? There was the immensely difficult problem of fitting national wage negotiations into the intensely human and personal hospital service. If savings could be effected without loss of efficiency, should not a hospital get the benefit of that economy? Had local authorities found their right role in the Health Service? There was a good case for some investigation after five years.

Then came the question of who should undertake it. Mr. Bevan had suggested the Central Health Services Council, but it was because that council was representative of all the interests in the Service that he did not regard it as the right body to undertake the inquiry. He desired an independent view from independent-minded people.

The case that there was something to be inquired into was unanswerable. Expenditure in the Health Service field could not be controlled unless man-power was controlled, because salaries and wages accounted for two-thirds of the cost of hospitals, and hospitals accounted for nearly two-thirds of the cost of the scheme. At the end of 1951 there were 328,000 full-time and 90,000 part-time staff in hospitals, an increase of respectively 15% and 33% over 1948. They must try to relate the numbers employed to the service obtained, and he hoped that as an outcome of the review more staff might be available for the hospitals and sanatoria which at present were in the greatest need.

Concern about Prescribing

The Government viewed the present cost of the pharmaceutical services, as did their predecessors, with the gravest concern. It was the only part of the National Health Service that he could not claim as under financial control at the present time. There had been a steady increase in the numbers of prescriptions, which were now running at the rate of 241 million a year in Great Britain. The average cost of a prescription had climbed from 38d. in 1949–50, to 40.5d., 47d., and 50.7d., and he had made an estimate of 52d. for each prescription for this year. This rise was due to a general rise in ingredient costs, though that was flattening out, and to the increasing use of new, valuable, and expensive drugs and to the important increase in the proportion of proprietaries. Before the Service came in the proportion of proprietaries was 6%. In 1949 it was 15%, and it was now 25%, which accounted for about half the drug bill; and the whole of the amount he had to pay out, taking into account the hospitals, was about £60m.

He was going to invite doctors in a month or so not to prescribe the drugs which Sir Henry Cohen's committee had referred to as not of proved therapeutic value. That would help the situation, but the biggest problem was that no fewer than 4,000 proprietaries came in the categories in which the Cohen committee advised they were not superior to standard proprietaries but which they thought ought to be prescribable subject to satisfactory price arrange-

¹ *Daily Telegraph*, March 16.

² *Ibid.*, March 19.

³ *The Times*, March 19.

ments being made. The problem that confronted him was what should be done. It was not a new problem. The House was recommended to take action over proprietaries first in 1914, and many efforts had foundered in the past. There was a genuine case for many of the firms, but the trouble was that there were firms who were merely wrapping up standard proprietaries in pretty packages and forcing them on the notice of doctors. And the difficulty was to distinguish between the two so that he would not harm the export industry or research, which had brought such splendid advances in chemotherapy, and to get rid of those firms that battered on the Service.

There were various possible approaches, but the Government had decided in the last few days to start a number of cost investigations—as many as they could undertake—into the cost of manufacture of certain of these proprietaries that seemed, at first sight, especially expensive. (Cheers.) He hoped it would yield substantial savings, and he intended to circulate doctors with the names of those proprietaries concerning which the Government was unable to reach satisfactory agreements on price. This action should not be taken to be the end of the story, and he did not rule out more drastic measures if this should fail.

Charges to Patients

As a result of the 1s. charge for prescriptions there was a drop of 14% in the first month. That came down, until in September the deterrent effect was ½%. In the three months at the turn of the year December, January, and February, the number of prescriptions dispensed was running at about 12% above a year before, even though the 1s. charge was on. It was true there was fog, floods, and 'flu, and it was quite impossible to make any valid comparison from year to year unless one looked at the sickness figures of the Ministry of National Insurance. The past year had been one on which it was genuinely almost impossible to draw conclusions. But when he calculated his Estimates he had put down a deterrent figure of 6% for the coming year. Whether it would be right or wrong he could not tell, and it depended more than anything on whether there would be an epidemic year or not.

The main problem was how to meet the thrusting needs of the hospital service. Last year the hospitals under-spent by £14m. owing partly to the Government's requests to them not to over-spend. In this year's Estimates the Government had provided £15,250,000 for extra expenditure. Stocks carried by hospitals amounting to £21m. in March, 1952, were being reduced by £3m., which was additionally available to hospitals for the coming year. Cash balances were being reduced by £2m., and, adding these figures to the £15,250,000, there was provided £20m. over the out-turn for last year for the hospitals. With this £20m. he could maintain the Service, bring into full use the developments that had been finished recently, and provide for modest future development.

The policy of successive charges would in time destroy the Service. The Government had shunned a further step down that road. A "hotel charge" had never been discussed either by himself or his colleagues at any stage. It might be that they were at the end of charges; he did not know, but at least a halt had been called. He had tried, as he had shown in his Estimates, to hold the line, but many of the things he had done could not be repeated year after year. What they wanted to achieve was a system by which the Service had an interest in economy which was as natural and rewarding as was its interest in medical efficiency. They were right to review the Service, and the Guillebaud committee was the best method of carrying out the investigation.

Due for Review

Mr. F. MESSER said that the Service was due for review. Consultants who were members of teams of full-time consultants were now leaving to become sessional consultants. Travelling time was taken into account as part of the session, and they got income-tax allowances on all expenses.

Among them were men now getting £2,000 or £3,000 a year who would have been lucky in the old service if they ever got £1,500. Surely there was a field for investigation.

Dr. S. JEGER said that the poor general practitioner had been the whipping-boy for what had been described as "unnecessary expenditure." It was true that some doctors, either through ignorance or malevolence, were not playing the game, and he had heard of one who prescribed a pound of cotton-wool a week for his barber, who used it round the necks of his customers. But some patients did not feel happy unless they were getting bottles of medicine to pour down their throats, which was one of the consequences of establishing a vested interest in patients.

Commander GALBRAITH, Under Secretary, Scottish Office, said that the Guillebaud committee would be able to study the merits of whole-time and part-time service but it would not be dealing with rates of pay. The differences between the English and Scottish services were in matters of administration, but so far as those differences had a bearing on expenditure it would be of advantage to have them reviewed.

An Opposition motion to reduce the Vote by £5 was defeated by 293 votes to 268.

NURSING DUTIES

The hospital nursing services were debated in the House of Lords on May 12. Opening the debate Lord CROOK founded his case on the recent report of the Nuffield Provincial Trust and the evidence produced by its job analysis of the great misuse of nursing skill. He asked, in effect, for urgent Government consideration of the report and the adoption of as many as possible of its recommendations.

Lord MORAN thought it was generally agreed that they could not look for any great increase in the numbers of nurses in the future, and therefore attention must be concentrated on making the best use of existing numbers.

Nursing Orderlies

He hoped the nursing profession would give careful attention to the use of the orderly. If an orderly was trained for a year he would be a most useful pair of hands. If there were enough trained nurses, they should be taken to the bedside; but in the present scarcity there was no option but dilution of the nursing profession.

Lord AMULREE supported the idea that some form of dilution was the only way out. The danger seemed to be that too many nurses were being trained to too high a standard. It had always seemed to him a pity to make the trained nurses' standard too high. The nurse so trained looked for an administrative job. No other would give her an increased salary.

Lord HADEN-GUEST regarded "inevitable dilution" as a defeatist argument. There was already far too much dilution in the nursing profession.

Need to Reorganize

Lord WOOLTON replied to the debate. He said there were some good points in the picture. The nursing force had increased by two and a half times in the past 50 years, so some progress was being made. The demand had increased even more, but that was also a sign of progress—more care was being taken of the sick. He gave an assurance on the Nuffield report. It was received by the Minister of Health at the beginning of April, and the advisory committee met on April 29 to consider it. The Minister was anxious that no time should be lost. He endorsed the importance given in the Nuffield report to the need for reorganization of hospital services. He had been horrified to find, in talks with the nurses, that promotion went in the line of administration. At the time he was thinking very little of administration. It was a great pity if highly trained nurses were having to do clerical work, which involved an entirely different capacity and attitude of mind. The things that ought to be looked at were what reorganization could be obtained in personnel employed in administration and also in the fuller use of orderlies.

ANTIBIOTICS BILL

The Therapeutic Substances (Prevention of Misuse) Bill was discussed by the House of Commons on Second Reading on May 13.

Mr. IAIN MACLEOD explained that the purpose of the first of the two clauses was to extend the scope of the Penicillin Act, 1947. It was right to ask for powers to make regulations, similar to those made under the 1947 Act, in respect of any substance which appeared to him and the other Health Ministers to be capable of causing danger to the health of the community. Isoniazid was the drug which had given rise to Clause 1. It was necessary they should consult the Medical Research Council, and questions had been raised whether he would also consult the manufacturers and other interests affected. He stated that there would be such consultations, provided it was understood that the final decision must be taken on medical grounds.

Clause 2 was popularly known as the "penicillin for pigs" clause. It had been found by experiment in the United States that minute quantities of antibiotics put into the feedingstuff could have a most remarkable effect in encouraging the growth and fattening of pigs. The first consideration was whether this could have any ill effects on human beings who would eat the meat produced, but he was assured by the Agricultural Research Council that there was not the slightest danger of this happening. The other danger which was being guarded against was the possibility by this wider use of antibiotics of a black market in penicillin, but the Government would take steps to ensure that the antibiotics were used in such a way that they could not be extracted and used for self-medication.

At the moment it was proposed to apply these regulations only to penicillin, since that was the only substance of this class of which there were satisfactory quantities, but it was possible that in the future aureomycin and perhaps terramycin would be manufactured in sufficient quantities in this country if they were suitable for use in the same way. He would consult the Agricultural Research Council and, if necessary, the Royal College of Veterinary Surgeons.

Danger of Sterility

Captain J. A. L. DUNCAN, a member of the council of the Royal College of Veterinary Surgeons, said that the use of such drugs for fattening pigs for slaughter might be all right, but farmers should be warned that if they were used for feeding pigs for breeding there was a danger of loss of fertility. The same applied to cattle and sheep for breeding. He sought an assurance that the Royal College of Veterinary Surgeons would be consulted.

Mr. G. R. H. NUGENT, Parliamentary Secretary to the Ministry of Agriculture, gave the assurance that there would be consultations with the College on many matters, and that these were already in progress on the drafting of the regulations.

The Bill was read a second time.

Synthetic Detergents Investigation

Mr. H. MACMILLAN, Minister of Housing and Local Government, announced on May 18 that he had appointed a committee "to examine and report on the effects of the increasing use of synthetic detergents and to make any recommendations that seem desirable, with particular reference to the functioning of the public health services." Its chairman is Sir Harry Jephcott, F.R.I.C., chairman and managing director of Glaxo Laboratories. Among its 17 other members are the following medical men: Dr. N. R. Beattie, principal medical officer, Ministry of Health; Professor J. C. Cruickshank, professor of bacteriology as applied to hygiene at the London School of Hygiene and Tropical Medicine; and Lieutenant-Colonel E. F. W. Mackenzie, director of water examination, Metropolitan Water Board.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 2 (No. 17) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	13	1	3	0	1	35	4	6	0	2
Dysentery ..	466	34	82	2	1	275	35	44	1	
Encephalitis, acute ..	7	0	0	0		6	0	0	0	
Enteric fever: Typhoid ..	0	0	0	0		0	0	0	1	1
Paratyphoid ..	6	1	1(B)	0	1(B)	8	0	0	0	2(B)
Food-poisoning ..	86	15		0		123	5		0	
Infective enteritis or diarrhoea under 2 years ..				24	20				12	16
Measles* ..	10,752	419	427	336	203	6,137	275	769	276	446
Meningococcal infection ..	32	3	12		3	40	3	13	2	1
Ophthalmia neonatorum ..	29	3	19	0		49	4	12	0	
Pneumonia† ..	549	28	212	7	2	747	47	266	8	2
Poliomyelitis, acute: Paralytic ..	19	4				22	3			
Non-paralytic ..	10	1		1	0	7	0		3	1
Puerperal fever§ ..	226	30	16	1		281	35	16	0	1
Scarlet fever ..	1,139	69	180	52	75	796	54	141	12	55
Tuberculosis: Respiratory ..			194	31				148	37	
Non-respiratory ..			39	5				26	1	
Whooping-cough ..	3,373	239	452	42	120	2,946	163	235	113	62

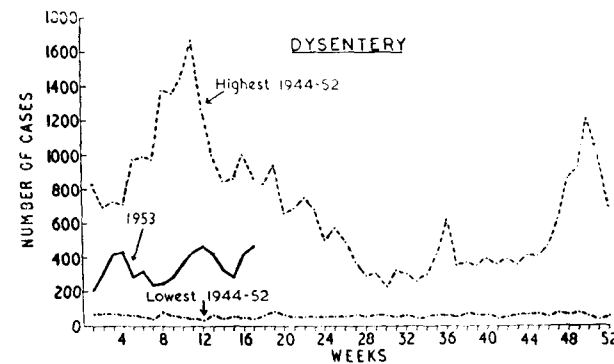
DEATHS In Great Towns	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0		0	1	0		0	0
Dysentery ..	0	0				0	0		0	
Encephalitis, acute ..	0				0	1				0
Enteric fever ..	0	0	0			0	0		0	
Infective enteritis or diarrhoea under 2 years ..	8	2	2	3	3	5		4	0	1
Influenza ..	21	2	1	0	1	17	4	5	0	0
Measles ..	0	0			1	0			0	3
Meningococcal infection ..		0	1				0	1		
Pneumonia ..	203	34	22	10	2	241	26		10	7
Poliomyelitis, acute ..	1	0			0	2	0			0
Scarlet fever ..		0	0		0		0		0	0
Tuberculosis: Respiratory ..	121	13	12	3	9	133	19	19	2	10
Non-respiratory ..	5	1	1	3	2	1	3	0	1	
Whooping-cough ..	1	0	2	0	0	4	0		0	0
Deaths 0-1 year ..	202	28	30	11	10	224	21	45	7	28
Deaths (excluding stillbirths) ..	5,047	691	562	98	171	5,129	744	620	113	202
LIVE BIRTHS ..	7,849	1,125	929	243	375	8,092	1,227	973	243	450
STILLBIRTHS ..	224	27	33			204	27	25		

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

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending May 9

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,387, whooping-cough 3,461, diphtheria 22, measles 9,809, acute poliomyelitis 38, dysentery 729, paratyphoid fever 14, and typhoid fever 1.

Infectious Diseases

The largest variations in the number of notifications of infectious diseases in England and Wales during the week ending May 2 were decreases of 2,979 for measles, from 13,731 to 10,752, and 132 for acute pneumonia, from 681 to 549, and increases of 167 for whooping-cough, from 3,206 to 3,373, and 92 for scarlet fever, from 1,047 to 1,139.

The largest falls in the incidence of measles were 267 in Yorkshire West Riding, from 1,317 to 1,050; 256 in Surrey, from 736 to 480; 210 in London, from 629 to 419; and 204 in Warwickshire, from 528 to 324. The largest fluctuations in the trends of whooping-cough were a rise of 46 in Kent, from 85 to 131, and a fall of 48 in Lancashire, from 497 to 449. Only small variations were recorded in the local returns of scarlet fever. 13 cases of diphtheria were notified during the week, 12 fewer than in the preceding week.

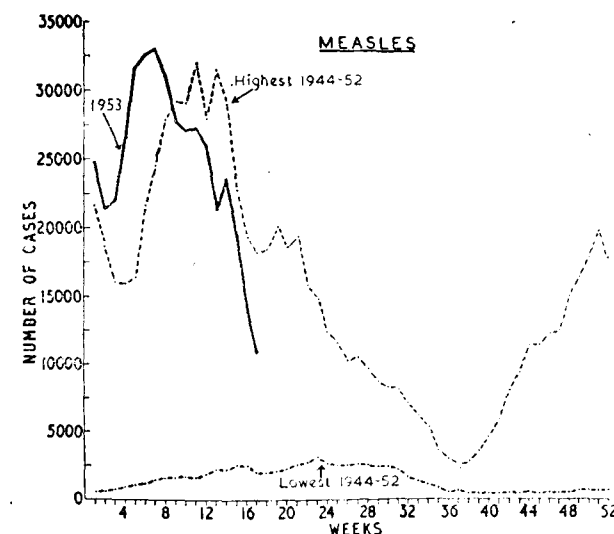
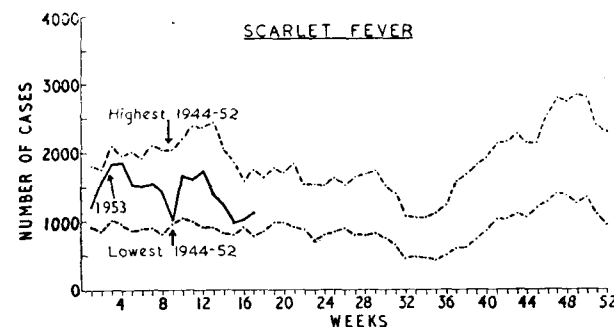
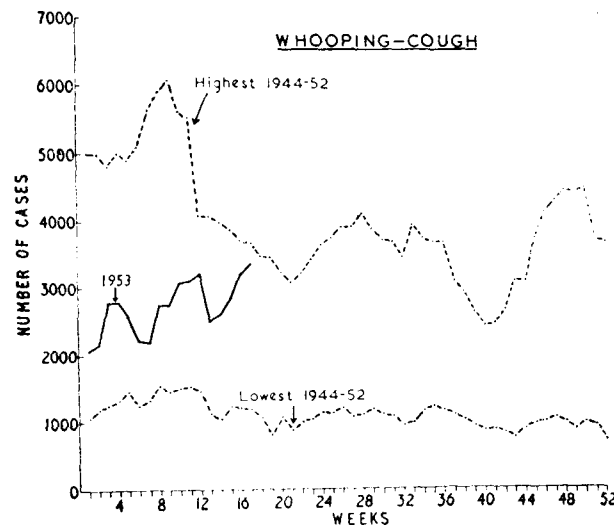
29 cases of acute poliomyelitis were notified—15 fewer for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were London 5; Southampton County 4 (Portsmouth C.B. 3); and Middlesex 4.

A rise in the notifications of dysentery from 419 to 466 was recorded during the week. The largest centres of infection were Lancashire 114 (Liverpool C.B. 35, Preston C.B. 22, Manchester C.B. 17); Middlesex 70 (Edmonton M.B. 26, Southgate M.B. 13); Essex 35 (West Ham C.B. 12); London 34 (scattered through 12 boroughs); Bedfordshire 28 (Bedford M.B. 17); Yorkshire North Riding 26 (Middlesbrough C.B. 26); Norfolk 23 (Great Yarmouth C.B. 21).

Smallpox in the North Country

The number of confirmed cases reported up to noon, May 19, is 30, including 8 deaths. No new cases have been reported since last week. Although the period of surveillance of known contacts is almost expired, the need for special vigilance must continue for a longer period, because the source of infection of 4 cases which occurred two to five weeks ago is uncertain.

In its first large-scale effort to raise funds for promoting various projects, the National Spastics Society is offering Coronation seals for sale at 1d. each. So far 2,250,000 seals, which show a picture of Westminster Abbey, have been printed for distribution. Supplies of seals may be obtained from the Appeals Secretary, National Spastics Society, 44, Stratford Road, London, W.8.



Medical News

The Committee of Inquiry on the Rehabilitation of Disabled Persons which was set up by the Minister of Labour and National Service, the Minister of Health, and the Secretary of State for Scotland, under the chairmanship of Lord Piercy, is now ready to receive evidence from interested persons and organizations. Those intending to give evidence should give notice as soon as possible to the joint secretaries of the committee (32, St. James's Square, London, S.W.1), with a memorandum of the views they wish to present.

Courage Laboratories of Ophthalmology.—At the Royal Eye Hospital, London, on May 13, Mrs. M. V. Courage laid the foundation stone of new laboratories which are to be known as the Courage Laboratories of Ophthalmology. They will be used for clinical research under the direction of Professor Arnold Sorsby. The Bishop of Kingston (The Rt. Rev. F. O. T. Hawkes) reminded those present at the ceremony of the large amount of good work which the firm of Courage and Company, Limited, had done for the Royal Eye Hospital: a few years ago they presented a nurses' home at Surbiton, and now they had come forward with the necessary funds to build these laboratories in the hospital precincts. The research department of the Royal Eye Hospital had been in existence for ten years, and immense benefit was hoped for with the new facilities which the laboratories would provide.

Chelsea Clinical Society.—The Annual Dinner of the Chelsea Clinical Society was held at the South Kensington Hotel on May 12 with the president, Mr. Eric Steeler, in the chair. The toast of the Society was proposed by the Very Reverend Archimandrite James Virvos, Provost of the Greek Cathedral, who engagingly found a similarity between the present dinner and the feasts of good fellowship which were facilitated by the nature of the Greek vineyards in the time of Hippocrates. There was much in common between the two civilizations of Greece and Britain. His ancestors, the Archimandrite continued, had deified Asklepios, whose daughter was Hygieia. Greece became the cradle of the scientific development of medicine, and in early Greece the doctor had become a distinct person from the priest doctor. In response Mr. Steeler welcomed this opportunity to pay tribute to a country which had made such fundamental contributions to medicine. The toast of the guests was proposed by Mr. David N. Matthews, and Sir Ernest Gowers and Sir Cecil P. G. Wakeley spoke in response. At the close of the evening Mr. Steeler inaugurated the new president, Dr. J. N. Loring.

Society of Endocrinology.—The following officers have been elected: *chairman*, Dr. S. J. Folley, F.R.S.; *hon. secretaries*, Professor C. H. Gray and Professor N. F. MacLagan; *hon. treasurer*, Professor G. W. Harris, F.R.S.; *editor of Society's Proceedings*, Professor S. Zuckerman, F.R.S. *Ordinary members of committee*: Dr. T. Mann, F.R.S., Dr. C. J. O. R. Morris, Dr. I. W. Rowlands, and Dr. S. L. Simpson. Communications should be addressed to the hon. secretary, at the Department of Chemical Pathology, King's College Hospital, Denmark Hill, London, S.E.5.

Scientific Film Review.—This is a new quarterly review of scientific and medical films, prepared by the appraisal panels of the Scientific Film Association and published by the British Film Institute. The first issue published last month contains appraisals of 17 new films, two of which are medical. Specimen copies of the review can be obtained on application to the general secretary, Scientific Film Association, 164, Shaftesbury Avenue, London, W.C.2.

Toxicity of Industrial Solvents.—The Medical Research Council has published a revised edition of *Industrial Health Research Board Report No. 80*, "Toxicity of Industrial Organic Solvents." The revision has been carried out by Dr. Ethel Browning, who prepared the original report in 1937, under the general guidance of the Council's toxicology committee. The book will be invaluable to all industrial medical officers: it summarizes available information on the properties, use, and toxicity of 126 solvents in general use in industry. Each section of the book is completed by an extensive bibliography up to 1948, and there is a general index. (Pp. 411. Price 35s. net from H.M.S.O., York House, Kingsway, London, W.C.2.)

Examiners for F.F.A.R.C.S.—In our advertisement columns this week the Faculty of Anaesthetists of the Royal College of Surgeons invites applications for the appointment of examiner for the F.F.A.R.C.S. The subjects in which examiners are required are, for the primary examination, anatomy, physiology, pathology, and pharmacology, and, for the final examination, medicine, surgery, and anaesthetics.

Nepal has been admitted a Member State of the World Health Organization.

Léon Bernard Prize.—The Sixth World Health Assembly awarded the Léon Bernard Prize to Dr. Johannes Frandsen, director-general of the National Health Service of Denmark, on May 11. The prize is given for his outstanding achievement in the field of social medicine in his own country. Dr. Frandsen has directed the Danish Health Service since 1928.

Anglo-French Exchange Bursaries.—The following have been awarded bursaries for special studies in France, under the exchange scheme announced in the *Journal* on January 17 (p. 169): Mr. F. B. Cockett, senior lecturer in surgery, St. Thomas's Hospital; Dr. R. H. Gorrill, senior lecturer in bacteriology, St. Mary's Hospital Medical School; Dr. A. Macdonald, reader in bacteriology, Liverpool University; Mr. A. McPherson, 1953 Laming-Evans Research Fellow of the Royal College of Surgeons; Dr. J. W. F. Scrimgeour, senior obstetric registrar, Manchester; and Dr. E. C. Turton, tutor in electroencephalography, Bristol University.

Sir Daniel Davies has been created a Knight Commander of the Order of St. Sylvester by the Pope, for his services to the Roman Catholic Church. Particular mention is made of his services to Cardinal Griffin and to the Hospital of St. John and St. Elizabeth, St. John's Wood, London.

Surgeon Captain J. G. Holmes has been awarded the Gilbert Blane Medal by the Royal College of Surgeons of England for his work in the promotion of naval medical science and hygiene. The medal was founded in 1830 by Sir Gilbert Blane, F.R.S., who is best known for the sanitary reforms he introduced to prevent scurvy in the Navy.

Mr. David N. Matthews, vice-president of the British Association of Plastic Surgeons, is spending a week at Düsseldorf, lecturing and operating at the West German Plastic Centre. Dr. J. D. Ebsworth is accompanying him, to give the anaesthetics.

Dr. Bertram Mann, a consultant chest physician at Halifax, has been awarded a N.A.P.T. exchange scholarship to Canada. He will go there in September to study methods of tuberculosis control for three months.

Dr. J. R. Macintyre has been appointed a nominated member of the Executive Council of St. Helena.

COMING EVENTS

Bart's Coronation Ball.—The Coronation Ball of St. Bartholomew's Hospital is being held at the Royal Festival Hall on June 12 from 11 p.m. to 5 a.m. Tickets (£2 10s. double) are obtainable from the Ball Secretary, Abernethian Room, St. Bartholomew's Hospital, E.C.1.

United Hospitals Festival Choir.—A Coronation Concert is to be held on June 24 at the Royal Festival Hall at 7.45 p.m., when the Choir, accompanied by the London Symphony Orchestra, will give a performance of "The Messiah." Tickets (price 12s. 6d., 10s., 7s. 6d., 5s., and 3s. 6d.) are obtainable from the Royal Festival Hall Box Office.

Simpson Smith Lecture.—Sir Clement Price Thomas will deliver the Simpson Smith Lecture on June 11 at the Medical Society of London, 11, Chandos Street, Cavendish Square, London, W.1, at 4.30 p.m. His subject will be "Benign Tumours of the Lung."

St. Cyres Lecture, 1953, will be delivered by Professor J. McMichael in the Barnes Hall of the Royal Society of Medicine, 1, Wimpole Street, W.1, on June 12 at 5 p.m. His subject will be "Right Ventricular Failure."

National Association for Maternity and Child Welfare.—The annual conference will be held at St. Pancras Town Hall, Euston Road, London, N.W.1, from June 10 to 12. The theme will be "Education for Parenthood." The speakers will include Dr. Jean Mackintosh, Dr. John Burton, and Dr. Catherine Crane. Tickets (price £1 1s.) may be obtained from the secretary, N.A.M.C.W., Tavistock House North, London, W.C.1.

NEW ISSUES

British Journal of Preventive and Social Medicine.—The next issue (Vol. 7, No. 2) will be available in a week's time.

Journal of Clinical Pathology.—The next issue (Vol. 6, No. 2) will be available in a week's time.

These journals are issued quarterly. In each case the annual subscription is £2 2s., single copy 12s. 6d.

Abstracts of World Medicine.—The May issue (Vol. 13, No. 5), which is now available, contains abstracts of important papers on both medical and surgical subjects drawn from the medical literature of some 20 different countries and of all five continents. In addition to clinical medicine and surgery, the subjects covered include pathology, bacteriology, pharmacology, and chemotherapy, and there are also sections dealing with medical genetics, public health and industrial medicine, toxicology, anaesthetics, radiology, and the history of medicine.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; a specimen will be sent free on request.

The above journals and *Abstracts of World Medicine* are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, May 25

EDINBURGH UNIVERSITY.—At University New Buildings, 5 p.m., Dr. Douglas Guthrie: Witchcraft and Witch-Doctors.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. Irving S. Wright: Observations in Peripheral Vascular Disease.

Tuesday, May 26

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. D. I. Williams: Erythrodermia.
●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 4.30 p.m., Dr. A. H. Harkness: Non-specific Infections in Male and Female.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Imperial Cancer Research Fund Lecture by Professor G. Hadfield: Hormones and Human Breast Cancer.
ROYAL EYE HOSPITAL.—5 p.m., Mr. T. M. Tyrrell: Traumatic Surgery of the Eye and Adnexa.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY, St. Mary's Hospital Medical School.—5 p.m., Almroth Wright Lecture by Professor C. L. Oakley: Site of Production of Antibodies.

Wednesday, May 27

EUGENICS SOCIETY.—At Royal Society, 5.30 p.m., Professor D. Baird and Miss E. M. Scott, M.A.: Intelligence and Childbearing.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Clefts, Vesicles, and Bullae.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Brigadier J. S. K. Boyd, F.R.S.: Phage Typing in Epidemiological Investigation.
ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Neurology.

Thursday, May 28

EDINBURGH UNIVERSITY.—At University New Buildings, 5 p.m., Dr. Douglas Guthrie: Ancient Drugs and Modern Remedies.
EPSOM AND SUTTON INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At Belmont Hospital, Sutton, 8 p.m., Dr. A. S. Thorley and Dr. W. W. Kay: Prolonged Deep Coma; Dr. L. Minski: Legislation and the Aggressive Psychopath; Dr. C. C. Evans: Recent Advances in Electro-encephalography.
●HAMPSHIRE GENERAL HOSPITAL.—3 p.m., Dr. Una C. Ledingham: Common Mistakes in General Practice; 4.15 p.m., Mr. J. C. R. Hindenach: Pain in Shoulder and Arm.
INSTITUTE OF CHILD HEALTH.—5 p.m., Professor S. van Creveld (Amsterdam): Clinical Significance of New Clotting Factors.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. I. W. Whimster: Developmental Anomalies, Hyperplasias, and Tumours of Neuro-ectodermal Derivatives in the Skin.

NUFFIELD ORTHOPAEDIC CENTRE, Wingfield-Morris Orthopaedic Hospital.—8.30 p.m., Dr. A. X. Cavadias: The Vasculature of Bone and the Healing of Fractures: An Experimental Study.
●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor R. V. Christie: Chronic Bronchitis and its Complications.
ROYAL EYE HOSPITAL.—5.30 p.m., Miss M. Savory: Ocular Tumours.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor Z. M. Bacq (Belgium): Chemical Protection against Ionizing Radiation; Therapy of Radiation Sickness.

Friday, May 29

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. G. B. Dowling, Dr. P. D. Samman, and Dr. J. E. M. Wigley.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., discussion for general practitioners by Mr. W. S. McKenzie: Indications for Tonsillectomy.
LEEDS REGIONAL PSYCHIATRIC ASSOCIATION.—At Oulton Hall, near Wakefield, 3 p.m., Dr. J. Valentine: Plans for Mental Health in the Region.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor C. F. W. Illingworth: Bleeding Peptic Ulcer.
●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. Patricia Benedict (Boston): Amenorrhoea, Types and Diagnosis.
ROYAL EYE HOSPITAL.—5.30 p.m., Professor C. A. Keel: Local Anaesthetics.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Obstetric and Gynaecological Conference on Puerperal Infection. Speakers, Dr. Melvin Ramsay and Professor Robert Cruickshank.

APPOINTMENTS

DAVIES, D. J., M.B.E., M.D., D.P.H., County Medical Officer of Health and School Medical Officer, Pembrokeshire.
FRANCIS SYDNEY GRAHAM MCKENZIE, M.B., Ch.B., Medical Superintendent, Royal Infirmary, Edinburgh.
FORSTER, ALBERT, M.B., B.S., D.P.H., Medical Officer of Health, Chester-le-Street Urban and Rural District Councils; Area Medical Officer, Durham County Council.
SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—L. S. A. Boothroyd, M.B., B.S., F.R.C.S., Surgical Registrar, Taunton and Somerset Hospital; A. G. Moffoot, M.B., Ch.B., F.R.C.S., Surgical Registrar, Royal Cornwall Infirmary, Truro; R. R. Knowles, M.B., B.S., D.P.M. (Part I), Registrar in Psychiatry to South-western Region (Bristol Mental Hospitals); E. W. Hughes, M.D., M.R.C.P., Resident Physician, Trehid Chest Hospital, Camborne, Cornwall; J. M. Large, M.B., Ch.B., F.R.C.S.Ed., Senior Surgical Registrar to Thoracic Unit at Hawke Moor Chest Hospital, Bovey Tracey, Devon; L. S. A. Boothroyd, M.B., B.S., F.R.C.S., Senior Surgical Registrar, Exeter Clinical Area.
THOMAS, D. VERNON, B.Sc., M.B., B.Ch., D.A., Deputy Director of Anaesthesia, Strong Memorial Hospital, and Associate Professor of Anaesthesia, University of Rochester School of Medicine, Rochester, New York.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Crawford.—On May 9, 1953, at the Jessop Hospital for Women, Sheffield, to Dr. Barbara (formerly Moore), wife of Dr. Colin K. Crawford, a son.
Hotchkis.—On May 13, 1953, at Aberfeldy Cottage Hospital, Perthshire, to Jean, M.B., Ch.B. (formerly Smout), wife of Alistair Hotchkis, Balgowan, Pitlochry, Perthshire, a daughter.
Price.—On April 24, 1953, at The London Hospital, London, E., to Vina, wife of Dr. J. L. Price, a daughter—Susan Vina.
Stewart.—On May 11, 1953, at Beech Hill Nursing Home, Barnstaple, Devon, to Eunice, M.B.E., wife of P. B. Stewart, D.F.C., M.B., M.R.C.P., a son.

MARRIAGES

Moos—Jungalwalla.—On May 22, 1953, at Kensington, London, W., Jamshed Sorab Moos, M.D., M.R.C.P., to Perin Kaikobad Jungalwalla, M.B., B.S., D.T.M.&H.
Turner—Dence.—On May 9, 1953, at Tunbridge Wells, Kent, Winston M. L. Turner, M.D., M.R.C.P., to Helen M. Dence, M.R.C.S., L.R.C.P.

DEATHS

Cook.—On April 15, 1953, at Lyme Regis Hospital, Dorset, Philip Nield Cook, M.B., B.S.
Eadham.—On March 30, 1953, Joseph Eli Ellison Eadham, M.B., F.R.C.S.Ed., of Sleaford, Lincs.
Fell.—On April 19, 1953, at St. Mary's, Colchester, Essex, Alfred Nolan Fell, M.D., aged 75.
Hall.—On March 30, 1953, at 4, Shooters Hill Road, Blackheath, London, S.E., Sydney Octavius Hall, L.R.C.P.&S.Ed., L.R.F.P.S., Lieutenant-Colonel, R.A.M.C., retired.
Haslett.—On April 11, 1953, at Brookmeadow, Budleigh Salterton, Devon, Robert Woods Haslett, M.B., F.R.C.S.I.
Kent.—On March 30, 1953, at 3, Park Court, Barry, Glam, Percy Wheeler Kent, M.R.C.S., L.R.C.P., D.P.H.
Lee.—On March 29, 1953, John Robert Lee, O.B.E., M.D., F.R.C.S., of 39, Harley Street, London, W., late of Melbourne, Australia, aged 79.
Lund.—On March 24, 1953, at Cowper Cottage, Mundesley, Norfolk, Kenneth Fraser Lund, M.B., aged 82.
Massingham.—On March 31, 1953, at Lilac Cottage, Biddenden, Kent, Richard Massingham, M.R.C.S., L.R.C.P.
Metcalf.—On April 2, 1953, at Moor Lane, Sherburn-in-Elmet, Yorks, George Frederick Metcalf, L.M.S.S.A., aged 45.
Moorhead.—On March 21, 1953, at Truro, Cornwall, Robert Leishman Moorhead, M.B., C.M., of Birch Green, Haywards, Sussex.
Morris.—On April 17, 1953, Dennis Morris, M.R.C.S., L.R.C.P., of 671, Romford Road, London, E., and Bedford, aged 27.
Robinson.—On March 29, 1953, at Whitley Bay Rest Home, 4, Camp Terrace, North Shields, Amy Robinson, M.D., aged 73.
Simpson.—On February 18, 1953, in a nursing-home, Reading, Berks, Lilian Gertrude Simpson, L.R.C.P.&S.Ed., L.R.F.P.S.
Soden.—On March 31, 1953, at The Little House, Ditchling, Sussex, Wilfred Newell Soden, M.C., M.D.
Stocks.—On March 24, 1953, at Ash Lea, Silverdale, Carnforth, Lancs, William Percy Stocks, F.R.C.S., formerly of Withington, aged 89.
Tandy.—On March 24, 1953, at 128, Shorncliffe Road, Folkestone, Kent, Oswald Cornwallis Stratford Tandy, M.B., Ch.B., D.P.H., aged 67.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Swine Erysipelas in Man

Q.—Can swine erysipelas infect man? What treatment is advised?

A.—The human equivalent of swine erysipelas is fairly common in butchers and others who handle material from infected animals. It is known as "erysipeloid," the name given to it by Rosenbach, although it was described and named "erythema serpens" by Morrant Baker many years earlier. The lesion is almost invariably on a finger or the hand, and resembles streptococcal erysipelas only in the fact that the skin is raised, indurated, and reddened. The colour differs, that of erysipeloid being a darker bluish-red, and extension proceeds much more slowly. The affected skin has a smooth shiny surface, and, owing to its thickening, the edge of the lesion is raised above the level of the surrounding skin. It produces a burning sensation with pronounced itching. If untreated, the disease may extend considerably and persist for weeks. It is rarely serious, but a complicating endocarditis, as in the pig, has been recorded, and arthritis is also said to occur. Isolation of the causative organism is difficult unless tissue is excised for cultivation, but those familiar with the disease have no difficulty in diagnosing it on clinical grounds. *Erysipelothrix rhusiopathiae*, the causative organism, is highly sensitive to penicillin, the administration of which is curative.

When to Operate on Internal Haemorrhoids

Q.—What are the indications for operation in cases of internal haemorrhoids? A patient has had three injections and still bleeds from her piles. What is advised?

A.—In cases of internal haemorrhoids prolapse is the chief indication for operation; continued bleeding at stool, despite adequate injection treatment, will also necessitate operation.

Most patients who are troubled only by bleeding are relieved by submucous injections of 5% phenol in almond oil. If, however, at the initial examination there is tendency to prolapse (i.e., the rectal mucosa can be made to appear by either drawing the perianal skin outwards or getting the patient to strain down), relief is likely to be only temporary. In cases with prolapse the longitudinal muscle of the rectum is stretched, and the submucous fibrosis produced by injection cannot correct this, although it may relieve bleeding.

In the case in question it is important to be sure that the blood is coming from the haemorrhoids. Presumably a preliminary sigmoidoscopy was done. This should be a routine investigation in all such cases. If there is any doubt about the source of the bleeding sigmoidoscopy should be repeated, and, if necessary, followed by a barium enema examination. If there is no doubt about the diagnosis, then it may be that the injections have not been adequate. Apart from actual relief of symptoms, a satisfactory injection result is indicated by palpable induration at the site of injection, as well as difficulty both in inserting the needle into the submucous space and in injecting more phenol, when the patient is re-examined after a fortnight. In the absence of such findings further injection must be considered. In the textbooks it is frequently stated that 1 to 3 ml. should be injected above the site of each haemorrhoid; but in practice it is common for the expert proctologist to use as much as 10 ml. at a time at each site. Most authorities would agree, however, that it is unwise

to inject more than 20 ml. in all at any one session. If thorough injection fails, then operation may be necessary.

Oestrogens and Vasomotor Rhinitis

Q.—Are oestrogens effective in cases of vasomotor rhinitis? A patient whom I have been treating for menopausal symptoms with dienoestrol has been completely relieved of long-standing severe nasal congestion.

A.—I know of no evidence that oestrogens have proved effective in the treatment of vasomotor rhinitis. Indeed, one would suspect that, theoretically, they should exaggerate the condition. Like other steroid hormones, such as deoxycortone, they lead to retention of water and salt. This is especially noticeable in connexion with the "sexual skin" (of the vulva and perineum) of monkeys, which becomes markedly oedematous during the oestrus phase of the ovarian cycle. Oestrogens have been employed, and in some instances success has been claimed, in the treatment of atrophic rhinitis. Here it is argued that the nasal mucosa may be a female secondary sex organ—hence epistaxis as a sign of "vicarious menstruation"—and that the atrophic nasal mucosa may resemble the post-menopausal atrophic vaginal mucosa, which can be stimulated by oestrogens to show proliferative changes. Vasomotor rhinitis is often an allergic manifestation, and there is evidence that it responds to A.C.T.H. or cortisone therapy.

Food Value of Ice-cream

Q.—What is the composition and food value of the commoner forms of ice-cream sold in this country?

A.—Ice-cream considered as typical in the technical literature is said to contain 3.8 g. of protein, 12.6 g. of fat, and 19.6 g. of carbohydrate per 100 g. of the moist material, which adds up to a total of 207 calories. A typical commercial mix in the dry state could be made up with 40% of full cream dried milk, 45% of fat and sugar combined, 10% of soya flour, and 5% of various "food additives," such as glyceryl monostearate and the seaweed products agar and sodium alginate. The "food additives" are needed to make the ice-cream smooth and stable; by applying them skilfully it is possible to make a saleable product with a low percentage of fat, which is the most expensive constituent. Ice-cream made from dried milk and containing a good proportion of fat is certainly a highly nourishing form of food. Its use can be criticized only when its purchase uses up money which would otherwise be devoted to buying milk or other cheaper dairy products. In ice-cream of poor quality additional cereal products, such as wheat-flour and oat-flour, are sometimes included in place of the dried milk, which reduce the nutritive value of the product as a source of animal protein. Water ices, made of flavoured fruit juice, or artificial substitutes, have practically no nutritive value, but they are readily distinguishable from ice-cream. Some proprietary forms of ice-cream give a frothy fluid on melting, which suggests that the mixture is whipped up with air to give as much bulk as possible in the frozen state.

Aedes Albopictus and Yellow Fever

Q.—Is *Aedes albopictus* a potential vector of yellow fever? Has it been found naturally infected, or has it been only artificially infected under laboratory conditions?

A.—*Aedes albopictus* may be classed as a potential vector of yellow fever because, in addition to a number of other culicine mosquitoes, it has been proved to be capable of transmitting the virus by its bite. The evidence, however, is from laboratory experiments, not from the discovery of natural infections. In 1929, Dinger, Schüffner, Snijders, and Swellengrebel obtained *A. albopictus* from Java, and in their laboratory at Amsterdam were able to transmit yellow fever virus from monkey to monkey by the bite of this

mosquito.¹ More recently (in 1943) Schüffner² repeated the transmission and noticed that the virus became attenuated when passed by *A. albopictus*, so that mortality among the infected monkeys dropped from 100 to 20%.

REFERENCES

- ¹ Kumm, H. W. (1931). *The Geographical Distribution of the Yellow Fever Vectors*. Baltimore, *American Journal of Hygiene Monograph Series*.
² Nauck, E. G., et al. (1948). *FIAT Review of German Science, 1939-1946: Tropical Medicine and Parasitology*, p. 138.

Epidural Analgesia

Q.—What are the principal indications for sacral epidural analgesia?

A.—Sacral epidural injections of local analgesics are made for three main reasons. First, the procedure is carried out to produce analgesia for operations on the perineum or in the pelvis, although there is no reason why, if sufficient local analgesic is injected, the operation should not be anywhere in the body below the first cervical nerve root. Epidural analgesia is held to have advantages over spinal analgesia in that the risk of subarachnoid infection is eliminated, there is said to be less sympathetic paralysis and therefore circulatory upset, and there is a negligible incidence of neurological complications like headache. Apart from these considerations, the method can be considered similar in its effects and indications to that of spinal anaesthesia.

Secondly, the method is used, in the United States in particular, to provide analgesia during childbirth. The possibility of certain complications like extradural infection, broken needles, or inadvertent subarachnoid injection, and a very high forceps rate from the obstetrics point of view, as well as the need for sufficient personnel to supervise the administration, have together militated against its popularity in this country.

Thirdly, sacral epidural injection of certain long-acting analgesic solutions like "proctocaine" is used to abolish or diminish pain in pelvic carcinomatosis. A less common reason for doing this block is as an alternative to lumbar sympathetic block whether for diagnostic or therapeutic purposes.

Tuberculin Testing in the Presence of Active Disease

Q.—Are there any grounds for the belief that tuberculin testing may cause a severe exacerbation if active tuberculous disease is present? Should testing be avoided if there is strong suspicion of infection?

A.—There is no danger in any of the standard methods of tuberculin testing. The dose of tuberculin that is used in skin-testing is only a fraction of the amount that would be required to produce a general reaction. The usual procedure if there is a strong suspicion of infection is to test first with a Mantoux 1 tuberculin unit (1/10,000) and only to use stronger tests when this has proved negative.

Repellents for Wasps and Bees

Q.—Is there any effective wasp and bee repellent for use by persons hypersensitive to their stings?

A.—Many attempts have been made to discover repellents that would be effective against wasps and bees, but so far without success. Dimethyl phthalate, which has proved so successful against mosquitoes and other biting flies, is not effective as a bee repellent.

NOTES AND COMMENTS

Aspermia.—Mr. R. H. BOYD (London, W.C.1) writes: In "Any Questions?" (May 2, p. 1005) there is an able summary of the investigation and treatment of a case of azoospermia in answer to a question on aspermia, which is absence of semen and not absence of spermatozoa. This is a common mistake even among experts. Aspermia does occur, but is the finding in under 0.1% of males, whereas azoospermia is found in 7%. Aspermia

may be due to absence, or inflammatory obliteration, of the seminal vesicles; to retrograde ejaculation into the bladder; or the non-emission may be the result of sympathectomy for hypertension—potency not being affected; etc. In all probability, however, the question does really refer to azoospermia. Bayle is quoted as an opponent of testicular biopsy on account of blockage of the vasa efferentia by haemorrhage. In a large series of bilateral biopsies on cases of oligozoospermia there has not been one instance of this. And, indeed, biopsy is the most useful accepted method of investigation. It is not needed in cases of bilateral gonococcal epididymitis, where spermatogenesis can be safely assumed. In this group the success rate from epididymovasostomy is indeed high, approaching Bayle's 66%, but in no other cause group can these figures be reached. The operation is worth doing, but the patient must expect little more than a 10% or at most 20% chance of cure.

OUR EXPERT writes: As Mr. Boyd suggests, experts do indeed differ. I certainly would not agree to his definition of aspermia as the absence of semen. For this the term "seminal anorrhoea" or, more simply and better still, "failure of ejaculation" should be used. A distinction is sometimes, though I think not altogether necessarily, drawn between aspermia (implying the total absence of elements derived from the germinal epithelium) and azoospermia (meaning the absence of mature spermatozoa). I have no strong views on the danger of testicular biopsy, but merely quoted the point that Bayle raises. I agree that the likelihood of efferential blockage resulting must be small. I would further point out that Bayle's 66% success rate is in *surgically suitable cases only*, most of which—as Mr. Boyd says—have a gonococcal aetiology. In point of fact, suitability for surgery can be determined only at the time of operation.

Allergy to Condoms.—Mr. L. LANDAU (director, London Rubber Company, Ltd.) writes: I note with interest your answer to a question under the heading "Allergy to Condoms" ("Any Questions?" May 2, p. 1006). I have in the past investigated a considerable number of similar cases, and agree with you that in this particular case we are dealing with sensitivity to rubber. I am, however, of the opinion that this developed sensitivity is not due to any of the chemicals used but to the rubber itself. Chemicals used in the manufacture of rubber protectives—namely, vulcanizing agents, accelerators, antioxidants, stabilizers, and dusting powders—are quite harmless, and I have so far not seen a single case where a patch test carried out with any of these materials resulted in a positive reaction. Occasionally, however, minute traces of alkaline substances, potassium carbonate or triethanolamine, may be left in the rubber and result in irritation. These substances, however, produce an unmistakable soda dermatitis, an effect different from that described by your correspondent.

OUR EXPERT writes: Mr. Landau's experience is completely contrary to my own and, indeed, to all the recorded cases that I know of. The rubber dermatitis that occurred from contact with respirators during the recent war was almost, if not quite invariably, due to the chemical processing of the rubber rather than to the rubber itself. It was regularly remedied by an official arrangement of providing a different type of respirator in such cases. Quite recently a case where rubber sensitivity was due to benzothiazole has been recorded.¹ I think Mr. Landau will also find upon inquiry that dermatitis in rubber workers, as distinct from rubber users, is also due not to rubber but to chemicals used in processing.

REFERENCE

- ¹ *Proc. R. Soc. Med.*, 1952, 45, 491.

"Any Questions?" Book: Second Series.—This is now available, price 7s. 6d. (postage 6d. extra), from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 6 1953

FACTS AND FANCIES ABOUT CANCER OF THE LUNG*

BY

D. W. SMITHERS, M.D., F.R.C.P., D.M.R.

Director of the Radiotherapy Department, Royal Cancer Hospital; Radiotherapist, Brompton Hospital for Diseases of the Chest

The startling rise in the recorded death rate from cancer of the lung and the implication of one of our favourite indulgences as chief culprit have suddenly made this a matter of public interest, which is no doubt the reason why this topic was selected for me. It is perhaps as well to remind ourselves, however, that the rise in the recorded death rate which is causing so much public concern to-day was already well established before the first world war, though it was only after it was over that the dramatic increase occurred. Even if we go back to King and Newsholme in 1893, we see that they were then maintaining that the registered increase in cancer deaths was due to improved diagnosis and better death certification. Adler in 1912, in his famous monograph, attacked the current opinion that malignant neoplasm of the lung was rare and maintained that this was a common disease which a physician might meet "any day in his practice amongst the young as well as amongst the old."

Doctors in England and Wales by 1949 were writing "cancer of the lung" on death certificates 25 times more often than they had been doing in 1912. There is no doubt to-day that the lung is one of the commonest sites in the human body for primary as well as for secondary malignant disease. The work that has been done in recent years makes it clear that some real increase in lung cancer has occurred in many parts of the world. What is not at all clear at present is the extent of that increase.

Much of the recorded rise can be accounted for. The number of persons living in England and Wales has gone up by 7½ millions in the past 40 years, and the age distribution has so changed that 21 persons in every 100 alive to-day are over 55 years of age, while only 12 persons in every 100 were over 55 then. The number of doctors resident in this country has also increased in this period from 25,000 to 48,000, which is a change from about 1,400 persons per doctor to about 900. The recorded death rate from cancer as a whole has been increasing over the years, and although the lung has shown the most spectacular rise it has not been alone in this. Death rates from cancer of all sites taken together are steeply graded with increasing urbanization (Stocks, 1947), and they vary directly with the number of doctors per 100,000 people (Green, 1926). If you take the recorded

*A shortened version of a B.M.A. Lecture delivered in Manchester on November 14, 1952. Much of the first part dealing with incidence, predisposing factors, and post-mortem records has been omitted, as these aspects of the subject have since been dealt with far more comprehensively, if with some differences in emphasis, by Dr. Richard Doll in his Milroy Lectures, 1953, to be published shortly.

death rate from lung cancer per million persons living, by age and sex, and plot this on a logarithmic scale, you will see that the curve for each age group has almost the same overall slope, showing that the proportionate increase in death rates has been much the same at all ages (Stocks and MacKay, 1946). The rise has been recorded predominantly in men over 45 years of age, being most pronounced in those dying between the ages of 55 and 74, the age group which already had the largest death rate.

The sudden interest in this subject and the recent accumulation of many new facts has led to a fine display of fancy. The different fancies that people have about the same facts usually depend on their training and outlook. What the clinician so readily attributes to his diagnostic skill the research worker is apt to believe may well be due to the action of a specific carcinogen. Both need to take particular notice of the way their natural bias is apt to lead them and to remember their responsibility to an anxious and ill-informed public when they publish their views on serious problems of fatal disease.

Diagnosis

We are well aware that a revolutionary improvement has taken place in the diagnosis of lung cancer. It would be a most extraordinary thing if the rise in the recorded death rate which has accompanied this had no relation to it at all. The symptoms of bronchial carcinoma are common and non-specific. Doctors in practice inside and outside hospitals see large numbers of patients who complain of cough, many with dyspnoea, a number with haemoptysis, and not a few with pain in the chest. Many of these patients are past their first youth, but only a few have bronchial carcinomas.

In the same year that Röntgen discovered x rays, Killian used an instrument to remove a piece of bone from a bronchus, and in 1898 first wrote about his method of direct bronchoscopy. This was demonstrated in England in 1902. It was in 1917, when Chevalier Jackson first removed a tumour bronchoscopically, that the importance of this procedure as a means of diagnosis of bronchial neoplasms was recognized, but it was not until the 1930s that bronchoscopy became a common form of examination even in special chest hospitals. Bronchoscopies were performed at the Brompton Hospital in the 1920s by Sir James Dundas Grant, with the patient sitting in a special chair in the ear, nose, and throat room, but a search of the operating theatre records reveals only one bronchoscopy done there by the

surgeons between 1908 and 1925. In the next four years there were 29, and in 1930, 28; while the number to-day is over 800 per annum, or an average of nearly three in every full working day.

Improvement in the treatment of patients with chest infections has permitted more of them to recover from the pneumonia which may be associated with a bronchial carcinoma, and has also led to a change of thinking on the part of doctors who see patients with pneumonia who have failed to respond to treatment. The immense increase in diagnostic radiological examination of the chest has been another no less important factor in the diagnosis of bronchial tumours in the period since the 1914-18 war. The most rapid increase in registration of lung cancer deaths did not, in fact, occur until the modern facilities for diagnosis of this disease became generally available. Even to-day, however, the accuracy of the diagnosis of bronchial carcinoma in the country as a whole and the reliability of death certification from this cause must still be under grave suspicion.

In 3,280 cases of lung cancer registered from 46 centres in England and Wales during 1945 and 1946 (Stocks, 1950) only 11% had had post-mortem confirmation of the diagnosis and only 38% of the total had had any histological examination. The difficulties of diagnosis are considerable. Even with post-mortem examination mistakes can be made. We have found four cases in the past few years in which the post-mortem examination was in error, and three others in which the death certificates differed from the post-mortem findings.

In two of the first four cases, one was said to have had a primary carcinoma of the kidney and the other of the pancreas, both with widespread metastases. When we received these death certificates, in accordance with the usual practice of the joint consultation clinic for neoplastic disease of the Brompton Hospital and Royal Cancer Hospital, we sent a copy of our notes to the pathologists concerned to ask if there was any evidence that the primary might have been in a bronchus as suspected by us during life. In both these cases further examination of the slides induced the pathologist to change his diagnosis to primary bronchial carcinoma. In the second two cases a diagnosis of non-malignant disease of the bronchi was made; in one of these, further sections were cut at our request nearer to the bronchial wall and the presence of a carcinoma was confirmed; and in the other—a coroner's post-mortem examination following a street accident—the fact that the patient had a completely collapsed and contracted left upper lobe was not noticed by the pathologist and no piece was removed for examination from the tumour site (from which we had already obtained a positive section).

In the other three cases the diagnosis was made at post-mortem examination, but incorrect death certificates were signed beforehand by doctors who did not know the whole story, and these still remain as the official record at Somerset House. One was certified as dying of pulmonary tuberculosis, when, in fact, a carcinoma of the bronchus was present; another of carcinoma of the bronchus, although this diagnosis had been rejected during life and careful search at necropsy revealed only bronchiectasis in the lungs with no sign of recurrence of an old carcinoma of the rectum excised some years before; and the third of carcinoma of the bronchus, although multiple metastases from a primary carcinoma of the common bile duct was the diagnosis reached by the pathologist who performed the post-mortem examination.

An analysis of differences between the diagnoses made in hospital and those put on death certificates is interesting. Those patients who died in our hospitals naturally had death certificates in accordance with our diagnosis, and all those who died elsewhere had at one time or another had a letter giving our diagnosis sent to their doctors. In

respect of agreement between clinical diagnosis and death certification, therefore, ours is a specially selected group in which close agreement should be expected. A number of differences still occurred, however (Table I).

TABLE I.—Analysis of Differences between Diagnoses on 591 Death Certificates and Those Made at the Brompton Hospital and Royal Cancer Hospital Joint Consultation Clinic, 1944-50

1. Diagnosis of Bronchial Carcinoma Accepted at the Clinic			
	Death Certified for Some Non-malignant Disease	Death Certified for Some Other Malignant Disease	No. of Death Certificates Examined
(a) With histological confirmation	5	12*	330
(b) Without histological confirmation	5	7†	224
Total	10	19	554

2. Diagnosis of Bronchial Carcinoma Rejected at the Clinic, Death Certified as Bronchial Carcinoma

Reasons for Rejection			No. of Death Certificates Examined
Insufficient Evidence of Primary Site	Diagnosis of Tumour of Some Other Site Established	Diagnosis of Some Non-malignant Disease Accepted	
12	3‡	6	37

* Four were certified as dying with metastases from unknown primary site, 3 (all with recurrent laryngeal palsy) as dying from cancer of the larynx, 2 as mediastinal tumour, and one each as cancer of the liver, rectum, and pancreas.

† Four were certified as dying from mediastinal tumour, one as metastases from unknown primary site, and one each as larynx and bone primary tumours.

‡ One had a carcinoma of the breast and one a carcinoma of the bile duct, both with lung metastases, and the third a disseminated reticulum-cell sarcoma.

Prior to the 1914-18 war it was unusual for a diagnosis of bronchial carcinoma to be made before death. Nearly all the cases reported came from the post-mortem room records. Only 6 of Sehr's 178 cases collected in 1904 had been diagnosed correctly during life. Ferenczy and Matolcsy (1927) found only 2 out of 40 (5%) diagnosed during life from 1896 to 1900, 18 out of 80 (22.5%) from 1907 to 1916, and 44 out of 150 (29.3%) from 1917 to 1925. In 84 post-mortem examinations of patients with lung-cancer made in a large hospital with a thoracic unit, Willis (quoted by Kennaway and Kennaway, 1947) found that the diagnosis made before death had been wrong in 35, or 42%. In Denmark—where the post-mortem examination rate is higher than in most other countries—Clemmensen and Busk (1947) found that of 564 patients recorded as dying of lung cancer there had been a post-mortem examination in 47%, the clinical diagnosis of lung cancer before death in this group being regarded as certain in 37%, uncertain in 26%, unknown in 15%, and not given in 22%. Even in 1952 McConnell, Gordon, and Jones, collecting 100 patients with lung cancer for a study of their smoking habits, had to reject 24 of their original cases because of proved errors in diagnosis in 11 and suspected errors in 13.

At our joint consultation clinic we had 821 patients referred to us with a diagnosis of lung cancer from 1944 to 1950. All these patients had already been seen by specialists in thoracic disease and had undergone a thorough investigation—including x-ray examination in all cases, bronchoscopy in most, and thoracotomy in some—and yet we have so far rejected the diagnosis in no fewer than 95 (8.6%) of them, and will probably reject it in more as the result of the repeated review of the evidence on which each patient's diagnosis rests which we make in the light of what happens over the years. If the 112 patients with this diagnosis seen during the same period at the Royal Cancer Hospital but not at the joint clinic are added, the number in which the diagnosis has been rejected is raised to 115.

From the large pool of patients dying with symptoms common to many chronic lung and heart disorders, an increasing number are being labelled "lung cancer" on a decreasing post-mortem examination rate for the total, despite a rising post-mortem rate for those dying in many hospitals. There is a wide variation in the degree of uncertainty with which this diagnosis is made. Death from respiratory disorders is comparatively common, from lung cancer comparatively rare. Without taking any account of patients dying from cardiac disease with similar symptoms there would still have been little difficulty in losing our entire present lung cancer death rate in the general death rate from respiratory disease in the past if these cases were really there to lose (see Chart).

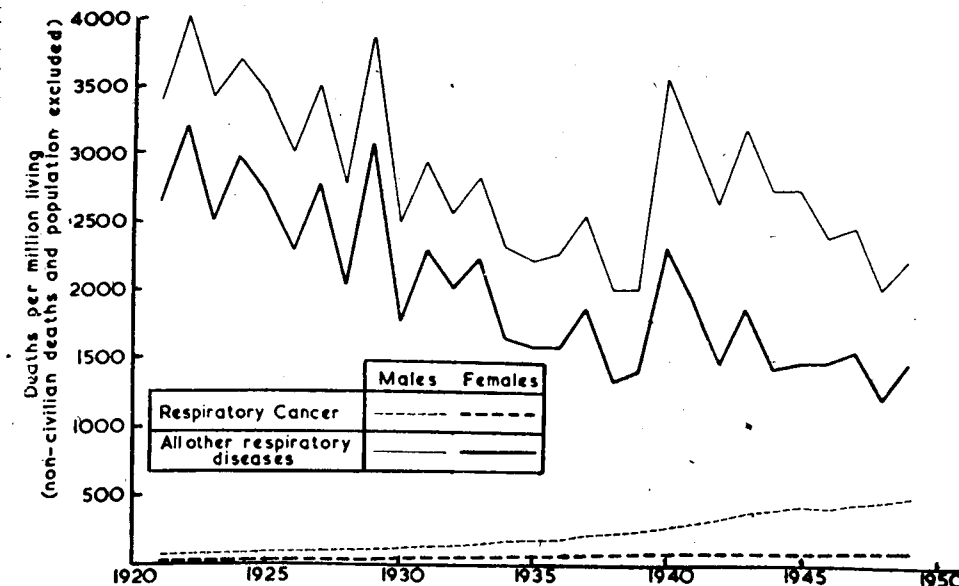
Treatment

Your view of the effect of treatment on patients with lung cancer depends (like most things in life) on the way you look at it. If you see over 13,000 deaths in 1951 on a steeply rising curve, and estimate that probably fewer than 250 pneumonectomies for lung cancer were performed in that year, that it is unlikely that more than 1,000 radical courses of x-ray treatment were given for this disease, and that the five year survival rate for the whole group is likely to be no more than a fraction of 1%, you may well feel hopeless about the situation. If you see an extremely difficult problem both in early diagnosis and in treatment in an often rapidly fatal disease which is at last being tackled with some success, you may take a more optimistic view. The fact is that at present we offer no effective treatment at all to most patients with lung cancer. Mackenzie (1939) estimated that 95% were not treated; and Tod (1949), ten years later, found that 87% of patients registered with lung cancer in Bradford were still receiving no treatment. In our special group of 818 patients with a diagnosis of lung cancer accepted who were sent to us for treatment in hospital from 1944 to 1950, we judged that we could do nothing helpful with surgery or radiotherapy for 24%, despite our anxiety to try at least to relieve symptoms whenever possible, and in only 28% was it possible for us to make an attempt at radical treatment by surgery or x rays.

It was, however, 20 years ago this April that Evarts Graham, starting to do a lobectomy on a 48-year-old doctor and finding no satisfactory interlobar fissure, boldly did the first successful pneumonectomy for bronchial carcinoma. This patient is, I believe, still working as an obstetrician in Pittsburg, and there are hundreds of patients who have followed this one. Nevertheless, it is still unfortunately most difficult to find out what surgery really has to offer, since the standard of recording the results of treatment in patients with cancer is so deplorably low. Despite the large numbers involved it is hard to find papers which provide information on the subsequent history of which groups of patients with bronchial carcinoma, which include all those seen at one hospital over a period of years, which say how these patients were selected, and which express the survival of those treated surgically in terms

of the group as a whole. I know of no such report in this country. There nearly always seems to be some important piece of information missing.

Ochsner, DeCamp, DeBailey, and Ray (1952) give a full account of 308 patients with lung cancer observed for more than five years after treatment. They do not say over what period these patients were seen, but we may presume that none were omitted. In this group 32% were resected and 6% lived five years (19% of those resected). No patient lived five years without resection. The percentage of patients who are suitable for resection when first seen varies greatly from hospital to hospital, according to the way the patients are selected. Whereas with Ochsner *et al.*, for instance, 35% were resected, at the Brompton Hospital in 1951 this was possible only in 18% of the total of 256 new patients with bronchial carcinoma seen in that year. The survival rates at five years for those resected vary around the 20% mark, but the rate in terms of all the new patients seen in hospitals is a great deal lower, and in



Crude annual death rates for cancer of respiratory system compared with similar rates for all other respiratory diseases (1921-49). (Taken from the Registrar-General's Statistical Reviews of England and Wales.) Since 1940, when multiple causes were certified, deaths have been assigned to the cause selected by the certifying doctor instead of by arbitrary rule.

terms of the recorded death rate for the whole country is still pathetically small.

Mass miniature radiography may bring a few more patients to hospitals in the early stage. Overholt (1950) has been enthusiastic about its possibilities, and has reported 145 patients in whom lung shadows were detected; of these, 51 were due to tumours, 35 of which were malignant. He believes that no more than 10% of patients with lung cancer are operable by the time symptoms appear, and that mass surveys may offer many the chance of operation in the silent phase and so set treatment ahead by months or years.

All patients with lesions discovered on survey and sent promptly for treatment have been resectable in his clinic, and 75% have shown no signs of lymphatic spread. It would be interesting to know how many pneumonectomies were performed for patients with asymptomatic non-malignant conditions and what happened to them afterwards. Overholt does say that of one group of 12 patients explored four were found not to have lung cancer. We have not been fortunate with our few cases found by surveys. Most have volunteered for examination because they were already worried about their chest, and the delay in reaching hospital for treatment when something abnormal was shown usually destroyed what value the examination might have had. Only 5 out of 27 sent as the result of surveys had been

symptom-free when x-rayed, and the average delay in receiving treatment after the radiograph had been taken was more than four months.

Radiotherapy is frequently said to have little effect on survival. That patients have survived for many years following radiotherapy for proved lung cancer is established; that this is a rare occurrence and that a few patients survive for these long periods untreated is also true. With many errors in diagnosis the claims of a few successes cannot be accepted without the most rigorous inquiry. From the point of view of survival following treatment most publications on the value of radiotherapy are therefore quite useless. When the few operable cases are taken away there is not much left for the radiotherapist to treat which presents him with even a reasonable chance of success. When we rightly doubt the diagnosis as soon as one of our patients lives for a year or more and reject all those which do not seem certain, no very impressive survival rate is to be expected. It is possible that pre-operative x-ray treatment (a trial of which I have advocated for some years, and which I have suggested might at least be given while the patient is on the waiting-list for a surgical bed) may have some value in increasing the resectability rate and reducing the risk of metastasis. We have treated too few this way to have learnt much, but the results in our small group are set out in Table II. An examination of the lungs in

TABLE II.—Patients with Bronchial Carcinoma Treated with Pre-operative Irradiation and Pneumectomy

Age	Sex	Radiotherapy: Date Treatment Finished and Dose Given	No. of Days Before Pneumectomy	Subsequent History	Length of Survival Since First Treatment
45	M	December, 1947. 5,800 r in 36 days	68	Alive and well September, 1952	4 years and 10 months
26*	F	March, 1949. 6,000 r in 44 days	112	Alive and well November, 1952	3 years and 8 months
33	M	November, 1949. 6,300 r in 41 days	72	Died May 16, 1950	6 months, died
59	M	March, 1950. 2,700 r in 19 days	8	Died October, 1950	7 months, died
52	M	March, 1950. 2,400 r in 26 days	22	Alive and well August, 1952	2 years and 5 months

* This patient had a positive section before treatment, but no residual tumour was found in the lung at operation.

these patients may also give us information, in time, about what might be expected from irradiation in the small favourable group at present treated surgically. Another possible extension of combined treatment is the implantation of radioactive gold grains at thoracotomy in patients found to have inoperable growths.

Survey of 933 Patients

Here is a brief account of what has happened to all the patients registered at the Royal Cancer Hospital from 1945 to 1950 who either came to hospital with a diagnosis of bronchial carcinoma or in whom such a diagnosis was later made. These patients have mostly been seen in the joint consultation clinic held with the Brompton Hospital (Brooks, Davidson, Price Thomas, Robson, and Smithers, 1951), and all those seen at this clinic from 1944 to 1950 are included. In this series there are 933 persons—521 with histological confirmation of the diagnosis accepted, 297 without histological confirmation but with the diagnosis accepted on clinical grounds subject to review, and 115 in whom the diagnosis has been rejected (in 11 despite positive pathological reports, Table III). There are therefore 818 patients with an accepted diagnosis of bronchial carcinoma. Only 35 of these were treated surgically, the low proportion (4%) being due to the fact that the main source of supply (726 patients) was through our reference clinic, which is for patients already judged unsuitable for surgery. Of these 35 surgical cases 10 were alive three years or more after treatment. A radical course of x-ray therapy was given to

TABLE III.—Eleven Patients with a Diagnosis of Bronchial Carcinoma Confirmed Histologically and then Rejected Clinically, 1944–50

Pathological Report Given On	Sex and Age	Pathological Reports	Reason for Rejecting Diagnosis
Piece obtained at bronchoscopy	M 38	Squamous-cell carcinoma	Living 8 years after radiotherapy. Section review doubtful
	M 54	Oat-cell carcinoma	Necropsy. Lung and brain abscesses only
	F 61	Undifferentiated carcinoma	Living 3½ years later with adenoma of bronchus
	F 58	Squamous-cell carcinoma	Operation revealed fibroma. First section found to have belonged to another patient
Piece removed with a drill	M 68	Oat-cell carcinoma	Living 4½ years after radiotherapy. Section review doubtful
Lymph node removed from neck	F 50	Squamous-cell carcinoma with pigment. Malignant melanoma. (Two pathologists)	Living 4½ years after radiotherapy to mediastinal mass; no further lymph node enlargement
Sputum	M 65	Squamous-cell carcinoma	Lived 3½ years after radiotherapy
	M 36	Oat-cell carcinoma	Necropsy. Hodgkin's disease
	M 36	Carcinoma cells	Living 4½ years after radiotherapy
	M 48	Oat-cell carcinoma	Living 2 years after small dose of x rays
	M 66	Clumps of carcinoma cells	Living 2½ years without treatment

192 patients, and 6 of these were alive three years or more after treatment (Table IV). The most interesting fact is perhaps the survival rate in the group where the diagnosis was rejected.

Really ill patients with bronchial carcinoma seldom benefit from radiotherapy—which may well add to their discomfort while prolonging their dying—but antibiotics may control infection and allow many more patients to be relieved of distressing symptoms by radiotherapy than was possible in the past. To my mind the relief of superior vena-caval obstruction or of haemoptysis and the appreciable lessening of cough, dyspnoea, or pain is well worth achieving. I hold the view that providing such relief is one of the most important functions of a doctor. Too many general practitioners, remembering the past, when irradiation sickness was a commonplace, local reactions were severe, and relief of symptoms was unusual and of short duration, seem to

TABLE IV.—Survival Times for 933 Patients Registered at the Royal Cancer Hospital in whom a Diagnosis of Cancer of the Lung was at One Time Made, 1944–50

821 Patients seen in the Joint Consultation Clinic with the Brompton Hospital, 1944–50, and 112 Patients seen at the Royal Cancer Hospital only, 1945–50.

Treatment	No. of Patients	Survived More Than			Remarks
		1 Year	2 Years	3 Years	
Surgical	35*	20	14	10	1 still living at 7 years. 1 still living at 6 years. 1 still living at 7 years
Radical x-ray therapy	192	66	17	6	
Palliative x-ray therapy	321	45	12	2	Mostly for the relief of one specific symptom only
Chemotherapy only	75	8	1	0	Some patients having x-ray treatment also had chemotherapy
Not treated	195	11	1	0	Mostly advanced cases with little prospect of symptomatic relief
Total	818	150	45	18	
Diagnosis rejected on review	115	50	28	24	One pneumonectomy, 3 lobectomies, 42 x-ray therapy, 3 chemotherapy, 66 not treated

* Five with pre-operative irradiation (two alive over three years); 12 with post-operative irradiation (all died under three years).

me to be far too ready to deny their less debilitated lung-cancer patients the benefits of the treatment which is available to them to-day. We have started an investigation in conjunction with the general practitioners who send patients to us, to try to assess how far the palliative treatment given has been worth while. We are anxious to know what quality of life these patients lead before death and how they die.

Surgery offers a real chance of cure to the fortunate few, but does not at present do more than begin to touch the fringe of the problem presented by the thousands of patients dying with lung cancer. Radiotherapy is shouldering the burden of treatment to an increasing degree, and is doing useful work in relieving suffering in a way which is not possible at present by any other means, and is still not sufficiently available to all who need it. Chemotherapy with the nitrogen mustards has so far, in my experience, added nothing to this group of patients to compensate for the general ill effects it has produced, let alone done anything to advance treatment.

Conclusions

The startling rise in the recorded death rate from lung cancer is in large part due to change in numbers and age of the population and to improved diagnosis. It is due in part to a real increase, but we are not yet in a position to say how great that real increase is.

The size and the difficulty of this problem are clear to us all. Although the five-year survival rate for the fortunate few who are operable when they first reach hospital has risen from nothing to between 20 and 30% in 20 years, and while much can be done with x-ray treatment to relieve suffering and sometimes prolong life for the less fortunate ones who are, nevertheless, still in fairly good general condition, there are still thousands of these patients each year for whom no real attempt at treatment is being made. Since we all have to die, since some 90,000 people are doing so each year with lung symptoms, and since this number is falling well, we should ask ourselves how far we are performing a useful service by helping to make a public issue of a comparatively small change within that group, which may be in large part due to our own method of recording. We should not be too readily swayed by those who demand that the public be told "the truth" while we are still attempting to sort the facts from the fancies for ourselves, especially since "the truth" when told may not appear to them in at all the same light as it does to us. Anthony Hope once wrote that "telling the truth to people who misunderstand you is generally promoting a falsehood."

The moment the word cancer is mentioned to the public (of which doctors are but a part) emotion is aroused and any calm objective view of the value of evidence presented becomes most difficult. It is important that the medical profession take note of this difficult problem of lung cancer and help to deal with it more efficiently, but it is also important that they do not make matters worse by merely joining in a cry and in-make the alarm. A sensible view of the relationship of smoking to this problem, for instance, should be and, after some wild comments in the lay and medical press, is now being presented to the general public; but no comparable effort seems to be going into an endeavour to persuade the authorities to cleanse the air of our industrial towns. As a profession which speaks so much and so rightly of the need to allay the cancer fear we should beware of putting extravagant accounts of rising cancer death rates and their causes before the public,

especially when neither the magnitude of the one nor the degree or responsibility of the other has yet been fully established.

I am greatly indebted to Sir Clement Price Thomas and Dr. Kenneth Robson, the other members of our joint consultation clinic at the Brompton Hospital and the Royal Cancer Hospital, for allowing me to use material collected from our records. Dr. J. R. Bignall, a research fellow jointly with the Institute of Diseases of the Chest and the Institute of Cancer Research, who is attached to our clinic, has kindly obtained much other information for me from the Brompton Hospital records; and Mr. P. M. Payne, the research fellow in medical statistics in the Radiotherapy Department of the Royal Cancer Hospital, helped me with the chart and tables. I am grateful to Miss J. Thompson and Miss M. Jeffries for the considerable amount of work which they did in the records department and library while we were preparing the original lecture of which this paper formed a part.

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FACTORS IN THE MORTALITY OF CLOSED HEAD INJURIES

BY

WALPOLE LEWIN, M.S., F.R.C.S.

Assistant Neurological Surgeon, Radcliffe Infirmary, Oxford
(From the Accident Service, Radcliffe Infirmary, Oxford)

It has been estimated that in this country every year road accidents account for over 20,000 cases of head injury severe enough to require admission to hospital. Their number and mortality are matters of some concern. Mortality figures for non-missile head injuries vary widely, depending on the selection of cases and on the circumstances in which the particular series is compiled, but most clinics in this country and abroad quote rates of 12–20%, and emphasize that in 60–70% of the fatal cases death occurs within the first twenty-four hours. These early deaths are due frequently to the severity of the brain lesion, but there is a danger of assuming too readily that such is necessarily the case and of failing to recognize those complications for which treatment may be effective. Some early fatalities—and later ones too—are due to intracranial haematomas; and there are other cases in which extracranial factors such as chest complications are responsible.

The remarkable capacity of the brain to recover from or compensate for the effects of injury has also to be remembered. Thus, aphasia and hemiplegia are com-

monly seen in the early days after injury, but they do not frequently cause permanent disability. Patients with very severe lacerations of the brain may survive for days or weeks. Brain-stem lesions carry a high mortality, but even with them recovery is possible: in the present series one patient with clinical evidence of such a lesion remained unconscious for six months following injury, and thereafter made a steady recovery, so that ten months after the accident she was talking and was later able to return home and look after her family.

Such observations make it pertinent to inquire more closely into the immediate causes of death in these cases, even though in the last analysis the head injury may have been responsible, and to seek ways in which the mortality may be reduced. Broadly speaking, the factors responsible may be divided into four groups: (1) the effect of the injury on the brain itself; (2) intracranial complications, particularly haemorrhage, and to a less extent oedema and infection; (3) extracranial factors such as chest complications, fat embolism, and metabolic disorders; and (4) injuries elsewhere in the body and other incidents, as, for example, cardiovascular complications precipitated by the injury.

Many of these factors are interrelated, but in this paper attention is directed especially to three factors which previous experience had indicated were important in the mortality rate of head injuries and for which treatment may be effective—namely, intracranial haematoma, chest complications, and metabolic disorders.

Case Material

Between November, 1948, and February, 1952 (three and a quarter years), 1,000 patients were admitted to the accident service of the Radcliffe Infirmary, Oxford, with closed (non-missile) head injuries. As this hospital is the only one in Oxford to receive such cases and all accident cases are admitted to this service, the opportunity was taken to study an entirely unselected group of head injuries admitted direct from the scene of the accident. These numbered 821. The remaining 179 cases were transferred from other hospitals in the region for further treatment of a major head injury or a suspected complication.

Intracranial Haematoma

Although extradural, subdural, and intracerebral haematomas develop in no more than a small proportion of head injuries (6.2% in this series*), their recognition is important, for they are essentially acute operative problems and also carry a high mortality rate. A review a few years ago showed that when all cases, including those disclosed only at necropsy, are considered the average mortality from extradural haematoma was 50% and from acute subdural haematoma over 60% (Lewin, 1949).

The diagnostic problem was emphasized by James and Turner (1951), who found that in their district more patients died of untreated intracranial haematomas than were coming under their care. Recognition of them is not always easy, but, as a general guide in management, once the conscious level of a patient has begun to improve following the injury, then one should anticipate a steady recovery, even though this recovery may be arrested at any stage for hours, days, or weeks. Any deterioration in the patient's condition, whether it be in the level of his consciousness or in the development of fresh neurological signs, or both, should raise the question of an intracranial clot and lead to exploration if there is any doubt of the diagnosis. A full appre-

*62 patients with haematomas in the total series. Among the direct admissions there were 32, an incidence of 3.7%.

ciation of the patient's conscious level and neurological state at the outset of treatment is the foundation for further management.

In practice the indications for exploratory burr-holes are usually clear-cut, and this useful procedure need not be applied indiscriminately. Thus in this series 97 patients were explored; in 56 an intracranial clot was disclosed, and in 8 a subdural hygroma—a proportion of positive to negative exploration of 2:1. In a further 9 patients exploration disclosed raised intracranial pressure from the effects of cerebral contusion and oedema, and led to a decompression being performed. Within this same period there were four patients in whom a clot was disclosed at necropsy. These four patients remained in deep coma from the time of injury until death; in two there was a subdural haematoma with cerebral contusion, the patients dying one hour and three hours after injury; in one there was an extradural haematoma on the one side and a subdural haematoma on the other, with cerebral contusion and a fractured base, the patient dying six hours after injury; and in the fourth patient, who died 56 hours after injury with clinical evidence of a brain-stem lesion, there was, in addition to bruising of the pons and mid-brain, a frontal intracerebral clot. It is not the purpose here to discuss whether surgical treatment in these patients could have affected the issue, but to record that they had intracranial clots and to emphasize that it is in this group of patients who remain in coma from the outset that so many of the diagnostic difficulties lie.

Extradural Haematoma

In only half the cases of extradural haematoma is the march of events in any way classical and uncomplicated by other factors. In the others there is, in addition to the extradural clot, severe cerebral contusion or clots in other situations. These patients are usually unconscious from the outset, and this accounts for many of the diagnostic problems. Thus there were 29 patients with extradural clots in this series, of whom 23 recovered and 6 died—a mortality of 20%. Of these 29 cases 12 were complicated by other factors; 5 of these were fatal (one undiagnosed, see above), and at necropsy all showed severe cerebral contusion with a fractured base. These patients are very worrying and may tax all the resources of a neurosurgical unit. Thus three of the seven recovered patients in this group required

TABLE I.—Intracranial Haematoma in 1,000 Cases of Closed Head Injury (69 Haematomas in 62 Patients, of whom 43 Recovered and 19 Died. Gross Mortality, 30.6%)

Type	Single Haematoma		With Subdural		With Intracerebral		With Extradural		All Cases		
	R	D	R	D	R	D	R	D	R	D	Total
Extradural	21	2	2	3*	0	1	—	—	23	6	29
Acute subdural (<14 days after injury)	13	9†	—	—	0	1	2	3	15	13	28
Chronic subdural (>14 days after injury)	3	0	—	—	0	0	0	0	3	0	3
Intracerebral	4	3*	0	1	—	—	0	1	4	5	9

R = Recovered; D = Died.

* Includes 1 case disclosed at necropsy.

† Includes 2 cases disclosed at necropsy.

two or three operations before they finally improved. However, the remaining 17 cases of extradural haematoma were uncomplicated and only one was fatal: the patient stopped breathing as he came into the admission room, and did not recover, although the extradural clot was evacuated immediately under artificial respiration. It should be remarked that 10 of these 17 patients were operated on at a time when their pupils were equal and reacting. A dilated pupil in these circumstances is not so much a sign of extradural haematoma as an indication of impending death.

Delay in operating also results in an increase in the mortality: extradural haematoma is one of the few surgical emergencies in which success or failure is so dependent on the time factor. For example, if there has been a short

lucid interval of up to four hours, and then a rapid onset of coma with a dilated pupil, exploration should be made at once. The melancholy fact is that the patients in this group, untreated, are usually dead within six hours of the onset of coma and are probably beyond recovery for some time before this.

Another point concerns the nature of the exploration. It is not sufficiently realized that nearly one-third of these clots (in this series 31%) occur in sites other than temporal—frontal, parieto-occipital, or cerebellar—and the teaching that a temporal burr-hole is necessarily the correct exploratory site leads to these clots being missed. The site of scalp bruising and laceration, and the position of a fracture line, are reliable guides to the site of the haematoma, and burr-hole exploration should be made accordingly.

Thus, although there will always be an appreciable mortality in extradural haematoma for the reason that nearly half the cases are complicated by other brain lesions, with timely surgery the mortality from an uncomplicated extradural clot should be low.

Acute Subdural Haematoma

By contrast, acute subdural haematoma, by which is meant a haematoma coming to operation or necropsy within 14 days of injury and large enough to be causing cerebral compression, usually accompanies cerebral contusion and laceration, and is therefore associated with a correspondingly high mortality rate. Of 28 patients in this series with acute subdural haematoma, 15 recovered and 13 died—a mortality rate of 46%. Doubt has been expressed whether surgery has anything to offer during the first 24 hours after injury in these cases, in which deterioration in the patient's condition is so often due more to the cerebral lesion than to the pressure of the clot; but it is difficult to see how in some cases such a differentiation may be made clinically. It is safer to explore when there is evidence of compression and also of deterioration in the patient's condition. The mortality at this time is certainly high: of 12 patients operated on within the first 24 hours, three recovered and nine died. However, three patients did recover, and in retrospect this number might well have been increased by at least two if an early tracheotomy had been recommended in one patient and a further decompression performed in the other—points which illustrate the interdependence of the various factors present in the acute head injury.

Decompressive Operations.—Burr-hole drainage of the clot may be enough if the haematoma is fluid and is very large, but in our experience there have been several cases in which this proved inadequate and the underlying cerebral contusion and oedema has required a decompression. Thus in the 20 patients of this series with acute subdural haematoma in whom at operation no clot other than the subdural was found, a bony decompression was performed in 11, in addition to drainage of the surface haematoma. Six of the 11 patients so treated recovered, and it was estimated that in at least 8 of the 11 patients the underlying brain damage was as much a factor in their clinical picture as the surface clot. There are also some cases of cerebral contusion without gross haematoma in which the bruising and oedema lead to raised intracranial pressure and steady deterioration in the patient's condition. A timely decompression in these cases may prove helpful; of nine such patients in this series in whom a decompression was provided by a bone flap or a subtemporal craniectomy, five recovered.

The high mortality of this severely injured group of patients may have resulted in a too conservative swing in their management, and the fact that some of these patients may be saved by early surgery requires reconsideration.

Acute Traumatic Intracerebral Haematoma

Comparatively little attention has been given to the possibilities of surgery in this condition, but with the help of angiography in suspected cases in the future it should

be possible to diagnose these haematomas more often and to attempt treatment. Small intracortical clots and lacerations filled with clot are common enough, but these intracerebral clots are truly subcortical and usually measure 5 cm. or more in diameter. They may occur at all ages and in brains with apparently healthy vascular trees. There were nine such cases in this series. Decompression alone would seem inadequate for their treatment as judged by the fatal issue in the three patients in whom this was done; on the other hand, four of the five patients in whom the clot was evacuated through a cortical incision recovered.

Chest Complications

Intracranial haematomas are uncommon, but, unfortunately, chest complications are all too common, and almost the rule in any case of prolonged coma. They are undoubtedly the cause of many deaths after head injury, and this is not surprising when we remember the ways in which the chest may be involved soon after injury. Thus there may be an associated chest injury with haemothorax and pneumothorax. A serious head and chest injury is a very lethal combination; there were 15 such cases in this series, with six recoveries and nine deaths.

The second way, and by far the commonest, is by the inhalation of vomitus or of blood from a fractured base during the early hours after the injury, when the patient is still comatose. Such a calamity is promoted by the almost invariable rule of transporting these patients on their backs, and by nursing a comatose patient with his head elevated in order to lower his intracranial pressure. This it may do, but the small benefit derived is nothing compared with the fatal risks of such a position. Massive inhalation may result in pulmonary collapse and immediate death, but a treacherous condition may also arise in those patients who do not die immediately. The main air passages may have been cleared by suction or by coughing, but blood and vomitus remain in the small bronchioles. The resulting areas of peripheral pulmonary collapse and oedema leave the patient with a diminished pulmonary reserve, and then a further minor incident may be terminal.

A third complication is pulmonary fat embolism, seen usually in patients with multiple injuries and coming on some hours after the injury. There have been at least eight such cases in this series, and there were probably others which were not detected.

Fourthly, there is the hyperacute pulmonary oedema secondary to brain-stem compression, a condition well known to neurosurgeons and which has recently been produced experimentally by Cameron (1948). Its sudden onset, with the production of quantities of thin blood-stained fluid, may be as dramatic as is its relief if the intracranial pressure can be reduced as by evacuation of a clot.

The lungs, therefore, are particularly susceptible following head injury, and, in those patients who survive these early complications, secondary bronchopneumonia or even lung abscess may develop later, or may follow as a result of prolonged coma.

Effect on the Brain.—The effect of the head injury and the accompanying unconsciousness on the lungs is not, however, the only problem. Anoxia and chest infection have a profound adverse effect on the brain, perhaps especially after recent injury. The brain cannot tolerate even a few minutes' anoxia (Howkins *et al.*, 1946); yet this is a not infrequent risk following head injury, with the upper respiratory tract filled with secretions and the patient cyanosed and breathing rapidly and irregularly. Moreover, it has been recognized for a long time that infection elsewhere in the body adversely affects a neurological lesion: witness the loss of tone in a paraplegic patient who develops a urinary infection, or the access of neurological signs in the child with a cerebellar tumour who develops an incidental infection. In patients with head injuries the same obtains. Onset of chest infection halts recovery and may also result in a deterioration of the patient's mental condition.

Treatment of Chest Complications

To mitigate the effects of these chest complications the basic treatment for the unconscious patient in this series has been nursing, prophylactic penicillin, and oxygen. The first essential was to obtain an unobstructed airway 24 hours a day. The patients were nursed flat from the outset, lying on their side, and, if that was not completely satisfactory, in the semi-prone or "tongue" position. They were turned from side to side two-hourly. Suction was available at the bedside of all patients in coma so that the nurse could easily clear away secretions in the nose and mouth with a soft rubber catheter. Physiotherapy twice daily to favour full expansion of the lung bases was also given, and if there was difficulty in clearing the upper respiratory tract efficiently there was no hesitation in giving these patients the benefit of full postural drainage with the foot of the bed elevated for short periods. These methods were supplemented where necessary by the use of simple airways, and oxygen was given intermittently or, in the severest cases, continuously.

In these ways it was possible to prevent and treat many of these chest complications. Although it is difficult to present reliable figures, the use of antibiotics has undoubtedly helped to prevent and to lessen the effects of chest infection.

Tracheobronchial Toilet

In some cases in which the obstruction extended down into the trachea and bronchi it was not possible to clear them by the measures described above. In this event the anaesthetist has sucked out the main air passages either by a catheter passed down the trachea directly or through an endotracheal tube which was afterwards removed. These methods proved valuable in the early hours after the accident and were also successfully employed in eight patients at a later phase of their illness. In a further three patients, bronchoscopy was successful in relieving a lobar collapse.

Where it became necessary to intubate a deeply comatose patient soon after admission and the airway was found to be unsatisfactory without the endotracheal tube, it was sometimes left in for some hours. Endotracheal intubation in these circumstances is useful, but experience has shown that it is unwise to continue this method for many hours, particularly if it looks as if the patient may survive the immediate effects of the brain injury and is likely to remain in coma for some days. The tube becomes encrusted with secretions and is less effective; and frequent endotracheal intubation leads to oedema of the pharynx and larynx with ulceration, so that ultimately the respiratory embarrassment is aggravated rather than relieved.

Tracheotomy

It was in such circumstances that tracheotomy was first employed in March, 1949. In this series 13 tracheotomies were performed. In none have we regretted doing it, and in some we wished it had been done earlier. There have been no complications following this operation, even though many of them were performed when the patients were desperately ill. In some instances the operation took place in the patient's room so as to disturb him as little as possible. The figures in regard to ultimate recovery are not impressive, since this resulted in only 3 of the 13 patients; but this emphasizes that operation was considered only in the severest cases, and the benefit of special nursing which was available to all these patients rendered the number of cases in which the question of a tracheotomy arose relatively few. It is perhaps more important to observe that in all cases any chest infection present cleared up once the tracheotomy was performed, and the improvement in the patient's condition was usually immediately apparent; it became easy to clear the trachea adequately, there was no further trouble with the airway, and the patient could now be nursed with the head elevated if desired. It was striking to observe a bilateral bronchopneumonia resolving rapidly

after tracheotomy. Another feature noticed was the long survival of some patients with severe brain injuries who had a tracheotomy. Thus it was possible to nurse four patients in coma for periods of eight to twelve weeks and two others for periods of a year without chest complications.

To date, of 18 patients who have had tracheotomy performed, nine improved to such a degree that the tube could be removed; of these, four recovered satisfactorily and two are still improving. In patients from whom the tube was removed the stoma closed quickly without complications.

The experience of these first cases suggests that tracheotomy is a valuable adjunct in the treatment of selected cases, although one would deprecate its use save in the severest head injuries, for simpler measures and good nursing will usually suffice. An early tracheotomy should be seriously considered in patients who have survived the early hours but are likely to remain in coma for some days, and in whom respiratory incidents are beginning to appear. It is useless to wait until the patient is in *extremis* and has already suffered the effects of anoxia. Some of our early cases were operated on too late. Of the last four patients who underwent tracheotomy only one died, and necropsy of that patient showed a normal respiratory tract. Similar experiences of tracheotomy have been reported from America by Echols *et al.* (1950), who advise it in cases in which coma is likely to persist more than 24 hours, and in which other methods of maintaining an adequate airway are inefficient.

Results

Table II summarizes the chest complications present in this series. The total incidence was 6.7%, which includes every case at necropsy in which anything more than mild

TABLE II.—Chest Complications in 1,000 Cases of Closed Head Injury

Chest Complication	Recovered	Died		Total
		Main Cause of Death	Contributory	
Injury	6	4	5	15
Bronchopneumonia	10	5	11	26
Pulmonary collapse	4	3	5	12
Pulmonary oedema	1	—	4	5
Lung abscess	—	1	—	1
Fat embolism	2	1	5	8
Total	23	14	30	67

basal oedema was found. Thus 30 cases were listed as "contributory" in view of the necropsy findings, even though clinically there was no evidence that the lung changes played an important part in causing death. However, the fact that nearly half of all the fatal cases showed significant lung changes illustrates the importance of this extracranial factor.

Metabolic Disorders

It has been known for a long time that disturbances of fluid and electrolytic balance may arise in comatose patients, but their nature and the extent to which they are present in patients with head injuries who survive the early hours after injury have been little studied. The dangers of dehydration, whether from inability to administer fluids adequately to the unconscious patient, or as a result of over-zealous application of dehydration as a method of treatment in head injuries, have been recognized (Munro, 1938). Cumings (1942) reported some cases of uraemia following head injury; and earlier in this series (Higgins *et al.*, 1951) it was observed that some patients developed a striking disturbance of chloride balance characterized by retention of this ion in the blood without a corresponding excretion in the urine.

It was decided, therefore, to study biochemically a consecutive series of patients who after the first 24 hours following injury remained sufficiently unconscious to require tube feeding, and to follow their progress until recovery of

consciousness or death. It may be mentioned here that our general routine of treatment was to pass a small rubber oesophageal tube or polythene tube through the nose 12 to 24 hours after injury, and to administer fluids, three to four pints (4.7 to 2.3 litres) during the first day, and thereafter increasing the amount as required. All our patients were fed by mouth, and it was not found necessary to resort to intravenous drips for feeding purposes. The details of the treatment and the full biochemical findings are described elsewhere (Higgins *et al.*, in press).

Table III summarizes the results. The high incidence of transient disorders such as glycosuria and changes in the plasma proteins, which in general corrected themselves without specific treatment, were of interest, since they provided

TABLE III.—Metabolic Disorders in 76 Unconscious Patients

	No. of Patients
Normal	8
Transient disorders	50
Proteinuria	32 of 44 patients examined
Raised blood urea	22 of 50
Low plasma protein	22 of 50
Glycosuria	13 of 50
Major disorders	18
Hyperchloraemia and hypochloruria	9
Hypochloraemia and hyperchloraemia	5
Water deprivation	2
Respiratory alkalosis	2
Renal uraemia	3
Total	76

further evidence of the general systemic disturbance which may follow head injury, although they were of little importance therapeutically. On the other hand, the 21 major metabolic disorders which developed in 18 patients deserve further comment, for, from earlier experience with these disorders and with the results of similar disturbances in cases unassociated with head injury, it would appear that they are not usually correctable spontaneously and are associated with a high mortality. It is believed, therefore, that the successful therapeutic correction of these disorders in 12 of the 18 patients, with recovery of seven patients, played a part in lowering the overall mortality, although it will be appreciated how difficult it is in such a complex setting to ascribe recovery or death to any one single factor. Water deprivation was uncommon in this series owing to the policy of giving fluids early, and in those cases in which therapeutic dehydration was employed the effect of this treatment on the patient was carefully watched.

It is not proposed to discuss here the causes of these metabolic disorders. Some certainly follow coma from whatever cause, but clearly the possibility of a central factor in some cases of head injury has to be borne in mind. Further work requires to be done on these metabolic changes, but the evidence suggests that the patient's fluid and electrolytic requirements are important aspects of his treatment and that the time has come when their assessment, at least in severe head injuries, should be made in conjunction with our biochemical colleagues.

Multiple Injuries

In addition to his head injury a patient may sustain other injuries which may influence considerably not only the prognosis of the case but also its management. Thus among 821 direct admissions there were, excluding those patients with simple contusions and lacerations, 269 cases with injuries in addition to the head injury—an incidence of 32.7%. Of these 269 patients 27 died, and, as indicated in Table VI, it was concluded that in seven cases at least death was due mainly to these other injuries. In 107 patients there were two or more injuries in addition to the head injury. Table IV indicates the principal injuries sustained. Fractures of the face and limbs were the commonest injuries. It was clear that the ready availability of specialist services within the framework of an accident service for the many problems that arose in their management proved an important factor in the successful outcome of many cases.

TABLE IV.—Other Injuries Sustained by 269 Patients with Head Injuries (All Direct Admissions. Incidence 32.7%)

Injury	No. of Cases
Fractures	332
Face (malar only, 50; nasal bones only, 20; maxillae, 37)	107
Upper limb (clavicle, 40; shoulder, 14; humerus, 6; forearm and wrist, 35; hand, 13)	108
Lower limb (pelvis, 15; femur, 17; knee, 6; leg, 32; foot, 5)	75
Spine (body, 15; processes, 10)	25
Thorax (ribs only)	17
Chest (12 with rib fracture)	13
Abdomen	8
Spinal cord and peripheral nerves, without fracture	8
Eyes	7
Major facial lacerations and soft-tissue injuries	15
Total	383

One difficulty in the management of the unconscious patient who has multiple injuries is the recognition that other injuries are present, fractures of the spine and pelvis and injuries to the chest and abdomen being easily missed unless systematically looked for; another is to decide which injury should take precedence of treatment and to accept in some cases a compromise between what is ideal for the particular injury and what is practicable in the circumstances. One should not accept unnecessary delay in the treatment of other injuries merely on the grounds that the patient has had a head injury, for this may delay recovery from shock and increase the risks of infection; but it is also important, particularly in the early hours after injury, to avoid, if possible, procedures which may interfere with the essential management of the unconscious patient or mask the developing signs of an intracranial complication.

Results

Table V summarizes the results in this series. The overall mortality was 9%, weighted by the higher mortality of those selected cases transferred from other hospitals with severe head injuries and complications. Of the 821 patients admitted directly from the accident 62 died, a mortality of 7.5%.

TABLE V.—Mortality in 1,000 Consecutive Cases of Closed Head Injury

	Cases	Deaths	%
Direct admissions	821	62	7.5
Transferred cases	179	28	15.6
Total	1,000	90	9.0

Cause of Death.—The cause of death in the 62 fatal cases among the unselected group has been assessed on the clinical evidence and necropsy findings (Table VI). A

TABLE VI.—Cause of Death in 62 Direct Admissions

Cause	No. of Cases
Head (cerebral contusion, 38; intracranial haematoma, 7; cerebral haemorrhage from vascular disease precipitated by minor head injury, 3)	48
Chest complications (pulmonary collapse (inhaled vomitus), 2; bronchopneumonia, 3)	5
Other injuries (chest, 4; ruptured liver, 1; multiple fractures, 2)	7
Other causes (coronary thrombosis, 1; hypertensive cardiac failure, 1)	2
Total	62

necropsy was performed in all but three cases. Although there were seven deaths due mainly to other injuries, two others from heart disease, and three in which the clinical and necropsy evidence left little doubt that intracranial haemorrhage from cerebrovascular disease had been precipitated by a trivial head injury, these have nevertheless been included in the total number of deaths, for a more complete account is then given of the many problems involved in accident work. Where there has been any doubt about the main cause of death the rule has been to ascribe it to the head injury. The three patients who died mainly from bronchopneumonia were all over 70 years of age. Of the 45 patients who died directly as a result of the head injury, five died within one hour of the accident.

Mortality of Head Injury.—To set alongside these figures one should mention those patients with minor head injuries who were treated in the casualty department and then sent home, and also those who died before reaching hospital. Within the period under review at least as many cases were treated in the casualty department for minor head injuries and sent home as were admitted. With the kind help of the local authorities it has also been found that during this same period 12 patients died of head injury on the roads before they reached hospital. One estimates, therefore, that the mortality of cases of head injury severe enough to be admitted to hospital was certainly well below 10%.

It may be encouraging to note that whereas the gross mortality of the first 500 cases in this series was 11.4%, in the last 500 cases it was 6.6%, and this lower figure has been maintained to date. The series would have to be extended much further, however, before one could conclude that this apparent improvement was due to anything other than extraneous circumstances.

Summary and Conclusions

Attention is drawn to the frequency and mortality of head injuries, and it is suggested that in addition to the immediate effects of the brain injury there are other factors, some of which are preventable or amenable to treatment, which play an important part in the mortality rate. The paper is based on 1,000 consecutive cases of head injury admitted to an accident service in the last three and a quarter years.

Intracranial haematoma developed in 3.7% of an unselected series. The need for urgency in the evacuation of extradural haematoma, and the incidence of these clots in sites other than temporal, are stressed. The value of decompression in some cases of acute subdural haematoma and in certain other cases, and the possibilities of surgery in acute intracerebral haematoma, are discussed.

Chest complications are common in head injuries and account for many deaths. Their causes and treatment are outlined. The use of tracheotomy in selected cases is described.

Evidence is presented to show that metabolic disorders may develop in these patients. It is suggested that their management, and attention to the patient's fluid and electrolytic requirements in the light of the biochemical findings, may help in lowering the mortality rate.

Injuries to other parts occur in over 30% of cases. Their frequency and variety illustrate the advantages of treating head injuries within the framework of an accident service.

The overall mortality of the 1,000 cases was 9%. Among the 821 unselected cases there were 62 deaths, a mortality of 7.5%.

It is concluded that there are several ways by which the mortality rate of head injuries may be reduced. Although further attention to intracranial complications is required, it is believed that as much benefit will be derived from the prevention and treatment of some of the extracranial factors.

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The problem of head injuries remained one of Sir Hugh Cairns's prime interests throughout his career. It was my privilege to have had the benefit of his advice and constant help throughout this study, and I wish to record my debt to him.

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STREPTOMYCIN RESISTANCE IN PATIENTS WITH PULMONARY TUBERCULOSIS PREVIOUSLY TREATED WITH P.A.S. ALONE

BY

F. W. A. TURNBULL,* M.B., M.R.C.P.Ed.

A. T. WALLACE, M.D., D.P.H.

SHEILA STEWART,* B.Sc.

AND

J. W. CROFTON, M.D., F.R.C.P.

(From the Department of Tuberculosis and Diseases of the Respiratory System, University of Edinburgh)

In the treatment of pulmonary tuberculosis with streptomycin alone the emergence of strains of tubercle bacilli resistant to the drug is well known. That the same thing happens when isoniazid is used alone is now established (Medical Research Council, 1952a). But the possibility of resistant strains emerging when cases of pulmonary tuberculosis are treated with sodium or calcium para-aminosalicylate (P.A.S.) alone has received much less attention. This is perhaps partly because of the less rapid emergence of resistant organisms when an attempt is made to induce P.A.S. resistance *in vitro* (Steenken and Wolinsky, 1950) and partly because of the greater technical difficulty of the resistance tests. Nevertheless, the emergence of P.A.S.-resistant strains in a large proportion of treated cases has been reported in the literature. Some of these reports are summarized in Table I.

The results suggest that P.A.S.-resistant strains may emerge at a later period of treatment than is usual when streptomycin or isoniazid is used alone, but that, with prolonged treatment, they are isolated from a notable proportion of patients who remain sputum-positive. It is logical to imply that if these patients are later treated with streptomycin and P.A.S. in combination P.A.S. will no longer prevent the emergence of streptomycin-resistant tubercle bacilli. This probability has often been emphasized but is still ignored by many clinicians, partly perhaps because no direct evidence has, so far as we know, been provided. In addition it has been suggested that resistance to P.A.S. is transient and, by impli-

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TABLE I.—Some Previous Reports of the Emergence of P.A.S.-resistant Tubercle Bacilli in Cases Treated with P.A.S. Alone

Authors	Total No. of Cases	Percentage from which P.A.S.-resistant T.B. Isolated	Period of Treatment (Days)
Delaude <i>et al.</i> (1949)	5	100	157-251
Medical Research Council (1950)	37	32	<84
Carstensen (1950)	79	13	184-435
Véran <i>et al.</i> (1950)	20	75	56-182
Veterans Administration (1951)	36	20	<62
Espersen (1951)	11	73	40-354
Tempel <i>et al.</i> (1951)	37	51	<120

cation, not of importance to later combined treatment (Tempel *et al.*, 1951). It is the purpose of this paper to provide evidence that P.A.S.-resistant organisms may be isolated from a high proportion of patients treated with the drug alone and whose sputum remains positive, that the resistant organisms may persist in the sputum for many months after treatment has ceased, and that streptomycin-resistant organisms may emerge rapidly if such cases are later treated with both streptomycin and P.A.S.

Material and Methods

The first group consists of nine patients with pulmonary tuberculosis who were treated with streptomycin, 1 g. daily, and P.A.S., 20 g. daily, for at least three months. (In one the daily dose of P.A.S. had to be reduced to 15 g. daily for five days a week at the end of two months, but her organisms were already streptomycin-resistant.) All had elsewhere had treatment with P.A.S. alone for periods varying from 6 weeks to 16 months, the exact daily dosage being in most cases unknown. The interval between the end of the course of P.A.S. alone and the beginning of the course of streptomycin and P.A.S. in combination varied from a few days to 39 months. Estimations of the drug sensitivity of the tubercle bacilli isolated from these patients, and the results of serial cultures and sensitivity tests while under treatment with streptomycin and P.A.S., were compared with similar results from a second group of five patients who began streptomycin and P.A.S. in the same doses about the same time, but who had not previously received P.A.S. alone. All the patients were initially included in the current chemotherapeutic trials organized by the Medical Research Council (1953).

Cultures of the sputum were obtained on Löwenstein-Jensen medium before the beginning of the course of streptomycin and P.A.S. in combination. Further cultures were made at least at monthly intervals for six months. Streptomycin- and P.A.S.-sensitivity tests were carried out in liquid medium according to accepted techniques (Medical

TABLE II.—Pre-treatment Temperatures and Radiographic State

Case No.	Previous P.A.S. Alone	Pre-treatment Temperature*	Radiographic Classification, Pre-treatment	
			Cavitation†	Confluence‡
1	+	Moderate	+++	++
2	+	Afebrile	+++	++
3	+	"	+++	++
4	+	"	+++	+
5	+	Moderate	++	+++
6	+	Afebrile	+++	++
7	+	"	+++	+++
8	+	Moderate	+++	+++
9	+	High	+++	+++
10	0	Afebrile	++	++
11	0	Moderate	+++	+++
12	0	Afebrile	++	++
13	0	Moderate	+++	+++
14	0	Afebrile	+	+

* Graded as follows: At least 1 reading in pre-treatment week over 101° F. (38.3° C.)—High, over 99° F. (37.2° C.)—Moderate, none over 99° F.—Afebrile.
† Total diameters of cavities present 5 cm. or above=+++; 2 to 4.9 cm.=++; less than 2 cm.=+.
‡ Shadows confluent over three-quarters or more of one zone=+++; one-quarter to three-quarters of one zone=++; less than one-quarter of one zone=+.

Research Council, 1948, 1950). Tubercle bacilli were regarded as drug-resistant if they were inhibited only by at least eight times the concentration which prevented growth of the sensitive control organism H37Rv; that is to say, if their "resistance ratio" was eight or above.

Comparability of the Two Groups.—The patients in the two groups were investigated with respect to factors in the pre-treatment state known to affect the emergence of resistant organisms. For this purpose we recorded the pre-treatment temperature and the extent of cavitation and confluence of shadows in the radiograph. The radiographic assessments were made by an independent panel unaware of the group to which the patient belonged, and the films were placed in previously defined categories. The results are recorded in Table II. It will be seen that the groups are roughly comparable, though in the first group gross cavitation was commoner.

Results (see Table III)

P.A.S. Resistance

It will be seen that in eight out of the nine patients who had previously been treated with P.A.S. alone tubercle bacilli isolated before beginning the combined streptomycin-P.A.S. course were P.A.S.-resistant, the resistance ratio varying from 16 to greater than 256 in different cases. In some cases there was a further substantial rise in the resistance ratio while on combined treatment. In the one patient, Case 9, whose bacilli were P.A.S.-sensitive before treatment, no P.A.S.-resistant organisms were subsequently isolated.

In three out of five of the patients who had not received previous P.A.S., bacilli isolated before the start of combined treatment were P.A.S.-sensitive. In the other two cases, for technical reasons, no pre-treatment culture was available for testing, but subsequent cultures were P.A.S.-sensitive. In none of these patients were P.A.S.-resistant bacilli isolated up to the end of the six months' observation period, though in three the sputum became negative.

It is clear, therefore, that P.A.S.-resistant tubercle bacilli emerged in a high proportion of those patients who had been treated with P.A.S. alone, and that the organisms might remain resistant for up to three years and more after stopping the drug.

Streptomycin Resistance

In 13 out of the 14 patients the tubercle bacilli were streptomycin-sensitive before the start of the combined course; in the thirteenth case (No. 10) the pre-treatment culture was contaminated but the bacilli were shown to be sensitive a month later.

Of those who had received previous P.A.S. alone, the one patient (Case 9) whose organisms were P.A.S.-sensitive before starting combined streptomycin and P.A.S. continued to excrete bacilli sensitive to both drugs up to the last available test, six months after starting the combined treatment. In all the eight other patients streptomycin-resistant organisms were isolated, in the first six cases within three months of starting treatment. In Case 7 the resistance ratio was 4, the upper limit of normal, after two and three months' treatment; at four months a culture slightly but definitely resistant (resistance ratio 8) was obtained for the first time, the ratio reaching 32 a few days later. In the remaining patient (Case 8) a resistance ratio of 4 was found at three months, the culture was contaminated at four months, and the first definitely resistant strain was isolated at five months. This last patient was the only one of the group whose bacilli attained only a low degree of streptomycin-resistance (resistance ratio 8); in the other seven the organisms became moderately or highly resistant.

Of the five patients who had not had previous P.A.S. alone, the sputum became negative in three (Cases 10, 12, and 14). In each case the last positive culture, on the 90th, 44th, and 31st days of treatment, remained streptomycin-sensitive throughout the six months' observation. In only one patient (Case 11) were slightly resistant organisms, with a resistance ratio of 8, isolated after five months' treatment.

TABLE III.—Results

Case No.:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Previous P alone	Duration (months)	7	6	11	6	1½	16	4	3	9	—	—	—	—
	Interval before SP course (months)	4	10	4	14	39	8	16	0	0	—	—	—	—
SP course	S 1 g. daily (months)	3	4	3	3	3	3	4	3	3½	3	3½	3½	3½
	S 1 g. thrice weekly (months)	½	2	3	0	3	3	0	3	2½	3	2½	3	1
P-resistance	Preceding SP course	>256	64	16	16	>256	64	>256	>32	4	½*	½	2	1½†
	Highest reached... Time after starting SP (months)	>256	64	>512	>256	>256	64	>1,028	>256	4	4	1	2	1
	Initial	Initial	6	6	Initial	Initial	5	6	Initial	3	Initial	Initial	Initial	Initial
S-resistance	Height of 1st resistant culture Time after starting SP (months)	32	8	256	128	32	>32	8	8	None	None	8	None	None
	Highest reached... Time after starting SP (months)	256	128	512	256	32	>256	32	8	1	1	8	1	4
	Initial	5	3	6	6	2	3	4½	5	Initial	3	5	1	6
Remarks											Sputum-negative after 90 days	Sputum-negative after 44 days	Sputum-negative after 31 days	

P=P.A.S. S=Streptomycin. Times are given in months. Resistance figures are resistance ratios (see text).
 * No pre-treatment sensitivity test; figure for first subsequent culture.
 † Pre-treatment sensitivity on solid medium only.
 ‡ Two days after first resistant culture.

Streptomycin-resistant tubercle bacilli, therefore, emerged in all of eight patients who had been previously treated with P.A.S. alone and whose organisms were P.A.S.-resistant before starting combined treatment with streptomycin and P.A.S. Of the six patients whose organisms were P.A.S.-sensitive before starting combined treatment, including one who had had previous P.A.S. alone, bacilli slightly resistant to streptomycin were isolated from only one, although in three the sputum became negative during the period of observation.

Discussion

The control group of patients who had not previously received P.A.S. alone was, of course, small. It was made smaller in the later stages of the investigation by a number of patients becoming sputum-negative. But a good deal of information is elsewhere available about the proportion of cases from which streptomycin-resistant organisms are likely to be isolated if streptomycin and P.A.S. are given in the same doses as in our patients. In the earlier Medical Research Council series the proportion did not exceed 10% (Medical Research Council, 1952b). In our group treated with previous P.A.S. alone the organisms were P.A.S.-resistant before combined treatment in eight out of nine, and in all of these streptomycin-resistant bacilli were isolated when they were later treated with streptomycin and P.A.S. in combination.

The implications of these findings are obvious. P.A.S., like streptomycin and isoniazid, should never be given alone to tuberculous patients. There is evidence that the use of streptomycin prevents or diminishes the emergence of P.A.S.-resistant organisms, just as P.A.S. prevents or diminishes the emergence of streptomycin-resistant organisms (Medical Research Council, 1950; Veterans Administration, 1951). If a patient is known to have had a long course, perhaps more than a month, of P.A.S. alone, it should be assumed, until the results of sensitivity tests become available, that his bacilli are P.A.S.-resistant. If chemotherapy is necessary he should be treated with streptomycin and isoniazid in combination. Finally, it is clear that tests for P.A.S. sensitivity are as important to the patient as those for sensitivity to streptomycin or isoniazid.

Summary

Tubercle bacilli from eight out of nine patients who had previously received sodium *para*-aminosalicylate (P.A.S.) alone for pulmonary tuberculosis were found to be resistant to the drug. The original course of treat-

ment lasted from 6 weeks to 16 months in different cases and the interval between the finish of the course and the resistance tests varied from a few days to 39 months.

When treated with daily streptomycin and P.A.S., streptomycin-resistant tubercle bacilli emerged in all the eight patients whose bacilli were P.A.S.-resistant before the start of the combined treatment. The streptomycin-resistant bacilli were obtained in six out of the eight cases within three months on combined treatment, in the seventh after four months, and in the eighth after five months.

By contrast a slightly streptomycin-resistant organism was isolated, after five months' treatment, from only one out of six similar cases whose organisms were P.A.S.-sensitive at the start of the combined course. Five of the cases had had no previous treatment with P.A.S. alone.

It is concluded that P.A.S.-resistant tubercle bacilli are likely to emerge if patients with pulmonary tuberculosis are treated with P.A.S. alone; that the resistant organisms may persist for long periods; and that, if the patients are later treated with P.A.S. and streptomycin, P.A.S. will then no longer prevent or diminish the emergence of streptomycin-resistant bacilli.

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TREATMENT OF PRIMARY PULMONARY TUBERCULOSIS WITH P.A.S.*

BY

R. McLAREN TODD, M.D., M.R.C.P., D.C.H.

Senior Lecturer in Child Health, University of Liverpool;
 Consultant Paediatrician, Alder Hey Children's Hospital,
 Liverpool, 12

Lehmann (1946) was the first to use *para*-aminosalicylic acid (P.A.S.) in the treatment of patients suffering from tuberculosis, and during the succeeding six years many workers have employed this drug in a variety of tuberculous conditions. P.A.S., combined with streptomycin, has been used successfully in miliary tuberculosis and tuberculous meningitis, conditions which result from dissemination of tubercle bacilli from a primary tuberculous complex, but as yet there have been few reports of the treatment of primary tuberculosis with P.A.S. Scarzella (1949) used it in eight children suffering from primary tuberculosis. Debré *et al.* (1950) treated two children aged 14 months and 11½ years, Lesné *et al.* (1951) 28 children aged 2 to 6 years, and Haggmüller (1951) 72 children aged 2 to 15 years. These workers claimed that P.A.S. seemed to be of value when judged by the return of temperature and sedimentation rate to normal, by gain in weight, and by improvement in the radiological appearances. It is, however, the experience of workers in this field that when children suffering from primary tuberculosis are removed from contact with adults who have open pulmonary tuberculosis and are given adequate rest and a suitable diet, progress is usually satisfactory. The assertion that P.A.S. is of value in primary tuberculosis may be justifiably questioned because in none of the above-mentioned papers was a control group of children of the same age and with identical hospital care studied.

The present investigation was planned to assess more critically the value of P.A.S. in primary tuberculosis. The children were seen during 1951 in Liverpool, where the mortality rate for tuberculosis is higher than the average for England and Wales, and the incidence of primary tuberculosis provides a large enough number of cases to be studied in one centre.

Plan of Investigation

Most of the children were admitted to Alder Hey Children's Hospital, Liverpool, where they were at rest in bed for a period of three months and received a diet adequate in protein, calories, and vitamins. On admission the following investigations were undertaken: tuberculin test, gastric lavage, full blood count, sedimentation rate, x-ray film of the chest, lumbar puncture, and weight. Subsequently the white-cell count and sedimentation rate were evaluated every two weeks, and lumbar puncture was performed at fortnightly intervals during the first six weeks and monthly thereafter. X-ray films of the chest were taken every month, and the children were weighed at weekly intervals.

Sixty-nine patients were studied, and for the purpose of this investigation they were divided into four age groups (see Table I). Alternate patients (trial group) in each age

*A paper read in the Section of Child Health at the Joint Annual Meeting of the British Medical Association and Irish Medical Association, Dublin, 1952.

TABLE I.—Age Grouping of 69 Patients with Primary Tuberculosis

Age Group	Trial Group	Control Group
Under 1 year	5	5
1 and 2 years	9	8
3 to 6	14	15
7 to 15	7	6
Total	35	34

group received 1 g. of P.A.S.* per lb. (2.2 g. per kg.) weight daily in divided doses two-hourly, for 12 weeks, while the remaining cases were given no specific chemotherapy (control group).

Table II records the clinical details of the trial and control groups, and shows that in most respects the two groups are comparable, though tubercle bacilli were isolated on gastric lavage from rather more patients in the control group.

In Table III the estimated duration of the tuberculous process is set out, and this shows that most of the patients had suffered from the disease for three months or less. This

TABLE II.—Diagnostic Features in 69 Patients with Pulmonary Tuberculosis

	Trial Group (35)	Control Group (34)
Contact history	25 (70%)	24 (70%)
Mantoux 1 in 10,000 ..	20	14
Mantoux 1 in 1,000 ..	13	18
Jelly test	2	2
Radiograph:		
Focus in L.U.L. ..	4	3
" " L.L.L. ..	7	10
Left hilar gland ..	1	—
Focus in R.U.L. ..	4	6
" " R.M.L. ..	3	2
" " R.L.L. ..	15	12
Right hilar gland ..	1	1
Positive gastric lavage ..	13 (37%)	17 (50%)

TABLE III.—Estimated Age of Primary Focus

	Trial Group (35)	Control Group (34)
1 month	12	14
2 months	6	6
3	7	7
4	3	3
5	1	—
6	1	—
Unknown	5	4

assessment was made on the time of appearance of erythema nodosum, phlyctenular conjunctivitis, and Mantoux conversion, and by a detailed investigation of the contact history.

Assessment of Progress

The progress of these cases cannot be estimated by any one test, and in this investigation six criteria were used—namely, clinical impression (based on appetite, vitality, temperature, pulse rate), serial blood counts, serial sedimentation rates, weight gain, serial chest x-ray films, and incidence of complications.

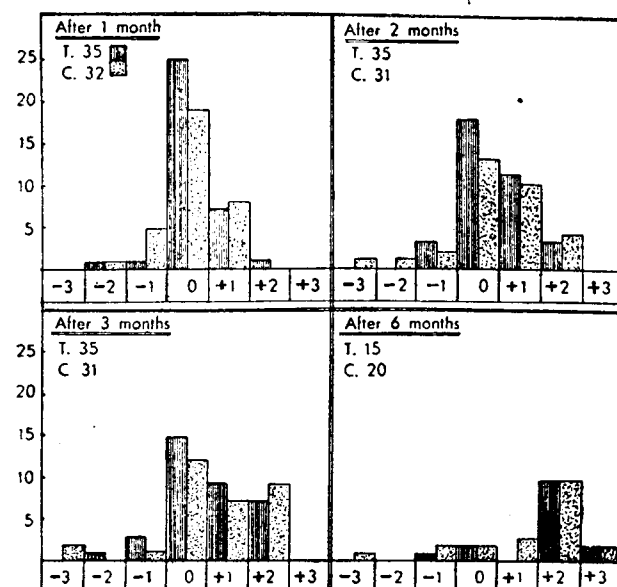
The clinical impression was that progress was equally satisfactory in both trial and control groups. In the majority of patients the temperature was normal throughout or it returned to normal within two weeks of admission. Appetite was good in most patients, and persistent tachycardia was not recorded.

White-cell counts and sedimentation rates were estimated on admission and at fortnightly intervals thereafter. The

*The preparation of P.A.S. used throughout this investigation was "paramisan sodium," kindly supplied by Herts Pharmaceuticals Ltd. It was given in the following mixture:

P.A.S. 1 g.
 Liquid extract of liquorice or syrup of
 orange 5 minims (0.3 ml.)
 Water ad 1 dr. (3.5 ml.)

general trend in all cases was towards normal figures, and, although there was a wide degree of scatter, no significant difference was found in the control and trial groups. The children were weighed on admission and at weekly intervals, and the percentage weight gain above the admission weight in each of the four age divisions was compared in the control and trial groups. No significant difference was shown. The x-ray appearances in the trial and control groups were compared one, two, three, and six months after admission to hospital (see Chart). Decrease in the



Radiological appearances after one, two, three, and six months.
T, Trial group; C, Control group

TABLE IV.—Complications

Age	Trial Group	Control Group
Under 1 year	1 patient: stridor, associated with collapse R.L.L. and emphysema R.L.L. 1 patient: vomiting after PAS 1 patient: D. and V.	1 patient: tuberculous meningitis at 4 months → death at 6 months 1 patient: tonsillitis 1 patient: D. and V.
1 to 2 years	1 patient: glandular pressure → collapse R.L.L. 1 patient: renal tuberculosis at 4 months	1 patient: tuberculous meningitis at 4 months → death at 7 months 1 patient: extension of primary focus following measles and whooping-cough 1 patient: Sonne dysentery
3 to 6 years	1 patient: collapse of R.M.L. 1 patient: ascitic tuberculous peritonitis at 3 months 1 patient: PAS sensitivity—rash, oedema	1 patient: miliary spread at 1 month
7 to 15 years	1 patient: collapse R.M.L. 1 patient: occasional vomiting with PAS	

x-ray shadow is indicated by plus 1, 2, or 3 (plus 3 indicates complete radiological resolution); when the shadow remained unchanged it is recorded as 0, and the extent of increase in size of the shadow is indicated by minus one, two, or three. There appeared to be no difference in radiological progress of trial and control cases using this method of assessment.

Table IV shows the complications encountered. These were of three main types: (1) complications of the tuberculous process, both local in the lung and generalized; (2) those resulting from P.A.S.; and (3) those, such as gastroenteritis, due to hospital cross-infection.

Local lung complications were more common in the trial group. Spread of the disease to the meninges occurred in

two children in the control group, and in spite of treatment with streptomycin and P.A.S. they died. One patient in the control group who developed miliary tuberculosis responded satisfactorily to these drugs. Renal tuberculosis and ascitic tuberculous peritonitis developed in two patients who had received P.A.S. for three months, and both subsequently recovered when streptomycin was given. One child in the trial group developed a generalized scarlatiniform rash and oedema of face, hands, and legs, but these toxic manifestations quickly subsided when P.A.S. was discontinued. In almost all patients the drug was well tolerated, and in only two patients were nausea and vomiting troublesome.

Discussion

There is general agreement with Wallgren (1945) that the mortality rate from tuberculosis is higher in infants and young children. In his series the mortality rate was 35.9% in the age group 0 to 1 year, 15.6% in the group 1 to 3 years, 4.4% in children from 3 to 7 years, and 0.8% in those aged 7 to 16 years.

Furthermore, the serious complications such as tuberculous meningitis usually arise within three months of the development of the primary complex. It is therefore not surprising that the two patients in the present investigation who died from tuberculous meningitis were under 3 years of age. In the children under the age of 3 years there was no obvious difference in the course of the disease in the trial and control groups when judged by clinical response, white-cell count, sedimentation rate, weight gain, and serial chest x-ray films. The serious complications, however, did arise in the control group, but even in the trial group one child developed renal tuberculosis and one developed tuberculous peritonitis.

Debré (1951) considers that, because primary tuberculosis in children under 2 years of age is likely to be severe, since early detection of general dissemination is difficult, and because tuberculous meningitis has a bad prognosis, streptomycin and P.A.S. should be given to all patients with primary tuberculosis in this age group. There is no doubt that as a general principle young children with primary tuberculosis should be under strict observation, and that early detection of complications may be possible by regular examination of the optic fundi for choroidal tubercles, routine lumbar punctures at intervals of not more than two weeks, and frequent x-ray films of the chest. Streptomycin may then be reserved for the treatment of these complications. A further controlled investigation is being carried out at the present time to assess the value of P.A.S. combined with streptomycin in children under the age of 3 years, but the number of cases so far treated is too few to assess the value of combined therapy.

The dosage of P.A.S. used in this investigation (0.5 g. per lb. (1.1 g. per kg.) per day) is higher than that given by Debré *et al.* (1950), Haggemüller (1951), and Lesné *et al.* (1951); their patients received approximately 0.3 g. per lb. (0.66 g. per kg.) per day, and it may be thought that the dosage used in the present cases was excessive, but the intention was to maintain a minimum blood level of about 8 mg. of P.A.S. per 100 ml. Lehmann (1946) recommended a level of up to 7 mg. per 100 ml., and Dempsey and Logg (1947) suggested 10 mg. per 100 ml. Blood P.A.S. levels were estimated in all our cases half an hour and two hours after the ingestion of the drug, and wide variations were found in the same patient on different occasions, but the average blood level at half an hour was 12.5 mg. per 100 ml. and at two hours (immediately before the next dose of P.A.S. was given) 7.5 mg. per 100 ml. Almost all the 35 patients tolerated this dosage, and in only one child did a generalized rash and oedema arise.

Electrocardiograms were taken on a number of patients, but no evidence of potassium deficiency (Cayley, 1950) was found. No other toxic manifestation such as bone-marrow depression, hypothermia, liver damage, or renal damage were observed in this series.

Summary and Conclusions

Sixty-nine children with primary tuberculosis were studied in Liverpool during 1951. Of these, 35 were given P.A.S. for a period of three months, and 34 were given the same general treatment but without P.A.S. When judged by clinical progress, white-cell count, sedimentation rate, weight gain, and serial chest x-ray films, there seemed to be no benefit from P.A.S. therapy. The severe complications occurred in children under the age of 4 years who did not receive P.A.S. Treatment with streptomycin and P.A.S. of young children with primary tuberculosis is discussed.

P.A.S. seems to be most useful in acute exudative tuberculosis (Marsh, 1952), and its value is limited in fibrous and caseous disease. In primary tuberculosis the most striking pathological feature is caseation in the regional lymphatic glands, and the primary focus in the lung is often small. It is therefore not surprising that P.A.S. has not caused a dramatic improvement in patients with primary tuberculosis.

I am grateful to the paediatricians, tuberculosis officers, and chest physicians of the Liverpool area for their help and co-operation in this investigation.

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INCIDENCE OF BLACK TONGUE IN ANTIBIOTIC TREATMENT

BY

W. TOMASZEWSKI, M.D., Ph.D.

(From the Department of Therapeutics, University of Edinburgh, and the Clinical Laboratory, Royal Infirmary, Edinburgh)

Black tongue (brown tongue, glossophytia, melanglossia, nigrities linguae) has been described by many authors, but its aetiology is so far unknown. It is usually associated with hypertrophy of the filiform papillae. In cases of extreme hypertrophy there is an accumulation of matted hair-like processes on the surface of the tongue, and the condition is known as black hairy tongue. Heavy smoking, dyspepsia, irradiation, various inflammatory lesions, washing the mouth with hydrogen peroxide, boric acid, silver nitrate, or chromic acid, and the use of certain tooth pastes have been rightly or wrongly blamed for the production of black tongue.

With the introduction of antibiotics into therapeutics black tongue is seen much more often, and is now regarded as one of the side-effects of antibiotic treatment. It was first reported in connexion with treatment with penicillin lozenges (Bedford, 1946; Ellinger and Shattock, 1946b; Ackers, 1947; Cross, 1949; Wolfson, 1949), but it has also been reported after parenteral penicillin therapy (Lahiri, 1947). It was soon noticed that systemic treatment with other antibiotics—for example, aureomycin and chloramphenicol—also pro-

duced this syndrome (Harris, 1950; Phillips, 1950; Wilheims, 1950; Tomaszewski, 1951a, 1951b).

In this paper an account is given of clinical observations and direct microscopical examination of the tongue scrapings in cases of black tongue associated with antibiotic therapy and in cases of idiopathic black tongue. Very few histological examinations of this condition have so far been reported (Heidingsfeld, 1910; Swinburne, 1939). An attempt was made to ascertain whether there was a common bacterial or fungal factor in these two types of the condition which might be of aetiological significance. The use of antibiotics in the treatment of a few cases of idiopathic black tongue is also described.

Material and Method

Investigations were made in various wards of the Royal Infirmary, Edinburgh, in cases of idiopathic black tongue; patients treated systemically with aureomycin, chloramphenicol, and penicillin; and in healthy volunteers who sucked penicillin, aureomycin, chloramphenicol, and streptomycin lozenges. Scrapings of the surface of the tongue from as far back as possible were taken with a sterile slide, and the material was pressed with another slide in order to obtain an even film. The scrapings were made at intervals of one to three days before, during, and after treatment. The films were examined unstained and after staining with Gram. For the unstained films phase-contrast microscopy was found to be particularly useful.

Black Tongue Occurring During Systemic Treatment with Chloramphenicol, Aureomycin, and Penicillin

In all, 21 cases of black tongue produced by oral administration of chloramphenicol and aureomycin in capsule form were examined. They comprised about 10% of a group of patients treated with these antibiotics. The incidence of black tongue was approximately the same with either treatment. Two cases appearing after the intramuscular administration of penicillin were also studied. The results of the investigations are given in Table I.

TABLE I.—Microscopical Examination of Black Tongue which Developed in 23 Patients Receiving Systemic Treatment with Antibiotics

Antibiotic	No. of Cases	Days of Treatment Before Discoloration	Onset of Discoloration		Blotchy Cells	Leucocytes
			Absence of Bacterial Flora	Presence of Fungi		
Aureomycin	9	5–21 (8)	4	6	5	1
Chloramphenicol	12	5–14 (7)	6	7	6	2
Penicillin	2	14–18 (16)	—	1	1	1

Figures in parentheses = average.

In most patients no subjective symptoms accompanied the discoloration, which was often first noticed by the doctor. Some patients, however, complained of a feeling of some foreign body or a tickling sensation on the tongue. The discoloration usually appeared after a few days' treatment (average about one week). In one-third of the cases the change in colour was associated with some degree of hypertrophy of the papillae, but in the remainder the papillae were normal or atrophied. In a few cases the number of leucocytes in the scrapings increased. Staining with Gram revealed a few peculiarly marked epithelial cells, the so-called "blotchy" cells, in about half of the cases.

These antibiotics exerted a pronounced influence on the bacterial flora of the tongue. In about 40% of cases bacteria were absent when the discoloration appeared. In the others the bacteria were greatly decreased in number and changed in character; but the development of the discoloration was not associated with the presence of any particular type of bacterial flora. Fungi were present in about 60% when the discoloration first appeared, and were invariably monilia.

different types of renal tumour has been roughly 13:3:1, and is similar to that reported by Dick and Flint (1951) and Riches, Griffiths, and Thackray (1951).

Whereas tumours of the renal parenchyma and renal pelvis usually occur in adults, renal embryomas usually occur in children. There have been no exceptions to this general rule in our series; the ages of patients with parenchymal tumours ranged from 35 to 77 years, those with pelvic tumours from 47 to 72 years, and those with embryomas from 2 to 7 years.

All three types of renal tumour are usually unilateral, but three adult patients (6%) in our series had bilateral parenchymal tumours: one of these, however, had multiple metastases, and the tumour in the contralateral kidney was therefore not necessarily a second primary.

Clinical Features

Pain, palpable loin swelling, and haematuria are said to be the cardinal clinical features, but it is recognized that one or more of these symptoms and signs may be absent even when a tumour is large. On occasion it is a distal metastasis which first draws attention to the disease (Creedy, 1935).

Pain.—Three of the 38 patients with carcinoma of the renal parenchyma were admitted in a comatose condition and no reliable history could be obtained. In the remaining 35 pain occurred sooner or later in 24 and was the first and most prominent symptom in 11. Pain also occurred in 3 of the 10 patients with tumours of the renal pelvis, but was absent in all three children with renal embryomas. The 24 patients with carcinoma of the renal parenchyma who complained of pain included 16 with severe intermittent aching in the affected loin, five with severe intermittent pain in one or other upper abdominal quadrant, one with typical renal colic associated with the passage of clots of blood, one with painful clot retention of urine, and one with pain in the neck and shoulder due to extensive metastases in the cervical vertebrae and cervical lymph nodes. Twelve of the 16 patients with loin pain and three of the five with abdominal pain were found to have extensive tumours infiltrating the vertebral or paravertebral tissues: of the remaining six patients, three were found to have hydronephrosis and three had considerable haemorrhage into apparently circumscribed tumours. The three patients with painful tumours of the renal pelvis all had squamous carcinomas; two had marked hydronephrosis due to obstruction of the pelvi-ureteral junction by tumour, and one had extensive local infiltration of the growth.

Palpable Loin Swelling.—A palpable loin swelling was noted in 23 of the 38 patients with carcinoma of the renal parenchyma, 2 of the 10 patients with tumours of the renal pelvis, and in all three children with renal embryomas. All the palpable tumours exceeded 3 in. (7.5 cm.) in diameter, and, as might be expected, those tumours which were situated at the lower pole of the right kidney were felt more often than those which were situated at any other site. A renal tumour which is less than 3 in. (7.5 cm.) in diameter does not materially increase the dimensions of a kidney unless it grows outwards from one or other pole, and is not likely to be palpable unless it develops in a lower pole.

Haematuria.—Sixteen of the 38 patients with carcinoma of the renal parenchyma complained of one or more attacks of haematuria, and 7 of the 16 had haematuria as a primary symptom. In 12 of these 16 patients the tumours were found to have grown into the pelvis of the kidney, but in the other four the tumours were well circumscribed and had spread the calices apart without invading them. Congestion of the radicles of the renal veins may possibly account for the haematuria of these latter patients. Excluding the three patients who were admitted in coma and from whom no history was obtainable, 19 of 35 patients with carcinoma of the renal parenchyma denied any history of haematuria. Yet 15 of them had large necrotic growths wholly or partly

replacing the kidney and involving the pelvis, and only four had well-circumscribed tumours nowhere invading the pelvis. Nine of the 10 patients with tumours of the renal pelvis had haematuria; indeed, intermittent painless haematuria was the sole complaint in eight. The single instance of a tumour of the renal pelvis occurring without haematuria was found in a patient who had a carcinoma which had invaded the peritoneum and spleen and other adjacent structures. Painless haematuria was the first symptom in one of the children with a renal embryoma, but a very large tumour was found in the right flank a few weeks later. The other two children had no haematuria at any stage of their illness.

Weakness.—Weakness, or a feeling of tiredness, was a frequent and often dominant symptom in patients with carcinoma of the renal parenchyma; in fact, 14 of 35 patients made specific mention of it, and in nine it was the first indication of disease. Where weakness accompanies a renal parenchymal cancer it generally has a sinister significance: 7 of the 14 patients who complained of this symptom died within six months, four others died within eighteen months, and only three survived more than two years from the onset of the first symptoms of disease. Weakness was not a symptom in any of the 10 patients with carcinoma of the renal pelvis or in the three children with renal embryomas. The weakness did not seem to bear any relation to the degree of anaemia, and several patients who complained of weakness were found to have normal haemoglobin values. Loss of weight, however, often seemed to be associated with the weakness, and a notable preponderance of pulmonary and pleural metastases was found at necropsy in these particular cases.

Fever.—Temperatures ranging from 99 to 100° F. (37.2 to 37.8° C.) occurred in 21 of the 38 patients with carcinoma of the renal parenchyma, in 3 of the 10 patients with tumours of the renal pelvis, and in two of the three children with renal embryomas. When fever occurs in patients with carcinoma of the renal parenchyma it may be due to extensive necrosis in the primary tumour and may be relieved by nephrectomy. This was the case in three of our patients. In general, however, pyrexia is an indication of a poor prognosis (Griffiths and Thackray, 1949), and is often associated with the presence of extensive pulmonary metastases. The fever that was present in three of our patients with tumours of the renal pelvis was due in one case to a closed pyonephrosis on the same side as the tumour, in another to obstruction of the opposite kidney by tumour spread in continuity, and in a third to extensive lymph-node and osseous metastases as well as bilateral pleural effusions.

Varicocele.—Varicocele was noted in 3 of the 21 men with carcinoma of the renal parenchyma and was an early manifestation of disease; two patients had large tumours of the left kidney with extensive perineal infiltration and nodules of growth along the renal pedicle and inferior vena cava; the third patient had a large tumour of the lower pole of the right kidney with infiltration of the peritoneum and other neighbouring structures.

Investigations

Urinalysis

Twenty-five patients with carcinoma of the renal parenchyma and seven with tumours of the renal pelvis had their urine examined by microscopy and bacterial culture. The urine of 21 of the 25 contained some pus cells and red blood cells; 12 had moderate or marked pyuria, but in only three was the urine infected. The urine of the other four was reported to show no red corpuscles or pus cells, yet all four had large tumours and two had gross haematuria; it is likely that repeated examinations of the urine would have shown some abnormality in these particular cases.

The urine of seven patients with tumours of the renal pelvis was reported to contain scanty or numerous pus cells,

and in all but one there was an excess of red blood cells; in five of these the urine was sterile on culture and in two it was infected.

Urinalysis was omitted in the three children with renal embryomas.

Radiology

Plain radiographs of the urinary tract were available for study in 23 of the 38 patients with carcinoma of the renal parenchyma and showed enlargement of a renal shadow in 11 and calcification in one.

Intravenous pyelography was performed on 20 of these 23 patients and the pyelograms suggested the correct diagnosis in 18 but gave no clue to the diagnosis in two. The main abnormalities seen on intravenous pyelography were defective filling of part or disappearance of the whole of a calix in six cases, defective filling or disappearance of the renal pelvis in nine, distortion of calices in four, dilatation of the renal pelvis in two, displacement of the kidney in five, and displacement of the ureter in two. Absence of excretory activity, shown by intravenous urography, is generally interpreted as an indication of a poor prognosis (Wade, 1933; Griffiths and Thackray, 1949). Five of our patients showed no excretion from the affected kidneys, and were found at operation or necropsy to have either infiltration of the renal pedicle by tumour or practically complete replacement of the kidney by tumour tissue. A normal excretion pyelogram, however, does not necessarily mean that a tumour is small or the prognosis good, and 5 of the 11 patients with normal excretion pyelograms were found at operation to have inoperable tumours widely infiltrating the surrounding tissues.

Retrograde pyelograms were made on nine patients with carcinoma of the renal parenchyma, and the films suggested the correct diagnosis in all nine. They showed abnormalities similar to those seen in the intravenous pyelograms, but the clearer pictures obtained by the retrograde technique proved more valuable for diagnosis.

Plain radiographs of the urinary tract of all 10 patients with tumours of the renal pelvis showed no abnormality of the renal shadows. Intravenous pyelography was performed on nine of these patients, and the films suggested the correct diagnosis in five, but gave no clue to the diagnosis in four. Absence of excretory activity occurred in two affected kidneys, and was found to be due in one case to a pyonephrosis with a large papilliferous carcinoma of the pelvis and in another to a transitional-cell carcinoma lining the whole of the pelvis and everywhere infiltrating the kidney parenchyma.

The main abnormalities seen in the intravenous pyelograms of the patients with tumours of the renal pelvis were dilatation of the pelvis or of a calix in five instances, defective filling of the pelvis in three, and defective filling of a calix in two.

Retrograde pyelography carried out in two patients with tumours of the renal pelvis showed a distinct filling defect of the pelvis together with a moderate hydronephrosis in both cases. In a third patient it was impossible to pass a ureteric catheter beyond the pelvi-ureteric junction because it was blocked by an extensive squamous-celled cancer.

X-ray films of the spine, pelvis, and long bones for bony metastases may be misleading. Out of 26 patients submitted eventually to post-mortem examination, nine with tumours of the renal parenchyma and one with a tumour of the renal pelvis were all proved at necropsy to have extensive metastatic deposits in bones which, x-rayed within a month or so of death, had showed no bony abnormality.

Anaemia

Nineteen of the 38 patients with carcinoma of the renal parenchyma had moderate or severe anaemia, while, in contrast, at least 8 of the 10 patients with tumours of the renal pelvis had normal haemoglobin values. The cause of the anaemia is obscure and cannot be related either to the degree of haematuria or to the site and extent of metastases. It is

possible that unknown products of tumour necrosis are capable of suppressing blood formation, and it may be significant that seven of nine severely anaemic patients also had fever.

Treatment

The treatment of choice for renal tumours is nephrectomy, or nephro-ureterectomy in the case of renal pelvic tumours. Extensive local infiltration may prevent operative removal, but distal dissemination is not necessarily a contraindication to surgical excision of the primary growth; a solitary metastasis of a renal parenchymal tumour may be reasonably excised, and on occasion it is justifiable to carry out a palliative excision of a necrotic or bleeding primary tumour.

In our series nephrectomy or nephro-ureterectomy was carried out in 17 of the 38 patients with carcinoma of the renal parenchyma, 8 of the 10 patients with tumours of the renal pelvis, and the three children with renal embryomas.

Twenty patients with carcinoma of the renal parenchyma were considered to be inoperable; two being moribund on admission, four having extensively infiltrating and excessively vascular tumours, and 14 having multiple metastases in the lungs, skeleton, brain, or skin. A single patient refused surgical treatment.

Two cases of carcinoma of the renal pelvis were considered to be inoperable, one having extensive local infiltration and another extensive spinal and general metastases.

In all, 55% of our patients with renal tumours were treated by nephrectomy or nephro-ureterectomy and 43% were inoperable; this operability rate is lower than that reported by Riches, Griffiths, and Thackray (1951), perhaps because our series includes all hospital cases, medical and surgical.

Post-operative irradiation was given to seven patients with carcinoma of the renal parenchyma, to one with a renal pelvic tumour, and to the three children with embryomas. Two patients with inoperable tumours of the renal parenchyma were treated by deep x-ray therapy alone.

Results

The overall picture of the end-results of our series of patients with tumours of the kidney must be regarded as unfavourable, for 39 (76%) of the 51 patients were dead within an arbitrary period of four years from the time they were first seen. This sad state of affairs, however, is not really a true reflection on the treatment, since 23 (43%) of the patients proved to be inoperable.

Of the 38 patients with carcinoma of the renal parenchyma, 27 died of their disease at times varying from three weeks to eight years from the time they were first seen at hospital. One who was inoperable lived for just over four years after exploration; one other died six months after nephrectomy from causes unassociated with the kidney lesion and at necropsy there was no evidence of tumour; four others died shortly after operation; and five still survive—one at eight years, one at two years, two at two and a half years, and one at one year after nephrectomy.

Of the 10 patients with carcinoma of the renal pelvis, two were inoperable and were dead within four months of their admission to hospital, four died of their disease within two years of their nephrectomy, one survived eight years to die of natural causes, and three still survive at two, three, and three years after nephrectomy.

The three children with renal embryomas died of their disease three, five, and eighteen months after nephrectomy.

Comment

It is unfortunately true that renal tumours, like other deep-seated growths, remain for long inconspicuous. This means that the chances of successful treatment are often correspondingly poor, a fact borne out by the high proportion of inoperable cases in our series of patients and the indifferent end-results of treatment.

The symptoms of pain and haematuria usually cause a patient to seek medical advice, but there can be no guaran-

tee that the disease is still curable even when hospital attendance quickly follows the onset of symptoms.

Loin pain may sometimes be due to the associated hydro-nephrosis, but is often caused by extensive local infiltration of the paravertebral and vertebral tissues, which is synonymous with inoperability.

The presence or absence of haematuria has, in our experience, proved to be of little value in deducing either the size or the pathological picture of renal parenchymal tumours, but it is rare for a tumour of the renal pelvis to occur without bleeding.

The close relation between the cells of all three types of renal tumours and the blood vessels of their stroma increases the risk of distal dissemination. Occult metastases (Shackman and Harrison, 1948) may already be present at the time of operation, and there is a considerable risk of vascular dissemination as the result of handling the tumour at operation unless early ligation of the renal pedicle is practised. This is best achieved through an abdominal or thoraco-abdominal incision.

The prognosis in any individual patient depends not only on the histological grading of the primary tumour but also on the presence or absence of metastases. The former may be accurately assessed by the microscopist (Riches, Griffiths, and Thackray, 1951), but the latter is often proved only by time. Subsequent appearance of metastases after nephrectomy represents the progress of previously present but "hidden" tumour deposits.

All the surgeon can do is to extirpate, where possible, the primary tumour and the associated lymph nodes, and on occasion an apparently isolated distal metastasis. The radiotherapist may have something more to offer, but our experience in this direction, admittedly limited, has not been particularly encouraging.

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The Association of Children's Officers has prepared a memorandum, *Cruelty to Children*, in response to a request made by the Joint Committee of the B.M.A. and the Magistrates' Association. The memorandum sets forth the views of children's officers on the secondary effects of cruelty to children, its definition, types, causes, and incidence. Remedies for neglect and physical violence are not difficult to apply, but prevention of mental cruelty is a much wider problem, says the memorandum, and one on which a lead can be given only by the medical profession, for there is as yet little public awareness of emotional suffering. The legal remedies are outlined and the importance of stable family life as a factor in reducing cruelty is stressed. The economic aspect of prevention is also considered. It may cost up to £5 a week to maintain a child in a children's home, over £6 in an approved school, and as much as £8 in a residential nursery. Children should not be removed from home simply for failure to attend school; it is less expensive to send the school attendance officer to fetch them every day. They should not be removed simply because the home is dirty; it is less expensive to put in a family service unit. Neither should they be removed simply because the house is overcrowded or insanitary or because there is no house; it is less expensive to provide a house. Children should not be removed from their mother simply because she is widowed, unmarried, or deserted, and so has to go out to work; it is less expensive to pay an adequate National Assistance allowance to keep her at home with them. The memorandum is obtainable from the association at Bradninch Hall, Castle Street, Exeter, price 4d.

PEPTIC ULCER IN WOMEN

BY

D. H. CLARK, Ch.M., F.R.C.S.Ed.

Surgical Registrar, Western Infirmary, Glasgow

Many writers have claimed that the symptoms of peptic ulcer—and presumably its activity—are influenced by menstruation and by pregnancy. Thus Taussig (1908), Sutherland (1910), and Szenés (1924) have suggested that menstruation causes an exaggeration of the symptoms of ulcer, while Mussey (1927), Crohn (1927), Hurst and Stewart (1929), and many others have claimed that pregnancy commonly has a beneficial effect. There is some evidence also to suggest that the symptoms of ulcer may be influenced adversely by the onset of the menopause. The investigation reported below was designed to test the validity of these observations.

The evidence here presented was obtained by interviewing 400 women in whom peptic ulcer had been demonstrated either by radiology or at operation. The ulcer was duodenal in 330 cases, gastric in 70. The patients' ages ranged from 21 to 74 years. In most cases the symptoms were of more than five years' duration.

Method of Interview

In a disease which remits and relapses with such facility the manner of eliciting and correlating the evidence is obviously of importance. During the interviews every effort was made to eliminate the element of suggestion. Much of the information was volunteered; much was obtained by questioning, as indirect as possible; some had to be obtained by direct questioning. All of these women had already been interviewed at least once previously, and the standard case record of the peptic ulcer clinic had been completed, so that information was already available on such relevant points as year of birth, age of onset of symptoms, and age at which complications occurred. At interview for the present investigation these points were confirmed. Thereafter inquiry was made into the gynaecological and obstetric history—for example, age at menarche, age at which pregnancies occurred, age at menopause, etc. Finally the effect of those events on the ulcer history was correlated.

Often the patient volunteered some information. If not, the standard questions were asked, "Have you noticed any relationship between your ulcer and menstrual period/pregnancy/menopause? Was your ulcer made better or worse, or did it remain the same? Apart from paraphrasing these questions according to the patient's understanding of them, no further attempt was made to elaborate a correlation. According to the patient's answer, "better," "worse," or "no change noted," the results were assessed. If a relationship had been noticed inquiry was made into the time relationship and the quality and quantity of the worsening or improvement.

Menstruation

Of the 400 patients, 291 had had ulcer symptoms before the menopause. In this group 81 (28%) claimed to have noted some relationship between menstruation and the occurrence of ulcer symptoms. In all these cases the symptoms were worse for a few days or a week before the onset of menstruation. In eight the ill-effect persisted during the menstrual period. In none had the symptoms been noted to increase in the post-menstrual phase.

In interpreting these findings it must be remembered that the symptoms of quite unrelated diseases may be aggravated in the pre-menstrual phase—the result, perhaps, of psychic influences or of the general malaise which many women experience at that time. In those patients who had noted pre-menstrual increase of symptoms there was no evidence

to indicate whether the exacerbation was due to such causes or to factors directly related to the menstrual cycle, or even to the use of aspirin and similar analgesics. On the whole, however, it may be concluded from the present series that the effect of menstruation on ulcer symptoms is inconsiderable.

Pregnancy

In assessing the effect of this state on the symptoms of peptic ulcer it must be remembered that normal pregnancy in healthy women is commonly associated with symptoms not unlike those of peptic ulcer.

Nausea, vomiting, and heartburn are said to occur during the first few months of pregnancy in almost 40% of cases. Usually they disappear about the end of the third month, but they may persist until term. Occasionally more severe dyspepsia occurs, and its resemblance to ulcer is heightened by the relief afforded by antacids. Rarely, hyperemesis gravidarum may lead to confusion.

In attempting to decide whether such symptoms were attributable to the ulcer, attention was paid to their severity and to the patient's own view regarding their origin. With their previous experience of peptic ulcer, most of the patients with heartburn, nausea, and vomiting during the early months attributed the symptoms to pregnancy and regarded the ulcer as "cured." In cases with more severe pain, relieved by alkalis, the patients were unable to distinguish it from the previous ulcer dyspepsia.

Of the total of 400 women 118 had been pregnant (see Table). The total number of pregnancies was 344. Of these, 313 had occurred subsequent to the onset of the peptic ulcer. On the criteria laid down above, it is believed that

Effect of Pregnancy

Total no. of women	400
Women with pregnancies	118
Total no. of pregnancies	344
No. of pregnancies after onset of ulcer symptoms	313
Free from ulcer symptoms	140 (44.8%)
Improved	136 (43.4%)
Not improved	37 (11.8%)

pregnancy was associated with a remission of the ulcer symptoms in 276 cases (88.2%). More than half of these patients claimed to have been completely symptom-free during the whole pregnancy; the remainder had minor symptoms which they regarded as unconnected with ulcer. In the remaining 37 pregnancies (11.8%) symptoms persisted which were indistinguishable from those of ulcer. In some of these the symptoms were much worse than previously, and 14 of the patients were admitted to hospital for treatment of the indigestion. At least four of these were found to have albuminuria, and it is possible that the exacerbation was not entirely due to renewed activity of the ulcer. In no case did a complication of ulcer (haemorrhage or perforation) occur during pregnancy.

Thus it would appear that in almost 90% of ulcer patients symptoms are in abeyance during pregnancy. In some of the cases the ulcer had been inactive immediately before the conception, and in them the remission persisted. In others the symptoms cleared up dramatically at an early stage of the pregnancy. In still others they improved gradually or the pregnancy became obscured by minor symptoms attributed to the pregnancy itself. Several patients averred that their successive pregnancies had been their only euphoric respites and that they had enjoyed the pregnant state for the well-being it afforded.

The benefit derived from pregnancy is generally short-lived, as Fig. 1 shows. By the end of the third month after parturition symptoms had recurred in almost half the cases, and by the end of the sixth month in three-quarters. At the end of two years almost every patient had suffered a recurrence.

Menopause

The distribution curve of the ages of the 400 patients at the onset of ulcer symptoms is shown in Fig. 2. In Fig. 3 it is compared with a similar curve for male patients, based

upon figures derived from 1,393 cases from the peptic ulcer clinic. It will be seen that, while in both sexes there is a steep rise of incidence between the ages of 15 and 24 years, thereafter there is a difference, in that in females there is a deficit during the age period 25–40 years, followed by a

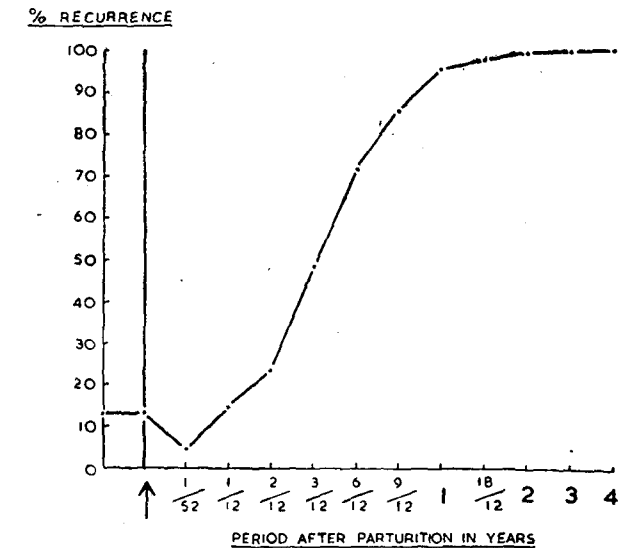


FIG. 1.—Recurrence of ulcer symptoms after parturition.

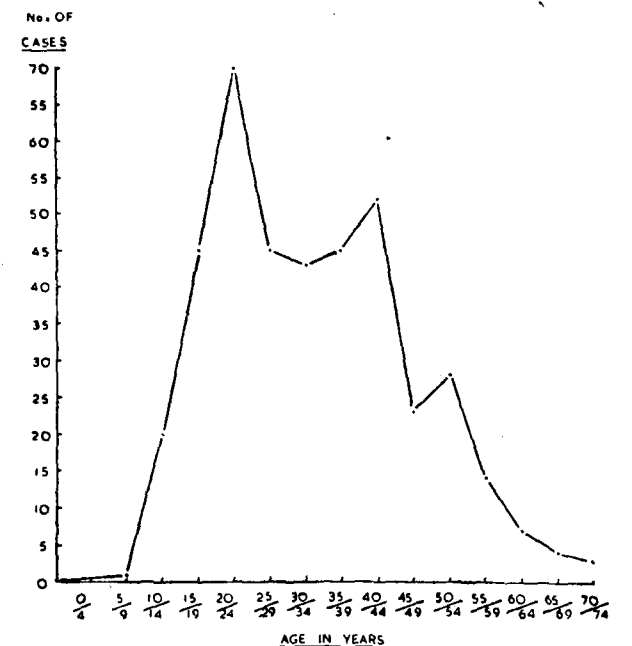


FIG. 2.—Age at onset of symptoms of peptic ulcer in 400 women.

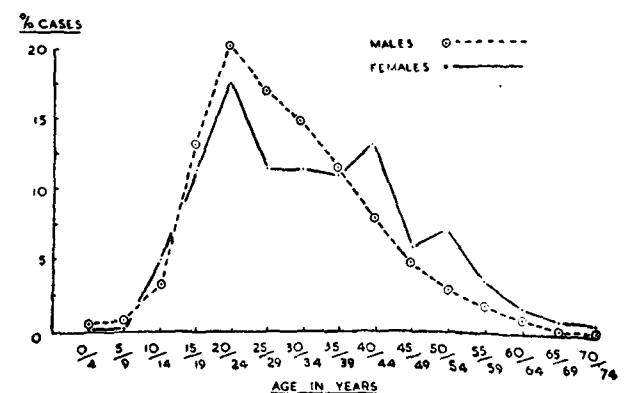


FIG. 3.—Age at onset of symptoms of peptic ulcer in males (1,393) and females (400).

secondary rise of incidence between 40 and 50. These features suggest a possible relation to the child-bearing period and the menopause.

In order to explore this possibility the time relationship between the onset of ulcer and the menopause has been noted in 204 of the women. In Fig. 4 these cases have been plotted in five-year groups according to whether the ulcer began to produce symptoms before or after, or about the time, of the menopause. Those cases in which ulcer symptoms developed in the five-year period which includes the year of the menopause and the two years before and after it are recorded at M. Others are included in the appropriate earlier or later five-year groups. It will be seen that there is a striking peak of incidence at or about the menopause.

The remaining 196 women have not yet attained the menopause. In order to produce a composite curve, comparable with Fig. 2, relating all 400 cases to the menopause, the onset of ulcer symptoms in this remaining group has

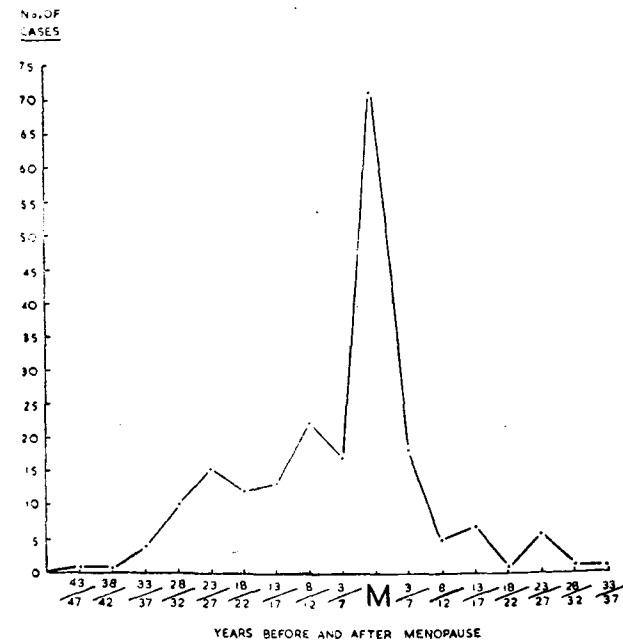


FIG. 4.—Relation of age at onset of symptoms to date of menopause in 204 women who have reached or passed the menopause.

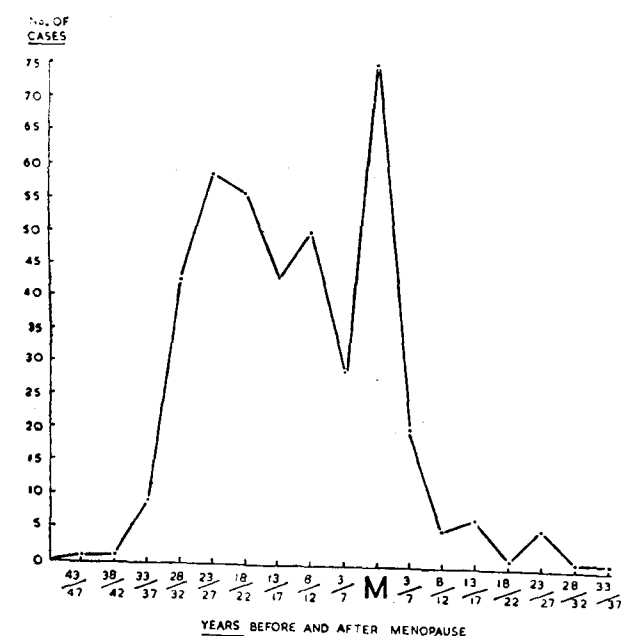


FIG. 5.—Relation of age at onset of symptoms to actual or expected date of menopause.

been related to the expected age for that event. On the information available for the 204 cases the age of menopause varied between 37 and 56 years, with over 90% between 40 and 50 years; the average was 45 years, and this figure was treated as the expected age of menopause in the remaining 196 cases.

Working on this basis, Fig. 5 shows the time relation of the onset of ulcer symptoms to the actual or expected age of menopause in the whole series of 400 cases. It will be seen that it again emphasizes the two peaks of incidence in women, the former occurring in later adolescence and early adult life, the latter at about the time of the menopause.

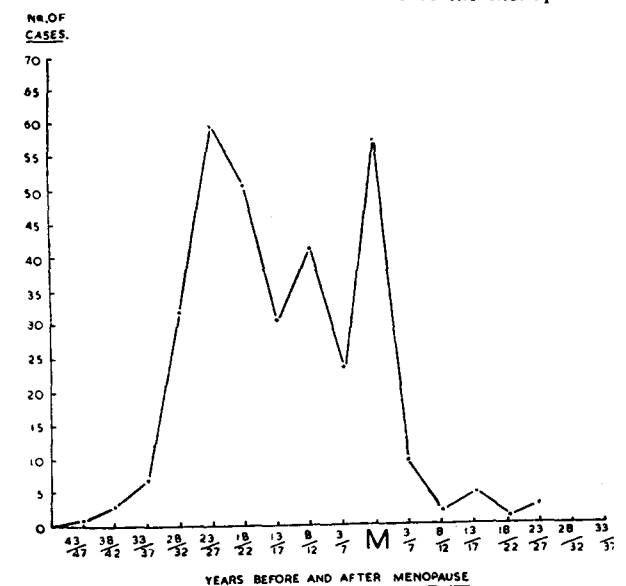


FIG. 6.—Duodenal ulcer (330). Relation of age at onset of symptoms to actual or expected date of menopause.

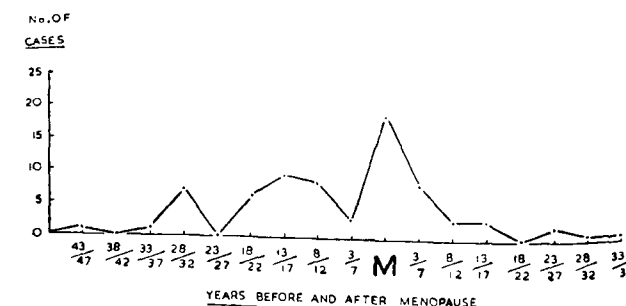


FIG. 7.—Gastric ulcer (70). Relation of age at onset of symptoms to actual or expected date of menopause.

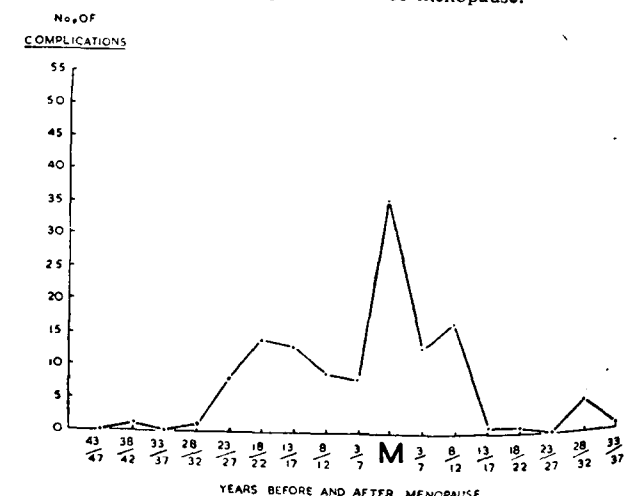


FIG. 8.—Relation of date of complications (haemorrhage or perforation) to actual or expected date of menopause (haemorrhage 95, perforation 33).

In this series of 400 there were 330 patients with duodenal ulcer and 70 with gastric ulcer. In Figs. 6 and 7 the two types have been treated separately in the manner described above for the series as a whole. It will be seen that the menopausal rise of incidence is not confined to one type, though, perhaps owing to paucity of numbers, the peak is less evident in the case of gastric ulcer.

In those women who had had ulcer symptoms before reaching the menopause inquiry was made concerning the progress of the symptoms at that time. There were 92 in this group and 41 (45%) of them either volunteered or agreed on indirect questioning that their symptoms had worsened at or about that time. This trend was confirmed by the fact that a large number of them were then constrained to attend hospital for the first time on account of ulcer symptoms.

The incidence of complications of ulcer gives added evidence of the harmful effect of the menopause on the activity of the lesion. Among the total series of 400 patients there was a history of 128 complications (95 haemorrhages and 33 perforations). Fig. 8 shows the time of occurrence of those complications in relation to the expected or actual time of the menopause. It will be seen that again there is a striking correlation, the number of complications occurring in the five-year period centred on the year of menopause being more than double that of any earlier or later period. Study of individual case records seems to give emphasis to the correlation, for several patients had more than one complication within a short time of the menopause, while one had two haematemeses and two perforations within the actual five-year period.

Discussion

Since peptic ulcer is prone to spontaneous remissions, great caution is necessary in attributing variations in symptoms to external events. However, the regularity with which remission of symptoms occurs in pregnancy and the frequency with which ulcers start, flare up, or undergo complications at or about the time of the menopause give us justification for concluding that those two states do influence the activity of the ulcer.

The manner in which they do so is uncertain, but two lines of speculation suggest themselves. (1) The effect of psychological disturbances on gastric function has been known for a long time, and has been demonstrated convincingly in recent years by many workers, notably Mittelman and Wolff (1942) and Wolf and Wolff (1943). It may well be that the remission of ulcer symptoms in pregnancy is related to the general feeling of well-being, success, and fulfilment characteristic of that state, while the mental stresses, irritability, and emotional imbalance of the menopause may account for the renewed ulcer activity at that time. (2) The mechanism may possibly be a hormonal one. It is well established that pregnancy is a period of increased hormonal activity with a marked increase in the gonadotrophic, luteal, and oestrogenic hormones, while the menopause is associated with a diminution in the sex hormones, and particularly the oestrogens.

Recent reviews of the literature by Sandweiss *et al.* (1939), Bralow *et al.* (1948), and Sandweiss (1951) make it clear that despite much research there is no clear proof of a relationship between the sex hormones and peptic ulcer. Certainly the use of these hormones in the treatment of ulcer has been disappointing, though it should be observed that they are present in pregnancy in much larger amount than can be given therapeutically.

Summary

The natural history of peptic ulcer in 400 women has been investigated with reference to menstruation, pregnancy, and the menopause.

Menstruation has an inconsiderable effect on ulcer symptoms.

Relief of symptoms occurred in nearly 90% of pregnancies. In most of them the remission occurred early

in pregnancy and persisted until term. Those patients who gained no relief had a higher proportion of abnormalities such as albuminuria and hyperemesis.

After parturition, recurrence of ulcer symptoms was common, especially during the first six months.

An unduly large proportion of ulcers start, flare up, or undergo complications at or about the time of the menopause.

I am indebted to Professor C. F. W. Illingworth for his help and criticism in the preparation of this paper; and to Miss S. Murray, of the peptic ulcer clinic, for secretarial help in arranging the interviews.

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A CASE OF GRANULOMA INGUINALE IN SCOTLAND: RESPONSE TO AUREOMYCIN

BY

A. GIRDWOOD FERGUSON, M.D., F.R.F.P.S.

AND

G. B. S. ROBERTS, M.B., Ch.B., B.Sc.

(From the Department of Dermatology, Stobhill Hospital, and the Department of Pathology of the University and Western Infirmary, Glasgow)

Granuloma inguinale, first described by McLeod (1882) and later by Conyers and Daniels (1896), is often thought of as a tropical disease, but it has been found in almost every country and climatic zone. Donovan's non motile encapsulated coccobacillus, long regarded as the probable causal agent, has been confirmed in this role by inoculation experiments in negro volunteers (Greenblatt *et al.*, 1939; Dienst *et al.*, 1947). Anderson (1943) described a method of cultivating the organism in the yolk sac of developing chick embryos; Dunham and Rake (1948) and Dienst (1948) reported successful culture in an artificial medium consisting mainly of yolk obtained from both fertile and infertile eggs. A positive skin reaction in human cases of the disease has been demonstrated by Kornblith (1944), with triturated infected material as antigen, and by Dienst *et al.* (1947), with a yolk sac culture of Donovan's organisms.

Although similar to the response evoked by the Leishman-Donovan body and by *Histoplasma capsulatum* (Hutchinson, 1952), the lesion in granuloma inguinale differs from these by the presence among its predominating plasma-cell and endothelial-cell masses of small polymorphonuclear micro-abscesses described by Allen (1948). Pund and Greenblatt (1937) showed that the organism has a characteristic morphological appearance in the tissues of the host, and the demonstration of these bodies is a further point in the differentiation of these lesions from leishmaniasis and histoplasmosis. An even closer similarity is seen to the lesions of rhinoscler-

oma, in which the main difference is the greater abundance and size of monocytic cells containing the causal organism.

The exact mode of transmission of the infecting agent remains unsettled. Males appear to be comparatively seldom affected; and the almost constant freedom from infection of the coital partners of manifest cases renders a venereal origin extremely improbable. Transmission of infection by an insect vector (*Phthirus pubis*) has been suggested by Butts and Olansky (1946).

Before modern antibiotics became available the treatment of choice was antimony, in the form of tartar emetic and later as stibophen. Greenblatt *et al.* (1947), however, found that antimony preparations were proportionately less effective as the disease became more chronic. From 1947 to 1950 the efficiency of streptomycin, chloramphenicol, and aureomycin in combating even the most recalcitrant cases has been amply demonstrated.

We are prompted to record the following case of granuloma inguinale, recently encountered in Glasgow, because it shows classical clinical and pathological features; because of its rapid response to oral aureomycin therapy despite manifest chronicity; and because of obscurity as regards the source of infection. Furthermore, a search of the literature failed to reveal any previous record of a case in which infection was apparently contracted in the United Kingdom.

Case Report

An unmarried woman aged 29 noticed a small warty growth at the anal orifice about five years ago. The lesion, although remaining localized to the perianal region, increased in size and finally ulcerated. At this stage (September, 1947) she was referred to a Glasgow hospital, where a biopsy from the affected part showed the features of a chronic non-specific plasma-cell granuloma. The Wassermann reaction was negative and the clinical diagnosis then made was that of non-venereal warts. X-ray therapy was administered (total: 1,500 r in daily doses of 300 r at 85 kV). There was some transient improvement after treatment, and in October, 1947, applications of carbon dioxide "snow" reduced the lesion to a small pea-sized warty growth.



FIG. 1.—The lesion before treatment, showing the extensive ulceration encircling the vagina and extending along the groin.

affected area was often macerated and foul-smelling, and the patient again sought advice from her practitioner. In consultation, one of us (A. G. F.) made a provisional diagnosis of granuloma inguinale and arranged her admission to Stobhill Hospital on September 11, 1951, for further investigation and treatment. She denied sexual intercourse and stated that she had

never been out of Scotland. There was no history of local injury or of pre-existing disease of the skin at or near the area involved.

Examination revealed a raised and sharply demarcated vegetative plaque with central linear ulceration. This lesion extensively involved the perineal cleft, vulva, and groins, the skin of the left groin being most severely affected.

The lesion was in general moist and foul-smelling (Fig. 1); the inguinal lymph nodes were not enlarged and there was no evidence of sinus formation. The Wassermann and Frei tests were negative.

Bacteriology.—Tissue smears made from the under surface of material excised for histological examination showed large mononuclear cells containing intracellular organisms which were Gram-negative but stained with Wright's stain, when they appeared as cocco-bacilli with clear unstained capsules. These organisms presented the morphological appearances of Donovan bodies (Fig. 2). An attempt was made to culture the Donovan bodies on egg yolk, using the method of Anderson (1943). Although various antibiotics were mixed with the tissue suspension, in all instances the eggs became heavily infected with pyogenic organisms and the embryos died.

Histology.—The lesion was a raised papillomatous granuloma covered by a very hypertrophic epithelium. No ulceration was noted in the material submitted, but in the upper and mid-corium there was granulation tissue of a rather open texture through which were scattered inflammatory cells, chiefly plasma cells, polymorphs, and mast cells. Small polymorphonuclear abscesses were seen between the dermal papillae. In the deeper portions of the lesion the fibrous tissue was very dense, and in its meshes there were large collections of plasma cells.

Examination of the superficial portion of the lesion revealed a number of large macrophages which contained intracytoplasmic cysts. These cysts in turn contained small round bodies which often appeared to be arranged at the periphery (Fig. 3) but could sometimes be seen throughout the cyst. The appearance of these cells corresponded with that of the "pathognomonic cells" of granuloma inguinale described by Pund and Greenblatt (1937). The bodies seen in these intracytoplasmic cysts stained with haematoxylin but were Gram-negative. They did not stain satisfactorily by the Romanowsky methods (Leishman, Giemsa, Dominici). Both the Donovan bodies and the wall of the cyst stained positively with the periodic-acid Schiff technique. In view of the statement by Pund and



FIG. 2.—Smear from the lesion, showing Donovan bodies in a large mononuclear cell. (Leishman's stain. $\times 2,000$.)



FIG. 3.—Donovan bodies are seen lying in an intracytoplasmic cyst in the mononuclear cell in the centre of the field. (Haematoxylin and eosin. $\times 1,000$. Paraffin section.)

Greenblatt (1938) that the Donovan bodies have an affinity for silver, various silver-staining techniques were tried, but all gave negative results, which may have been due to the material being fixed in formol corrosive fluid, which has a generally deleterious effect on this form of staining.

Treatment.—When investigations had been completed aureomycin therapy, 2 g. daily in divided dosage by mouth,



FIG. 4.—The lesion after treatment with aureomycin. The ulcerated area has been completely healed by a smooth epithelium.

the proliferative and ulcerative lesion was replaced by soft and pliable scarring. Aureomycin and dibixin were discontinued on November 13 (the total dosage of aureomycin being 80 g.). Improvement has since been maintained and healing was complete (Fig. 4). Examination on June 11, 1952, revealed no evidence of recurrence.

Discussion

Although granuloma inguinale is most common in tropical and subtropical areas, sporadic cases are occasionally seen in temperate climates. Our patient, who had never been abroad, developed her disease in Scotland; we have been unable to trace any record of a previous example, but it is possible that cases occur which are either unrecognized or not reported, particularly in seaport towns.

The question of a source of infection is one of considerable interest. Despite a wealth of available material in the New World and the Tropics, opinions remain divided about the venereal origin of this disease. The comparatively low infection rate among males and the apparent resistance to contagion of coital partners are points of importance as regards a possible non-venereal aetiology. In our case there was an emphatic denial of exposure to venereal infection, and there is nothing in the history to suggest that this statement should not be accepted. There is therefore no clear indication of the method of transmission of the causal organism. The possibility of an indirect mode of infection—for example, by pubic lice—cannot, however, be entirely discarded, and in this connexion the observations of Butts and Olansky may well be important.

Since the advent of the antibiotic series of drugs it has become evident that antimonial preparations, ineffective in chronic and long-standing cases of granuloma inguinale, are outmoded. Penicillin has been found by Chen *et al.* (1951) to produce a potent bacteriostasis in the laboratory, but has proved disappointing *in vivo*. Streptomycin, terramycin, chloramphenicol, and aureomycin have all proved useful in actual practice, the dosage varying according to the duration of infection and the chronicity of the disease. Important

observations regarding the potency of aureomycin are to be found in the work of Wright *et al.* (1948), Hill *et al.* (1949), and Wammock *et al.* (1950). Further, Greenblatt *et al.* (1950) reported good results using aureomycin by mouth in a series of 46 patients, five of whom had not responded to streptomycin. The average total dosage was 20–30 g. over a period of ten to fifteen days, and only two relapses were observed. The smallest total dose was 10 g. and the largest 70 g. In this latter instance the patient's lesions were extremely chronic and had been streptomycin-resistant. In general it appeared that extensive or slowly responsive cases required from 40 g. to 70 g. of the medication in order to effect a complete cure. Our case was given a total of 80 g. in view of the long duration and extensive nature of the disease process. Up to the time of writing there has been no evidence of recrudescence.

The infecting agent persists for a long time in tissue. Here the material removed in 1951 showed "pathognomonic" cells containing numerous Donovan bodies which had remained unaltered in spite of x-ray and other local therapy. Nevertheless, it would appear easier to confirm the diagnosis by the examination of smear preparations than by histological examination of the material removed. The diagnosis was readily apparent in 1951 on the examination of smears, in which the organisms have a very characteristic appearance, but the bodies were found only in sections after prolonged search. Furthermore, the presence of the infecting organism in tissue was not appreciated in 1947, although the chronic granulomatous nature of the lesion was then fully apparent and the question of a specific causal agent was raised.

The lesions in our case showed well-marked pseudo-epitheliomatous hyperplasia, a feature which has been stressed by Philpotts (1947). This, together with widespread plasma-cell infiltration in the corium, should always suggest a search for "pathognomonic" cells and organisms in suspected examples of the disease.

Summary

A case of granuloma inguinale of the chronic ulcero-vegetative type is described.

The patient contracted the disease in Scotland, and this would appear to be the first recorded example of such an occurrence in Great Britain.

A venereal origin of the disease could not be established.

Despite the chronicity of the condition a complete cure was achieved by means of a total dose of 80 g. of aureomycin over a period of five weeks.

Our thanks are due to Mr. P. S. Waldie, Department of Medical Photography, Stobhill Hospital, for the clinical photographs.

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PYRIMETHAMINE IN TREATMENT OF VIVAX MALARIA

PRELIMINARY REPORT

BY

JASWANT SINGH, M.B., Ch.B., D.P.H., D.T.M.&H.

A. P. RAY, M.B., B.S.

P. C. BASU, M.B.

AND

B. G. MISRA, L.M.F., L.T.M.

(From the Malaria Institute of India, Delhi)

Pyrimethamine ("daraprim"), a 2:4-diaminopyrimidine compound, has been shown to be highly effective against blood-induced infection of *Plasmodium gallinaceum* and *P. berghei* (Falco *et al.*, 1951). Jaswant Singh, Misra, *et al.* (1951) recently observed that the drug is four times as active as proguanil against *P. knowlesi* in rhesus monkeys, and that it has causal prophylactic action against *P. gallinaceum* in fowls (Jaswant Singh, Basu, and Ray, 1952). Jaswant Singh, Krishnaswamy, *et al.* (1952) have also reported that *P. berghei* in albino mice showed phenomenal sensitiveness to pyrimethamine.

In *P. falciparum* and *P. malariae* infections, McGregor and Smith (1952) have demonstrated that the compound has powerful action on dividing schizonts, but less so against trophozoites. But so far, to our knowledge, very little has appeared in the literature on the effect of the drug against *P. vivax* infections.

Present Investigation

The present report records findings on the effects of this compound on the clinical symptoms and also on the parasites in the first 30 cases of vivax malaria attending hospitals in Delhi State. Seventeen patients gave a previous history of malaria during the past year or so, and in these the spleen was palpable in five cases. On the first examination of blood smears, besides other forms, gametocytes were detected in 11 cases. In 13 other cases there was no previous history of malaria, the spleen was not palpable, and gametocytes were detectable in 9.

Pyrimethamine was administered orally, and each patient received a single dose of 25 mg. (2½ tablets, each containing 10 mg.) of the base. The results are tabulated. The overall

Clearance of Clinical Symptoms, Asexual Parasites, and Gametocytes in Hours

Clearance of	In Hours						Total Cases
	24	48	72	96	120	144	
Clinical symptoms:							
Group I	9	3	5	—	—	—	17*
Group II	5	2	6	—	—	—	13
Total	14	5	11	—	—	—	30
Asexual parasites:							
Group I	6	8	3	—	—	—	17
Group II	5	5	2	1	—	—	13
Total	11	13	5	1	—	—	30
Gametocytes:							
Group I	1	1	4	5	2	1	14
Group II	—	—	3	2	1	3	9
Total	1	1	7	7	3	4	23

Group I = with previous history of malaria.
Group II = No history of previous attacks.
* Five out of 17 cases had enlarged spleen.

picture appears to be that 46.6% (14 out of 30) of the patients became afebrile within 24 hours, 63.3% within 48 hours, and 100% within 72 hours. In 36.6% of the cases clearance of asexual parasites was attained within 24 hours, in 80% within 48 hours, and in 96.6% within 72 hours.

Out of 14 patients who became afebrile within 24 hours, 9 (64.3%) were from Group I—that is, they had had previous attacks of malaria during the course of a year or so—as compared with 35.7% in Group II, without any previous history. Further, it was observed that 6 out of 13 cases (46.1%) in Group II had the second paroxysms 48 hours after the treatment, as against 5 out of 17 (29.4%) in Group I.

The rate of asexual parasite clearance within 24 hours was 54.5% (6 out of 11) in Group I, and 45.5% (5 out of 11) in Group II. Moreover, parasite clearance in all cases in Group I occurred within 72 hours, against 96 hours in Group II.

Thus it would seem that clearance of symptoms and asexual parasites was more rapid in those who had a previous history of malaria than in those who had not. McGregor and Smith (1952) observed that in *P. falciparum* and *P. malariae* malaria the drug acts "just as swiftly in non-immunes as in subjects who possess considerable immunity." But in view of the present observations we are unable to lend support to this view so far as vivax malaria in India is concerned. Therefore the question of repeating the dose may have to be considered, particularly in cases without any previous history of malaria.

The action of pyrimethamine on gametocytes was found to be much slower, and in only 39.1% of the cases did the gametocytes disappear within 72 hours; in 4 out of 23 cases (17.3%) they persisted for 120 hours or more.

The redeeming feature of pyrimethamine seems to be its remarkable effectiveness against *P. vivax* in so small a dose (25 mg.). It would appear that the drug has a future, and further work is indicated.

In view of the high degree of cross-resistance between proguanil and pyrimethamine, recently demonstrated in simian malaria by Jaswant Singh, Ray, *et al.* (1952), one must withhold final judgment until reports on large-scale and continued observations are available, particularly from areas where some strains of plasmodia have been reported to be refractory to proguanil (Field and Edeson, 1949; Gilroy, 1950, personal communication; Chaudhuri, 1951; Wilson *et al.*, 1952).

We wish to thank Brigadier J. S. K. Boyd, of the Wellcome Laboratories, London, for his valuable suggestions from time to time since the beginning of the series of investigations with pyrimethamine, and also for the supply of the drug whenever required.

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A new edition of the *Alphabetical and Local List of Old Students* has just been issued from St. Thomas's Hospital Medical School. The list, which is revised to March 30, 1953, and supersedes the 1948 issue, gives brief details of nearly 3,000 alumni of the Medical School. It may be obtained from the Beadle of the Medical School, Albert Embankment, London, S.E.1, price 5s. 3d., including postage.

GOITRE AND HYPOTHYROIDISM DEVELOPING DURING TREATMENT WITH P.A.S.

BY

H. T. DAVIES, M.B., B.S.

House-Physician, St. Bartholomew's Hospital, London

AND

H.-J. B. GALBRAITH, M.D., M.R.C.P.

Medical Registrar, St. Bartholomew's Hospital, London

Since the introduction of *p*-aminosalicylic acid (P.A.S.) for the treatment of tuberculosis by Lehmann in 1946, many thousands of patients must have received large doses of this drug for long periods. It is only during the past year or two that a few reports have appeared on the development of goitre and hypothyroidism in patients being treated with P.A.S. In these reports, as in the case here described, the circumstances are most suggestive that P.A.S. has a goitrogenic action in some individuals.

Case Report

A male medical student aged 28, with no personal or family history of thyroid disease, was admitted for treatment of pulmonary tuberculosis. On February 21, 1952, intramuscular streptomycin, 1 g. every three days, and P.A.S. (as the sodium salt), 10 g. daily, were started; later the dosage of P.A.S. was increased to 12 g. The patient's progress was satisfactory until, on July 29, after 56 g. of streptomycin and 1,600 g. of P.A.S. had been given, a symptomless diffuse non-tender goitre was noticed. Recently the patient had felt some impairment of appetite and possibly an increased susceptibility to cold; his upper face appeared puffy, but there was otherwise no clinical evidence of hypothyroidism. The serum cholesterol was 220 mg. per 100 ml.

On August 6 the basal metabolic rate was -10%, and on August 19 the streptomycin and P.A.S. were replaced by isoniazid. At this time the basal metabolic rate was -21% and the serum cholesterol 268 mg. per 100 ml. Radio-iodine studies seven days after discontinuation of the drugs suggested excessive thyroid activity with, however, no corresponding increase in the rate of organic binding of the iodine. This pattern is compatible with the incomplete removal of a thiouracil-like block of thyroid activity. Radiographs showed no recent increase in size of the heart. The electrocardiogram was normal.

Four weeks after discontinuation of streptomycin and P.A.S. the appetite and facies had returned to normal, the goitre was only just palpable, and the basal metabolic rate had risen gradually to -1%, although the serum cholesterol had fallen to only 245 mg. per 100 ml. Four months later the thyroid was still just palpable, the basal metabolic rate was +5%, and the serum cholesterol was 215 mg. per 100 ml.

Discussion

The development of myxoedema during P.A.S. therapy was first described by Clausen and Kjerulf-Jensen in 1951. Three patients developed hypothyroidism and goitre after taking 610 g., 1,780 g., and 2,500 g. of P.A.S. respectively in the usual dosage. The endocrine state and the gland size in the usual dosage. The endocrine state and the gland size in the usual dosage. The endocrine state and the gland size in the usual dosage.

Bergqvist and de Maré (1952) reported two cases of hypothyroidism with goitre and two cases of goitre without objec-

tive evidence of hypothyroidism in patients treated with simultaneous thiosemicarbazone and P.A.S. Streptomycin had been given to three of the patients for part of the time, but it would seem difficult to incriminate this drug. One patient died of myxoedema and cerebral oedema; at necropsy the thyroid showed a glandular hyperplasia identical with that seen after the administration of thiouracil. In two other cases the authors thought the thyroid condition improved when the thiosemicarbazone was stopped, the administration of P.A.S. continuing; while in the fourth the goitre had disappeared five months after simultaneous withdrawal of P.A.S. and thiosemicarbazone. These authors suggested that the thiosemicarbazone and P.A.S. may have a synergistic action or that the thiosemicarbazone may act by retarding the renal excretion of P.A.S. A further case of goitre following treatment with P.A.S. and thiosemicarbazone has been described by Librach (1952). Bergqvist and de Maré also quote a personal communication from Stavanow, who has seen "a few cases of goitre and one case of mild hypothyroidism following P.A.S. medication."

In animal experiments, principally on rats, Kjerulf-Jensen and Wolffbrandt (1951) showed that P.A.S. and its degradation product in the body, meta-aminophenol, produce a thyroid hyperplasia qualitatively comparable with, but quantitatively much less than, that induced by thiouracil. This hyperplasia can be prevented by the simultaneous administration of thyroid extract.

Hanngren (1952), in a preliminary communication on radio-iodine studies of three patients before and during P.A.S. therapy, showed that P.A.S. inhibited the uptake of iodine by the thyroid.

Astwood and his colleagues (1945) found that many aminophenol compounds, including 4-aminobenzoic acid, had a goitrogenic effect. It is not surprising, therefore, that P.A.S. (4-amino-2-hydroxybenzoic acid) has been shown to have a similar action.

Summary and Conclusions

A case in which goitre and mild hypothyroidism occurred during treatment with P.A.S. and streptomycin is described; the thyroid condition returned to normal within four weeks of discontinuing treatment.

The literature, in which at least 10 similar cases are mentioned, is reviewed.

It would seem that P.A.S. has a definite although feeble antithyroid action similar to that of the thiouracil drugs, and in a small proportion of patients receiving such treatment goitre and, possibly, hypothyroidism may develop without the dosage being excessive or the duration of treatment very prolonged. Fortunately, the process appears to be reversible if the situation is realized, and the administration of P.A.S. stopped, before the myxoedema is severe.

Our thanks are due to Dr. A. W. Spence and Dr. F. H. Young for permission to publish this case and to Professor J. Rotblat for the radio-iodine studies.

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The Annual Federal Conference of the Flying Doctor Service of Australia was opened in Sydney by Sir John Northcott, Governor of New South Wales, on April 20. During 1952 aircraft maintained at nine stations in the Australian outback made nearly 1,000 flights, covering just over 253,000 miles.

Medical Memorandum

Polyarteritis Nodosa Presenting as Acute Diabetes Mellitus

In view of the manner in which the following case presented, it is felt that it may be of value as yet another form in which polyarteritis nodosa may be encountered.

CASE REPORT

The patient, a South Indian pipe-fitter aged 30, was admitted to hospital on December 17, 1951, having had fever and headache for three days. Three months previously he had been an in-patient for a disease that resembled enteric fever, and his serum at that time gave a Widal reaction of 1 in 250 to *Bact. typhosum* H. He had a continuous high temperature for 20 days, but with relative bradycardia and a palpable spleen. He was discharged after five weeks. The only medicine received was aspirin in small amounts.

On examination his temperature was 102° F. (38.9° C.), pulse 110, respirations 28; no physical signs were found. Total white cells were 10,000 (74% polymorphs, 16% lymphocytes, 8% monocytes, 1% eosinophils, 1% basophils). No malaria parasites were seen. The Widal reaction was negative. His temperature fell to normal at the end of 72 hours, and he was symptomless; he had been given aspirin, 5 gr. (0.32 g.) thrice daily, and Dover's powder, 15 gr. (1 g.) at night, for three days.

Early on the sixth morning he complained of severe pain in the left abdomen, lateral to the umbilicus; there was deep tenderness in this area and the abdomen was soft. He was given $\frac{1}{4}$ gr. (16 mg.) of morphine and 2 ml. of nikethamide intramuscularly. Later in the morning the tip of the spleen could be felt for the first time. At 3 p.m. he had a "fit," observed by the nurse, which consisted of twitching of the face, both eyes, hands, and legs. After this he was very quiet for 10 minutes, but then became noisy and started throwing himself about the bed for 30 minutes; this was followed by a similar fit to the first. When seen by the doctor the patient was in coma, but the corneal reflex was present; there were no localizing signs, but both pupils were widely dilated. No reflex changes were found, but there were gentle squirming movements of both arms. His blood pressure was 120/80.

A catheter specimen of urine showed a heavy cloud of albumin, sugar +, and acetone +. Many pus cells, a few red blood cells, and granular casts were present in the deposit. The blood sugar was 265 mg. per 100 ml. Cerebrospinal fluid examination showed a yellowish fluid, under normal pressure; proteins 0.04 g.%; no globulin; chlorides 656 mg. per 100 ml.; a few red blood cells; and 9 lymphocytes per c.mm. The flow increased on jugular pressure.

The following measures were taken on the assumption that this was a diabetic coma: normal saline intravenously, gastric lavage with normal sodium bicarbonate solution, 50 units of insulin subcutaneously, and 2 gr. (0.13 g.) of phenobarbitone sodium intramuscularly.

He showed great restlessness, but this was controlled by 4 ml. of paraldehyde intramuscularly and 1/100 gr. of hyoscine. The blood sugar on the following morning (seventh day) was 50 mg. per 100 ml., and shortly after he vomited dark-brown material suggesting altered blood. He was still in coma. His blood pressure was 130/90. Urine was collected from an indwelling catheter, and penicillin, 1,000,000 units four-hourly, was ordered. Urine output was only fair after substitution of 5% glucose in half normal saline; the acidosis was controlled with small amounts of insulin, the carbon-dioxide-combining power rising from 29 to 60 vols.% over the next 48 hours, sugar and acetone disappearing from

the urine. In addition the patient was given 8 g. of potassium chloride as a rectal drip of 2% potassium chloride over the next 24 hours. The chest remained free of adventitious sounds, though the temperature rose to 100° F. (37.8° C.).

On the ninth day the blood pressure rose to 170/115, with a pulse of 116. Intravenous therapy was stopped and 2,000 ml. of 5% glucose in normal saline was given per rectum. There was no relief from the deep coma; the urine continued to show albumin +, W.B.C. ++, R.B.C. +, but no casts, and it was acid. Ophthalmoscopic examination revealed early papilloedema but no disease of vessels and no exudates or haemorrhage. Plasma cholesterol was 70 mg. per 100 ml., and the Widal reaction was again negative. On this day it was noted that arterial pulsation in both femoral arteries ceased just below the groins and there were bilateral colour changes in the legs below the knees. The temperature of both limbs was reduced.

On the tenth day the blood pressure rose to 200/120 and the condition of both legs was the same. There was no change in his general condition; he continued to secrete urine on a total rectal intake of 1,400 ml. He died quietly on the fifteenth day. The temperature rose terminally to 102° F. (38.9° C.).

Post-mortem Examination.—An emaciated male with bilateral dry gangrene of legs below the knees. The following points were of interest: (1) 2 oz. (28 ml.) of straw-coloured fluid in the pericardium; a small discoloured area in the posterior myocardium of the left ventricle suggesting a healed infarction. (2) Pleura and lungs appeared normal. (3) Liver showed an area of yellowish discoloration in the left lobe. (4) Greater omentum showed a small area of greenish discoloration in its free edge. (5) Pancreas apparently normal. (6) Spleen showed a massive infarct. (7) Both kidneys showed massive infarcts progressed to necrosis. Adrenals apparently normal. (8) The brain showed no evidence of meningitis, abscess, haemorrhage, thrombosis, or emboli. The pituitary fossa and pituitary gland were apparently normal.

Histological examination showed an acute arteritis in both the larger and the smaller vessels, well seen in the femoral arteries and the arteries of the spleen, liver, brain, and kidney. There was a panarteritis with degenerative changes in the intima and media of both arterioles and larger vessels, with considerable perivascular inflammatory cell reaction and penetration of all layers. In the afferent arterioles of the kidney, fibrinoid degeneration was seen with arteriolo-necrosis. The aneurysmal formation in the larger vessels was of interest in that it is seldom seen in the modern form of polyarteritis (Robb-Smith, 1952, personal communication).

COMMENT

In this case the only known possible antigens were the *Bact. typhosum* and aspirin, but the former rests only on the evidence of a positive Widal reaction, which may have been an anamnestic reaction in the absence of positive blood, stool, or urine cultures.

During the patient's last illness the diagnosis of polyarteritis nodosa was not considered until the appearance of bilateral arterial block in the legs. Then in retrospect the onset of acute abdominal pain followed by convulsions and cerebral vascular accident suggested the diagnosis. The absence of an eosinophilia was not thought to be of significance.

It is believed that the acute diabetes was due to an associated acute haemorrhagic pancreatitis.

My thanks are due to Dr. A. H. T. Robb-Smith, of Oxford, for kindly giving his opinion on the sections, to Dr. W. B. Roantree, late Chief Medical Officer, Kolar Gold Field, and to Messrs. John Taylor and Sons (India), Ltd., for permission to publish this case.

GEOFFREY FRENCH, M.D.,
Senior Assistant Medical Officer, Kolar Gold Field.

Reviews

NEW TEXTBOOK OF MEDICINE

Medicine. Vols. I and II. Edited by Hugh G. Garland, T.D., M.D., F.R.C.P., and William Phillips, M.D., F.R.C.P. (Pp. 2,146; 167 pages of art. plates, 7 in colour. £6.) London: Macmillan and Co. 1953.

The publication of a new textbook of medicine in two volumes and costing £6 would in any event be a major happening in British medicine. In the present instance it is even more exciting because Garland and Phillips have made the experiment of writing a textbook which attempts to describe and integrate the whole work of the physician. The dilemma of modern medicine is the increasing accumulation of knowledge and the great variety of approaches to the patient. Recent authors and editors have met this dilemma in different ways. The Edinburgh school, under the leadership of Professor Davidson, produced a short textbook last year by means of being exclusive and by omitting much that many of us would feel properly belongs to internal medicine. Harrison and his colleagues in America produced an extremely large book, of which perhaps a half consisted in morbid physiology or phenomenology—to my mind a somewhat unfortunate legacy of Mackenzie and Lewis to the modern generation of medical students—while the other half consisted in a rather short clinical account of disease which did not interdigitate exactly with the physiological section. Price in this country, and Cecil and Loeb in America, have adhered to the type of textbook in which organic disease, as met in the consulting-room and clinic, is treated in a relatively encyclopaedic fashion, so that their books can be used as working manuals. Although this type of book is in the direct line of descent from Osler, the philosophy of medicine and many of its social and psychological aspects are deliberately eschewed.

Garland and Phillips have tried to be inclusive and to produce a whole out of the ordered grouping of the units, like Smuts in his philosophy of holism. The unique quality of their book is shown by the fact that of the forty-two contributors there are only about eleven whom I should feel justified, or shall I say invulnerable, in picking as examiners in medicine in the final examination. A large part of the first volume is devoted to subjects which have hitherto been confined to semi-philosophical treatises, such as Clark-Kennedy's *Medicine* or Halliday's *Psychosocial Medicine*, or else to special monographs as, for example, aviation medicine and industrial medicine. To the general physician this unconventional first volume is intensely interesting, and I know colleagues who are reading steadily through it, evening after evening, with manifest delight.

The more conventional remainder of the book probably contains as much as any ordinary person needs to know about internal medicine. There is, perhaps, less detailed information about organic disease than in Price or Cecil, and rarities such as gynaeomastias and the Klinefelter syndrome are not indexed. Some common things are also omitted, such as the importance of chronic bronchitis in the aetiology and prognosis of pneumonia at the present time. It is, of course, always possible for the specialist to time. It is, of course, always possible for the specialist to look through a book and find minor faults. It is not true, as here stated, that subacute combined degeneration is confined to pernicious anaemia and total gastric resection; it is found occasionally, though rarely, in association with macrocytic anaemia of steatorrhoea and intestinal stenosis. It is also not true that in subacute combined degeneration liver is effective only by the parenteral route, as a reading of the paper published by Suzman in 1931 will show. It would be easier to understand the mechanism of pernicious anaemia if liver or liver extracts by mouth, usually of course in high dosage, had not been shown to be effective in subacute combined degeneration.

It is not always easy to find the name of the writer of the section one is reading, and I must confess that I hanker

after a few references or footnotes. It would be a useful luxury if the complete index could be inserted at the end of the first volume as well as the second. The Achilles' heel of any large textbook of medicine nowadays is treatment, for the larger the book the slower the interval between the writing of the article and publication. Neither terramycin nor iso-nicotinic acid hydrazide is indexed, nor is there mention of aplastic anaemia after chloramphenicol. The tempo of the writing is irregular, and it is something of a shock to turn from the leisurely story of little John and his fantasies of aggression, so happily illustrating the Freudian dialectic, to the austerity of the passage on cystic disease of the lungs. Indeed, the reader must constantly remind himself that Garland and Phillips, like the Walrus in *Alice in Wonderland*, are deliberately talking of cabbages and kings.

As I have said, this is an experiment and an exciting one. Time will show how successful it is, but all teachers of medicine will thank Garland and Phillips and their team for having made the experiment and having put such an immense amount of labour into it. In spite of multiple authorship, the general framework is closely knit and the clinical articles read smoothly. There are many reproductions of radiographs, and most of them are excellent. The book is beautifully produced, and is in every way a credit to British medicine.

L. J. WITTS.

OBSTETRICS IN GENERAL PRACTICE

A Guide to Obstetrics in General Practice. By Professor William C. W. Nixon, M.D., F.R.C.S., F.R.C.O.G., and Eric B. Hickson, M.R.C.S., L.R.C.P., D.Obst.R.C.O.G. (Pp. 301. £1 10s.) London: Staples Press. 1953.

With the rapidly changing face of obstetrics in general, and of the scope and nature of domiciliary midwifery in particular, the information and instruction offered to the general-practitioner obstetrician by the standard undergraduate textbooks is not always appropriate to his needs. This contention is implied, if not stated, by Professor Nixon and Dr. Hickson. But in setting out to remedy this deficiency perhaps their most difficult task was to decide on the subjects for inclusion and for emphasis. It is characteristic of the care and trouble they have taken with this book that in making this decision they did not rely merely on their own wide experience, one in consulting and hospital practice, and one in general practice, although this must have served as a very reliable guide. They also paid attention to every obstetrical problem which appeared in the "Any Questions?" column of this *Journal* during five years, and they analysed the reasons for midwives' calls to doctors in one county during two years.

With this basis the authors have given us a book of reasonable size and price, which deals essentially with day-to-day practical issues. Thus, they dismiss the cause of toxæmia of pregnancy as unknown, and the valuable space saved by avoiding a discussion on theories is devoted to a detailed account of the diet suitable for this or for some other complication of child-bearing. Again, they omit the technical minutiae of operations such as internal version or bringing down a leg in favour of detailed advice on matters such as low-forceps delivery, analgesia and anaesthesia, and post-partum haemorrhage. They pay proper attention to such subjects as the management of those common upsets and symptoms of pregnancy which are labelled "minor" only by those who have never experienced them: the preparation and education of the expectant mother and father; the matters requiring the attention of the attendant during normal labour; the management of the healthy and sick newly born child; breast-feeding and its problems; and indeed many of those aspects of midwifery which in the past have been neglected by the doctor and left rather to the midwife.

What are the doctor's responsibilities by way of certificates and notifications in relation to childbirth? What

advice is to be given to a woman wanting to adopt a baby, or to have one adopted? All manner of practical issues such as these are raised and answered in a simple authoritative way—one in which the idealistic and academic outlook of the head of a teaching unit, accustomed to working under the best hospital conditions, is tempered by that of a general practitioner, who knows only too well the limitations as well as advantages imposed by attending a woman in her own home. The two authors have also not hesitated to obtain help from other authorities, one of these being Dr. H. Waller, who discusses breast-feeding. They and their associates deserve commendation for their common sense and courage in deliberately omitting so much of the academic and specialist aspects of obstetrics in the interests of producing a book which should prove a real help to those who undertake, or propose to undertake, midwifery as part of their general practice.

T. N. A. JEFFCOATE.

CLINICAL MISTAKES

Klinische Fehldiagnosen. By Professor M. Bürger. (Pp. 480; 209 figures. M.58.50.) Stuttgart: Georg Thieme. 1953.

Mistakes in diagnosis have come to all of us, and we are only too happy to forget them. To gather them together and to build from them the brilliant account which this volume presents was an inspiration of genius. The author first considers what we ought to aim at in diagnosis, pointing out that at the present day such terms as debility, dropsy, jaundice are altogether inadequate, and that we should never be satisfied until we have placed our finger upon the essential abnormality of structure or function which underlies the illness or disability of which the patient complains. He points out what a snare laboratory tests and x rays may prove to be by revealing abnormalities which are irrelevant to the real diagnosis, and pleads for the incalculable value of the eye and hand of experience.

But the greater part of the book is devoted to clear and accurate descriptions, well illustrated, of cases in every field of medicine and surgery where errors in diagnosis have occurred. Each case is carefully analysed to see how a mistake might have been avoided and how it actually arose. At every turn one feels the vast experience and clear insight which lie behind it all. Both in conception and in execution the book is unique. It is well worthy of translation. To anyone engaged in the practice and still more in the teaching of medicine or surgery it will be an inspiration.

HENRY SOUTTAR.

AUSTRALIA AT WAR

Clinical Problems of War: Australia in the War of 1939-1945. Volume I. By Allan S. Walker, M.D., Ch.M., F.R.A.C.P. (Pp. 726; illustrated. £1 15s.) London: Angus and Robertson (48, Bloomsbury Street, W.C.1), on behalf of the Australian War Memorial.

This is a very long book. It is both comprehensive and selective. On the one hand it deals with the whole of war medicine and surgery, with tropical diseases, systemic affections, nutritional problems, psychiatry, wound treatment in general and the surgery of the regions and the specialties, and with the special aspects of medicine and surgery in captivity. On the other hand it is concerned only with the experiences of the medical services of the Australian Forces; it discusses their methods and their results and it quotes their writings. Though some of the chapters, such as those on chemotherapy and traumatic shock, take a broader view, it is more concerned with detail than with a general survey. It reports the war much as a pathologist might report on a malignant tumour from the examination of a biopsy specimen from a part of it, describing the appearances seen under the oil immersion. As a whole it is tough reading, but in detail it provides a valuable record that will be of great assistance to future historians.

H. PAYLING WRIGHT.

In some aspects the views expressed are at variance with those of others who went through the same campaigns. It would be interesting to know whether the recommendation that compound fractures should be plated under penicillin cover is supported by a review of the after-history of cases so treated.

The most valuable thing about this book to the general reader is that it gives a picture of war medicine and surgery under conditions of real war, where the medical officers are doing all that is possible under impossible conditions, when transport fails, supplies are unobtainable, and the assaults of the enemy and the forces of Nature forbid any but makeshift methods. In the Western Campaigns such conditions were found only for a short time in 1941. After the battle of Alem Halfa in August, 1942, the medical services could leave the possibility of serious interference with their plans by the enemy out of the question. The Australian Forces in New Guinea and the Pacific faced conditions that can be inferred from their writings and the results, and realized even more clearly from the excellent illustrations which form such a striking feature of this book.

HENEAGE OGILVIE.

BLOOD COAGULATION

Human Blood Coagulation and its Disorders. By Rosemary Biggs, B.Sc.(Lond.), Ph.D.(Toronto), M.D.(Lond.), and R. G. Macfarlane, M.A.(Oxon.), M.D.(Lond.). (Pp. 406; 57 figures. £1 12s. 6d.) Oxford: Blackwell Scientific Publications. 1953.

In recent years studies on blood coagulation have assumed such complexities that many workers in this field find it difficult to keep abreast of current progress. This is the book for which many have been waiting. Drs. Biggs and Macfarlane consider the factors known to take part in the mechanism of clotting and point out where nomenclatures overlap and where experimental observations may be related to one another. Each chapter is summarized to facilitate rapid reference.

Of the book's twenty chapters the first seven are on coagulation factors, thrombin, fibrinogen, prothrombin, thromboplastin, factors V and VII, and the natural inhibitors of clotting. There are also chapters on clot retraction, fibrinolysis, anticoagulants, and the basic pathological coagulation phenomena met with in disorders of the clotting mechanism. Part II covers abnormalities observed clinically in patients. The authors discuss fibrinogen deficiency, haemophilia, thrombocytopenia, hypoprothrombinaemia, and anticoagulants, together with laboratory methods for the investigation of such conditions. Finally, they consider haemostasis and the significance to the body of coagulation. Technical methods of many tests frequently used in the study of these problems are set out in appendices.

This should prove a most useful book to anyone concerned either clinically or experimentally with blood coagulation. Its lucidity of style makes it suitable for recommendation to undergraduate students anxious to learn more than is usually found in textbooks, while for post-graduates and physiologists it should help to clarify many complex theories. Its general format, with copious sub-headings, makes it easy for reference on specific points. The line diagrams are clear and self-explanatory, the index is good, and the printing and general production are satisfactory. It is inexpensively priced at 32s. 6d., an important feature in specialized publications of this kind.

The authors have produced a readable and understandable book on a difficult subject. They have brought together many controversial studies and, as far as possible, produced an intelligible general picture of present knowledge. The width of their view is indicated by the 900 references to original papers quoted in the text. This is undoubtedly the most important book on blood coagulation to have appeared in Britain for many years.

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HOMAGE TO LIND

In 1753, with George II on the throne and only six years after the defeat of Prince Charles Edward Stuart at Culloden, James Lind published the first edition of his *Treatise on Scurvy*. He was a medical graduate of Edinburgh University who had followed his profession as a ship surgeon in the Navy. In those days the perils of the sea were reinforced by the frequent appearance of scurvy, which afflicted most crews that had been afloat for more than a few weeks. Thus in a voyage spent harassing the Spaniards in the South Seas Lord George Anson had recently buried about three sailors out of every four in his squadron as victims of the disease. These losses were incurred even though the protective action of fresh foods, and particularly fruits, was widely, if only vaguely, realized. Lind's contribution to the eradication of the disease can therefore hardly be classed as an original discovery. But he performed an immense service for humanity by correlating the experience of previous authorities, by distinguishing between truth and error, and by finally putting his theories to experimental tests. In H.M.S. *Salisbury*, a 50-gun fourth-rater, he dosed six pairs of scorbutic seamen with the supposed remedies then in favour, which included cider, elixir vitriol, vinegar, sea water, oranges and lemons, and an electuary made with garlic, mustard seeds, and other ingredients. Both the seamen given the oranges and lemons improved rapidly, and one was completely healed after receiving the fruit for only six days. Among the rest of the seamen, those given the cider, which unfortunately had gone sour, finished the fortnight of the trial in a better condition than any of the others.

Some forty years later, and two years after Lind's death, the force of his treatise impelled its way through the slowly moving machinery of the eighteenth century Admiralty, and provision was made for an allowance of lemon juice for every seaman. Except for the unfortunate substitution of the inactive lime juice for lemon juice half a century later the practical problem of preventing scurvy was solved. Dr. C. P.

¹ Published by the Edinburgh University Press, price 45s.
² Preliminary Report of the Vitamin C Subcommittee of the Accessory Food Factors Committee of the Medical Research Council, *Lancet*, 1948, 1, 853. See also leading article in *British Medical Journal*, 1948, 2, 828.

Stewart and Dr. A. P. Meiklejohn, therefore, are to be congratulated for their happy idea of organizing a symposium of the Nutrition Society to mark the bicentenary of the appearance of the *Treatise*, and to blend a historical appreciation of Lind's work with modern developments on vitamin C. A fortnight ago they drew together at the University of Edinburgh a distinguished international gathering, which included most of the best-known authorities on the subject.* A series of interesting papers ranged from the early investigation of scurvy and of the antiscorbutic vitamin, by Dame Harriette Chick, to the role of chromosomes in the synthesis of ascorbic acid in plants and animals, by Drs. Mapson and Isherwood. Members of the conference were received at the Royal College of Physicians of Edinburgh, of which Lind was once a member, by its President, Dr. W. A. Alexander. Sir Sheldon Dudley, who was awarded the honorary degree of doctor of laws of Edinburgh University by Sir Edward Appleton, F.R.S., gave the Lind Oration on May 22, and the proceedings also included a formal lecture on "The Impact of Vitamin Research on the Practice of Medicine" by Dr. Sydenstricker. The celebrations concluded with a light-hearted dinner composed mainly of rich sources of vitamin C, including scurvy grass as a garnish, adrenal capsules dressed with paprika, and parsley as a savoury.

To coincide with the conference Drs. Stewart and Douglas Guthrie have produced a new edition of Lind's *Treatise*.¹ This has been reinforced by notes on modern developments, for which the editors have enlisted the help of various authorities. The book makes fascinating reading, and few will disagree with the editors when they say that Lind's writing is surprisingly modern both in style and in outlook. "In order to make way for the restoration of solid learning" he found it necessary to "expunge all terms as were contrived to give an air of wisdom to the imperfections of knowledge." In spite of our ability to prevent scurvy, moreover, some of the problems which faced Lind are still awaiting solution. He considered that the predisposing cause of scurvy was constant exposure to damp air and that diet was only the secondary cause. Thus, in his experience, sailors would contract scurvy at sea within a few weeks, even when they were given much the same diet as would keep them in health for months on land. He observed that scurvy was most apt to afflict those

*Vice-Admiral Sir Sheldon Francis Dudley, F.R.S., and Surgeon Rear-Admiral J. Hamilton represented the Royal Navy. Sir Edward Mellanby, F.R.S., Dame Harriette Chick, Professor H. A. Krebs, F.R.S., Professor R. C. Garry, and Drs. L. J. Harris, L. W. Mapson, and F. A. Isherwood were other British representatives. America was represented by Drs. C. G. King, V. P. Sydenstricker, J. H. Crandon, R. M. Kark, and W. J. Darby, France by Drs. H. Gounelle and H. Tenlon, Belgium by Professor E. J. Bigwood, and Holland by Dr. M. van Eekelen.

who were indolent or melancholy by nature. Alcoholic spirits, but not wines or beer, tended to precipitate scurvy. Fever made the sailor prone to scurvy, and scurvy in turn increased liability to fevers. Two hundred years ago, therefore, Lind recognized the conception of "secondary" or "conditioned" dietary deficiencies which is still a fertile field for modern research. It would have caused him no surprise if he could have known that the conscientious objectors at Sheffield who volunteered to subsist on a diet deficient in vitamin C developed only slight signs of scurvy after four to six months.² They spent their nights in dry beds, not in wet hammocks. He would have been intrigued by American work which suggests that good temper depends on a high concentration of ascorbic acid in the blood. The failure of Dr. Kark to influence the ascorbic acid metabolism of his soldiers by exhausting marches through the snow, or by an overnight flight between regions of extreme heat and extreme cold, would have come as a challenge to his powers of observation and experiment. When we remember also his other treatises, which did much to abolish typhus from the Navy and to improve its general hygiene, we may well regard him as the true founder of the Royal Naval Medical Service. We may also rejoice with Sir Sheldon Dudley that the Lind tradition is still alive to-day.

PENICILLIN IN TISSUE FLUIDS

It has often been claimed, and is widely believed, that a large dose of aqueous penicillin exerts a much more prolonged effect than the rate of its elimination from the blood would suggest. The high concentration initially attained is said to facilitate diffusion from the blood into foci of infection where the penicillin remains and continues to act long after the blood has been cleared of it. That this is true of certain types of lesion there can be no doubt: it was first proved by Florey, Turton, and Duthie¹ in a study of the penicillin content of exudates in wounds in a more or less chronically septic condition. After an intramuscular dose of 100,000 units penicillin was always present in the exudate after eight hours, often after twelve, and sometimes for even longer. Ungar² reported similar findings in abscesses experimentally induced in rabbits by the intramuscular injection of turpentine. Weinstein, Daikos, and Perrin³ planted fibrin clots subcutaneously in rabbits, and, by removing them at intervals after an injection of penicillin, digesting them, and assaying their drug content, showed that it persisted much longer in them than in the blood.

The more cautious have questioned the applicability of these findings to other kinds of lesion. That they apply to a focus into which exudation is proceeding and in which the exudate accumulates is evident from the findings of Florey and his colleagues. What has not been proved is that they are true of an area of acute inflammation without tissue breakdown, fully and indeed excessively supplied with blood, and with adequate lymph drainage. This describes the earlier stages of many infections of various tissues for which penicillin is used, and it is important to know how long the drug may be expected to remain effective in such an area after a known dose. This question has been re-examined by Eagle and his co-workers,⁴ to whom we owe much of our more exact knowledge of the mechanism of penicillin action. They injected a measured large inoculum of haemolytic streptococci intramuscularly in one hind leg of mice and followed this two hours later with a single dose of sodium penicillin, varying from 0.05 mg. to 50 mg./kg., into the other leg. Groups of mice were killed at intervals of one and a half to fifteen hours, the infected muscle being removed, emulsified in a Waring blender, and cultivated quantitatively. It was thus possible to plot curves showing the progressive destruction of the streptococci while the drug was acting and their subsequent growth when its effect was lost. Regardless of the size of the dose, the initial killing proceeded at the same rate. That there is no advantage in high concentrations of penicillin *per se* has been shown before by Eagle⁵ himself and by others. At the end of the period for which a given dose is known (from the authors' previous studies) to provide a blood concentration effective against streptococci, the rate of killing almost immediately fell off, and was succeeded by slow multiplication within three hours. Even the two largest doses, equivalent to 1 and 4 million units in a man, had ceased to kill after six hours, and rapid multiplication followed them after six and nine hours respectively.

These findings need to be interpreted with the reservation that penicillin is eliminated more rapidly by the mouse than the human kidney, but the fact remains that the effect of large doses was not much more prolonged than that of small ones after the point at which the blood concentration fell below the critical level. These experiments seem to afford inescapable proof that in normal tissues, or

¹ *Lancet*, 1946, 2, 405.

² *Ibid.*, 1950, 1, 56.

³ *J. Lab. clin. Med.*, 1951, 38, 712.

⁴ *Ibid.*, 1953, 41, 122.

⁵ *J. exp. Med.*, 1948, 88, 99.

⁶ *Proc. Soc. exp. Biol. (N.Y.)*, 1948, 89, 297.

tissue in the earliest stages of inflammation, the supposed persistence on which the policy of large infrequent doses of aqueous penicillin depends is a myth.

A method previously used by Ercoli and his colleagues⁶ provides another approach to the problem. These workers gave the drug first and an inoculum of bacteria at intervals after it, and claimed to have shown that protection is still afforded after penicillin has ceased to be detectable in the blood. As Eagle and his colleagues point out, Ercoli used procaine penicillin in oil, which continues to be absorbed in slowly diminishing amounts for a long period, and may thus affect a highly sensitive organism for some time after it has ceased to be assayable. In their own experiments, in which a large dose of aqueous penicillin was followed at intervals by inoculation with pneumococci or streptococci in mice or streptococci (group B) in rabbits, there was a high mortality even in animals inoculated about one hour *before* the blood penicillin had fallen below the effective level. There is only one further reservation to be made before translating such findings to the clinical field: they evidently apply only to the non-immune animal, and few patients are as susceptible to their infections as mice are to highly virulent pneumococci and streptococci. When the body itself can also put up some resistance, bacterial recovery from a dose of penicillin may perhaps be slower. Similar studies need therefore to be made in animals partly protected by antibodies, and this interesting and almost entirely unexplored field Eagle and his colleagues are now investigating. Unless these further studies reveal an entirely different picture, the appropriate conclusion seems to be that, in certain forms of infection at least, "depot" preparations of penicillin, giving a moderately high blood concentration for many hours, are theoretically preferable to infrequent doses of aqueous solutions, however large.

MEDICAL AUXILIARIES

The decision of the Minister of Health in March this year not to implement the recommendation of the Cope Committee came as a great disappointment to those who wish to see the position of medical auxiliaries firmly established within the medical firmament. In 1933 the Representative Body of the B.M.A. approved the establishment of a national register, and in 1936 the Board of Registration of Medical Auxiliaries was incorporated. The Board is a voluntary organization. With the advent of the

National Health Service the question of a statutory register took on a new and more urgent look. In 1949 what has come to be known as the Cope Committee was set up by the Government. The work was done by eight committees dealing with eight different auxiliary services. The report of the Cope Committee was published in 1951,¹ and two years of rumour about the fate of its recommendations were brought to a head by Mr. Macleod's announcement in the House of Commons on March 19 of this year. It was a long time to wait for such a meagre conclusion.

Mr. Macleod gave as his reason for inaction his belief that "there was insufficient agreement on fundamental matters to proceed with statutory registration on the lines proposed by the Cope Committees."² There were, it is true, three minority reports to the Cope Committee Report, in which representatives of the almoners, the occupational therapists, the speech therapists, and the physiotherapists dissociated themselves from certain conclusions of the Report. Among such a wide range of medical auxiliary activity such disagreement was bound to arise. Some objection was raised, for example, to the term "medical auxiliary": could this be applied equally to almoner and laboratory technician? Surely all these valuable workers help in the work of medicine even though not medical men and women themselves. And what more convenient word than auxiliary could be found to express this? And there have been disputes about who should be included among the physiotherapists. Objection was also raised to the predominance of the medical profession on the council recommended in the Cope Report to administer a system of statutory registration of medical auxiliaries in the National Health Service. But the report showed that a majority in every committee was in favour of a statutory register and the setting up of a central council to keep it. Every medical man on every committee supported this recommendation, and to ignore this weight of opinion, as Mr. Macleod seems to have done, is, to say the least, unfortunate.

What the public needs first and foremost—and the medical profession—is a guarantee that medical auxiliaries are adequately trained in their work. Any system which allows half-trained persons to treat patients cannot possibly be countenanced by doctors whose ultimate responsibility for the care of patients it is, by the medical auxiliaries themselves, or by the public. Public and profession alike must be able to identify properly trained medical auxiliaries by reference to a statutory register, admission to which

¹ *British Medical Journal*, 1951, 1, 869 and 877.

² *Ibid.*, 1953, 1, 736.

must offer safeguards parallel to those for admission to the medical, dental, and nursing registers. Statutory registration confers not only safeguards but also status on those registered. As Lewis and Maude have shown, there is a growing clamour for professional status among persons following a wide variety of vocations. This is a movement which must command sympathy in the established professions. Yet it is not just arrogance in the medical profession that claims that medical auxiliaries should come under the wing of the doctor. In the medical profession itself there is concern at increasing specializing among doctors, and at the apparent consequent weakening of the influence of the general consultant and the general practitioner. There is a very great danger in the attempts to foster independence of medical auxiliaries from the medical profession—in fostering further specialization outside the control of the doctor, on whom ultimate responsibility for the patient must ultimately lie. Such a trend is not in the interests of the public, nor, indeed, in the interests of that indispensable and growing band of workers known as medical auxiliaries. It is, for example, the close voluntary association with doctors that has been largely responsible for the fine work done by the chiropodists, especially in the evolution of their excellent course of training. As more and more skills develop, and as the division of labour grows ever more refined in the field of health, the more necessary it becomes to co-ordinate all this work under medical guidance. We can only hope that the Minister of Health will look into this matter once more, and, too, that we shall not see in the regulations he may issue on the work of medical auxiliaries anything that may undermine the steady uphill efforts of those who have had this matter at heart during the past twenty years.

PREVENTIVE WORK IN HOSPITALS

Preventive medicine as a hospital function was one of the main themes of the eighth International Hospital Congress held last week in London. The promotion of health and protection against particular diseases—the most important aspects of preventive medicine—depend only slightly on hospitals, though they must be based in part on knowledge established by hospital research workers. Thus, as Dr. Godber told the Congress, the organization of the British National Health Service does not place the hospital in the forefront of the national programme of preventive medicine; the hospitals' part in preventive work is a supporting one, but the sup-

port should be active and neither grudging nor condescending.

Some recent circulars from the Ministry of Health about the control of infection in hospitals are a reminder of certain special problems in preventive medicine. For, despite the decline of the ordinary infectious diseases, hospitals carry their own serious environmental hazards of infection among patients and staff, and constant vigilance is necessary. Overcrowding of in-patient departments, and more noticeably of out-patient departments, is not so rare as might be hoped, and it constitutes what ought to be an avoidable danger to the health of patients and staff. Nor is the food served to in-patients always of a sort apt to stimulate a sense of well-being. But plenty of fresh air, sunlight, and appetizing food ought to be prominent among the hospital's preventive-medicine work. Hospitals should set a good example in such matters and also in the effective immunization of staff against such diseases as smallpox and diphtheria—and, we may now hope, tuberculosis. While it may not be in the forefront of the national programme of preventive medicine, the hospital service is the most conspicuous part of the Health Service; any failing on its part to secure health promotion and specific protection against particular diseases for hospital patients and staff sets a bad example which may have widespread repercussions.

Early recognition and prompt treatment of disease, important features of preventive medicine, are fully within the province of hospitals in partnership with general practitioners. Unfortunately, long waits for out-patient consultation and for admission are still too common. Great expansion of general hospital in-patient accommodation in the near future is unlikely; indeed it is doubtful whether many more general hospital beds are required throughout the country as a whole. But many hospitals lack adequate facilities for consultative out-patient work and for pathological and x-ray investigation of both in-patients and out-patients. Despite the great expansion of specialist medical staff since July, 1948, more consultants are required if, soon after request by a general practitioner, all patients are to be seen by an appropriate consultant able to give adequate time personally for examination, diagnosis, prognosis, treatment, and follow-up. Hurried work is often poor work, and the evil of excessive litigation against hospital staff may indirectly bring benefit if it impels consultants to demand reasonable time to deal carefully with each patient.

The early recognition of disease is seriously impeded in most hospitals by inadequate consulta-

tive out-patient accommodation. Here two pertinent sentences may be quoted from the interesting paper given by Professor Vines at the Congress:

"As an immediate step a programme might be devised to raise the importance of the polyclinic services to a level more comparable with the service accorded to in-patients, and some principle might be accepted to the effect that all general hospitals of 100 beds or more should offer out-patient services varying in scope from a full range of specialisms at the largest hospitals to a minimum of general medicine and general surgery at the smallest. The aim of the service would be directed to keep the patients out of the hospital beds as far as possible, in contact with their home life and even with their normal occupations."

A programme such as that would be very much cheaper to carry out than would a large expansion of in-patient accommodation. Unfortunately there is risk now that recognition of the just claims of mental-health and mental-deficiency hospitals for a fair share of capital and running-cost expenditure, entailing greatly increased in-patient accommodation, will push the necessary expansion of general hospital out-patient accommodation into the background again.

A further aspect of preventive work is limiting the patient's disability and rehabilitating him. Here it may be doubted whether the lessons about hospital rehabilitation learnt in the last great war are being remembered. In particular, the question arises whether there is a reasonable future for physicians in charge of the physical medicine services in hospital groups. It will be most unfortunate if hospitals, preoccupied by discussions about preventive medicine as a hospital function, and misled by certain exaggerated and false claims that they are the centre of all health services, should fail in one of their own preventive functions—helping the patient to attain the highest possible degree of recovery. There is still a tendency to regard hospital rehabilitation as something confined to the orthopaedic department, and to forget that a physician skilled in physical medicine, acting in consultation with the other clinical consultants, is an essential member of the medical team in a hospital group. A director of physical medicine can deal with a population of a quarter of a million or more; he can save much expenditure on physiotherapists by eliminating unnecessary physical-medicine treatment; and he is the doctor most likely to maintain liaison with the other rehabilitation services outside the hospital service: it therefore appears shortsighted policy to allow so slow an increase in the number of physicians in charge of physical-medicine services, and such meagre development of rehabilitation departments, as we have seen since July, 1948.

ALCOHOL AND BARBITURATES

Alcohol and barbiturates are among the drugs most often taken in Britain and the U.S.A. It is somewhat remarkable therefore that so little is known about the effects of taking them in combination. When two drugs are administered together they may help or oppose one another. The first type of effect is called synergism, the latter antagonism. If the combined effect is no greater than the sum of the effects of each drug separately, their actions are said to be additive; if it is greater, they are said to potentiate one another. These phenomena and methods for their investigation are well explained by Gaddum.¹ Unfortunately, bacteriologists appear to use the term synergism where pharmacologists would speak of potentiation.²

It is hardly surprising that alcohol and the barbiturates are synergistic, since each separately may, in appropriate doses, cause excitement from loss of cortical control, sleep, anaesthesia, or death from paralysis of the respiratory centre. Observations on animals, however, suggest that these drugs are not only synergistic but actually potentiate each another.³ Thus alcohol potentiated the effect of sodium pentobarbitone after injection into rabbits,⁴ and barbiturates injected into mice potentiated the effect of inhaled alcohol.⁵

In these observations statistical methods were used to overcome variations in susceptibility between different animals. It is far more difficult to assess the significance of the few recorded observations on the combined effect of alcohol and the barbiturates in man. Great natural variations in susceptibility to both drugs occur. A subject used to taking alcohol is unlikely to die until the blood alcohol is in the region of 0.4 to 0.5%, a level equivalent to the consumption of a full bottle of whisky.

The mean fatal dose of phenobarbitone is probably about 5 g. (75 gr.), and in general the fatal dose of a barbiturate is about fifteen times the usual hypnotic dose. Yet death has resulted from as little as 2.0 g. (30 gr.) of quinalbarbitone ("seconal") and it is impossible to foretell how any given individual will react.⁶ Jetter and McLean⁷ have reported three cases in which patients who had taken barbiturates died shortly afterwards—an unusual event with long-acting barbiturates—and who were found to have blood alcohol levels insufficiently high in themselves to endanger life. Fisher and his colleagues,⁸ studying patients who had died after taking barbiturates as well as alcohol, found blood concentrations of barbiturates not usually associated with a fatal outcome. Thus one case with a blood alcohol of 0.17% (equivalent to about 9 oz. (250 ml.) of whisky)

¹ *Pharmacology*, 3rd ed. London: Oxford University Press, 1948.

² Garrod, L. P., *British Medical Journal*, 1953, 1, 953.

³ Ramsey, H., and Haag, H. B., *J. Pharmacol.*, 1946, 88, 313.

⁴ Dille, J. M., and Ahlquist, R. P., *ibid.*, 1937, 61, 385.

⁵ Sandberg, F., *Acta physiol. scand.*, 1951, 22, 311.

⁶ Koppányi, T., and Fazekas, J. F., *Amer. J. med. Sci.*, 1950, 220, 559.

⁷ *Arch. Path.*, 1943, 38, 112.

⁸ *Amer. J. clin. Path.*, 1948, 18, 462.

⁹ Dunlop, D. M., et al., *British Medical Journal*, 1952, 1, 292.

¹⁰ *Proceedings of the First International Conference on Alcohol and Road Traffic*, p. 132. Kugelberg's Boktryckeri, Stockholm, 1951.

¹¹ Quoted by Goldberg, L., *ibid.*, p. 105.

had a barbiturate blood level of only 0.6 mg. per 100 ml., a level which may result from as little as 0.6 g. (9 gr.) of quinalbarbitone ("seconal"). The balance of evidence suggests that in man synergism at least, if not potentiation, may occur between alcohol and the barbiturates. It is possible that the taking of alcohol increases the rate of absorption of a barbiturate from the alimentary canal as well as enhancing its effect on the central nervous system.

But all this should be seen in its proper perspective. Vast quantities of strong spirits are consumed every year in most parts of the world and have been for centuries. In Britain about 10% of all prescriptions on form E.C.10 are for barbiturates,⁹ and in the U.S.A. it is estimated that in 1948 300 tons were administered—equivalent to nearly 5,000 million doses of 1 gr. (65 mg.). Fatalities arising from a combination of alcohol and a barbiturate must be very rare in relation to the population at risk, although it is possible that those who take the edge off life with alcohol do not require another drug to assist them and vice versa. It is highly unlikely that a person receiving the usual sedative dose of phenobarbitone will endanger his life by taking his usual evening cocktails. But if a patient is given heavy doses of a barbiturate, as is common in the treatment of psychiatric conditions, it would appear wise to advise him to be very sparing in his consumption of alcohol.

Much more important—and there is almost no reliable information on it—is the problem of the combined effect of small quantities of alcohol and low doses of barbiturates on the capacity to drive a motor vehicle safely. There is ample evidence that small quantities of alcohol impair driving efficiency—as little as 3–4 oz. (85–114 ml.) of spirit in the road tests described by Bjerver and Goldberg.¹⁰ Goldberg¹¹ states that barbiturates "have a deteriorating effect on driving." It is to be expected, although not yet proved, that a few drinks soon after an ordinary pharmacopoeial dose of a barbiturate would make dangerous a person in charge of a vehicle. The prescriber would be well advised to warn a patient of this possibility, since it is an offence to be in charge of a vehicle while under the influence of any drug to such an extent as to be incapable of having proper control. Indeed, the risks of combining alcohol and a barbiturate lie here rather than in the possibility of death arising from gross overdosage of the two substances.

PEPTIC ULCER IN WOMEN

Fifty years ago Borri¹ suggested that there might be some connexion between peptic ulcer and the sex hormones: he had noted the common occurrence of peptic ulcer at, or shortly after, the menopause. Children rarely suffer from peptic ulcer, and the incidence in boys and girls is the same until puberty.² Thereafter peptic ulcer and its complications are commoner in men than women—in the ratio of five males to one female.

Szenes³ in 1924 was impressed by the beneficial effect that pregnancy had on peptic ulcer, and Mr. D. H. Clark in a paper in our columns this week confirms this

observation: he finds that in almost 90% of his female patients the symptoms of a peptic ulcer are in abeyance during pregnancy. Various suggestions have been made to account for this finding, and attempts made to relate it to many isolated observations. The gastric secretion response to histamine or alcohol is lowered in pregnancy.⁴ Ahlmark⁵ in Stockholm found the blood histaminase to be increased one hundred times at the end of the first month of pregnancy, a finding which is as yet unexplained.

Over thirty years ago Kosaka and Lim⁶ extracted a hormone, which they called enterogastrone, from the intestinal mucosa; this inhibited both the secretory and motor activity of the stomach. A similar substance derived from urine was named urogastrone. Sandweiss⁷ and his colleagues found that the urine of pregnant women contained a substance which had a protective and curative effect on experimental Mann-Williamson ulcers in the dog. In small doses it did not inhibit gastric secretion or motility. Sandweiss found this anti-ulcer substance, which he named "anthelone," to a lesser extent also in male urine, but extracts of urine from patients with active ulcers were less effective. It is possible that these three factors are the same, or different components of the same extract. How they act on ulcers is still unknown. They have been used with varying results in patients, but as yet are not sufficiently purified or concentrated for more general clinical trials.

Clark records two peaks of incidence of peptic ulcer in women, one early in adult life and the other at the menopause. In his patients complications were particularly common at the menopause. In general, perforation of a peptic ulcer occurs much more commonly in men than in women—DeBakey,⁸ for instance, in a large series found over 90% to have occurred in men—but the mortality rate from haemorrhage and the liability of peptic ulcers to recur is approximately the same in both sexes. It may be, as Clark suggests, that the mechanism of ulcer activity at the menopause is hormonal. Nearly every endocrine gland has at some time or other been brought into the picture, but the consensus of present-day opinion is that no single hormone or combination of hormones is of therapeutic value in peptic ulcers. The one exception to this may be sex hormones, which might be tried as part of the treatment of peptic ulcer in women during the menopause. Much research is concerned with answering the question, Why do patients get peptic ulcers? It might be profitable to put the question another way—why do people not get peptic ulcers?—and examine more closely the mechanisms of protection against the formation of peptic ulcers.

¹ Zbl. inn. Med., 1904, 25, 689.

² Saltzstein, H. C., Farbman, A. A., and Sandweiss, D. J., *Endocrinology*, 1940, 27, 400.

³ Mitt. Grenzgeb. Med. Chir., 1924, 37, 652.

⁴ Ivy, A. C., Grossman, M. I., and Bachrach, W. H., *Peptic Ulcer*, 1950, Philadelphia, p. 737.

⁵ *Lancet*, 1944, 2, 406.

⁶ *Proc. Soc. exp. Biol. (N.Y.)*, 1930, 27, 890.

⁷ *Amer. J. dig. Dis.*, 1939, 6, 6.

⁸ *Surgery*, 1940, 8, 852.

SWIMMING-POOL TUBERCULOSIS

Swimming-pools, with some justification, have been blamed for the spread of a variety of cutaneous infections, such as warts, molluscum contagiosum, and epidermophytosis. They would seem likely to help the transference of infection by such organisms as thrive or even survive in a watery medium, and the public health problems they raise are of interest and importance. Measures such as chlorination are normally adopted to counter these hazards, though the protective measures themselves are not always harmless to the skin. Knowledge gained from research into contamination and infection from confined swimming-pools can to some extent be applied to countering river pollution and contamination. And the increasing use of chemicals in industry and the home will create plenty of new problems, such as that occasioned by the considerable discharge of modern detergents into our waterways.

In 1951, at the International Congress of Clinical Pathology, Herlitz, Linell, and Norden reported an epidemic of skin lesions caused by a special type of acid-fast bacillus in 80 patients attending swimming-pools at Örebro, Sweden. The rough walls of the bath caused abrasions of the skin, and the epidemic ceased when the walls were smoothed. A mycobacterium, possibly related to *Mycobacterium marinum*, was recovered from lesions and from the pool and was described. There were resemblances bacteriologically to the tubercle bacillus, and histologically there was a tuberculoid structure in the lesions. Hellerström raised the question whether the organisms might be tubercle bacilli modified by chlorination of the water or other factors. He reported, first in 1939¹ and more recently at the International Congress of Dermatology in London, a series of patients showing lesions resembling lupus vulgaris following abrasion of the skin in swimming-pools. Further cases of a similar nature have been reported in the U.S.A.² and in Scandinavia.³ The abrasion fails to heal and in a few weeks presents a reddened, papular, inflammatory, and sometimes ulcerated appearance. As healing proceeds, apple-jelly nodules are manifest which resemble lupus vulgaris histologically. In a case reported by Brück⁴ the tubercle bacillus was cultured, and it infected guinea-pigs. A swimming-pool attendant was found in one instance to have open pulmonary tuberculosis.

Invasion of the skin by the tubercle bacillus from without commonly produces either a tuberculous chancre, if the patient has not previously been infected, or warty or necrogenic tuberculosis otherwise. But on occasion we see in farmers, butchers, and others a tuberculous lesion of the skin resembling pyoderma which may or may not ulcerate; it gives rise to a multitude of rather glassy, apple-jelly nodules in the course of slow resolution. Hellerström's patients would appear to show this type of lesion, though it is of interest that many had previously had a negative tuberculin test, which became positive after the swimming-pool lesions developed. It is also of interest that adenitis was in most patients negligible. The problem is clearly of importance, for

¹ *Acta derm. Venereol. (Stockh.)*, 1939, 20, 276.

² *J. Amer. med. Ass.*, 1953, 151, 724.

³ Hellerström, S., *Acta derm. Venereol. (Stockh.)*, 1952, 32, 449.

⁴ *Ibid.*, 1952, 32, 443.

tuberculous infection from rivers and swimming-pools may not always be cutaneous; indeed, there are reports of pulmonary infection from such sources. Probably chlorination as normally practised is not an adequate safeguard.

CORONATION HONOURS

The Coronation Honours were announced on Monday of this week. As the *Journal* went to press early because of the Coronation, the full list of honours bestowed on members of the medical profession cannot be published until next week.

The conferment of knighthoods on Professor David Campbell, President of the General Medical Council, and on Dr. F. M. R. Walshe, President of the Royal Society of Medicine, is a fitting recognition of their services to Medicine. Professor Campbell, a graduate of Glasgow University, has since 1930 been Regius Professor of Materia Medica and Therapeutics at Aberdeen, and since 1949 President of the G.M.C. Dr. Walshe is one of that distinguished group of neurologists who have upheld the tradition of the National Hospital for Nervous Diseases, Queen Square, and his contributions to neurology have earned him election to the Fellowship of the Royal Society. His writings have not been confined within the limits of his specialty, and in his essays on the wider aspects of medicine he has blended a scholarly and philosophical approach with a wit that has sharply punctuated a literary style of supreme excellence. The K.B.E. has been bestowed on Acting Air Marshal J. M. Kilpatrick, a graduate of Belfast University who occupies the highly responsible post of Director-General of the Medical Services of the R.A.F. Lieutenant-General Sir Bennett Hance, formerly Director-General of the I.M.S. and now Medical Adviser and President of the Medical Board, Commonwealth Relations Office, has been elevated to the K.C.M.G. The Hon. Mr. Nicholas Attygalle, F.R.C.S., President of the Senate, Ceylon, has been made a knight bachelor in recognition of his services to medicine, and the K.B.E. has been bestowed on Mr. F. G. Bell, F.R.C.S., formerly Professor of Surgery at Otago University. Dr. George Macdonald, Professor of Tropical Hygiene and Director of the Ross Institute at the London School of Hygiene and Tropical Medicine, has been awarded the C.M.G., as has Mr. P. S. Foster, F.R.C.S., of Christchurch, New Zealand.

Among those awarded the C.B.E. are Dr. W. G. Barnard, Professor of Pathology, London University; Dr. G. Brown, honorary consulting anaesthetist to the Adelaide Hospital; Dr. T. M. Davies, Deputy Director-General of Medical Services, Ministry of Pensions; Dr. A. D. Marston, senior honorary anaesthetist, Guy's Hospital; Dr. A. A. Miles, Director of the Lister Institute; Dr. G. I. Strachan, Professor of Obstetrics and Gynaecology, Welsh National School of Medicine; and Dr. R. R. Trail, Medical Director of Papworth and Enham-Alamein Village Settlements.

The medical profession will also wish to congratulate Miss Enid Russell-Smith, Under-Secretary of the Ministry of Health, who is made Dame Commander of the Order of the British Empire.

fatal disease. Other people die in old age with a number of pathological conditions present that have originated mainly from the process of ageing, as, for example, arteriosclerosis or myocardial degeneration. If among these senile conditions there is one that has mainly contributed towards causing the death to occur when it did, this condition should be given preference upon the death certificate, with old age or senility (these terms are synonymous) either unmentioned or shown entirely as a contributory condition. The third and last group of elderly people are those fortunate few who die without any particular disease or degenerative condition playing a recognizably major part, and in such cases it is reasonable and correct to certify that death was due only to old age. If the deceased was 70 years or more such a certificate will be accepted without question; but if death occurred at a younger age a medical inquiry will be sent to ascertain whether or not some other more definite condition was also present, and, if so, the death will be assigned to this other condition.

Next Refresher Course Article.—"Intermittent Claudication," by Mr. J. B. Kinmonth.

Nova et Vetera

SIR HANS SLOANE AND THE BRITISH MUSEUM

By a happy accident the Coronation of her Majesty Queen Elizabeth II coincides almost exactly with the bicentenary of one of our greatest national institutions. The British Museum—a term which very appropriately includes not only the vast collection at Bloomsbury but the no less important natural history collection at South Kensington—was founded by Act of Parliament passed on June 7, 1753. It was the direct result of the design of that great physician, Sir Hans Sloane, who died a few months earlier aged 93. With certain reasonable provisos, he left his immense collections to the nation, desiring that they should be used for public enjoyment and instruction and kept together "to the manifestation of the glory of God, the confutation of atheism and its consequences, the use and improvement of physic, and other arts and sciences, and the benefit of mankind." Parliament wisely and happily decided on June 7 of that year to combine with it two other considerable collections then available into one great national institution. This was the beginning of the British Museum. Of these collections, that of Sloane was by far the largest and most diverse. This fact and the action of the trustees named in his will, who brought the matter to the attention of Parliament, make Sloane the real founder of our national museum. Its two branches are rightly controlled by the same standing committee, thus emphasizing that any separation between the humanities and those other arts that we are accustomed to call the "sciences" is but accidental, artificial, and temporary, and that in many regions they do in fact overlap each other. This is wholly in accord with the feelings and outlook of the founder. The actual physical separation of the two types of objects was not effected for another century. It was in 1856 that the greatest of British comparative anatomists, Richard Owen (1804-92), was called as first director from the Hunterian Museum of the Royal College of Surgeons to South Kensington. It may well be that there is, for all institutions, an optimum size beyond which growth is harmful rather than helpful. Nevertheless the separation of the "sciences" from the "arts" is a misfortune which Sloane himself foresaw and one which the present cordial relations of the two great branches of our national museum are now doing much to remedy.

Study in France

Hans Sloane was born at Killyleagh, County Down, Ireland, in 1660. The name Hans—a shortened form of Johannes or John—implies no German relationship but was

a recognized Scottish-Irish form used at that time. He came of a fairly well-to-do family and seems never to have been in want. He had a sickly youth and never enjoyed perfect health, though this did not prevent him from reaching extreme old age. At 19 he came to study in London, and there he made friends of the illustrious naturalist, John Ray (1627-1705), and the "father of chemistry," Robert Boyle (1627-91). Both of these distinguished men influenced him deeply. After four years he left for further study in France, where he attended medical, botanical, chemical, and anatomical lectures in Paris and Montpellier and took his degree at the obscure and now extinct university of Orange in Provence. He returned to London in 1684 and called on that distinguished physician Thomas Sydenham (1624-89) with a letter from Boyle commending him as skilled in scholarship, botany, and anatomy. Sydenham read the letter, looked at the young man, and said: "That is all mighty fine, but it won't do—Anatomy, Botany—Nonsense! Sir, I know an old woman in Covent Garden who understands botany better, and as for anatomy, my butcher can dissect a joint full as well; no, young man, all this is Stuff: you must go to the bedside, it is there alone that you can learn disease."

Nevertheless the two became fast friends, both professionally and personally. Sloane went to the bedside and became, beyond doubt, one of the most effective practitioners of his day, for, despite the unscientific state of medicine, he was a very careful observer and had just that calm and cautious yet optimistic temperament that inspires hope and confidence in the patient. He disliked complex prescriptions, preferred to try one remedy at a time, and was deeply aware of the influence of the mind on disease. Under all circumstances and in any age he would have been a first-class physician.

It is not necessary here to recount Sloane's life, which has just been admirably told in an attractive little book by G. R. de Beer, the Director of the British Museum (Natural History). In 1687 Sloane sailed for the West Indies in the suite of the Duke of Albemarle, Governor of Jamaica. He spent some sixteen months in that island, and his report on its natural history is a classic. He returned to practice in London, occupying his spare time in accumulating, arranging, and cataloguing his collections. In 1695 he married and settled at 3, Bloomsbury Place, where he practised for many years. In 1712 he became physician to Queen Anne and in 1706 Physician-General to the Army. In 1716 he was made a baronet, being the first medical man to receive that title. In 1719 he became President of the Royal College of Physicians, and in 1727, on the death of Newton, he succeeded him as President of the Royal Society. Among his medical activities is his physiciancy of Christ's Hospital for thirty-six years, his assistance to Captain Coram (1668-1751) in instituting the Foundling Hospital in 1739, and his attempt to establish a free dispensary. He practised till he was 82, when he retired to Chelsea. He died there eleven years later and was buried there.

Varied Collections

The number and variety of the collections that Sloane accumulated are truly astonishing. There were about 50,000 printed books that formed the basis of the British Museum Library, about 3,800 volumes of manuscripts, about 32,000 medals and coins, 334 volumes of dried plants which formed the basis of the British Museum Herbarium, 12,500 other specimens of plants, 5,500 insects, 1,900 quadrupeds, 1,500 fishes, 1,200 birds, and thousands of other specimens under other headings, including anatomical preparations. Some idea of the variety of the collection can be gathered from a special issue of the *British Museum Quarterly* that has just appeared as a special bicentenary number. In its articles by keepers of various departments, under the general charge of the Director and Principal Librarian, Sir Thomas Kendrick, K.C.B., details may be learned of the nature of the treasures in their keeping. It is noteworthy that in the great Sloane collection of manuscripts a very high pro-

portion are medical. Among them is a volume containing William Harvey's lecture notes of 1616. In this issue of the *Quarterly* the passage containing the first public statement of Harvey's discovery of the circulation is reproduced in facsimile. Another famous but more beautiful medical manuscript is Roger of Parma's treatise on surgery written and exquisitely illustrated in France in the thirteenth century.

We cannot end without an anecdote of Sloane which is perhaps not known to all our readers. In 1740 the composer Handel was taking tea with Sloane, who showed him his library. Handel placed his buttered muffin on the volume in his hand. The outraged silence of Sir Hans did not appal him with a sense of guilt. "To be sure," Handel admitted, "it was a careless trick, but it did no monstrous mischief; yet it put the poor old bookworm terribly out of sorts. I offered my apologies but the old miser would not have done with it. If it had been a biscuit, it would not have mattered." And Handel went on to suggest that Sloane's displeasure was due to his parsimoniousness. "But Sloane's displeasure was due to his parsimoniousness. 'Ach, mein Gott, muffin and butter. And I said to myself, 'Ach, mein Gott, that is the rub! It is the butter'—which indeed it was, but not for the reason which Handel alleged. In those days butter was not rationed—except in libraries."

CHARLES SINGER.

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INTERNATIONAL HOSPITAL CONGRESS PREVENTION: A MAJOR HOSPITAL FUNCTION

The eighth International Hospital Congress was held at Church House, Westminster, from May 25 to 30. It was attended by more than 500 participants from 35 different countries. The Chairman of the Congress was Dr. René Sand, Emeritus Professor of Social Medicine, University of Brussels, and President of the International Hospital Federation. The central theme of the Congress was "Preventive Medicine as a Major Function of the Hospital," and after two plenary sessions on Whit-Monday the Congress broke up into sectional groups and study and research committees, which reported to plenary sessions on the closing day.

The Congress was opened by the Minister of Health, Mr. IAIN MACLEOD, who declared that a new breeze was blowing down the rather dusty corridors of their long debates on health. He had been particularly impressed by the desire in many quarters to get away from what was called the tyranny of the hospital bed. It would be a proud boast when a Minister of Health could say that he no longer needed 10,000 hospital beds because the demand for them was not there. It might be that this was a long way off in the future, yet the conquest of so many infectious diseases and the massive fall in the incidence of tuberculosis gave ground for hope.

If the task of prevention was formidable, Mr. Macleod continued, powerful allies could be enlisted in its pursuit—the achievements of doctors and scientists, the great advances in chemistry, better food and housing, the growing consciousness of the importance of public and private hygiene, as well as new standards of hospital architecture and administration. It had been said that hospitals were once only isolation. It had been said that hospitals were hostels, the ante-room to the morgue; at best they were prisons, and at worst prisons. All that had gone and progress was still continuing. The link between welfare services and the hospital was becoming stronger.

Importance of Polyclinic Services

The first contribution in the general discussion was by Professor H. W. C. VINES, of Charing Cross Hospital Medical School, who restated the argument which he had put forward at the recent conference of hospital administrators at Hastings (*British Medical Journal*, May 16, p. 1104). The real future of the hospital service might well

come to lie, not in the wards, but in the polyclinics. As an immediate step a programme might be devised to raise the importance of the polyclinic services to a level more comparable with the services afforded to in-patients. All general hospitals of 100 beds or more should offer out-patient services, varying in scope from a full range of specialisms at the largest hospitals to a minimum of general medicine and surgery at the smallest. The clinics should have direct linkage with the ancillary services of radio-diagnosis and pathology, and the provision of treatment rooms and recovery rooms should in particular be ample.

Professor C. A. ROMANZI, of the Medical School, University of Genoa, whose paper was read in his absence, declared that the difficult task of creating a harmonious system of medico-social assistance should be entrusted not to an administrator or to a hospital physician, but to a new type of person remaining to be created, one who would not treat patients but act as their guardian, and one who understood how a hospital could give its best service to society.

The debate was continued by Dr. EDWIN L. CROSBY, president of the American Hospital Association, who said that the close integration of the hospital in-patient department with its out-patient department and with the home was fundamental if the most economic and efficient care of all patients—particularly the elderly—was to be achieved. It was here, said Dr. Crosby, that the closest co-operation between the health department and the hospital was to be seen. As the patient left the hospital and was discharged from its area of responsibility, he was followed by the health department to see that the results attained were not lost and that the individual resumed his full responsibilities as a citizen.

Dr. Crosby added that in the United States and Canada, working in close co-operation with hospital trustees and administrators, physicians had established certain standards of hospital care, and as a result the Commission on Accreditation of Hospitals (of which the speaker was director) could place its stamp of approval on a hospital and indicate to the community that it was a safe place to enter for treatment and care. The actual licensing of hospitals remained the responsibility of the Government and was largely delegated to health departments.

"Rehabilitative Medicine"

Professor G. PORTMANN, dean of the Faculty of Medicine at Bordeaux, gave some examples of the function of the hospital in what he called "rehabilitative medicine"—that is, returning the patient to normal life in society, better able to resist the recurrence of his illness or the contraction of a new disease. One example concerned deaf patients. At the Hôpital St. André in Bordeaux there had been set up a university laboratory for the study of deafness. It had been provided with the most up-to-date equipment, and it was now possible to examine the hearing of a child under the age of 3. Psychogalvanic tests were employed to detect the existence of the smallest remnant of the auditory function, all the more accurately in that they were carried out without the patient's knowledge, and therefore not disturbed by psychological factors. This remnant of the auditory function having been assessed, electrical rehabilitation was undertaken, followed by the wearing of a hearing-aid which enabled the child to go to an ordinary school, to talk, and to develop its intelligence. In this way large numbers of children, some from homes for the backward, others from homes for the deaf and dumb, had been restored to normal activity.

Sir ALLEN DALEY, former chief medical officer of the L.C.C., said that it was always being urged that people ought to come under treatment earlier. Public health could do something to bring this about by health education, but elsewhere the initiative must lie with the individual. One of the ways in which the hospital and also the family practitioner could help the public health department was by giving more information about the illnesses which afflicted

the population, so that the department could better ascertain what preventive services should be installed. The liaison between public health people and clinicians might be still closer.

Dr. ROBERT BUECKI, of Detroit, found himself differing at one point from Professor Vines's contentions. Professor Vines had suggested that the hospital bed unit should be separated from the diagnostic, or preventive medicine, or positive health unit. That, however, would be a mistake. From the standpoint of efficient use of their facilities and equipment hospitals could not afford such duplication.

An account of the rehabilitation and follow-up services available in Great Britain was given to one of the sections by Dr. J. A. SCOTT, medical officer of health of the L.C.C. He began with the work of almoners, nearly 1,000 of whom were employed in nearly 500 hospitals, and he went on to survey the rehabilitation centres in this country, in particular Roffey Park (industrial fatigue, depression, and anxiety states), the Farnham Park Recuperative Centre (surgical, traumatic, orthopaedic, and medical), and Stoke Mandeville Ministry of Pensions unit (spastic and paraplegic cases). There were nearly 5,000 convalescent homes as part of the national hospital service in England and Wales, and 52,000 persons had convalescent treatment in 1951. What the hospitals started the Ministry of Labour did much to complete, and Dr. Scott described the disabled persons register, the industrial rehabilitation units, and the Remploy factories. The register, now in its eighth year, contained the names of nearly 900,000 persons, of whom 40% came into the surgical group and 38% into the medical. He concluded with a reference to the various voluntary bodies which supplemented hospital treatment.

District Units

Dr. K. J. MANN, the director-general of the Hadassah Medical Organization at Jerusalem, spoke of the need for small units to meet effectively the day-to-day demands. His own organization (which also maintained Israel's own medical school in partnership with the Hebrew University) had opened five district medical stations in the area served by the University Hospital in Jerusalem. These outposts, staffed by public health nurses and general practitioners, were taking medical care into the homes of patients, tackling after-care problems, giving instruction in twentieth-century hygiene to members of ancient communities, and dealing with everyday ailments on the spot, thereby saving specialized hospital and clinic staff.

A warning about the cost of what he called "closed care"—that is, in-patient provision, as opposed to "open care" in the form of out-patient departments or the service of private or public doctors—came from Sweden. Dr. O. JOHANSSON, superintendent of the Karolinska Sjukhuset at Stockholm, said that the average running expenses for each hospital bed in Sweden reached a figure of at least £3 a day. Public opinion tended more and more to declare that the limit of taxation had been reached, and people were not willing to accept heavier burdens to pay for medical attendance. If the building of new hospitals were avoided large amounts would be saved, and he thought this could be done if closed and open care were better co-ordinated. Hospital beds should be used for the care of acute cases only. Preventive care and treatment during convalescence should be carried out in out-patient departments, which should be used for longer periods, up to 12 hours a day, and the laboratories perhaps up to 24 hours. Why not shift-work in these departments as well as in the wards?

After plenary sessions the Congress broke up into sectional groups and study and research committees, where less formal discussions were held on hospital planning, construction, equipment, and maintenance, medical and nursing care, and social and welfare services. The members of the Congress paid a comprehensive series of visits to hospitals and other centres of interest, and one of their social arrangements was a reception in the Great Hall of B.M.A. House.

Patient Care

At its closing plenary sessions the Congress received reports from its committees. One committee, with Dr. T. ROWLAND HILL (who was appointed B.M.A. representative at the Congress) as its chairman, reported on the care of the acute case. It pointed out that in Great Britain, with medical service free, patients did tend to seek doctors' help early, but there was need for the education of the public in the recognition of early signs and symptoms. But even early consultation was not enough. The family doctor must have adequate facilities to help him.

So far as the out-patient department was concerned, again to quote British experience, the "open" department had virtually disappeared, and had been replaced by an appointments system. The old system, however inconvenient, had its points, for the department was then like a great health centre where the patient could call when he had a sudden feeling that he should seek medical aid. The present form of consultative appointments, under which patients must be referred by their family doctor, had the disadvantage that the family doctor and the consultant met only on rare occasions.

Another committee, under the chairmanship of Sir GEORGE HENDERSON, Secretary, Department of Health for Scotland, reported its conclusions on various matters of hospital administration. One of the most pressing problems, Sir George Henderson declared, was how to give hospital care to everyone who needed it, without overloading the hospitals unduly. This became more difficult as the responsibility was transferred to public authorities or to prepaid insurance schemes, and in almost every country it was aggravated by the plain fact that the span of life was increasing. In Great Britain the immediate question resolved itself into reducing waiting lists. There was much evidence of support for some kind of home-care service—a projection of the hospital service designed to supplement, and partly to replace, orthodox hospital care. Where there was opposition to the home-care organization it came mainly from the doctors themselves. Professor E. M. BLUESTONE, of Montefiore Hospital, New York, had outlined a programme of home care which was inaugurated in New York in 1947. As originally conceived, it was for indigent patients only, but it was now proposed to extend it to patients who could afford a reasonable doctor's fee. A system of home medical care which had been organized in Cincinnati had also been described to the committee. This provided many varieties of hospital service at the patients' own homes at the lowest possible cost, but the position of the family doctor was not made specially clear.

Health centres, unfortunately, said Sir George Henderson, had not so far attracted very much attention, but it might be found that the health centre could take a load off the hospital by enabling family doctors to work far more than at present without turning themselves into hospital assistants.

Social and Welfare Services

A sectional group, of which Professor J. M. MACKINTOSH was chairman, concerned itself with the social and welfare services centring around a hospital. Professor E. M. BLUESTONE, of New York, acting as rapporteur, said that the section felt that the emotional effects of prolonged illness, with special reference to age and to the family, should be given most careful consideration in organizing medical care, inasmuch as social and psychological factors in disease were often of as much consequence as physical factors. The Congress was recommended by this group to adopt the social concept of rehabilitation in preference to the medical concept of cure; the former was felt to be more continuous, complete, and comprehensive.

Another recommendation was that the distribution of medical care among the available practitioners of medicine should be reconsidered with a view to including more health examinations, for which purpose more physicians should be trained. The Congress and its affiliated agencies were

also asked to consider the fee-for-service method of providing medical care. It was felt that some form of voluntary or compulsory health insurance would meet the situation.

Another group, under the chairmanship of Professor G. SOLLAZZO, of Italy, brought forward certain conclusions on preventive medicine in hospitals. An opinion voiced by this group, though not unanimous, was that there should be B.C.G. vaccination of all newborn infants in hospital; also that the chests of all patients passing through the out-patient department and of all in-patients should be radiographed in order to detect tuberculosis. In another report on nursing care, brought forward by Miss M. J. MARRIOT, matron of Middlesex Hospital, it was urged that the nurses' curriculum should take more note of the social aspects of disease.

Other groups reported on hospital planning, construction, and equipment, and administration, organization, and finance.

PHYSICAL TREATMENT OF RHEUMATIC DISEASES AT BRITISH SPAS

The British Spas Federation Medical Committee—of which Lord Horder is chairman and Dr. G. D. Kersley secretary—has been investigating the value of hydrotherapy and physical treatment in certain types of rheumatic diseases, the results obtained at a number of spas being pooled. We have received the following brief summary of the statistical data analysed by Dr. E. Lewis-Fanning, statistician to Cardiff University.

At the suggestion, and under the direction, of the Medical Committee of the British Spas Federation, an investigation of the effect of physical treatment, including hydrotherapy, on rheumatic cases at a number of centres has been carried out.

It was realized from the start that a completely controlled therapeutic trial was not possible, as it was impossible to rule out psychological influences. Such factors must, however, play their part in the effect of therapy, and every effort has been made to give genuine clinical assessments. Only typical cases of rheumatoid arthritis, osteoarthritis, and fibrositis were investigated, and no parenteral therapy was used during the period of observation. Cases were assessed before treatment, directly after treatment—that is, in 3 to 6 weeks—and again three months later.

128 cases of rheumatoid arthritis, 227 of osteoarthritis, and 112 of fibrositis were followed up in this way, and the results statistically analysed by Dr. E. Lewis-Fanning, of Cardiff University. Degree of pain on movement or at rest, swelling, tenderness, and range of movement were numerically recorded, together with age and sex, on a special proforma drawn up for the purpose. No points of especial interest were forthcoming from analysis of age and sex group, but the general effect of treatment, both immediate and after three months, is of importance, and accords well with clinical impressions.

In the rheumatoid arthritis group, of 128 patients approximately half appeared to derive significant immediate benefit, and a slightly larger number were definitely improved on and a three-months review. This applied both to a more "active" and to a more "quiescent" subgroup. In the former, 68% showed decrease in tenderness and 54% of swelling of the worst-affected joint, but only 36% had reduction of pain at rest. One patient only appeared to be worse.

In the group of 227 osteoarthritis, approximately two-thirds stated that they had less pain, and half had increase in range of movement. After three months the result was slightly less good, with only 62% stating that they had less pain than before treatment.

In the group of 112 patients with "fibrositis," again two-thirds claimed improvement, and the result of assessment three months later showed neither increase nor decrease in this benefit figure.

Correspondence

Habitual Abortion

SIR,—In their paper "Progesterone Implantations in Habitual Abortion" (*Journal*, May 16, p. 1073) Dr. G. I. M. Swyer and Miss Doreen Daley criticize quite fairly some findings of mine on the spontaneous cure rate of abortion sequences—I notice they still cling to the stupid term "habitual abortion"—but then unkindly add: "The results we obtained . . . suggest either that the population we were sampling was not comparable with those which provided the basis for the Malpas and Eastman calculations or that those calculations were themselves fallacious. We incline towards the latter possibility."

As your annotator points out in the same issue (p. 1095), these figures of mine were never claimed as an absolute yardstick against which to measure the results of empiricism; their one object was to establish that there is a high spontaneous cure rate for recurrent abortion and that this spontaneous cure rate varies according to which of several reasonable assumptions is made, all such assumptions being necessarily nothing more than intelligent guesses. My guess seemed to fit the population I knew, but MacGregor and Stewart, in a subsequent paper,¹ saw fit to modify, and I think improve, the original calculations. Whatever assumption is made, the spontaneous cure rate remains quite high.

In a later paper, "The Categories of Abortion Sequences,"² I pointed out that cases of recurrent abortion can be divided into two groups, one group that in which a cause can be discerned and in which the prognosis depends on the nature of the cause, the other that in which no cause can be discerned and in which the prognosis is uniformly good. This conclusion takes the problem out of the field of statistics, as indeed it should be.

Recurrent abortion will never be comprehended until we have a better understanding of the conditions of early foetal growth. My present feeling is that the problem of early spontaneous abortion is tied up with the interrelationship between conceptus volume and the mechanism for nervous inhibition of the uterus in pregnancy.

To end on a more general note, a quotation from *Walden* seems apposite: "If we knew all the laws of Nature, we should need only one fact, or the description of one actual phenomenon, to infer all the particular results at that point. Now we know only a few laws, and our result is vitiated, not, of course, by any confusion or irregularity in Nature, but by our ignorance of essential elements in the calculation." This last phrase of Thoreau lightens the dilemma.—I am, etc.,

PERCY MALPAS.

Liverpool.

REFERENCES

- ¹ *J. Obstet. Gynaec. Brit. Emp.*, 1939, 46, 857.
- ² *Ibid.*, 1942, 49, 12.

SIR,—I have read with great interest the paper by Dr. G. I. M. Swyer and Miss Doreen Daley (*Journal*, May 16, p. 1073) and your annotation (p. 1095) on this subject. I should like to correct the impression that my colleagues and I, having claimed good results from treatment of cases with a history of habitual abortion with progesterone implants in the pregnancy under consideration, were "challenged to treat alternate cases with implants of an inert compound," and that for reasons not specified in your annotation we declined the challenge.

In the papers quoted^{1,2} the nearest we got to claiming good results from this treatment was the comment of our expert statistical colleague Dr. Richard Doll, expressed as follows: "Provided the 'normal' incidence of spontaneous abortion is of the order of 10% and the incidence of abortion due to recurrent factors is not much less than 0.1% it is reasonable to conclude that the present figures indicate an effect of treatment." It was we ourselves who suggested that this effect might be psychotherapeutic. Com-

menting on Bevis's studies¹ we pointed out that serious consideration should be given to the possibility that a considerable proportion of the patients "who had experienced more than three early abortions had done so for psychological reasons and that any procedure which is likely to gain their confidence may well prove successful." In this connexion I note that "extensive preliminary investigations," including "five or more consecutive pregnanediol assays," were performed on a number of the cases in the series reported by Swyer and Daley. May not these investigations have had a powerful psychotherapeutic effect? Finally, it was we who issued the challenge to treat alternate cases with implants of an inert compound, for in our second paper we said: "There is of course an obvious way of settling the question whether a progesterone implant is endocrinologically or merely psychologically therapeutic—namely, to treat alternate cases with implants of progesterone and an inert compound such as cholesterol."

In your annotation you say: "For reasons given" (in a subsequent letter to which you give a reference,² though you do not disclose the reasons) "the challenge was declined" (by us). The reasons are that I did not, as you, Sir, I gather do not at present time, feel convinced that the contention had been proved that progesterone implants were without effect in the treatment of habitual abortion (be this effect "endocrinotherapeutic" or psychotherapeutic). I expressed my attitude in a further letter³ as follows: "If my wife had had three miscarriages and was pregnant I should most certainly ask one of my colleagues to give her a progesterone implant. How could I, therefore, implant an inert substance in similar circumstances into any patient entrusted to my care?"—I am, etc.,

London, W.1.

P. M. F. BISHOP.

REFERENCES

- ¹ *British Medical Journal*, 1950, 2, 130.
- ² *Ibid.*, 1952, 1, 244.
- ³ *Lancet*, 1951, 2, 207.
- ⁴ *British Medical Journal*, 1952, 1, 604.
- ⁵ *Ibid.*, 1952, 1, 923.

Post-partum Haemorrhage

SIR,—I also would like to endorse the importance of the paper by Drs. J. D. Martin and J. G. Dumoulin on the subject of the use of intravenous ergot (*Journal*, March 21, p. 643), as does Mr. Keith Vartan (*Journal*, May 16, p. 1108), but from a different point of view.

From the sphere of a general practitioner in a country district, I can foresee this method earning unjustified condemnation because of the high incidence of manual removal of the placenta, to which the paper and Vartan's letter both refer. May I therefore emphasize, as forcibly as I can, a point of technique which is of paramount importance if this method is used, and which I have not seen emphasized before? My own preference is to give the ergot as soon as the contraction which enables the head to be crowned has subsided, or, in the case of a forceps delivery, as soon as the head has been eased out. The vitally important step comes next. Knowing that a long and powerful contraction will arrive in a matter of 30 to 40 seconds, the need to deliver the shoulders and the rest of the baby with all reasonable speed has gone. This feeling of urgency is almost an instinct in the older midwives, and is surprisingly difficult to resist. It is this which must be changed. The shoulders can be delivered slowly and gently, as they need only to be guided and controlled. Once the thorax is born, the abdomen, thighs, and extremities should be deliberately delayed instead of allowing them to arrive at the normal speed. It is this which is so surprisingly difficult to do and even more difficult to teach midwives to do, so deeply ingrained is the feeling that delivery should be completed "before the pain goes." If one follows this seemingly minor change of technique, it will usually be found that as soon as the cord is clamped, tied and cut, and the baby out of the way, the placenta is resting in the upper vagina with a firmly contracted uterus above. Completion of the third stage is over in two minutes.

To digress from the bare bones of tables and statistics, I would add that most of my midwifery is in cottages and houses in a rural district. I expect to be able to deal with some of the complications of labour—and am equipped to do so—which involve anaesthesia and a forceps delivery. My anaesthetic of choice is still chloroform, and the adoption of this intravenous ergot technique has robbed these manipulations of the fear of a post-partum haemorrhage which always lurked in the background previously. Indeed, on one occasion, when chloroform was given for me by a consultant anaesthetist instead of by my partner, intravenous ergot was the only thing which saved a devastating bleeding from an almost atonic uterus. Over a period of three years I have used this method when the need or opportunity arose, and in some sixty cases retention of the placenta has not occurred, and it goes without saying that the small loss of blood has been striking.

As I said, I am writing from the point of view of the general-practitioner obstetrician to endorse the great value of the intravenous ergot technique and to emphasize the importance of this detail of its performance which I think is the keystone of the whole thing. It may save the method from hasty and unfair condemnation in that very sphere of midwifery where it is of the greatest value—the cottage in the country.—I am, etc.,

Ilminster.

HUGH CARTWRIGHT.

Transverse Arrest of Head

SIR,—I have read with great interest the correspondence which has appeared since the publication of Mr. Bryan Williams's excellent article on "Transverse Arrest of Head and the Occipito-posterior Position" (*Journal* April 18, p. 865). It speaks highly for present-day obstetrics that Mr. Williams's advocacy of Kielland's forceps has not provoked a repetition of the unjustified criticisms made by Continental writers following the publication of Kielland's original article in 1916.¹ At that time a few, but very vocal, obstetricians condemned the instrument even though some had never used it.

I note that the old controversy of whether Kielland's forceps should be used only by obstetricians still persists, but I am surprised that Dr. C. Rutherford Morison (*Journal*, May 16, p. 1107) considers the "wandering method" to be a new one. Not only did Kielland refer to this in his original paper but many writers have done so during the last 37 years.²⁻⁴—I am, etc.,

St. Asaph.

E. PARRY JONES.

REFERENCES

- ¹ *Mösch. Geburtsh. Gynäk.*, 1916, 43, 49.
- ² Berecz, J. (1922). *Zbl. Gynäk.*, 46, 969.
- ³ Jarcho, J. (1925). *Amer. J. Obstet. Gynec.*, 10, 35.
- ⁴ Kielland, C. (1919). *Norsk. Med. Laegevid.*, 80, 1197.
- ⁵ Miles, L. M. (1948). *Amer. J. Obstet. Gynec.*, 55, 504.
- ⁶ Saenger, H. (1916). *Mösch. Geburtsh. Gynäk.*, 44, 231.
- ⁷ Schwenke, K. (1928). *Ibid.*, 80, 82.
- ⁸ Vedder, J. B. (1940). *Wis. med. J.*, 39, 103.

Proctalgia Fugax

SIR,—The article by Mr. M. R. Ewing on proctalgia fugax (*Journal*, May 16, p. 1083) raises many interesting questions, and prompts me to describe a condition which, though dissimilar, presents sufficient points of resemblance to proctalgia fugax to make one wonder whether the two conditions may not have a common origin.

The condition, which recurs at intervals of four to six months, consists essentially in a dream of which the main content is a sense of forcible compression in the region of the waist, causing intense anxiety, inability to take a breath, and fear of asphyxiation. Sometimes this sensation is accompanied by an objective dream content, such as that one's waist is being compressed by the hands of another person, by a rope, a metal band, or other apparatus, and that one is endeavouring vainly to escape. At other times there is no objective content, the sole matter of the dream being the sense of compression. At the height of the dream, when the sensation becomes unbearable, and reminiscent of the "being held very tightly by the rectum and unable to escape" of Mr. Ewing's patient, waking occurs.

The first feeling on waking is one of terror. This, however, is rapidly replaced by relief on discovering that the incident was, after all, merely a dream. The dream, which began in childhood, has persisted well into middle age, and has become somewhat more frequent of late years. I have been unable to associate it with food, fatigue, temperature, mental anxiety, ill-health, or any other predisposing cause.

The points of resemblance between proctalgia fugax and the condition which I have described but cannot name are as follows: (1) occurrence of an acute distressing spasmodic condition in an apparently healthy person; (2) absence of recognizable physical cause; (3) nocturnal incidence, usually in the small hours; (4) "aura," in some cases a feeling of malaise, in mine a frightening dream; (5) a sensation of violent gripping, in one case in the rectum, in the other round the middle of the trunk; (6) rapid disappearance of the symptom without after-effects.

I believe the cause of both these conditions to be psychological, probably an unresolved anxiety state. I should be greatly interested to learn the views and experience of others, and especially to know whether the condition I describe is as relatively common in women as proctalgia fugax would appear to be in men.—I am, etc.,

London, N.W.11.

SYLVIA G. CHAPMAN.

SIR,—I enjoyed Mr. M. R. Ewing's survey (*Journal*, May 16, p. 1083) of this distressing complaint. When it was discussed at the Gastro-Enterological Club in 1948, Ryle raised objection to the name as being a Greek-Latin hybrid, but clearly the term has come to stay. At this time I remarked that, as Mr. Ewing suspects, the disease is not rare. As a leading symptom it seldom appears, and, in fact, over a five-year period I was consulted primarily for this pain eight times only. Six of the patients were doctors. During the next five years at the end of the history-taking I asked every patient, no matter what disease, whether he or she had ever suffered from rectal pain. Sixty-six replied in the affirmative, and analysis of their discomfort made it clear that they were suffering from proctalgia fugax. It is the transient nature of the pain and the long intervals of freedom which induce forgetfulness or lack of sufficient anxiety to drive the victim to the doctor.

Of the different methods of treatment, Ryle was convinced that sustained deep pressure on the perineum was the most effective. Many others, notably W. E. Tanner, declared that distension of the rectum by enema of water or even air would abolish this unbearable pain. Mr. Ewing is impressed by the rapid response to the taking of food. If this is, in fact, effective it will certainly be welcomed by "proctalgics" as a substitute for their previous therapeutic gymnastics. It is in relation to aetiology that this point is of especial interest. Mr. Ewing assumes that initiation of the gastro-colic reflex inhibits painful muscle spasm, and implies, I think, that it is colonic or rectal spasm he has in mind. I wonder if this is so? I agree that amyl nitrite is useless. May it not be that the pain is due to segmental cramp of a section of the levator ani? When I described the pain in the *Lancet* (1928, 2, 1263) I described the finding in one case of simultaneous contraction of the iliac colon and rectum, but I am sure that this finding is quite exceptional. In fact it has not since been confirmed by nine doctor patients who at my request have repeatedly explored their rectums in attacks. In two of them no abnormality was found. In seven a tense tender band was palpable through the rectal wall on one or other side, never anteriorly, and always at the full length of the examining finger.—I am, etc.,

London, W.1.

A. H. DOUTHWAITE.

Liver Injury by Antibiotics

SIR,—We did of course read with great interest the annotation (*Journal*, April 4, p. 777) concerning liver injury due to antibiotics.

We would, however, like to point out that certain statements made therein are subject to misinterpretation by the casual reader. In particular, the toxic effects of

aureomycin administered to humans, which were demonstrated by Lepper and his associates,¹ have not been demonstrated to our knowledge for terramycin. While it is true that Lepper and his group did show that large doses of terramycin intravenously in mice were capable of producing liver damage, clinical studies have not demonstrated such toxicity.—I am, etc.,

New York.

MICHAEL CARLOZZI,
Chas. Pfizer and Co., Inc.

REFERENCE

- ¹ *Arch. Intern. Med.*, 1951, 88, 271.

Litigation Against Doctors

SIR,—The council of this association, representing the staffs of the regional hospitals in England and Wales, wishes to register its grave concern about the increase of litigation involving members of the medical staffs of hospitals. It has been stated that the number of successful cases, in which an action for negligence against a medical officer is proved, has not increased. This is beside the point. The increase in claims against members of the profession, whether successful or not, whether justifiable or not, is not in doubt. It is certain that such claims and actions hinder the proper function of hospitals. They disturb the confidence of the hospital medical staff, particularly junior staff, in undertaking the responsibility of casualty and anaesthetic work, and lead to extravagant and frequently unnecessary precautionary investigations and to estrangement between hospital authorities and the medical staff.

It has been stated that a new definition of "negligence" as it affects a medical practitioner is called for. It is perhaps too much to ask for a complete restoration of confidence between doctor and patient against a background of an all-providing State and the infinite possibility of free litigation. The litigious or aggrieved patient is, however, still fortunately in the extreme minority. An effort wherever possible should therefore be made to point out to a public which may be satisfied though apathetic that increase in claims or actions against the profession is bound, for reasons already detailed, to react unfavourably upon the particular patient by increasing the cost of the service and disturbing that mutual harmony and confidence without which the best work is impossible.—I am, etc.,

London, W.C.2.

R. E. JOWETT,

President,
Regional Hospitals' Consultants and Specialists
Association.

Succinylmonocholine

SIR,—Lehmann and Silk report (*Journal*, April 4, p. 767) that succinylmonocholine acts in the rabbit as a muscle-relaxant drug of lower potency and longer duration than suxamethonium (succinylcholine). They also find it is destroyed by cholinesterases. Whittaker and Wijesundera¹ had previously identified succinylmonocholine as a product of the enzymatic hydrolysis of succinylcholine *in vitro*. These findings raise two questions of importance to anaesthetists. To what extent could succinylmonocholine itself be used as a muscle-relaxant of longer duration than succinylcholine? To what extent may the production of succinylmonocholine in the body, after administration of succinylcholine, account for the occasional prolonged reactions to the latter drug? Our findings in the mouse and cat may help to answer these questions. We used the chlorides of both compounds, and results are given in terms of active cation.

The intravenous dose of succinylmonocholine required to paralyse 50% of mice running on a rotating drum was 1.8 mg. per kg. (30 mice). The corresponding figure for succinylcholine was 0.11 mg. per kg. Succinylmonocholine has been administered intravenously to eight cats under chloralose anaesthesia. The dose of succinylmonocholine required to abolish response from the tibialis muscle stimulated through its motor nerve was about 1.7 mg. per kg. The corresponding dose of succinylcholine was 0.04 mg. per kg. The ratio of activity of succinylmonocholine to succinylcholine, of about 1 to 40, is the same as that reported by Fraser² for the cat's gastrocnemius. After administration of succinylmonocholine the muscular contraction was briefly enhanced before the onset of paralysis. Succinylmonocholine

caused considerably longer paralysis in the cat than did an equivalent dose of succinylcholine. As might be expected, succinylmonocholine was prolonged and potentiated by neostigmine.

As with high doses of succinylcholine (Somers⁴), succinylmonocholine had a marked pressor effect in the cat at doses of 7 and more mg. per kg. For example, to a cat maintained by artificial ventilation, successive doses of 17, 34, and 68 mg. succinylmonocholine per kg. were given at intervals of 1½-2 hours. After 34 mg. succinylmonocholine the blood pressure rose from 120-230 mm. Hg and returned to its previous level within 2½ minutes. The dose of 68 mg. per kg. was fatal. The rise in blood pressure caused by succinylmonocholine was abolished by hexamethonium and is therefore "nicotinic" in type. In some cats there was also a transitory fall in blood pressure after succinylmonocholine which was abolished by atropine. The pressor effect of succinylmonocholine would be an objection to the use of the drug in man, if it occurs at doses close to the fully effective dose. Since the rate of destruction of succinylmonocholine by plasma cholinesterase is lower than that of succinylcholine, and since in man an effective dose of succinylmonocholine would no doubt be higher than that of succinylcholine, there would seem to be a greater danger of prolonged reactions to succinylmonocholine. If succinylmonocholine were to be widely used, a preparation of plasma cholinesterase should presumably be available as an antidote. The danger of prolonged reaction might, however, be somewhat offset by the fact that cell cholinesterase slowly destroys succinylmonocholine.

With regard to the second question, succinylmonocholine is so much less potent than succinylcholine in animals that we might expect that the amounts of succinylmonocholine produced in man by the enzymatic breakdown of single doses of succinylcholine would be insufficient to exert any appreciable blocking action on the neuromuscular junction. An exception might occur, however, where very large doses of succinylcholine are administered by intravenous drip. For example, Bourne, Collier, and Somers⁵ report delayed recovery in a patient who received a total of 2.3 g. of succinylcholine during three hours. The gradual return of strength seen in this patient would be in keeping with the continued presence of a just effective quantity of a longer-acting relaxant such as succinylmonocholine.

Our thanks are due to Miss M. P. Hatton for technical assistance, and to Mr. E. Eastwood for preparation of succinylmonocholine.—We are, etc.,

H. O. J. COLLIER.

BARBARA M. MACAULEY,
Research Division,
Allen and Hanburys Ltd.

Ware, Herts.

REFERENCES

- ¹ *Biochem. J.*, 1952, 52, 475.
- ² Communication to British Pharmaceutical Society, London, January, 1953.
- ³ *Brit. J. Pharmacol.*, 1953, 8, 19.
- ⁴ *Lancet*, 1952, 1, 1225.

Dangers in the Use of Thorotrast

SIR,—A case showing chronic changes in the central nervous system following "thorotrast" ventriculography shown at the Royal Society of Medicine by Dr. Robert Hughes, of Liverpool, and the basis of an article by him,¹ prompts me to report a similar case.

The patient had thorotrast introduced into the ventricles in 1941 for an unexplained hemiplegia which probably, in the light of future evidence, was of vascular origin. Four years later, in 1945, he began to lose control of his micturition. In 1947 he noticed loss of control of his bowel function and is now completely incontinent of both urine and faeces. On examination, he had a low cauda equina lesion and had slight sensory loss over the first and second sacral roots. He had completely lost his sexual function. The anal canal was patulous, and at least three fingers could be inserted into the anus without discomfort. X-ray examination of the lower spine showed that the thorotrast was collected at the base of the theca and surrounding the roots. X-ray of the skull showed that thorotrast was still present in the ventricular system.

The patient refused to come in for lumbar puncture, so we were unable to investigate him further, but x rays of the spleen and liver showed thorotrast in these organs. It would appear, as in Dr. Hughes' case, that most of the original thorotrast is still within the patient. The cauda equina lesion must be caused by either arachnoiditis due to chemical irritation; continuing radioactivity of the material, which was shown to be present in Dr. Hughes' case and our own; or even the possible development of a tumour in the region of the cauda equina, malignant disease having been found to result from thorotrast introduced into the system.

This case is recorded to emphasize the importance of realizing the dangers associated with the use of thorotrast, which is still used too freely as an opaque medium, and also the delay in the development of symptoms. Several years often elapse before the patient complains of any symptoms. At a later date it is wellnigh impossible to remove this substance from the theca, as it becomes intimately bound to the spinal roots and no treatment alleviates the serious cauda equina lesions.—I am, etc.,

Bristol, 8.

A. M. G. CAMPBELL.

REFERENCE

- ¹ Hughes, R. R. (1953). *Proc. roy. Soc. Med.*, 46, 191.

Reaction to Blood Transfusion

SIR,—There is nothing that offers a better opportunity for legal action than a transfusion reaction. The public not unnaturally thinks that every mishap is due to some carelessness in grouping or cross-matching. It is, however, not aware that a dangerous or fatal reaction can occur in the absence of any such error, and it is to afford evidence in support of some unfortunate pathologist who gets caught out in this way (as I myself was) that I consider that the following case should be given as much publicity as possible.

A woman aged 52 was admitted for operative treatment of a hernia. Her haemoglobin was 67%. Complete blood count showed mild secondary anaemia, but was otherwise not illuminating. Blood group A, Rh positive. It was thought advisable to give her a pint of blood pre-operatively. Rh-positive blood was cross-matched for her. After about 5 ml. of this had been transfused, she developed all the signs of a complete incompatibility with violent pain in the back, extreme pallor, and collapse with almost imperceptible pulse. The transfusion was instantly stopped and cross-matching was quickly repeated with entirely negative results. A fresh specimen of blood was grouped with exactly the same result as before, and a cross match of the fresh serum with the original pint of blood also showed no incompatibility.

The patient fortunately survived, contrary to all expectation, and the operation was carried out successfully without transfusion. Probably on account of the very small amount of blood transfused there was no haematuria. A fresh specimen of blood was sent, together with the peccant bottle of blood, to Dr. Platt at the North London Blood Transfusion Centre, who verified our grouping and stated that no abnormal agglutinins or other reasons for incompatibility were found.

It is therefore suggested that the incompatibility was not a cellular one but was due to plasma. As against this, it is surely unusual for a plasma incompatibility to show itself in this way with pain in the kidney region. It more commonly seems to take the form of rigors occurring after rather more than 5 ml. of blood has been given, or possibly even the next day.

She was never very well afterwards, a fact that she did not hesitate to attribute to the transfusion, but the real reason (as also that of her anaemia) became apparent about a year later when she was admitted moribund with an inoperable carcinoma of the stomach and secondary deposits in the liver from which she died.

In 30 years of transfusing blood I have only once seen such a catastrophe happen before, and that was with blood on which no cross match had been carried out. But in those days only the most enlightened persons thought this necessary. I hope the record of this case may be of service to anyone who encounters a similar disaster.—I am, etc.,

London, W.1.

J. W. SHACKLE.

Half-way Houses for the Elderly

SIR,—Because it has been difficult to place certain elderly sick people into the categories of regional board (hospital) or local authority (hostel) responsibility there has arisen the idea that there must be a category of people who fall between these two groups. It is stated that some people need more care than they can receive in local authority accommodation, and do not need sufficient care to warrant their admission to hospital. King Edward's Fund for London and the National Corporation for the Care of Old People have provided accommodation in large houses in the London area which are variously designated as half-way houses or rest homes. These homes provide accommoda-

tion for 20 to 40 patients, and, I am informed, have been established for experimental purposes. No doubt the appropriate bodies will issue one of their most valuable statements when they have had time to assess the value of this type of accommodation, but I believe we should consider now what function this type of accommodation does fulfil and whether it is really necessary.

I believe that all patients can be grouped into those falling within the categories of sick or well, and, while it is said that the elderly readily move from sickness to health and back again, this does not invalidate the ability to place them in the group most suitable for their needs. If a patient can dress himself, wash himself, and feed himself, although he may need some assistance, and provided that he is neither mentally deranged nor incontinent, he should be regarded as the responsibility of the local authority. All other patients should fall within the responsibility of the regional board. The patients who are well one day and ill the next should be placed under regional board responsibility if their illness lasts for a few days continuously. The regional board would therefore be responsible for all types of sickness in the elderly, ranging from those who need the most expert medical and nursing care to those who need simple nursing care, and finally to those who are "frail ambulant." These needs can best be supplied by a geriatric unit, and in many parts of the country this type of service has been provided.

The various homes established by voluntary bodies and known as half-way homes, etc., do fulfil a most useful function, but, as I believe, a function not originally intended, and certainly do not treat the type of patient who is popularly supposed to need "half-way" care. One doctor working in one of these homes considers that convalescence is half way between health and sickness, and his home is used entirely as a convalescent home for the elderly people following acute illness. Other homes cater for the less seriously ill, and I believe others provide accommodation for healthy people which should be provided by the local authority.

One would suggest that a grave difficulty in the service for sick elderly patients is the absence of facilities for convalescence. Such accommodation is extremely desirable and would, if provided in conjunction with a geriatric unit of a hospital, enable many patients to leave hospital earlier and than they do, would reduce thereby the waiting-list, and would provide accommodation at less cost than a hospital bed. Would it not be possible for the regional boards and the local authorities to agree on a suitable method of financial support for this type of establishment?—I am, etc.,

J. M. GREENWOOD.

Manchester.

Gold Therapy in Rheumatoid Arthritis

SIR,—I have read carefully the paper by Drs. R. A. Peebles Brown and J. P. Currie (*Journal*, April 25, p. 916) on observations on gold therapy in rheumatoid arthritis. Being responsible for the introduction of gold salts in the treatment of rheumatoid arthritis, and being quoted in this article, I wish to present the following remarks.

It is highly desirable to check the treatment of rheumatoid arthritis against the response of control cases. But the value even of such experiments is practically annihilated by the fact that it is impossible to collect a sufficient number of cases which are strictly similar as regards duration, gravity, and anatomical changes, and which can be kept over a sufficient length of time in identical conditions of observation. The paper of Drs. Peebles Brown and J. P. Currie is based on a single course of gold salts and placebo injections given during a few weeks and on the assessment of the patients after 13 months. It overlooks entirely several important factors which we indicated more than 15 years ago and which are now generally accepted. No judgment can be passed on the value of chrysotherapy in rheumatoid arthritis after a single course of injections, since almost half of the patients show the first definite signs of improvement only after the second course or even later; even in cases which have been improved during the first course of gold salts, if a second course is not given after a period of six to eight weeks, there occurs almost certainly a relapse within the following months.

In choosing an interval of 13 months for the assessment of their cases—that is, 8-10 months after the end of the treatment—they have availed themselves of the most unfortunate time, since they estimate the condition of their patients at the very moment of the relapse. It is hard to believe that the authors are unaware of the usual and irregular course of rheumatoid arthritis. But the

most powerful argument against any investigation based on short-term experiment on such a chronic disease as rheumatoid arthritis is that no therapeutic results can be assessed except after several years of clinical observation, certainly not less than five years.

As gold salts are still used in rheumatology after 24 years and in spite of the introduction of cortisone and A.C.T.H., there seems to be some clinical evidence to the medical profession at large of their therapeutic value. Why are gold salts the only antirheumatic drugs which have resisted the test of time after 20 years? And are the clinical results not the best evidence from which to evaluate the therapeutic value of our treatments? Gold salts are certainly not a panacea and should be associated with all the recognized forms of treatments of rheumatoid arthritis, but they would not remain in use if they did nothing more than saline injections.—I am, etc.,

J. FORESTIER.

Aix-les-Bains.

Carcinoma of the Breast

SIR,—I have read with much interest and pleasure the erudite article in the Refresher Course series by Mr. Hedley Atkins on carcinoma of the breast (*Journal*, May 16, p. 1099). Under the heading of diagnosis he very rightly emphasizes the difficulty of saying with certainty what a lump is until it has been removed and carefully examined; and that all single lumps in the breast should be removed, with the possible exception of fluctuant lumps all the physical signs of which disappear after aspiration.

Years ago I was taught that pain was a favourable sign suggesting "chronic mastitis" and that carcinoma was a painless lump. I used also to teach this, but have long given up doing so after seeing many cases of carcinoma of the breast in which pain was coming in sharp sudden stabs. Corry recently wrote an article¹ emphasizing this point and giving records of his cases over many years. I have at present under my care two ladies, one of whom was first made aware of anything wrong by being awakened at 3 a.m. by a severe pain in the breast which persisted for some hours. It was a typical carcinoma. The second had initially a persistent pain going on for some days. She had a Stage I carcinoma. The presence or absence of pain in the breast should not influence one in following Mr. Atkins's advice about removing all single lumps in the breast.

Another point in diagnosis is the dimple in the breast with, or without, a lump. I have another lady under my care at present who noticed a dimple in her right breast as long ago as two years; she watched it gradually get deeper and was not at all disturbed, because an article in a popular magazine made no mention of dimples, but only referred to the importance of showing all lumps to the doctor. She was only able to feel a lump for the first time six weeks ago. She has a deep carcinoma with involvement of axillary nodes.—I am, etc.,

London, W.1.

JOHN HOSFORD.

REFERENCE

- ¹ *Lancet*, 1952, 1, 274.

Smoking and Cancer of the Lung

SIR,—Mr. J. A. Heady and Mr. R. G. Barley (*Journal*, May 16, p. 1105) have attempted to put the data of Dr. Richard Doll and Professor A. Bradford Hill (*Journal*, December 13, 1952, p. 1271) into a suitable form for showing to the man in the street the difference in his chances of dying from cancer of the lung if he smokes a given number of cigarettes per day. To this end the authors take 1,000 young men aged 25 and calculate the numbers who would survive to ages 55, 65, and 75 under the alternative assumptions that they do not smoke, that they smoke 15-25 cigarettes per day, or that they smoke 25-50 cigarettes per day. I have examined this problem, using a slightly different approach, but one that I feel would give the ordinary layman a more precise answer to the blunt question: "What happens if I smoke x cigarettes per day?"

If a group of men aged 25 are considered and the average time that they live from then on is found, this average is designated

the expectation of life of a man aged 25. To work out this average a simple method is to take, say, 1,000 men aged 25 and using the appropriate death rates find the number who would be alive at ages 26, 27, 28, and so on. It is then a fairly straightforward matter to transfer this series of numbers into an average length of life. Owing to the form in which the smoking data are available the exact numbers surviving to each individual age cannot be obtained. Instead a number of pivotal values are obtained and a graphical graduation employed to get the intermediate values. To obtain the values for ages over 75, for which there are insufficient data, the following artifice is adopted. On a large sheet of graph paper the numbers surviving for ages 25-75 are plotted for each of the three groups of smokers. On the same sheet the appropriate figures from the 1942-4 male life table compiled by the Government Actuary's Department for the whole of life are superimposed. It is then assumed that the three curves under consideration would have the same form above the age of 75 as that of the life table curve and a suitable extrapolation is made by eye. In passing it should be noted that quite wide differences in the forms of the three curves for these advanced ages did not materially affect the final figures.

The results found by the methods described are given in the table, which relates to greater London.

Expectation of Life of a Man aged 25

Non-smoker	45.9 years
Smoking 15-25 cigarettes per day	44.9 years
Smoking 25-50 cigarettes per day	44.2 years

Whilst these results cannot be regarded as exact, they show that a man aged 25 suffers a reduction of about 2.2% in his expectation of life if he is a moderate smoker and about 3.7% if he is a heavy smoker. The question as to whether this is regarded as being an appreciable reduction or not must be left to the individual to answer for himself.—I am, etc.,

P. G. MOORE.

London, W.C.1.

Controlled Hypotension in Neurosurgery

SIR,—I have read with interest the paper on controlled hypotension in neurosurgery with hexamethonium and procaine amide by Dr. David Aserman (*Journal*, May 2, p. 961). I feel, however, that it is unwise to inject a dose of 100 mg. of hexamethonium when the patient is placed in a 30 degrees anti-Trendelenburg tilt, as a sudden cardiac arrest can and has occurred in the young and robust who happen to be sensitive to this drug. I am in agreement with a large initial dose of the hypotensive agent, but would rather give it when the patient is flat. After due time has elapsed to assess its effect the patient can then be postured to the degree required for the optimum blood-pressure level. If the blood-pressure fall is inadequate, or the pulse rate increases by more than 10 beats per minute, procaine amide can be employed.

Dr. Aserman makes the important statement that the blood flow through the brain is less than is indicated by the brachial blood pressure, and if cerebral anoxia is to be avoided it should be realized that for every 15 in. (37.5 cm.) that the head is raised above heart level there may be a drop of some 30 mm. Hg. Dr. Aserman states that in general surgery under hypotension reactionary haemorrhage has been one of the most frequent complications, but this has not been my experience. Furthermore, he suggests doses of thiopentone up to 1 g., but I feel the total dose of this drug can with profit be kept down to 0.5 g. even in the robust, although in this type of patient an initial dose of procaine amide in the region of 1 g. may be necessary, together with the infiltration of the area to be incised with an analgesic without adrenaline. The development of an attack of asthma he mentions in a man 70 years old adequately anaesthetized and under such vagolytic drugs as gallamine triethiodide, pethidine, and hexamethonium is difficult to accept. One is tempted to blame some degree of mechanical obstruction associated with the endotracheal tube for the trouble.

The problems of cerebral anoxia and "retractor anaemia" discussed are interesting and it may well be that these dangers will be mitigated in the future by the use of the new phenothiazine derivative R.P.4560 ("largactil") at present under clinical trial. This drug appears to have a wide

spectrum of activity, for in addition to being analgesic, anti-histaminic, vagolytic, and adrenolytic, it lowers body temperature and metabolism. Oxygen consumption is thereby reduced and the resistance of tissues to anoxia is increased. Indeed the future use of hypothermia and artificial hibernation in surgery and anaesthesia would appear to be assured.—I am, etc.,

Hull.

W. N. ROLLASON.

The Premenstrual Syndrome

SIR,—Over the last decades it has become abundantly clear that the adrenal cortex exhibits a cyclical activity in the female, that it produces both male and female sex hormones, that it responds to gonadotrophin, that the ovaries probably respond to A.C.T.H., and that progesterone has a cortical hormone-like action. In short the interrelations of the ovary and the adrenal are so close that the steroid metabolism of the mature female moves as one biochemical unit. Under these circumstances the fact that you were able to publish three articles on the premenstrual syndrome without so much as mentioning the adrenal gland must be taken as an illustration of a general reluctance to look further than the ovary when dealing with disturbances of the menstrual cycle.

I have elsewhere¹ pointed out the many difficulties and inconsistencies inherent in any attempt to explain the premenstrual syndrome on a purely ovarian basis, and Drs. Raymond Greene and Katharina Dalton (*Journal*, May 9, p. 1007) seem to be well aware of the many snags to their hypothesis. The idea of a disturbed ratio between mineralocorticoids and oestrogens on the one hand and glucocorticoids and progesterone on the other goes considerably further in explaining the totality of the syndrome. At the same time, it is probably wrong to attribute to direct endocrine action all the complaints met with in the premenstrual phase. Many of these depend on an uncovering of basic physical and psychological defects. This seems especially true of premenstrual manifestations of allergy, which are almost certainly due to the withdrawal of steroid protection from hypersensitive shock organs and not to a pathogenic effect of hormones upon normal organs, as Greene and Dalton suggest.

Whilst thus disagreeing with their pathogenic concepts I congratulate your authors on having accurately described the clinical manifestations of a very important disorder. I also fully agree that progesterone treatment will relieve most cases. I have even found it effective in a very obdurate case of premenstrual ulceration of mouth and vulva. In view of the intricate interrelations of the steroid hormones, however, no pathogenic conclusions can be drawn from the pharmacological action of progesterone.—I am, etc.,

Glasgow.

E. GEIRINGER.

REFERENCE

- ¹ *J. Obstet. Gynaec. Brit. Emp.*, 1951, 58, 1010.

Sliding Hernias Through the Oesophageal Hiatus

SIR,—Dr. G. Rios-Solans (*Journal*, May 9, p. 1029) expresses surprise about the comparative discrepancies between necropsy and x-ray findings in cases of hiatus hernias. He contrasts his own findings of 26% of such hernias with x-ray findings of only 11%.

It is by no means easy to demonstrate a hiatus hernia radiologically unless the patient is tilted into the Trendelenburg position and screened prior to the taking of the films. I have found repeatedly that it is only possible to demonstrate a hernia if the patient is slightly turned into either a left anterior oblique or left posterior oblique position. Radiologists frequently desist from carrying out this examination in the elderly because they do not like to submit the patient to the additional discomfort of such positioning. If, however, the examination is carried out in the manner indicated, I have found a hiatus hernia rate of 20-25% in all patients submitted to barium meal examination who are over the age of 60.—I am, etc.,

London, W.1.

J. RABINOWITCH.

Obituary

WILLIAM FORBES, M.B., F.R.C.P.Ed.

We record with regret the sudden death on May 17 of Dr. William Forbes, senior lecturer in pathology in the University of Edinburgh. He was 38 years of age.

Born at Edinburgh on September 4, 1914, William Forbes attended George Heriot's School, of which his father, Mr. William Forbes, had been physics master, and became *proxime accessit* to the head of the school and the first winner of the nature science medal in 1932. He then began his university career, taking a combined course in medicine and science at Edinburgh. After distinguishing himself as an undergraduate, and gaining many prizes and the medal and first place in pathology, he graduated M.B., Ch.B. in 1938. A year devoted to the intensive study of pathology followed, and he obtained the B.Sc., with first-class honours in pathology, in July, 1939. After holding a hospital clinical appointment, he passed the M.R.C.P.Ed. examination in 1941. About that time he joined the staff of the pathology department in the university and at the Royal Infirmary, and did strenuous work in both during the period of the last war. Forbes was very anxious to go on active service with the Forces, but, partly from health reasons and mainly because the Central Medical War Committee considered he should be reserved for his civilian duties, he loyally carried on in the university and in the hospital service. His hospital work included duties not only at the Royal Infirmary but at many other hospitals, including the municipal hospitals and the Emergency Medical Service hospitals around Edinburgh. The heavy strain of that period told on a frame already not too robust, and left effects from which it is doubtful if he ever really recovered. In appreciation of his good work Forbes was elected F.R.C.P.Ed. in 1945.

When Dr. William Blackwood went to the National Hospital in Queen Square, London, in 1947, Forbes succeeded him in the University of Edinburgh as senior lecturer in neuropathology—he had been a lecturer himself since 1944—and a year later he became honorary consultant in his subject to the South-eastern Region of Scotland. The laboratory, formerly financed and managed by a laboratory committee of the Scottish mental hospitals, now became involved in a much wider field than that of the mental hospitals and dealt with material not only from within but from sources outside the region. It became necessary to second assistants from the main department of pathology to cope with the volume and variety of work, which continued to increase. The department of neurological surgery, under Professor Norman Dott, utilized the resources of the neuropathological laboratory, and joint weekly conferences were held. Teachers had also to be provided for the increasing number of postgraduate courses. All of these activities absorbed Forbes's energies, leaving him with little time for any sustained research. In addition, his health was never good, and despite six months' leave in 1948 he was still obliged to take things quietly for several months after that.

Forbes had shown promise of good work during his honours course in pathology, gaining the Gunning Victoria Jubilee Fund Prize in Pathology in 1940 for original work on histamine in relation to eosinophils. He later published several papers on pathological sub-

jects and was intending to proceed with work on the grading of gliomata, cerebral oedema, and cerebral anoxia, but the constant pressure of routine examinations and of teaching precluded him from finding time for all he would have liked to do. This preyed upon his sensitive mind and greatly worried him, making further inroads on his physical reserve.

Greatly interested in classical music, Forbes had a fine collection of records, which he gladly lent to those who appreciated them. During the war he gave "concerts" of his records on Sunday evenings to members of the University Naval Division, to their delight and profit. He also had a wide knowledge of English literature and could be a most entertaining conversationalist. It is a tragedy that one so full of energy and promise should have fallen by the way so early. Deep sympathy is extended to his widow.—A. M. D.

ALEXANDER MILES, M.D., LL.D., F.R.C.S.Ed.

R. E. A. has sent us the following appreciation of the late Mr. Alexander Miles, whose obituary notice was printed in the *Journal* of April 25 (p. 942): As women students in the "dark ages," we were allotted to the wards in the Edinburgh Royal Infirmary of the junior surgical and junior medical lecturers. Those of us who had Mr. Miles as chief can never be sufficiently grateful for the care and interest he took in teaching us. One aspect of his character stands out clearly in my memory. At the end of the session Mr. Miles reviewed the work done in wards 5 and 6, in which several cases of sepsis had developed. He went over all the possible causes, and finished by saying, "But I have to admit that at the same time some of my outside cases have also gone wrong, and I fear I must own to being the culprit." This shows the character of Mr. Miles, who could admit before a class of the despised women medicals that he had made a mistake. I doubt if many other teachers at that time would have done so.

Squadron-Leader A. T. MITCHELL died on April 18 at the early age of 26. After an outstanding career at school and university, Andrew Tannock Mitchell, who was born on September 12, 1926, graduated M.B., Ch.B. from the University of Glasgow in 1949. He then became house-surgeon to Mr. Arthur Jacobs at the Glasgow Royal Infirmary and later was house-surgeon at Greenock Royal Infirmary. On entry into the Royal Air Force for National Service he was accepted for surgical duties, attaining the rank of squadron-leader. He did his work conscientiously and well, treating all his patients with equal care and courtesy. He was a delightful person, honest and true. Strength of mind and doggedness of purpose were covered by a quiet and unassuming manner. His character was put to the test little over a year ago, when the first signs of a fatal disease appeared. When this was confirmed soon afterwards he did not give way to self-pity. Instead he faced the future with a courage which won everyone's admiration. He kept his illness secret from all he could, continuing on full duty till near the end. His death, therefore, came as a shock to many people. During his illness he was sustained by his fiancée, a friend from childhood days, and after their marriage in August last year he was ideally happy. Her professional skill and loving care also lightened the last few weeks, when he was unable to get up. To his wife, his parents, and his brother will go out the sympathy of numerous friends in whose hearts the memory of "Mitch" will long remain.—J. N. M.

The death of Dr. J. E. G. THOMSON at Montrose on April 29 has removed one who, before his retirement in 1947, was an outstanding general practitioner. James Ettershank Gordon Thomson graduated M.B., Ch.B. from the University of Aberdeen in 1907, before he was 21 years

of age, and then went straight to Arbroath, which was to be the scene of his life's work. He was called up as a member of the Territorial Army on the outbreak of war in 1914 and saw service in France and Gallipoli, and was awarded a well-earned Military Cross in 1918. Of a shy and retiring disposition he was beloved by his patients, to whom he gave unstinting service. His clinical acumen was exceptional, and he was a capable surgeon in the days when general practitioners in Arbroath performed appendicectomies, among other operations. A member of the British Medical Association for many years, Dr. Thomson was president of the Dundee Branch in 1928-9. He is survived by a widow and a daughter, to whom we extend our sincere sympathy.—J. W.

Dr. JAMES CHALMERS, who died in hospital at Stoke-on-Trent on April 29 at the age of 65, was in general practice at Alton, Staffordshire, for some seventeen years before he retired to live at Oakamoor, North Staffordshire, in 1951. James Chalmers was born at Aberchirder, Banffshire, on August 22, 1887, and was educated at the University of Aberdeen, where he graduated M.B., Ch.B. in 1912. After graduation he held a resident appointment at Aberdeen City Hospital, and in 1913 he took the D.P.H. On the outbreak of war in 1914 Dr. Chalmers entered the R.A.M.C. and served throughout in Egypt, where he was D.A.D.M.S. at the general headquarters of the Egyptian Expeditionary Force, with the rank of major. For his services he was mentioned in dispatches. After the war he returned to Scotland, and then in 1924 he obtained a senior resident appointment at the City Hospital, Birmingham. In the following year he entered general practice at Tamworth, where he also acted as medical officer of health to the urban and rural district councils. He was joint honorary secretary of the Nuneaton and Tamworth Division of the B.M.A. in 1927-8, and honorary secretary from 1928 to 1931. After moving to Alton in 1933 he continued in general practice there until he retired two years ago. Dr. Chalmers's chief interest was in the practice of medicine, and he kept up his reading of British and American medical literature until almost the end of his life. To an ever-increasing number of patients he endeared himself by his unvarying kindness and his care and attention to their welfare. He was devoted to salmon fishing, and he would have liked to know that his ashes would be buried in a churchyard overlooking his beloved Deveron, in his native Scotland. He is survived by his widow.—J. M. K.

We record with regret the death of Dr. E. A. S. SHAW at his home in London on May 2 at the age of 76. Evan Alan Sivell Shaw was born at Callao, Peru, on September 13, 1876, and was educated at Bonn and Brussels. He received his medical training at Glasgow, Edinburgh, and at the Rotunda Hospital, Dublin, and took the Scottish triple qualification in 1910. After taking a post as a ship surgeon in 1910-11, he settled in general practice in London, working in the Kensington, Bayswater, and Notting Hill districts for 40 years. During the first world war he served abroad as a captain in the R.A.M.C. For 20 years he was deputy medical officer at Wormwood Scrubs Prison. Dr. Shaw will be very much missed in the district in which he practised. The welfare of his patients was his life's work, and although broken-hearted by the death of his wife two years ago he hid his sorrow and continued to administer help and comfort wherever needed. He was rewarded by the affection and gratitude of his patients. Mrs. Shaw also was greatly loved in the district, for she never heard of any sick persons who were alone without visiting them and offering her help. In an area of London where many people live alone in lodgings her kindness was especially appreciated.

Dr. WINEFREDE M. GIBSON writes: I read with regret the obituary notice of the late Professor WARFIELD LONGCOPE in the *Journal* of May 16 (p. 1113). The postgraduates who visited Johns Hopkins Hospital while Professor Longcope was physician-in-chief will remember him with affection.

Both he and Mrs. Longcope gave friendly hospitality to them, and I shall always remember being present, one Christmas Day, at their Christmas dinner, and being welcomed as one of the family. Since 1938 they never missed sending a greeting at Christmastide; it is no wonder, indeed, that he was greatly loved by his students and his friends.

The death of Dr. ALFRED NOLAN FELL was recorded in the *Journal* of May 23 (p. 1169). We are indebted to "J. H." for the following further appreciation. As a fellow-student at Edinburgh University of the late Dr. A. N. Fell, I also would like to pay tribute to his memory and to his prowess at Rugby football. The University fifteen of his day had a great reputation in Scotland, and a following in keeping with that reputation. Fell was the fastest three-quarter of his time; to see him gain possession of the ball and then streak for the line was an experience never to be forgotten. Scotland these days is in the Rugby doldrums and could well do with another Fell. One of his last public appearances was at a jubilee reunion last June of some of the survivors of his year (1902) at Edinburgh. He was in the chair on that occasion, and his speech proposing the toast of Alma Mater will linger long in the memory of those who were present. He, like the rest of his year who were present at that reunion, was very happy in the knowledge that he had completed fifty years in the practice of his profession, and that he had been able to return to his Alma Mater to acknowledge his indebtedness to her. He was the kindly family doctor at his very best, and so his patients and friends will miss him very much indeed. But they will have very happy memories of him.

Universities and Colleges

UNIVERSITY OF OXFORD

Professor H. R. Dean, Professor of Pathology in the University of Cambridge and Master of Trinity Hall, Cambridge, has been elected to an Honorary Fellowship of New College, Oxford.

In Congregation on April 30 the following medical degrees were conferred:

D.M.—J. V. Garrett, J. M. Jefferson.
B.M.—W. H. Allchin.

In Congregation on May 5 the appointment by the Board of the Faculty of Medicine of Dr. J. E. French as University Demonstrator in Pathology from October 1, 1953, to September 30, 1958, was approved.

UNIVERSITY OF CAMBRIDGE

Professor J. D. Boyd has been appointed a member of the Board of Research Studies, to serve until December 31, 1955, in place of Mr. C. L. G. Pratt, resigned.

The following medical degrees were conferred in Congregation on April 25:

M.CHIR.—P. G. Somerville.
M.B., B.CHIR.—E. T. Stacey.

In Congregation on May 9 the following degrees were conferred:

M.A.—B. W. Davy, M.D., D.P.H.
M.D.—G. Osborne (by proxy), J. W. B. Forshaw, P. B. Kunkler.

M.CHIR.—J. P. Stephens.

UNIVERSITY OF WALES

In Congregation on February 13 the following medical degrees were conferred:

M.B., B.Ch.—H. L. S. Davies, Barbara M. Evans, W. Harrop-Griffiths, G. Harry, Margaret Land, E. B. Phillips, M. S. I. Wilkinson.

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

DIPLOMA IN PUBLIC HEALTH.—G. M. Davies, E. H. B. Hopkins, Sadie M. James, P. K. Murphy.

UNIVERSITY OF BIRMINGHAM

Professor T. McKeown has been appointed representative of the University at the International Congress of Genetics to be held at Bellagio, Italy, in August; Professor E. Brodie Hughes,

Professor J. M. Smellie, and Emeritus Professor W. H. Wynn, in addition to the Dean of the Faculty of Medicine, have been appointed representatives on the Standing Joint Committee of the University, the United Birmingham Hospitals, and the Regional Hospital Board; Dr. E. Bulmer has been nominated for re-appointment and Professor Smellie for appointment as representatives on the Board of Governors of the Teaching Hospital; and Professor C. F. V. Smout has been reappointed representative on the Regional Hospital Board.

Dr. J. H. Cort has been appointed Lecturer in Physiology and Dr. Constance A. C. Ross a Research Fellow in the Departments of Paediatrics and Child Health and of Pharmacology, from January 19, 1953.

Dr. A. B. L. Beznak has resigned his post as Lecturer in Physiology in the University, as from April 30, 1953, on appointment to the Chair of Physiology in the University of Ottawa, and Dr. Robert Morrison his post of University Clinical Lecturer in Radiology on appointment as Senior Scientific Officer at the Radiotherapeutic Research Unit at Hammersmith Hospital.

The title of honorary part-time Lecturer in Medicine has been conferred on Dr. O. L. Wade, Senior Registrar in the Medical Professorial Unit, United Birmingham Hospitals, during the tenure of his present appointment. The title of University Research Fellow has been conferred on the following for the duration of their present appointments: in the Department of Experimental Pathology, Dr. H. Bickel, Dr. J. D. Blainey, Dr. J. P. Bull, and Dr. D. S. Rowe; in the Department of Physiology, Dr. I. D. Singh.

Dr. Mario Manzotti has been appointed temporary Assistant Lecturer in the Department of Physiology.

Sir Harold Himsworth, Secretary of the Medical Research Council, will distribute the prizes and give an address to students at the opening of the 1953-4 session on October 5. He will also open the new block for clinical teaching and research, which is now nearing completion.

The title of University Research Fellow has been conferred on Dr. J. S. Howell, a cancer research worker (corrected announcement).

UNIVERSITY OF LEEDS

The following appointments are announced: Mr. Herbert Agar, Clinical Lecturer in Obstetrics and Gynaecology, as Honorary Demonstrator in Anatomy; Dr. F. G. W. Marson, as Lecturer in the Department of Medicine; and Dr. R. L. Langley, as Honorary Lecturer in the Department of Paediatrics and Child Health.

Dr. C. K. Anderson has been appointed Research Fellow in Genito-urinary Pathology for one year in the first instance, from November 1, 1953, and renewable annually thereafter, and Dr. P. G. Keates Research Fellow in Radiodiagnosis for one year, from October 1, 1953.

UNIVERSITY OF SHEFFIELD

The following appointments are announced: T. Hanley, M.D., M.R.C.P., Full-time Lecturer in Medicine; D. S. Munro, M.B., M.R.C.P., Full-time Lecturer in Therapeutics; A. Young, F.R.C.S., F.R.C.S.Ed., Part-time Clinical Teacher in Diseases of the Ear, Nose, and Throat; A. H. Cameron, M.B., B.S., Lecturer in Pathology.

Dr. J. E. Mitchell has resigned from the appointment of Demonstrator in Anatomy on returning to clinical work.

Dr. P. G. Walker has been appointed honorary part-time Lecturer in Biochemistry.

Dr. Lorna H. Drought has resigned her appointment as assistant medical officer to the Student Health Service.

QUEEN'S UNIVERSITY, BELFAST

The following medical degrees were conferred on December 19, 1952:

M.D.—*D. T. Gilchrist, *D. A. R. Orr, *I. D. Thompson, J. F. Breach, D. T. Glass, F. D. Honneyman, S. H. S. Love, E. A. Murphy, W. A. Norris, G. U. Thomas, Irene M. Thompson. M.B., B.Ch., B.A.O.—D. J. Acheson, Barbara D. Allen, G. A. Balmer, Ann T. Bowden, G. W. Donaldson, T. N. Elmwood, A. Gaston, Mary S. Gilbody, K. I. McD. Heath, Sheila H. Hoey, A. K. Irvine, R. H. Johnson, J. Kelly, G. W. C. McCartney, J. D. McDowell, A. C. M. L. Miller, H. R. St. L. Ormonde, G. B. Purce, Ellen D. Shilliday, A. B. Siewers, F. A. Thompson.

*With commendation.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Faculty held on April 13, with the President, Dr. Andrew Allison, in the chair, the following candidates were admitted Fellows of Faculty: *Qua Physician*. E. B. Hendry, S. J. Irani, J. H. R. Ramsay, C. Ratnavel, R. S. Walker. *Qua Surgeon*, M. I. Anwar.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 16 (No. 19) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	17	1	12	0	3	16	3	10	0	
Dysentery ..	736	119			9	367	34	61	5	1
Encephalitis, acute ..	4	0	1	0		5	0	1	0	
Enteric fever: Typhoid ..	2	0	0	1		3	0	0	0	1
Paratyphoid ..	11	2	1(B)	0		5	0	8(B)	0	
Food-poisoning ..	234	21		0		91	4		0	
Infective enteritis or diarrhoea under 2 years ..				19	17				12	23
Measles* ..	10,034	305	492	355	245	4,494	240	426	228	469
Meningococcal infection ..	43	3	11	1		40	3	14	0	2
Ophthalmia neonatorum ..	47	7	10	1		36	1	13	0	
Pneumonia† ..	515	29	192	7	4	491	34	214	6	2
Poliomyelitis, acute: Paralytic ..	25	5		0	3	15	3		5	1
Non-paralytic ..	11	1				6	0			
Puerperal fever‡ ..	254	15	6	1		267	41	17	2	1
Scarlet fever ..	1,286	68	174	30	62	1,033	74	172	20	61
Tuberculosis: Respiratory ..			165	33				153	24	
Non-respiratory ..			39	5				24	8	
Whooping-cough ..	3,312	244	480	50	153	2,993	178	191	79	61

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0		0	0	0		0	0
Dysentery ..	0	0				3	1		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0			0	0		0	
Infective enteritis or diarrhoea under 2 years ..	9	0	0	1	3	10		4	1	1
Influenza ..	10	2	0		3	9	1	1	0	0
Measles ..		0	1		1		0	2	0	2
Meningococcal infection ..		0	0				0	2		
Pneumonia ..	209	17	9	11	6	203	28		8	5
Poliomyelitis, acute ..	1	0			0	1	0			0
Scarlet fever ..		0	0		0		0		0	0
Tuberculosis: Respiratory ..	100	14	16	1	7	113	24	23	2	8
Non-respiratory ..		1	1	0	6		1	6	0	1
Whooping-cough ..	1	0	1	0	0	2	1		0	0
Deaths 0-1 year ..	220	23	30	5	15	193	21	40	15	7
Deaths (excluding stillbirths) ..	4,861	677	526	102	203	4,790	694	591	118	151
LIVE BIRTHS ..	8,411	1257	932	235	462	8,145	1212	937	247	450
STILLBIRTHS ..	205	25	17			199	26	28		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Infectious Diseases

Only small fluctuations occurred in the trend of infectious diseases in England and Wales during the week ending May 16. The largest were an increase of 225 in the number of notifications of measles, from 9,809 to 10,034, and decreases of 149 for whooping-cough, from 3,461 to 3,312, and 101 for scarlet fever, from 1,387 to 1,286.

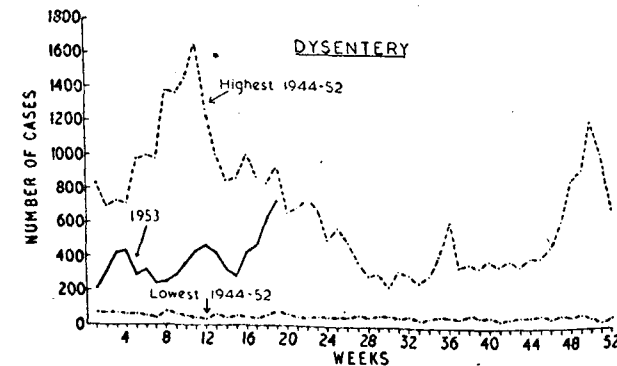
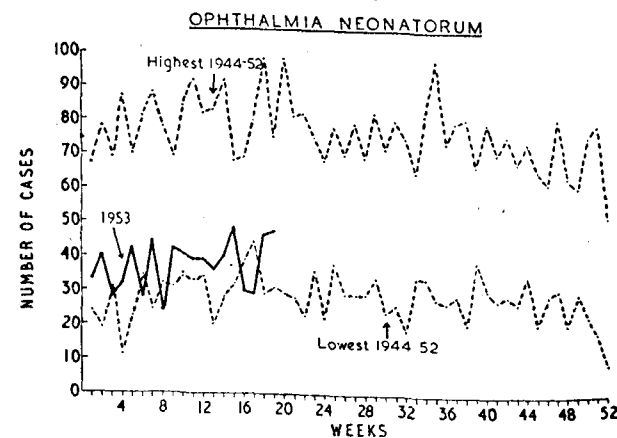
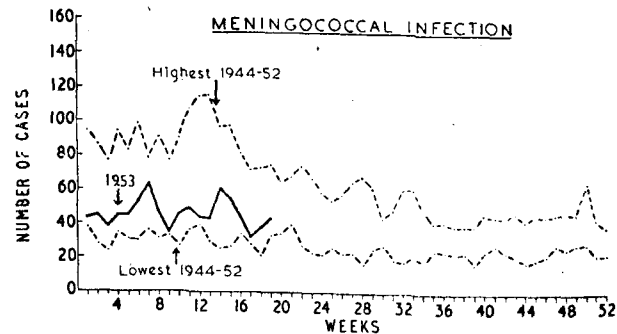
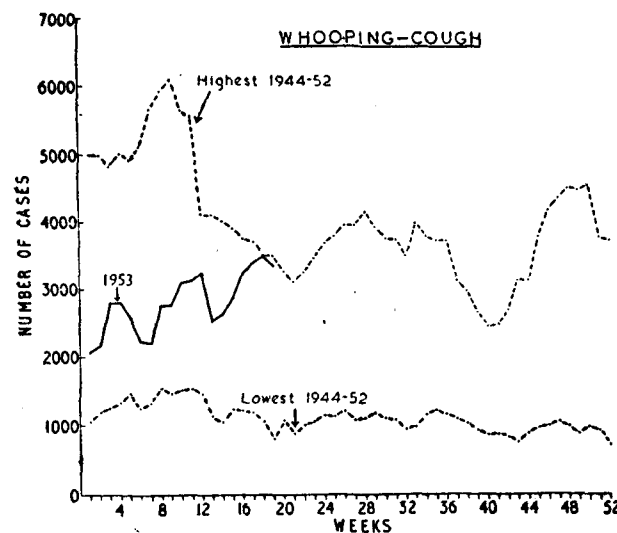
The largest rises in the incidence of measles were 113 in Lincolnshire, from 218 to 331; 72 in Lancashire, from 1,417 to 1,489; 72 in Cornwall, from 215 to 287; and 59 in Sussex, from 354 to 413. The largest falls were 74 in Staffordshire, from 364 to 290; 59 in Nottinghamshire, from 177 to 118; 55 in Warwickshire, from 308 to 253; and 58 in Essex, from 348 to 290. Only small variations were reported in the local trends of scarlet fever. The largest fluctuations in the returns of whooping-cough were falls of 149 in Lancashire, from 531 to 382; and 40 in Warwickshire, from 221 to 181; the largest rise was 50 in Surrey, from 96 to 146. 17 cases of diphtheria were notified, being 5 fewer than in the preceding week. The chief features of the returns of diphtheria were a rise of from 2 to 5 in Warwickshire and a fall from 6 to 1 in Staffordshire.

36 cases of acute poliomyelitis were notified during the week, 3 fewer for paralytic and 1 more for non-paralytic cases than in the preceding week. The largest returns were London, 6 (Lewisham 2, Woolwich 2), Kent 6, Berkshire 4 (Bradfield R.D. 2).

The notifications of dysentery numbered 736 and were 7 more than in the preceding week. The largest centres of infection were London 119 (Kensington 35, Islington 18, Chelsea 11, Greenwich 11, Westminster 11, Wandsworth 10), Middlesex 108 (Edmonton 35, Enfield 19, Tottenham M.B. 14, Southgate M.B. 10), Lancashire 100 (Liverpool C.B. 30, Stretford M.B. 21, Manchester C.B. 15), Norfolk 74 (Great Yarmouth C.B. 66), Durham 56 (Stanley U.D. 48), Essex 34 (Walthamstow U.D. 10), Yorkshire West Riding 28 (Leeds C.B. 11), Leicestershire 28 (Leicester C.B. 28), Warwickshire 28 (Birmingham C.B. 26), and Bedfordshire 26 (Bedford M.B. 15).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in April was 106, compared with 122 (revised figure) in the previous month and 127 (revised figure) in April, 1952. The number of cases of industrial disease reported was 45, including lead poisoning 10, anthrax 4, epitheliomatous ulceration 15, and chrome ulceration 16. There were no deaths.—*Ministry of Labour Gazette*, May, 1953.

Week Ending May 23

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,306, whooping-cough 3,103, diphtheria 19, measles 10,277, acute poliomyelitis 29, dysentery 754, paratyphoid fever 4, and typhoid fever 3.

Sixty-two mass radiography units are now operating in England and Wales. This was stated by Miss P. Hornsby-Smith, speaking at a Mass Radiography Campaign meeting in Orpington on April 27. Miss Hornsby-Smith appealed to the individual to co-operate with the State by making full use of the units when they came to his area.

Medical News

The Practitioner.—Various medical journals in their various ways have celebrated the Coronation, one austere with verse. Among them the *Practitioner* comes out with flying colours and a most attractive cover. Its main piece is an assembly of photographs of British medical institutions and houses of consultants and general practitioners (inside and outside), and health centres, and in particular of the early homes of some famous general practitioners. The pictures alone make the special number a good buy. A foreword by the Minister of Health on general practice hits three nails firmly on the head: "The status of the general practitioner," he writes, "depends essentially upon three things: the trust of his patients, the respect of his colleagues, and the means to do his job adequately." An editorial comment in the opening pages strikes a timely note: "The *Practitioner* has never been merely a journal of general practice; that is taking the narrow specialist view which is doing so much harm in medicine to-day. It is a journal for practitioners of medicine—whether general practitioners or consultants—and if it is to subserve this function it must not only be able to present the advances in medicine which it is the duty of consultants to propagate for the benefit of general practitioners, it must also present the consultants with the accumulated wisdom of the general practitioners of the country." This is a sound recipe for the repast our contemporary is putting before its readers each month.

each month.

Westminster Hospital Medical School Dinner.—The Old Students' dinner was held at Grosvenor House on May 29. The occasion was marked by the farewell of Dr. I. W. Magill, founder of the school of anaesthesia at the Hospital and chairman of the dinner, who retires this year from the staff. When the Loyal Toast and the toast to the Hospital and Medical School had been drunk, Mr. H. E. Harding, the Dean, proposed "The Guests," whom he referred to as "friends of Westminster Hospital and School: people who have given rather than taken." They included Sir Robert Young, "the doyen of practising physicians," the Lords Wigram, Addison, and Kershaw, members of the Board of Governors, and the directors-general of the three armed Services. In his reply Sir Robert Young referred to some of the differences between medicine now and when he began: there were then no x rays, clinical laboratories were only just being set up, and diagnosis depended solely on history-taking and the evidence of the five senses. "Although," as he epitomized the change, "the science of medicine has advanced greatly, I am not quite sure that the art of medicine has advanced with equal steps." Dr. R. Machray proposed the health of the chairman, Dr. Magill. He reminded his audience how Dr. Magill had been the first member of the staff to devote himself entirely to the practice of anaesthesia. To no one man, he said, perhaps

he looked forward to further discoveries from the department of anaesthesia at the Westminster.

W.H.O. Budget for 1954.—The Sixth World Health Assembly's committee on programme and budget has recommended that the W.H.O. budget of \$8½m. for the financial year 1954 should be spent as follows: nearly \$4½m. on advisory services, \$1½m. on technical services, \$1m. each on regional offices and administrative services, and the remainder (less than \$½m.) on organizational meetings, expert committees, and conferences. In the words of the retiring Director-General, Dr. Brock Chisholm: "What W.H.O. is now spending on international action for the protection of the health of the men, women, and children of the world is no more than the amount many a large city spends on its own municipal sanitary arrangements. Indeed the budgets of the Organization have been and are ridiculously small, when viewed against the background of the tremendous health needs of a world in which two-thirds of the population is still deprived of the benefits of modern scientific and medical knowledge."

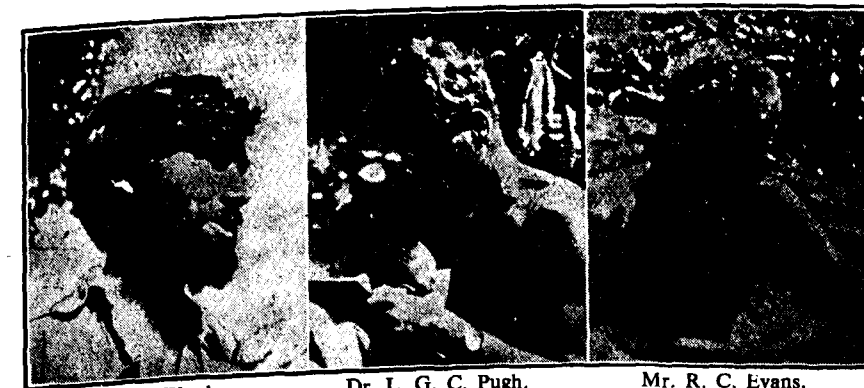
Award of Albert Medal.—The gold Albert Medal of the Royal Society of Arts for 1953 has been awarded, with the warm approval of the Duke of Edinburgh, President of the Society, to Dr. E. D. Adrian, O.M., P.R.S., Master of Trinity College, Cambridge, for his outstanding contributions to neurophysiology. The Albert Medal, which is the highest award in the gift of the Society, was instituted in 1864 to commemorate the Presidency of the Prince Consort from 1843 to 1861. It is awarded annually for "distinguished merit in promoting Arts, Manufactures, and Commerce."

The Annual Conference of Prison Medical Officers was held at the Home Office on May 22, the chair being taken by Dr. H. K. Snell, Director of Medical Services, Prison Commission. At the morning session Dr. N. J. deV. Mather, consultant psychiatrist at Crumpsall Hospital, Manchester, addressed the conference on "Schizophrenia in Relation to Criminal Behaviour." The afternoon was devoted to the subject of the management of the homosexual in prisons and Borstal Institutions, papers being read by Dr. W. J. Gray and Dr. D. A. Ogden. The papers were followed by a discussion.

Tavistock Clinic.—The Tavistock Clinic, London, has issued a prospectus of the training courses available there during the year 1953-4. These include courses on child psychiatry and psychotherapy, clinical psychology, the Rorschach method of personality assessment, and psychogenic speech disorders. There are also two courses for general practitioners, on "Psychology in General Practice" and "Speech Disorders in General Practice." The number of vacancies for these courses is very limited. Applications for the prospectus should be made to the Training Secretary, The Tavistock Clinic, 2, Beaumont Street, London, W.1.

China.—The Government of the Republic of China has notified the Director-General of the World Health Organiza-

Medical Members of the Everest Expedition



Dr. M. Ward.

Dr. L. G. C. Pugh.

Mr. R. C. Evans.

tion that it will again participate in the organization's work. China withdrew from W.H.O. in 1950.

Bart's Journal Coronation Number is being sent to all Bart's men, whether regular subscribers or not. Any who do not receive a copy should write for one to the Editor, St. Bartholomew's Hospital Journal, St. Bartholomew's Hospital, London, E.C.1.

COMING EVENTS

Surrey Coronation Ball.—The Coronation Dinner and Ball of the Surrey Branch of the British Medical Association will be held at Selsdon Park Hotel, Sanderstead, on June 25 at 7.30 p.m. Tickets (price 2 guineas) may be obtained from Dr. L. A. Gibbons, Fulham House, Waterlow Road, Reigate, or from Dr. J. W. Starkey, 9, Lovelace Road, Surbiton.

Society for Endocrinology.—A lecture on "The Prostatic Glands as Targets for Steroids" will be given by Dr. Charles Huggins, of the Ben May Laboratory for Cancer Research, University of Chicago, at the Royal Society of Medicine, Wimpole Street, W.1, on June 23 at 5.30 p.m. The chair will be taken by Dr. J. F. Folley, D.Sc., F.R.S. Admission free without ticket.

A Refresher Course on the Anterior Pituitary Hormones will be held at the Hôpital Laennec, Paris, from June 23 to 27. Apart from lectures by Professor H. M. Evans, director of the Institute of Experimental Medicine at Berkeley, California, there will be clinical and therapeutic papers. Registrations should be sent as soon as possible, accompanied by the fee of 5,000 francs, to Centre d'Etudes et de Recherches Endocrinologiques, 37 rue Spontini, Paris.

British Association of Sport and Medicine.—A meeting will be held in the Westminster Hospital Medical School on June 24 at 5 p.m., when Sir Adolphe Abrahams and Dr. A. McEldowney will open a discussion on "The Doping of Athletes."

British Association of Urological Surgeons.—The annual meeting of the British Association of Urological Surgeons will be held in Leeds from June 25 to 27. The meeting will include operating sessions, clinical demonstrations, and the reading of papers. There will also be a discussion on urinary tuberculosis opened by Mr. J. Cosbie Ross. Members are asked to make their own hotel reservations, and those requiring further information should communicate with the hon. secretary, 45, Lincoln's Inn Fields, London, W.C.2.

NEW ISSUES

Abstracts of World Medicine.—The June issue (Vol. 13, No. 6), which is now available, contains abstracts of important papers on both medical and surgical subjects drawn from the medical literature of some 20 different countries and of all five continents. In addition to clinical medicine and surgery, the subjects covered include pathology, bacteriology, pharmacology, and chemotherapy, and there are also sections dealing with public health and industrial medicine, forensic medicine, anaesthetics, radiology, and the history of medicine.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; a specimen will be sent free on request.

SOCIETIES AND LECTURES

Monday, June 8

EDINBURGH UNIVERSITY.—At University New Buildings, 5 p.m., Dr. Douglas Guthrie: Early Days of Medical Education in Scotland.
MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—7.30 p.m., E. Gurney-Clark (Columbia University, New York): Natural History of Acquired Syphilis and its Relationship to Preventive Medicine.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. A. L. Cochrane: Medical Field Work.
ROYAL EYE HOSPITAL.—5 p.m., Mr. R. A. Burn: Blood Diseases and their Ocular Complications.

Tuesday, June 9

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Professor C. A. Keele: Hyperidrosis.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Moynihan Lecture by Dr. H. L. Jaffe (New York): Giant Cell Tumour (Osteoclastoma) of Bone: Its Pathological Definition and the Inherent Clinical Implications.
ROYAL EYE HOSPITAL.—5 p.m., Mr. T. M. Tyrrell: Corneal Grafting and Indications.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY, St. Mary's Hospital Medical School.—5 p.m., Almon Wright Lecture by Professor J. R. Squire: Hypersensitivity and Disease.

Wednesday, June 10

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Mycology—Pathogenesis of Tinea Capitis.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. R. E. O. Williams: Control of Air-borne Infection.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor Milroy Paul: Surgery of the Congenital Anomalies of the Midline Ventral Abdominal Wall.
ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Neurology.

Thursday, June 11

EDINBURGH UNIVERSITY.—At University New Buildings, 5 p.m., Dr. Douglas Guthrie: Evolution of Sick Nursing.
HAMPSTEAD GENERAL HOSPITAL.—3 p.m., Mr. A. Emyln Williams: Common Diseases of the Anus and Rectum; 4.15 p.m., Dr. E. W. Hart: Minor Ailments in Childhood.
HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. J. A. Tulloch: The Prognosis after Myocardial Infarction.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Mycology—Superficial Fungus Infections of the Skin.
NUFFIELD ORTHOPAEDIC CENTRE, Wingfield-Morris Orthopaedic Hospital.—8.30 p.m., Dr. H. L. Jaffe: Solitary Fibro-osseous Lesions of Bone and their Relation to Fibrous Dysplasia.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. B. Ackner: Depression.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Bradshaw Lecture by Sir James Paterson Ross: Unsolved Problems in the Surgery of the Sympathetic Nervous System.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor D. Campbell: Function of the General Medical Council and its Influence on Medical Education and Ethics.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. A. S. Paterson: Postgraduate demonstration in neurology.
WEST LONDON HOSPITAL MEDICAL SCHOOL.—At Medical Society of London, 4.30 p.m., Alex Simpson Smith Memorial Lecture by Sir Clement Price Thomas: Benign Tumours of the Lung.

Friday, June 12

INSTITUTE OF CARDIOLOGY.—At Royal Society of Medicine, 5 p.m., St. Cyres Lecture by Professor J. McMichael: Right Ventricular Failure.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. F. R. Bettley.
LEEDS UNIVERSITY.—At Littlewood Hall, Instructional Block, General Infirmary, Leeds, 8.15 p.m., Professor Sydney Sunderland (Melbourne): Applied Anatomy of Peripheral Nerve Trunks.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. C. L. Cope: Adrenal Cortical Function.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Obstetric and Gynaecological Conference. Mr. Aleck Bourne: Delay in Labour.

Saturday, June 13

ASSOCIATION OF CLINICAL BIOCHEMISTS: SOUTHERN ENGLAND AND SOUTH WALES REGION.—At Courtauld Institute of Biochemistry, regional meeting. 1.30 p.m., demonstrations; 2.30 p.m., papers.

APPOINTMENTS

NORTH-EAST METROPOLITAN REGIONAL BOARD.—The following consultant appointments are announced: J. Suchet, M.R.C.S., L.R.C.P., Hospital, Bow, and Poplar Hospital; A. Giordani, M.R.C.S., L.R.C.P., D.M.R.D., Part-time Radiologist, Harold Wood and Goodmayes Hospitals; R. H. V. Hafner, F.R.C.S., Part-time Orthopaedic Surgeon, Mildmay Mission and Queen Elizabeth Hospital for Children; Mrs. Helen Gillespie, M.R.C.S., L.R.C.P., Part-time Psychiatrist, West Essex Child Guidance Clinic, Walthamstow; S. F. Hans, M.D., F.R.C.S., M.R.C.O.G., Part-time Obstetrician and Gynaecologist, Hertford Group of Hospitals; S. D. Perchard, M.D., M.R.C.O.G., Part-time Obstetrician and Gynaecologist, Mile End Hospital; Lord Amulree, M.D., F.R.C.P., Part-time Geriatrician, St. Matthew's Hospital; N. E. France, M.B., B.Ch., Full-time Pathologist, Queen Elizabeth Hospital for Children; Ivy M. Tuck, M.B., B.S., Full-time Pathologist, St. Margaret's Hospital, Epping.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Herst.—On May 8, 1953, at Guy's Hospital, London, S.E., to Pamela, M.B. (formerly Green), wife of Edward R. Herst, M.B., a son—law Malcolm.
MacAuliffe.—On May 16, 1953, to Judy (formerly Baldry), wife of Dr. Richard MacAuliffe, of Saltburn, Yorks, a daughter.
McCoy.—On April 28, 1953, at the University College Hospital, London, W.C., to Dr. and Mrs. James McCoy, 14, Great Russell Street, a daughter—Katherine Mary.
Miller.—On May 22, 1953, at St. Mary's Hospital, Harborough, Magna, near Rugby, Warwickshire, to "Prue," wife of Dr. Peter Miller, a sister for Anne and Susan—Jean Rosemary.
Nathanson.—On May 17, 1953, to Margaret (formerly Milman), wife of Dr. N. E. Nathanson, a daughter.
Reid.—On May 21, 1953, at 2, The Mount, Pontefract, Yorks, to Nicky, wife of James A. Reid, F.R.C.S., twins—a son and a daughter.
Whittaker.—On May 8, 1953, at the European Hospital, Kitale, Kenya, to Beth (formerly Morgan), wife of Dr. Leslie R. Whittaker, a son—Clive Leslie.

DEATHS

Boyd.—On May 8, 1953, at Birchington, Kent, John Errol Moritz Boyd, M.C., M.R.C.S., L.R.C.P., Colonel, R.A.M.C., retired.
Carling.—On May 2, 1953, Albert Carling, M.B., B.Ch., formerly of Bristol, aged 88.
Chalmers.—On April 29, 1953, in hospital, James Chalmers, M.B., Ch.B., D.P.H., of Woodbank, Oakmoor, Staffs.
Fenn.—On April 26, 1953, Arthur James Fenn, M.R.C.S., L.R.C.P., of 199, Southampton Way, London, S.E., aged 69.
Fernando.—On May 2, 1953, in London, Charles Walter Solomon Fernando, M.R.C.S., L.R.C.P., D.M.R.E., of Horton Place, Colombo, Ceylon.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Prognosis after Accidental Haemorrhage

Q.—Please can you give the prognosis for future pregnancies after a stillbirth due to accidental haemorrhage?

A.—The future outlook in such a case depends very much on whether the accidental antepartum haemorrhage was associated with toxæmia of pregnancy, chronic hypertension, or chronic nephritis. It depends on whether the woman still has evidence of hypertension or impairment of renal function; and her age and parity may also have a bearing.

Unless there is any special predisposing factor present, the risk should be assessed against the fact that the overall incidence of this complication is less than 1% of all deliveries, and this figure includes the less severe cases in which the foetus often survives.

Hormones and Peptic Ulcer

Q.—What part do hormones play in the aetiology and treatment of peptic ulcer?

A.—There are, unfortunately, more theoretical than practical considerations in our present knowledge of the relation of hormones to the aetiology and treatment of peptic ulcer. Hypersecretion is a common finding in duodenal ulcer, and it is at least conceivable that interference with normal hormonal control of secretion might play a part. It is possible that the gastric phase of secretion due to the production of gastrin by the pyloric mucosa could be prolonged if a normal inhibiting mechanism failed. There is some evidence that inhibition is caused when the acid in the stomach reaches a certain concentration. Again, the small intestine hormone enterogastrone normally reduces gastric secretion, and if its production was inhibited hypersecretion could result.

There appears to be some relation with the adrenal glands, for increased gastric secretion is also produced by A.C.T.H. or cortisone, and experience has shown that patients suffering from gastric or duodenal ulcer tend to relapse and may bleed or perforate under treatment with these substances. There is, however, no evidence that adrenal cortical hyperactivity in the absence of steroid therapy plays a part in duodenal ulcer, although it is suspected that it might explain the exacerbation of ulcer symptoms which may follow acute emotional disturbances. It is also likely that sex hormones may play a role in the determination of peptic ulcer. 80% of ulcers occur in men and there would appear to be substantial sex protection in the female, a protection which is most marked during the reproductive years of life. Before puberty the incidence of ulcer is small, but the sex incidence is equal. After the puberty the frequency of ulcer rises in both sexes, but the increase is far greater in men. There is a sudden increase in frequency of peptic ulcer in women at and after the menopause, and in the later decades of life the frequency of ulcer approximates in the two sexes. Peptic ulcer appears to be particularly inactive during pregnancy and acute perforation is then excessively rare. Peptic ulcer in women is discussed in an article at p. 1254 and an annotation at p. 1270.

Unfortunately experience with oestrogens, progesterone, gonadotrophins, and testosterone has not demonstrated any significant effect on gastric secretion or beneficial results

on the healing of ulcer. The possibility of an anti-ulcer hormone promoting healing of the ulcer crater apart from any effect on gastric acidity has been postulated to explain the prolonged absence of ulceration which may occur after the administration of enterogastrone in dogs subjected to the Mann-Williamson operation (a method of diverting duodenal juice away from the pyloric region, by transplanting the duodenum into the ileum and anastomosing the cut end of jejunum to the pylorus). Sandweiss and his fellow workers have claimed that the urine of pregnant and non-pregnant women contains a substance capable of facilitating the healing of Mann-Williamson ulcers in dogs without affecting gastric acidity, and that this protective factor is not present in the urine of ulcer patients. It is conceivable that the isolation of such a factor, if it really exists, or the chemical identification of urogastrone excreted in the urine and derived from enterogastrone, would offer hope of a hormonal cure of duodenal ulcer.

In the vast medical literature on peptic ulcer all the endocrine glands have been implicated, but there is no real evidence of the part they play.

Holiday T.A.B.

Q.—For which Western European countries is T.A.B. inoculation a wise precaution before a holiday? How long before the holiday should inoculation be performed, and what dosage is advised for adults and children? How long will immunity last, and are booster doses recommended for subsequent years?

A.—Enteric fever (typhoid and paratyphoid) is still an endemic infection of some prevalence in France, Spain, and Italy. In Germany after the war there were numerous large epidemics which have probably left their mark in an increased incidence of enteric carriers. Infection is less common in the Low Countries and relatively rare in Scandinavia.

T.A.B. inoculation should preferably be completed a few weeks before going on holiday, as it sometimes causes systemic as well as local reactions. The effects of such reactions can be minimized by having the injection in the late afternoon or evening, and by taking an antipyretic tablet before going early to bed. The dosage depends on the type of vaccine used: for alcoholized vaccines the dose is 0.25 ml. and 0.5 ml. for adults (0.2 and 0.4 for females), half the adult dose for children aged 5 to 14, and one-fifth to one-third of the dose for younger children. Babies under 1 year do not need to be immunized. With phenolized or heat-killed vaccines the dose is roughly double that for the alcoholized vaccine. The two injections are best given at an interval of seven to fourteen days, and a considerable degree of protection is believed to last for one to two years. A booster dose should be given after that time if the individual is going back to a country where the infection is still prevalent and the water supplies are suspect.

It must, however, be emphasized that infection may occur in spite of active immunization with any type of vaccine, and every precaution should be taken to avoid unnecessary risks with food and drink, particularly in country districts or small towns where piped water supplies are not available. Fortunately, chloramphenicol has a specific curative effect on enteric fever, and anyone holidaying abroad who develops a suspicious illness should consult a doctor, who will presumably prescribe chloramphenicol if he is at all worried about the possibility of enteric infection.

Foetal Asphyxiation by the Cord

Q.—Can an infant in utero be asphyxiated by its own cord?

A.—Anomalies of the umbilical cord can certainly cause asphyxia and death of the foetus in utero, and this can occur at any stage of pregnancy or labour. Knots which

tighten, loops which form around the foetus, and even torsion of the cord, sometimes cause foetal death and abortion as early as the 12th week. Usually, however, such arrangements of the cord remain loose enough to avoid interference with the circulation in the umbilical vessels until labour is in progress. Then, with the descent of the foetus, the knot or loop tightens sufficiently to cause asphyxia. Looping of the cord around the foetal neck can sometimes be suspected or diagnosed as a cause of asphyxia during labour—one test being to study the behaviour of the foetal heart when the head is deliberately pushed down towards the pelvis.

Nevertheless, the cord is very often looped once or twice round the foetal neck without any harm resulting. It remains loose until the foetal head is actually delivered. Moreover, "cord round the neck" is such an easy explanation to offer for the death of the foetus that it becomes suspect as a cover for bad obstetrics. This diagnosis is undoubtedly made more often than is justified, and it is therefore often viewed with suspicion. Despite this, there can be no doubt that tightening of a loop of cord round the foetal neck or trunk, or tightening of a true knot, is a definite although rare cause of foetal asphyxia.

Coital Posture and Obesity

Q.—What coital position is best for a man with a small penis who is married to an obese wife? At present they are having difficulty in the act.

A.—Variation in the size of the male phallus, and obesity in one or other partner, are common, and yet it is surprisingly rare for such mechanical factors to prevent coitus, even though they make it less satisfactory. The case in question should be reviewed to make sure that the blame for failure in coitus is not being wrongly placed, and that other causes such as male impotence or vaginismus are not present. If the trouble proves to be entirely mechanical then an intelligent couple might be expected to find the most satisfactory posture by experiment, and in this they could be helped by some book such as Van de Velde's *Ideal Marriage* (Wm. Heinemann Medical Books), which devotes a whole chapter to coital postures. The position which might prove most satisfactory is the one in which the wife lies on her back and extends her trunk either by placing a firm pillow under the lumbar spine or by allowing her legs to hang downwards over the edge of a couch, as in Walcher's position, which was formerly used in obstetric practice.

Recurrent Gall-stones

Q.—What is the likelihood of stones recurring in the common bile duct after cholecystectomy or choledochotomy? Is there any satisfactory way of preventing recurrence?

A.—Most of the so-called "recurrent stones" have been overlooked at the original operation, and the incidence of recurrence therefore bears an inverse relationship to the diligence with which the original operation has been carried out. Even with routine exploration of the common bile and hepatic ducts it is possible for stones to be missed, for they may easily slip far up into the latter, or a small stone can be missed at the lower end of the common duct as a result of a bougie or forceps being passed beside it. For this reason many authorities on biliary surgery have advocated cholangiography on the operation table, but this is not a method which is likely to be of any practical value outside a large surgical centre.

Truly recurrent stones are more likely to occur in the presence of residual infection, or because a fragment of stone has been left behind. A piece of suture material in the duct may act as a nidus for further stone formation, as also may a small stump of cystic duct. Poor drainage through the sphincter of Oddi may occur as a result of narrowing at the lower end of the common duct, and dilata-

tion with bougies may be advisable at the primary operation in these circumstances. A measure which has not attained wide popularity is the practice of side-to-side choledochoduodenostomy to assist drainage. This alternative channel may certainly allow an overlooked stone to be passed subsequent to operation, but many regard the possible regurgitation of duodenal contents as a real objection to the procedure.

To summarize, therefore, most recurrent stones have been previously overlooked, and even with the most careful surgery this may still occur, although the likelihood is then very largely ruled out. Mere scrutiny of the ducts and external palpation are often a very unsatisfactory method of exploration.

Compensation and Industrial Pulmonary Disease

Q.—What industrial pulmonary diseases are eligible for compensation?

A.—The important industrial lung diseases for which benefit is paid under the National Insurance (Industrial Injuries) Act, 1946, are pneumoconiosis and byssinosis. Where the pneumoconiosis is accompanied by respiratory tuberculosis, the effects of the tuberculosis are treated as the effects of the pneumoconiosis. Pneumoconiosis is defined in the Act as meaning "fibrosis of the lungs due to silica dust, asbestos dust, or other dust, and includes the condition of the lungs known as dust reticulation." Claimants for benefit must have worked in specified occupations and processes after July 5, 1948. These occupations and processes cover practically all processes where there is a risk, and they are listed in Ministry of National Insurance Leaflet N.I.3, obtainable at any local office of the Ministry of National Insurance. Claimants who have worked in these occupations, but not since July 5, 1948, may be able to claim compensation under the Workmen's Compensation Acts. Byssinosis is not included in the above definition, as it is not a fibrosis of the lung. Claimants to benefit for byssinosis must have been employed "in any occupation in any room where any process up to and including the carding process is performed in factories in which the spinning or manipulation of raw or waste cotton is carried on" for at least 20 years.

Beryllium poisoning, with its pulmonary manifestations, is prescribed disease No. 36. In the same way, pulmonary tuberculosis is an industrial disease (disease No. 38) when contracted by those whose insurable employment involves close and frequent contact with some source of tuberculous infection in certain occupations. These occupations are, shortly, those involving the treatment or nursing of cases of tuberculosis, attendance as a health visitor or home help, or research or laboratory work connected with tuberculosis.

Correction.—William Harvey was physician to Charles I, not Charles II as stated in the *Journal* of May 30, p. 1208, and he was not President of the Royal College of Physicians: though offered the honour, he declined it.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: Aitiology, Westcent, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: Britmedads, Westcent, London. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 4499. TELEGRAMS: Medisecra, Westcent, London. B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 13 1953

PARENTERAL HEXAMETHONIUM IN HYPERTENSION

BY

BRENDA MORRISON, M.D.

(From the Department of Medicine, Postgraduate Medical School of London, and Hammersmith Hospital)

Hexamethonium has now been used for over three years in the treatment of hypertension, and Table I summarizes briefly the results reported in 15 groups of patients, using hexamethonium (C6), pentamethonium (C5), and/or M & B 1863 (a homologue of hexamethonium); most investigators have used the oral route, entirely or for the major part of treatment, and

incomplete realization of the value in treatment of this postural fall, one author even referring to it as an undesirable side-effect. The time which has elapsed since the last dose of hexamethonium was administered must also be of some importance when assessing the effect on the blood pressure, yet in many cases no reference to this time interval was made. It seems likely that variations

TABLE I.—Summary of Results of Treatment of 15 Groups of Hypertensive Patients with Hexamethonium and Allied Drugs.

Authors	No. of Cases	Route	Follow-up (Months)	B.P. Data		Drugs Used	General Opinion
				Position	Time from Dose		
Saville (1950)	5	Oral	3-6	Not stated	Not stated	C5	Symptomatically useful
Campbell and Robertson (1950)	8	I.M. and oral	1-4	Recumbent	" "	C6	Favourable
McNally (1951)	9	Oral	Up to 3	Sitting	" "	C6	Encouraging
Cusack and Cusack (1951)	9	I.M. 2/52 oral	Not stated	Not stated	Averages (high and low)	C5 and C6	Unfavourable
Locket et al. (1951)	34	I.M. 2/52 oral	1-3	Not stated	Before and after dose	C5 and C6	Favourable (symptoms and signs)
Smirk and Alstad (1951)	53	S.C.	2-14	Standing, sitting and lying	—	C6	Moderate. Poor control
Mackey and Shaw (1951)	15	Oral	1-10	—	Not stated	C6	Doubtful
Fullerton and Milne (1951)	31	Mostly oral; few S.C.	1-5	Standing and lying	—	C6	Variable
Persson (1951)	12	Oral	—	—	—	C6	Not very good
Bechgaard et al. (1951)	12	Oral	—	—	—	C6	Favourable
Murphy (1951)	43	9" parenteral, 34 oral	1 1/2-11	Standing	" Standard "	C6	Unfavourable
Locket et al. (1952)	14	Mostly oral, few S.C.	Not stated	Not stated	Not stated	M & B 1863	Favourable
Campbell et al. (1952)	42	Mainly oral	2-18	" "	" "	C5, C6, and M & B 1863	Unfavourable
Blainey (1952)	34	Oral and S.C.	6-9	Variable	Variable	C6	Mixed
Freis et al. (1952)	32	S.C.	1-5	Supine	Averages of many	C6	Mixed

there is much difference of opinion concerning the benefit obtained. Only Smirk and Alstad (1951) have reported the treatment of a large number of patients for many months by subcutaneous injection, and they have no doubt that adequate control of the blood pressure can be maintained, with relief of symptoms. The present paper presents a study of a rather different group of patients treated by subcutaneous injection.

It was felt that if the value of a new remedy is in doubt, and especially when dealing with a complex condition like hypertension, the most decisive indications of its effects would be seen in severe or even hopeless cases. For this reason, and also because the treatment was felt to be too rigorous to warrant its employment in milder cases, the patients in this series were selected from the more limited numbers affected by complicated-essential, malignant, and renal hypertension.

Although it was made clear in the earliest reports on the action of the drug that there is a notable accentuation of the fall of blood pressure in the upright posture, some authors have not stated in which position their pressure readings were obtained, and there seems to have been

in route of administration and recording of data might account for much of the divergence of opinion among different authors.

Conclusions reached in a study of the effects of hexamethonium bromide on normal individuals (Morrison and Paton, 1953) have been helpful in interpretation of the results reported here, and especially in the approach to the problem of tolerance to the drug.

Case Material

Of the 39 patients studied, 17 were men and 22 were women, and their ages ranged from 22 to 64 years. The patients were classified in the following manner:

Group A. Essential Hypertension Without Complications.—All this group were considered unsuitable for treatment.

Group B. Essential Hypertension complicated by (1) headaches of typical hypertensive character; (2) clinical, radiological, or electrocardiographic evidence of left ventricular enlargement; (3) central nervous system episodes, including giddy attacks, black-outs, encephalopathy, or minor cerebral vascular accidents. All group B cases were regarded as requiring treatment unless they were too old.

A man aged 30 (group F) had already suffered from encephalopathy and a thrombosis of the central artery of the retina, and had very severe headaches. He was one of the first patients to be treated, and received the drug only by mouth for a few weeks. The blood pressure was resistant and he required 3 g. daily to produce a moderate fall. After some trouble with constipation produced by the drug, he collapsed in the lavatory with hypo-

tension and coma. He remained unconscious for some days after the blood pressure had risen, and was left with evidence of permanent cerebral damage, particularly dysarthria.

This case drew attention to the hazards of oral therapy, and all patients have since been treated by subcutaneous injection.

In the remaining three patients subsequent experience indicated that they were really unsuitable for this form of treatment, and it was accordingly discontinued.

A man aged 61, an arteriosclerotic, was unable to co-operate; hypertension was not very severe. Treatment was persisted in for only two to three weeks.

A woman aged 57 had chronic renal hypertension, but was very labile and not progressive. She was rather unintelligent and lived too far from the hospital for adequate supervision.

A woman aged 63 had chronic nephritis with severe headaches. She had periods of mental confusion, which made her unable to co-operate in treatment outside hospital.

Patients Giving up Treatment (6)

In two of these the side-effects were very severe (excessive faintness and weakness with marked constipation, visual upset, and difficulty in micturition), and both felt worse on treatment. (One also had Sturge-Weber syndrome with epilepsy and very severe headaches, which did not improve when his blood pressure was lowered.)

Two further patients had well-marked cardiac enlargement and signs of congestive failure before treatment; they improved considerably, but gave up treatment against advice after two months. They returned with severe heart failure after three months and six weeks, and restarted treatment. They both responded again, one very remarkably (see below).

The remaining two patients who gave up were young subjects with little disability, and, having obtained symptomatic relief, decided that they did not wish to continue injections.

Patients Continuing Regular Treatment

Of these 24 patients 18 are leading active and practically normal lives, doing a full day's work and able to undertake such activities as gardening and dancing. The other six are much improved, but are still restricted in their activities. Three of these are cases of malignant hypertension, the first one having a severe degree of cardiac damage which necessitates a very quiet life, the second having a good deal of faintness and weakness but able to do some work and steadily improving, and the third being still in the initial stages of treatment, but able to get about normally. Two have other disabilities (chronic bronchitis and emphysema and aortic thrombosis causing claudication), and it is these disabilities rather than the hypertension which restrict their activity. The sixth is a 59-year-old woman who has not felt well enough to resume work in a laundry.

Details of Results

Blood Pressure

In a previous investigation of the effects of hexamethonium on normal subjects a very wide variation in sensitivity was demonstrated (Morrison and Paton, 1953). These hypertensive patients showed a similar wide scatter, but, judged on percentage fall of blood pressure, they seem to be somewhat more sensitive to an initial dose than normal individuals. The general course of the blood-pressure response (Fig. 1) was the same as in the normal individuals, with the same correspondence between the falls in the standing, sitting, and recumbent postures; the degree of postural accentuation, however, showed a considerable variation.

In the early phases of treatment, when small doses are being used, the pressure falls fairly steeply and rises again to the previous level within three to four hours. With larger doses, and usually when tolerance has developed, the maximum fall tends to occur later and to be maintained for a longer period—that is, the whole curve becomes more rounded and obtuse (Fig. 1, *a* and *b*). The similar differ-

ences in shape between the curves of plasma levels suggest that this alteration may be due largely to differences in rate of absorption with large doses.

Fig. 2 shows a typical example (Case 14) of the behaviour of the blood pressure during 14 months of treatment; data were not available for the early stages, but it will be seen

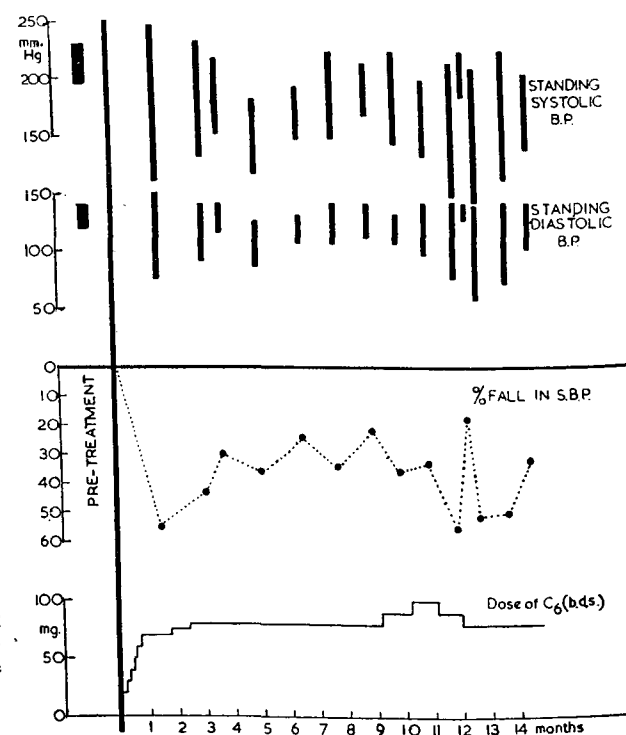


FIG. 2.—Blood-pressure response during fourteen months' treatment with hexamethonium (Case 14). The upright heavy lines show the range of pressure on the day of observation—that is, the reading taken immediately before a dose and that taken one hour afterwards; the mean for the day is taken as half-way between these two. The dotted line shows the percentage fall in the standing systolic pressure in each instance.

that after the first six weeks the response to the drug remained fairly uniform with some phasic variation from time to time. Similar behaviour was shown in all cases treated over any length of time. In Table III the blood-pressure averages before treatment are compared with the mean pressures at time of writing for 19 patients who had had regular treatment for more than three months.

TABLE III.—Falls in Mean Systolic and Mean Diastolic Blood Pressures in 19 Patients Treated for More than Three Months (the Readings in the Standing and Sitting Postures are Averaged.)

Case No.	Months on Treatment	Mean Systolic B.P. (mm. Hg)			Mean Diastolic B.P. (mm. Hg)		
		Before Treatment	Present	Fall	Before Treatment	Present	Fall
7	15	185	135	50	110	90	20
8	16	220	195	25	145	130	15
9	10	175	155	20	130	110	20
11	14	220	175	45	140	125	15
12	14	220	155	65	140	110	30
13	12	220	145	75	113	105	8
14	13	215	155	60	133	105	28
16	14	255	160	85	132	110	22
17	13	250	160	90	150	110	40
18	13	215	165	50	135	95	40
20	11	222	165	57	137	117	20
22	10	202	160	42	130	115	15
24	10	227	185	42	120	110	10
25	7	200	175	25	120	112	8
26	8	225	165	60	130	110	20
28	6	217	160	57	140	120	20
30	6	215	170	45	135	120	15
35	3½	210	150	60	140	105	35
36	3	210	170	40	117	100	17

Reduction in mean systolic pressure ranged from 20 to 90 mm. Hg and in diastolic pressure from 8 to 40 mm. Hg. On the out-patient days the morning dose is often two to three hours late, so that the pre-injection reading is probably higher than usual. In addition, for at least one or two hours the pressure is much lower than the mean value, as can be seen from the diagrams, and this complete or almost complete relief of hypertension, for a short period twice or thrice during the 24 hours, may have a more important effect on the course of the disease than we can assess at present.

It has been our experience that most of the tolerance (see below) which develops does so during the first four to six weeks of treatment. There remain three types of variation in the response of the patient to a constant dose:

(1) Sudden exacerbations of hypertension with little or no response to the usual dose have often occurred. These were very temporary, and when the patient was seen again in a day or so the response had returned to its previous level.

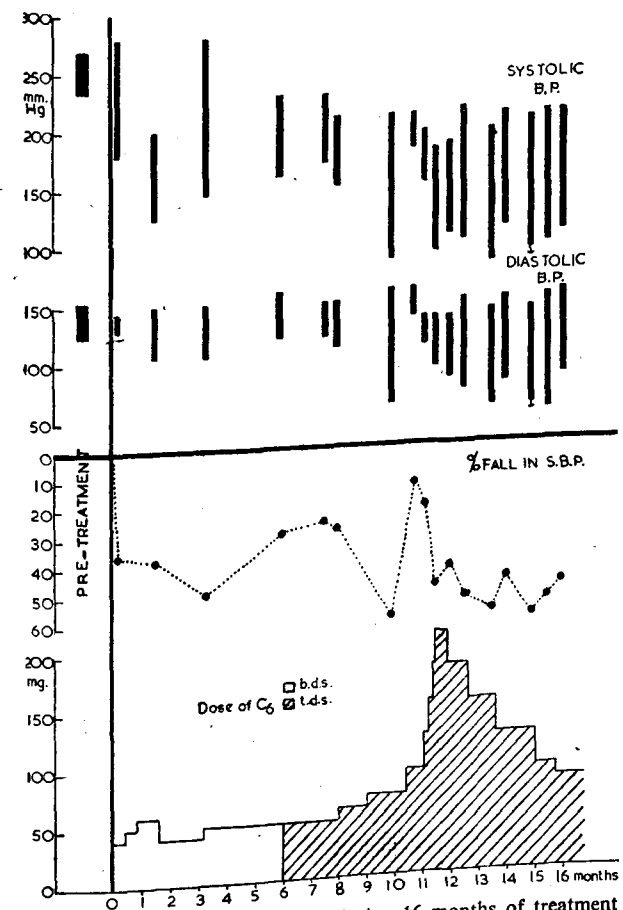


FIG. 3.—Blood-pressure response during 16 months of treatment (Case 16). The exacerbation of symptoms with diminished response to the drug began after 10½ months and lasted for some weeks (see text).

(2) Occasionally more prolonged exacerbations with diminution of response have been encountered. The best example is shown in Fig. 3, and the case history is as follows:

Case 16.—A married woman, with severe hypertension following pre-eclampsia. The exacerbation which occurred after a period of domestic stress was accompanied by a return of severe and incapacitating headaches for one week, followed in a few days by development of homonymous hemianopia, which was probably due to a cortical thrombosis. It was necessary to increase the dose threefold in order to obtain a satisfactory lowering of pressure. However, after several weeks the condition showed a steady improvement, and it was necessary, because of excessive hypo-

tension, to reduce the dose again in stages to an amount just above that on which she had previously been stabilized for months.

(3) In addition there is a very definite increase in blood-pressure fall when other causes of peripheral vasodilatation are operating: hot weather, unwonted exercise, and especially a feverish illness have all been repeatedly observed to be associated with an extra and sometimes excessive fall in blood pressure. The splanchnic vasodilatation which follows a meal can have the same effect, and there have been many instances of a postprandial dip in the blood-pressure curve during a six-hour follow-up. On the other hand, in cold weather nearly all the patients have shown a lesser fall. Temporary adjustments in dosage have been necessary in these eventualities.

In the presence of fever about half the dose produced the usual effect. Diarrhoea and vomiting are other potent hypotensive agents, and some very great falls of blood pressure have been seen when their effect became added to that of hexamethonium; it was deemed advisable to omit the drug altogether until the initial acute phase of the disturbance had been overcome, and then to give only about one-third of the usual dose until the blood pressure regained its former height. In both febrile and gastro-intestinal upsets the lessened requirements of hexamethonium have extended beyond the duration of the acute illness by several days, a fact which may be at least partially explained by temporary sodium depletion.

Headaches

Of the 24 patients who received regular treatment, 19 complained of typical hypertensive headaches, which in 10 were very severe and often incapacitating. They were almost completely relieved in 15, and in the other 4 they were much lessened in frequency and severity. The patients were all quite satisfied that this symptom had been greatly ameliorated by treatment. There have been quite frequent examples of development of a headache when an injection has been delayed for test purposes and in such cases the headache lessened and disappeared in parallel with the fall in blood pressure. The only example of complete failure to relieve headache was in a patient with cerebral angiomas.

Central Nervous System (Apart from Headache)

Recurrent giddiness was a feature in 10 of the 24 cases, and in all it seems to have disappeared. Nine had suffered from encephalopathy before treatment, and it has shown no recurrence in eight and only a very minor recurrence in the ninth, over periods of three to sixteen months. One patient had a cerebral vascular accident with almost complete recovery before treatment, and suffered a recurrence of almost identical nature whilst on treatment, but this also largely cleared up; treatment was continued because of the generally poor outlook without it (he also has cardiac involvement), and there has been no further trouble for six months. Another patient, already mentioned, had a small occipital cortical vascular lesion during an exacerbation, but it was related to excessively high blood pressure and would possibly have been more serious in the absence of treatment.

Optic Fundus Changes

In every case of malignant hypertension, even in those dying while on treatment, the papilloedema diminished in a week or so; later the haemorrhages absorbed and the exudates showed progressive hardening, shrinking, and clearing over three to six months.

Case 28, who had the most severe retinopathy ever seen in this department, showed a remarkable improvement after six months' treatment (Fig. 4).

Cardiac Strain

Shortness of breath on exertion was present in 13 treated patients and in 12 it was accompanied by radiological evidence of cardiac enlargement or by the electrocardio-

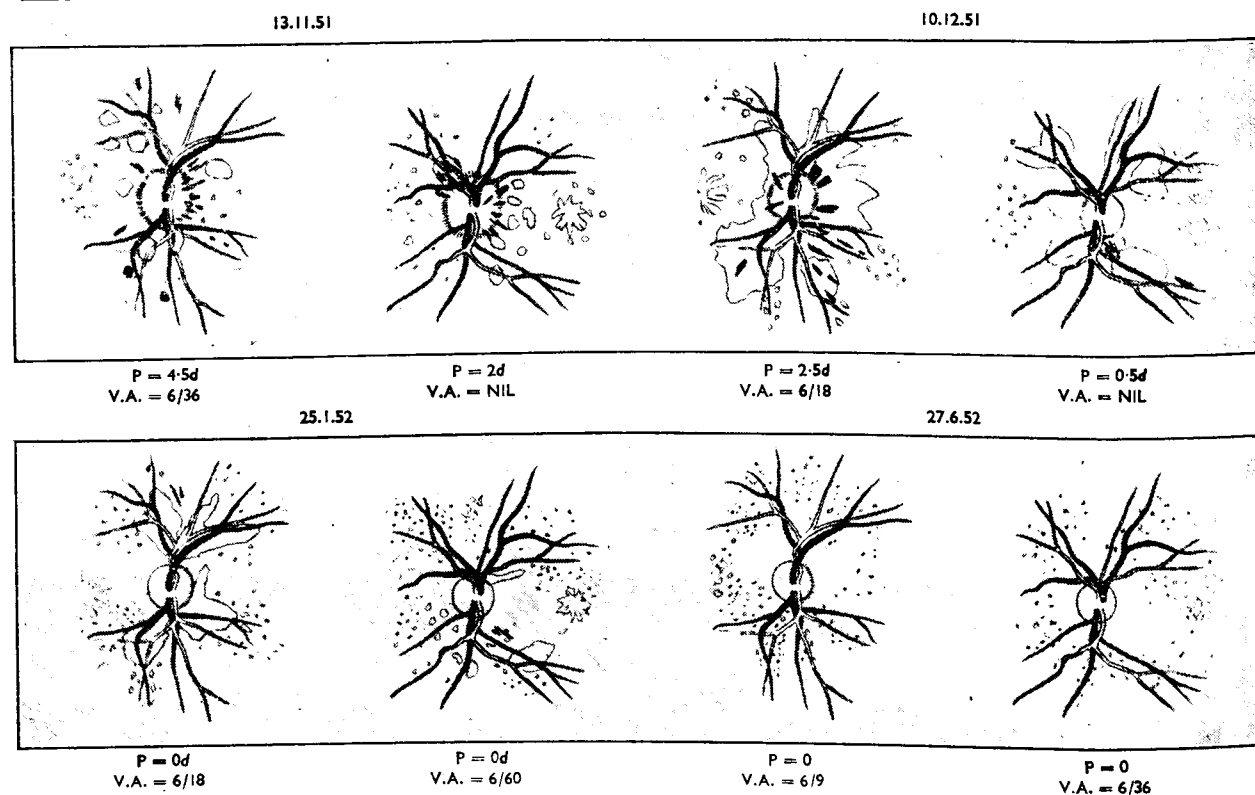


FIG. 4.—Case 28. Diagram of fundus changes in a case of malignant hypertension (a) before treatment, (b) after four weeks' treatment (temporary worsening after initial improvement), (c) after ten weeks, and (d) after seven and a half months. P=papilloedema. V.A.=visual acuity.

graphic changes of hypertension. In the early months of treatment most of these patients reported much improvement, but two have developed a different type of dyspnoea related to changes in the lungs (see below), which is possibly a complication of long-term therapy.

Paroxysmal nocturnal dyspnoea had occurred in six patients, and three of them had frank congestive cardiac failure on admission; one of these died after three months (see above), three have had no recurrence, and the other two were freed of attacks but relapsed after discontinuing treatment; their cardiac failure again cleared up with combined hexamethonium and digitalis therapy.

In one case cardiac asthma was dramatically relieved by hexamethonium treatment alone—and relapsed as dramatically when the drug was temporarily discontinued. There was a direct correlation between the lowering of the blood pressure and the relief of dyspnoea.

In eight patients the cardiac volume was estimated before and after three to six months' treatment (method of Carl Eric Friedman, 1951). Two were within normal limits and remained so; the remainder were initially between 100 and 250 ml. per m.² body surface above normal, and four of

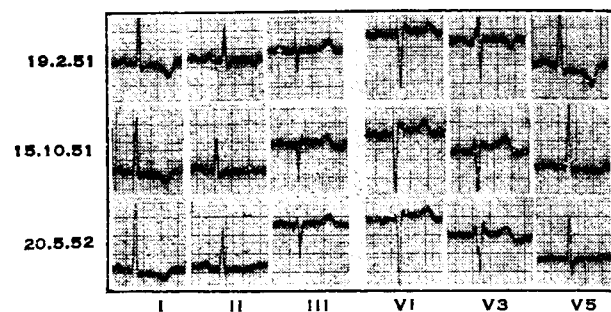


FIG. 5.—Improvement in electrocardiographic changes after 15 months' treatment with hexamethonium.

these showed a significant reduction in size—that is, more than 100 ml. per m.² after treatment.

Electrocardiographic changes were followed in 22 cases. Six were normal and showed no change after 4 to 15 months; six initially showed well-marked evidence of left ventricular hypertrophy with much improvement after 3 to 16 months (Fig. 5); seven showed initially great or moderate evidence of left ventricular hypertrophy and were unchanged after 1 to 12 months; and three showed moderate degrees of left ventricular hypertrophy, which was slightly greater after 3 to 15 months' treatment.

Renal Disease

Among the seven cases which had a normal blood urea before treatment there is no instance of a rise having occurred during the period of follow-up. Of the five cases which showed a raised blood urea before treatment, three have had no further rise, and in the two which have shown a slow rise over many months there has been no evidence that hexamethonium has accelerated the progress of renal disease. (Owing to slower excretion in the presence of renal impairment, injections in these cases were given only 12-hourly or even once daily.)

Treatment of Side-effects

If the disability becomes acute from any of these effects it can be relieved promptly and completely by omission of 12 to 24 hours' treatment (an advantage of first importance when comparing parenteral and oral routes of administration). Dryness of the mouth, dysphagia, difficulty of micturition, and to some extent the pupil changes are usually relieved by giving 25 to 50 mg. of the urethane of β -methylcholine ("mecothane") sublingually at the time of the injection. This drug does not seem to have much effect on the constipation, and purgatives of the phenolphthalein type or even regular omission of a dose twice weekly have been necessary in a number of patients. Bladder difficulties are relatively uncommon and are always lessened by emptying the bladder just before an injection.

Tolerance

This interesting phenomenon shows a remarkable difference in severity among different patients. All those who could be followed closely during the initial phases of treatment showed a definite diminution in response after the first test dose, but, in some, little further tolerance developed, and they were stabilized within a week or ten days and their blood pressure remained controlled at the same level of dosage for many months. At the other extreme were patients who developed rapid tolerance to the drug, which continued to increase for several weeks, but usually reached a maximum within about six to eight weeks of starting treatment and thereafter remained static; in a few patients a slow steady increase in tolerance was seen over many months. In several patients 300–450 mg. thrice daily was required to overcome the tolerance, and in one instance up to 600 mg. thrice daily has been used.

Fig. 6 shows the development of tolerance in a typical case. Each time the dose was raised a more satisfactory blood-pressure fall was obtained, but the effect fell away during the next two to three days. Between * and * in the figure two further increments of dosage had no beneficial effect for some reason which is not understood, but after three days there was a sudden return of sensitivity, and the behaviour of the blood pressure thereafter followed the pattern indicated. Towards the end of the third week the development of tolerance slowed down, and from the fifth week onwards the patient maintained a fairly uniform response to the same dose which has now been continued for five months.

All gradations between the two extremes have been seen among different individuals. The development of tolerance in this series showed no relation to the type of disease, to initial severity of the disease, or to initial sensitivity of the patient to a test dose.

In Fig. 1, b the plasma levels after a dose of 450 mg. can be compared with the effects on the blood pressure in a patient with a high degree of tolerance. The expected amount of hexamethonium excreted by the kidneys over the period can be calculated from the plasma levels and from the glomerular filtration rate. In this instance the patient would be expected to excrete about 430 mg. in the eight hours of the observation. This indicates that in the presence of full tolerance there is apparently no destruction of the drug in the body, although it is obvious that the degree of lowering of the blood pressure is greatly diminished in proportion to the high plasma levels, when this is compared

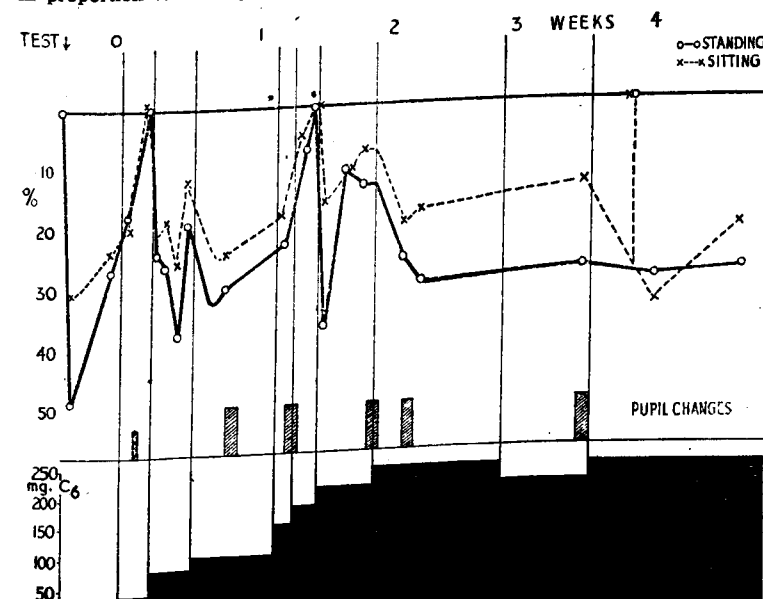


FIG. 6.—Development of tolerance to hexamethonium. Blood-pressure responses to increasing doses of the drug are shown. The heavy line indicates percentage fall in standing systolic pressure and the dotted line percentage fall in sitting systolic pressure. (Pupil changes are assessed on a points system: one point for partial and two points for complete interference with light reaction, for each hour of a four-hours observation period.)

with the effects on normals or in a patient just beginning treatment (Fig. 1, a).

Relationship of Tolerance to Pupil Changes

It was noticed during observation of a patient who was developing tolerance of the blood pressure to smaller doses of hexamethonium that no pupil changes were evident with a dose below 50 mg. When, however, the dose was increased to 75 mg. partial interference with pupillary function was seen, and this increased as the dose was raised, in spite of the fact that the effect on the blood pressure was lessening. The observation was extended to other patients, and in several cases in which the necessarily detailed data could be obtained it was shown that during the first few weeks pupil changes increased in proportion to the dose given and, having reached a maximum, remained maximal indefinitely. In contrast to this the blood-pressure response was showing the pattern already described (Fig. 6). The relationship between blood-pressure response, pupil changes, and dose is also shown in Fig. 6.

Although not lending themselves to the same easy observation as the pupils, the dryness of the mouth and the constipation, as judged by patients' complaints, showed very much the same increase in proportion to the dose of the drug as did the pupil changes.

When the 21 cases which have continued with regular treatment for more than three months are divided into groups according to their present (stabilization) dose, the average disability from side-effects (calculated from a points system) can be compared with the average fall in mean systolic and diastolic blood pressure. In short, the tolerance shown by the blood pressure does not apply to these parasympathetic effects of hexamethonium (Fig. 7).

In patients exhibiting tolerance, discontinuance of the drug for several weeks or even days was followed by an increased sensitivity, so that caution had to be used in restarting treatment if hypotensive collapse was to be avoided. However, the tolerance, which formerly took several weeks to reach a maximum, became re-established in several days and the patient again required the same high dose.

Pulmonary Complications

Since the completion of this study three patients have developed lung changes which may be a complication of long-term hexamethonium therapy. Initially all three had

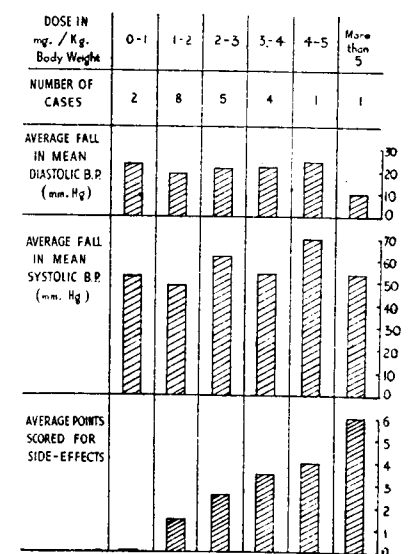


FIG. 7.—Relationship of (a) blood-pressure fall and (b) side-effects to the stabilization dose of hexamethonium. Points were given as follows for side-effects—one for moderate degrees and two for severe degrees of mouth dryness, constipation, and interference with pupillary function—maximum six points; the averages for the dose group were then calculated.

malignant or pre-malignant hypertension, two had congestive heart failure, and the third was a chronic nephritic with raised blood urea (80 to 120 mg. per 100 ml.). Up to the time of development of the pulmonary changes they had been improving satisfactorily, radiological signs of cardiac failure had completely cleared, and they had returned to an active life. Dyspnoea then developed quite suddenly after fifteen, nine, and seven months' treatment; shortness of breath was pronounced on any exertion, but, in contrast to previous cardiac dyspnoea, it was relieved by lying flat.

X-ray examination showed bilateral symmetrical opacities in the lungs, in the upper zones and mid-zones. Multiple sputum examinations were negative. Because of these changes hexamethonium treatment was discontinued in these three patients, and a week later one of them died from a cerebral haemorrhage. Necropsy showed a central induration of both lungs due to extensive cornification, regarded as the result of organization of an intra-alveolar fibrinous exudate (preliminary report from Dr. Doniach). X-ray examination of the remaining patients in the series has not revealed any other examples of these changes.

Discussion

These cases were studied in more detail than is necessary for routine treatment; but it is evident that there are few short cuts if adequate control is to be maintained. Each patient must be stabilized individually, and there is no set formula for dosage or period of stay in hospital; the out-patient follow-up is time-consuming and really requires a special clinic. The necessary work can be tedious for both patient and doctor at times, but this has to be set against the fact that this form of therapy, when adequately carried out, is a real advance in the treatment of both malignant and complicated hypertension.

Little can be said yet about long-term results, but the recovery of four out of seven patients with malignant hypertension from acute and serious illness, and their return to a reasonably active life for periods of three, seven, nine, and fifteen months, compares favourably with previous experiences of such cases.

The complications encountered during this study have been of two kinds: the occurrence of cerebral vascular accidents in four patients who were liable to them in any case (and two of whom had had attacks prior to treatment), and the recent finding of dyspnoea and radiological lung changes in three cases.

In two out of four instances of cerebral vascular accident the blood pressure was known to be poorly controlled at the time and was almost certainly high when the incidents occurred; two of them made a functionally complete recovery.

The pathogenesis of the pulmonary changes referred to above is still obscure, and further work is in progress. There is no definite evidence that the changes are due directly to hexamethonium. Although these three patients required large doses of the drug, others who required as much or more have remained well. Regular chest x-ray examination and immediate attention to any complaint of increasing dyspnoea are certainly indicated in view of these developments, but, as stated, radiography of the remaining patients in the series has failed to show any instance of unsuspected lung disease.

Our feeling is that the risk of these complications should not be regarded as a contraindication to the use of hexamethonium in severely ill hypertensive patients, whose outlook in many cases is very poor. They can often be relieved of most of their symptoms and returned to a more active life.

In the less advanced but complicated cases it is quite clear that symptomatically there has been great amelioration, and most of the patients were able to lead practically normal lives, whereas they had often been incapacitated and

wretched because of recurrent headaches for long periods. To attribute the continued relief that has been attained in these cases merely to the placebo effect of injections must seem nonsensical to anyone who has had experience of trying to alleviate these headaches by multitherapy in the past. The fact that the headaches returned when the blood pressure got out of control, and were again relieved when control was re-established, is further evidence against this. Whatever may be said about relief of headache, placebos could hardly be credited with the reversal of fundus and electrocardiographic changes. In patients like Case 28 (Fig. 4) the restoration of vision alone constitutes a very great advance and must make any unpleasantness and inconvenience from treatment a minor consideration to the patient.

The blood-pressure falls shown in Table III may not at first sight appear very dramatic, particularly the diastolic readings; but when account is taken of the fact that these figures represent the estimated lowering in the average blood pressure for the whole day, and moreover that it has been maintained pretty consistently for months on end, it becomes easier to connect the improvement in symptoms and signs with the actual changes in blood pressure. As already mentioned, there is the additional factor of lowering of pressure to normal or near normal levels for one to two hours twice or thrice in the 24 hours, and this may perhaps be the more important of the two considerations. The fact that relief of both headache and cardiac asthma can be correlated with the fall in blood pressure to a more moderate level must subscribe to the rationale of hexamethonium treatment as a practical measure.

The treatment of chronic renal hypertension has been as satisfactory as that of the other groups, and there is no evidence of further impairment of renal function as a result of long-term therapy.

Indication has already been made of cases considered unsuitable for treatment. These are, in summary, (a) patients over 60 years, because they run a high risk of thrombotic accidents and also suffer more severely from side-effects; and (b) patients under 60 years who have insufficient symptoms or adverse physical signs to justify the disadvantages of treatment.

In a recent review of the pathogenesis of hypertension, Schroeder (1951) draws attention to the evidence that psychoneurogenic factors play an important part in the aetiology, both of essential and of other forms of hypertension; the evidence from this small series that emotional disturbances were not only associated with established hypertension but could actively exacerbate the process in all groups is in agreement with his views. The importance of giving this feature of the disease due consideration in the management has already been pleaded, and one could go further and say that failure of hexamethonium treatment is more likely to be due to psychological than to physical causes.

The finding that "tolerance," so far as the blood pressure was concerned, was not accompanied by similar lessening of parasympathetic effects has suggested that true tolerance to the drug, in the sense of loss of ganglion-blocking power, may not occur to any great degree and that the word is in fact a misnomer. If instead one postulates that for some reason, and in certain cases, the factors maintaining abnormal arteriolar tone are further increased during the evolution of tolerance, the emphasis is shifted from the drug to the disease. It is conceivable that this could be brought about by a large increase in the number of impulses traversing the sympathetic vasomotor pathways (with therapeutic doses ganglion block is probably never complete); or other factors—for example, humoral agents produced in the kidney and elsewhere—may increase in effectiveness. The increase in effect every time the dose is raised (Fig. 6) must be due to blocking of further impulses at ganglia, as this is the only way the drug acts, and therefore favours the former view, but it is possible that humoral factors are also

increased. No evidence has been obtained why this phenomenon is seen to such a varying degree in all clinical groups, or why there is a maximum level of tolerance for a particular patient.

Summary

A study is presented of 39 hypertensive patients on treatment with hexamethonium bromide by subcutaneous injection. The patients were drawn from the complicated-essential, malignant, or renal groups of hypertension, and uncomplicated cases were not included.

Details of treatment routine and general management are given, as it is felt that these are of great importance in the achievement of successful results.

Five patients died whilst on treatment and it was discontinued for various reasons in six others, but 28 patients received regular therapy for periods varying between three and fifteen months and were seen at least once a month in the out-patient clinic.

After the development of a very variable amount of tolerance to the drug during the first four to eight weeks, all patients were able to be stabilized on a dose which gave an average blood-pressure level much below that found in the control period. Reduction in mean systolic pressure ranged from 20 to 90 mm. Hg and in mean diastolic pressure from 8 to 40 mm. Hg, and the maximum reductions—for example, one to two hours after an injection—were often twice as great.

Hypertensive headaches (often very severe and incapacitating) were almost completely relieved in 15 out of 19 cases, and lessened in frequency and severity in the other four. Giddiness disappeared and encephalopathic attacks did not recur, except in one instance. Shortness of breath from cardiac causes was generally improved and in several cases there was striking relief from acute cardiac dyspnoea. Diminution in cardiac volume was demonstrated in five out of seven cases after three to six months' treatment, and in seven out of 16 cases electrocardiographic signs of left ventricular hypertrophy were altered towards the normal. Retinopathy was strikingly improved in all severe cases, papilloedema subsiding, and extensive exudates and haemorrhages becoming reabsorbed, with restoration of normal vision after about six months' treatment.

One instance of coronary thrombosis and two major and two minor cerebral vascular accidents occurred during treatment, but in two of the latter the blood pressure was high at the time. No evidence of increased damage was found among patients with impaired renal function.

A recent development has been the occurrence of dyspnoea and symmetrical opacities in the lung fields on x-ray examination in three patients after fifteen, nine, and seven months' successful treatment. The pathogenesis of this is still obscure.

Side-effects were troublesome in proportion to the size of the dose and thus most severe in the cases developing a higher degree of "tolerance." The problem of "tolerance" is discussed and some suggestions are made regarding its nature.

I should like to thank Professor J. McMichael for his help and advice in carrying out this study and in preparing the paper, also Dr. W. D. M. Paton for estimating the plasma levels, Dr. J. F. Goodwin for the E.C.G. reports, and Dr. R. E. Steiner for the cardiac volume estimations. My thanks are also due to Messrs. May and Baker Ltd. for supplies of the drug, for technical assistance, and for a grant towards the expenses of this investigation.

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EFFECTS OF HEXAMETHONIUM ON NORMAL INDIVIDUALS IN RELATION TO ITS CONCENTRATION IN THE PLASMA

BY

BRENDA MORRISON, M.D.*

Research Assistant, Department of Medicine, Postgraduate
Medical School of London

AND

W. D. M. PATON, B.M.†

National Institute for Medical Research, Mill Hill,
London, N.W.7

Since hexamethonium was introduced as a ganglion-blocking agent (Paton and Zaimis, 1948) a number of publications have reported upon its effectiveness in the treatment of hypertension and certain other disorders; but, apart from the original observations of Organe, Paton, and Zaimis (1949) and reports by Arnold and Rosenheim (1949), Arnold, Goetz, and Rosenheim (1949), Burt and Graham (1950), and Grob and Harvey (1950) on the production of hypotension in the recurrent subject with marked fall in blood pressure on standing up, subsequent attention has been directed mainly to the effects of the drug in disease rather than in normal individuals.

Clinical experience with a series of hypertensive patients being treated with hexamethonium at Hammer-smith Hospital revealed very early that the reactions were of a most complex nature, and correspondingly difficult to interpret. We felt, therefore, that a further study of the actions of this agent in normal man was necessary.

Clinical Method

Eighteen observations were made on 16 normal young adult volunteers (4 women and 12 men). Since the best clinical results seem to be obtained from regular subcutaneous injections (Smirk and Alstad, 1951), we have given our test doses in this way. After control observations for 20 to 30 minutes, doses between 20 and 100 mg. of a 10% solution of hexamethonium bromide were given subcutaneously. In all but two this was the first dose of hexamethonium. Blood pressure, pulse rates,

*In receipt of a grant from Messrs. May and Baker Ltd.

†Now at University College Hospital Medical School, University Street, London, W.C.1.

systolic pressures was seen in the erect position (mean 28%), but in the sitting and recumbent positions the changes were generally insignificant (less than 10 mm. Hg).

3. *Pulse Rate.*—Pulse rates were counted in the first eight subjects, and in all these the rate rose as the blood pressure fell, but the magnitude of the rise showed too great an individual variation to be of use in assessing the effects of the drug. For this reason routine counting of pulse rate was discontinued in the later tests, but tachycardia was usually obvious except in the two cases of bradycardia already referred to.

4. *Subjective Effects.*—Faintness or lightheadedness on standing, sometimes with nausea or sinking feelings in the abdomen, was complained of when the blood pressure fell below 100 mm. Hg in 10 subjects, although these symptoms were not noted in two subjects until the pressure had reached 80 and 55 mm. Hg. In the remaining subjects the blood pressure never fell below 100 mm. Hg and only very transient giddiness, or nothing at all, was noticed. The rapidity of the fall in pressure as well as the actual level reached evidently contributed to the severity of the reaction, and sometimes the faintness passed off whilst the blood pressure was still at a level at which they had previously felt faint.

Four subjects commented on a feeling of warmth in the feet, though none observed it in the hands. One said that his feet felt full, and that they squelched when he stood up. Another experienced a feeling of warmth in the abdomen "like eating a hot meal." Dryness of the mouth of slight or moderate degree was mentioned by 13 subjects.

5. *Objective Effects.*—Pallor of the face was conspicuous in eight subjects during the period of low blood pressure, and occurred mainly in those showing the greater falls. Conjunctival injection was not systematically looked for, but it was sometimes obvious, and one man complained of itching of the eyes. In about half the cases drowsiness was evident to the observer, and was usually confirmed by the subject.

Ocular Changes

Table II summarizes the pupillary changes observed in the 18 tests. The results are arranged in ascending order of dosage. Fig. 5 shows the relationship of ocular changes and plasma concentration of hexamethonium in one of the subjects.

TABLE II.—Observed Effects of Hexamethonium on Pupillary Function in 18 Normal Individuals, Arranged in Ascending Order of Dose Given. The Figures After the Plus Signs Refer to the Times of Onset and Offset of the Change

Dose Given (mg. per litre E.C.F.)	Increase in Pupil Size		Interference with Light Reaction		Interference with Accommodation	
	Degree	Duration (Hours)	Degree	Duration (Hours)	Degree	Duration (Hours)
1.2	—	—	—	—	—	—
1.5	—	—	—	—	—	—
1.8	—	—	—	—	—	—
1.85	—	—	—	—	—	—
2.2	—	—	—	—	—	—
2.35	—	—	—	—	—	—
2.6	—	—	—	—	—	—
2.7	+	1½ only	+++	1-1½	+	1-1½
3.9	+	1-1½	+	1-1	—	—
4.2	+	1-1½	+	1-2	—	—
4.9	+	1-3	+	1-3	+	1-2
5.4	+	1-3	+	1-3	++	1-4
6.5	+	1-2	—	—	+	1-2
6.5	+	1-2	—	—	+	1-1
7.1	(+)	1-4	++	1-2½	+	1½ only
7.1	+	1-3	++	1-3	++	1-3
7.8	+	1-4	+++	1-4	++	1-4
8.6	+	1-4	+	1-1	++	1-4

Pupil Size.—There was no increase in pupil size at doses less than 2.7 mg. per litre of E.C.F., but above this dose level the pupils always increased in size except in one test. No attempt has been made to assess differences in degree of this change, but the duration was generally longer with the higher doses. The widening of the pupil was never maximal and, moreover, the outline was sometimes irregular, suggesting the paralytic or "dead" pupil rather than the

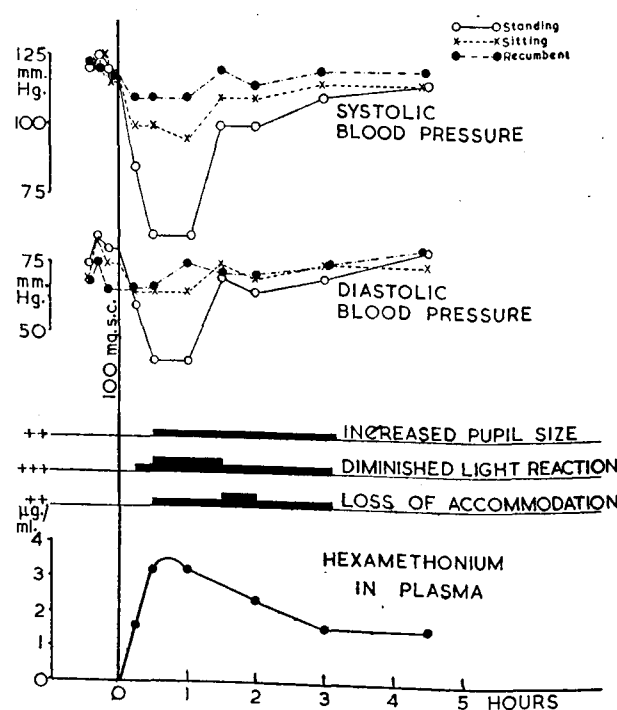


FIG. 5.—Relationship of ocular changes to blood pressure fall and plasma hexamethonium levels in a subject who received 100 mg. subcutaneously.

actively dilated pupil of sympathetic stimulation; this probably indicates an interference with both sympathetic and parasympathetic ganglionic transmission.

Interference with Light Reaction.—This was assessed in three grades according to whether the reflex was perceptibly diminished (+), very sluggish (++), or abolished (+++). No interference was seen with doses below 2.35 mg. per litre; above this level there was a rather variable effect: four cases showed no change at 2.6, 3.9, 6.5, and 6.5 mg., but one at 2.7 mg. showed complete paralysis. In the remainder there was a general increase in the degree and duration of reduction of the light reflex in proportion to the dose. When the light reaction was partially paralysed the contraction was often ill-sustained, although the pupil did not undergo the repeated fluctuations of true hippus. Poorly sustained contraction may sometimes be seen in normal pupils, but is much commoner under the influence of hexamethonium.

Interference with Accommodation Reaction.—No change in accommodation was seen below 4.9 mg. per litre, with the exceptions of an unusually late effect in a one-eyed subject at 1.5 mg., and a slight very transient effect in a second subject at 2.7 mg. With doses above 4.9 mg. per litre there was consistent interference with or loss of accommodation for periods between one and four hours. As this reaction has a considerable voluntary component it is possible that the slighter degrees of ganglion block by hexamethonium may be compensated by increased effort on the part of the subject. The convergence of the eyeballs is quite unaffected.

Concentration of Hexamethonium in the Plasma

Fig. 3 showed a typical graph of the rise and fall of concentration of hexamethonium in the plasma after a subcutaneous injection. To show the extent of variation in shape of such curves they have all been superimposed (Fig. 6). Correction for dose and body weight has not been made, since this would alter the height but not the form of the curves. Fig. 7 shows the standing blood-pressure changes and plasma-concentration curve for the subject who showed the most rapid absorption.

The three phases of the curve—that is, the rise, the peak value, and the subsequent fall—considered pharmaco-

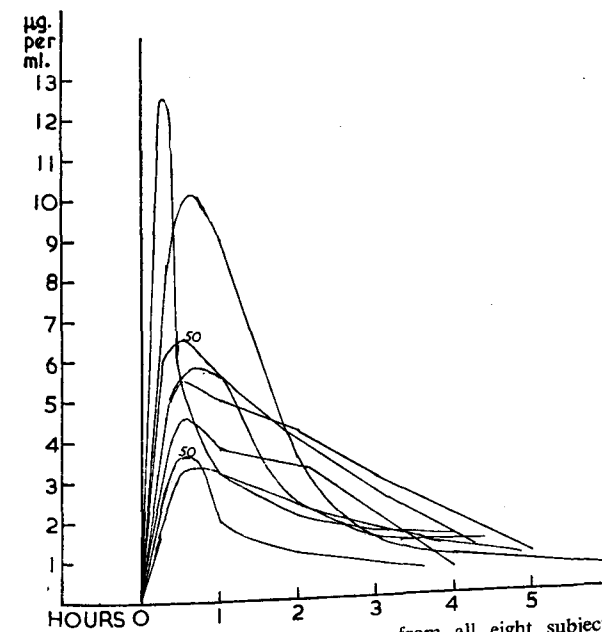


FIG. 6.—Plasma concentration curves from all eight subjects, superimposed to show differences in shape (not adjusted for body weight). Two received 50 mg. and six received 100 mg.

logically, correspond to the three factors determining the plasma levels—that is, the rate of absorption, the volume of body fluid in which the hexamethonium is dissolved, and its rate of excretion by the kidney. These three aspects are considered in turn.

Rate of Absorption.—The rate of absorption can be estimated from the speed with which the peak concentration is approached. The highest value was attained in approximately half an hour or less in all tests. In every test at least half the peak value, and often much more, was reached in 15 minutes. If absorption is an exponential process—that

is, if equal fractions of the unabsorbed residue are assimilated in equal times—then half the total dose must usually be absorbed in about 15 minutes. A few of the plasma curves have been regular enough to allow an estimate of the rate of excretion to be made, and hence an estimate of the amount left unabsorbed at various times. When this is done the absorption—that is, the fall in the amount still unabsorbed—follows the postulated exponential course. These considerations imply that absorption should be seven-eighths complete within about one hour in most individuals.

Distribution in the Body.—The

TABLE III.—Peak Plasma Levels Found in Each Subject with Dose of Hexamethonium Injected and the Weight of the Subject. Columns 5 and 6 Show the Estimated Volume of Solution of the Drug at the Peak Times in Litres and as a Percentage of Body Weight Respectively

Subject No.	Dose Given	Wt. of Subject	Peak Plasma Level	Calc. Vol.	% of Body Weight
1	100 mg.	58 kg.	10 mg./litre	10 litres	17.2
2	100 "	92 "	4.5 "	22 "	24.2
3	100 "	76 "	5.5 "	18.2 "	23.9
4	50 "	64 "	6.4 "	7.8 "	12.2
5	100 "	76 "	12.8 "	7.8 "	10.3
6	100 "	70 "	8.0 "	12.5 "	17.9
7	100 "	70 "	3.5 "	28.6 "	40.9
8	50 "	51 "	3.5 "	14.3 "	28.0

peak plasma values in each test are given in Table III. They correspond in magnitude to a distribution of the drug in a volume equivalent to between 10 and 41% of body weight. Of these values four lie within the 15–25% range (which appear to be the extreme values for extracellular fluid given in the literature), two lie above this (28% and 41%), and two below it (10.3% and 12.2%). The range and average (23.1%) of these figures suggest that hexamethonium is in fact dissolving in extracellular water. Incomplete distribution outside the vascular compartment and a variable rate of excretion would readily account for individual discrepancies.

Excretion.—It is already known that about 90% of a parenterally administered dose can be recovered from the urine during the subsequent 12 hours (Zaimis, 1950; Milne and Oleesky, 1951; Wien and Mason, 1951; Harrington, unpublished). We have calculated the expected clearance of hexamethonium by simple filtration in our subjects from the plasma-concentration curves, assuming that the glomerular filtration rate (G.F.R.) remains normal under the influence of the drug (Moyer and Mills, 1953) and has therefore a mean value of 125 ml. per minute (s.d.=25 ml. per minute). The periods of observation were four to six hours, by which time the plasma concentrations had sunk in five subjects to 1 µg. per ml. or less, and in the remainder were below 1.6 µg. per ml.

In Table IV the expected amounts excreted have been calculated first from the mean G.F.R. and secondly from the upper and lower limits of the G.F.R. (taking $\pm$ twice the

TABLE IV.—Expected Amounts of Hexamethonium Excreted Over Four to Six Hours by Simple Glomerular Filtration, as Calculated from Plasma-concentration Curves and Normal Range of Glomerular Filtration Rates

Subject	Expected Total Excreted (mg.)		Dose Injected (mg.)
	From Mean G.F.R.	From 2 x S.D. Range of G.F.R.	
1	143	86–200	100
2	66	40–93	100
3	86	52–121	100
4	100	60–140	50
5	99	59–138	100
6	150	90–210	100
7	74	44–103	100
8	44	26–61	50
Average	95		88

standard deviation for this purpose). Although the dose given differs in some instances considerably from the former calculated value, in one case only does it fail to fall within the range of the expected excretion. These results are compatible with the excretion of hexamethonium by simple filtration without tubular excretion or reabsorption—that is, like inulin—and in this our findings agree with those of Young, de Wardener, and Miles (1951), who made a direct comparison of inulin and hexamethonium clearances.

Correlation of Clinical Data with the Concentration of Hexamethonium in the Plasma

Blood Pressure

It has already been mentioned that the degree of reduction of blood pressure runs parallel to the rise and fall of

hexamethonium in the plasma. In Figs. 3, 5, and 7 this parallelism can be seen for three types of curve, and the same relationship was found in the remaining tests. The maximum blood-pressure fall always coincided within a few minutes with the peak plasma concentration, and the blood pressure returned to the control value when the plasma concentration fell to about 2 $\mu\text{g. per ml.}$ (1–3.5 $\mu\text{g.}$). In no case was there a detectable fall in blood pressure with a plasma concentration of less than 1 $\mu\text{g. per ml.}$ No observations of blood pressure were made during the first 10 minutes after injection, so that the plasma levels at the onset of the blood-pressure falls are not accurately known.

To reduce the standing systolic blood pressure below 100 mm. Hg (which was the usual level at which faintness occurred in normal subjects), plasma concentrations varying from 2.5 to 7.8 $\mu\text{g. per ml.}$ were necessary in different individuals.

The variability of these responses led to a more detailed analysis of the individual tests. In Fig. 8 all the plasma concentration values obtained in each of five subjects are

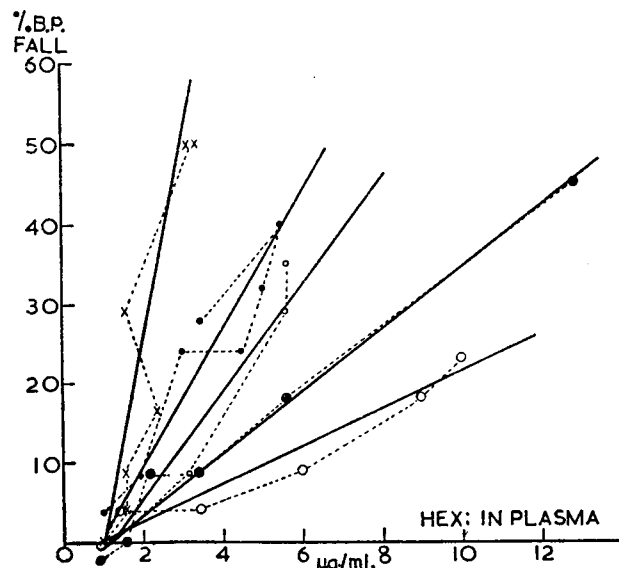


FIG. 8.—Relationship of percentage fall in standing systolic blood pressure to different plasma levels of hexamethonium in five subjects. Although the relationship is a linear one for each individual, the sensitivity of the different individuals is very variable.

plotted against the corresponding reductions in standing systolic pressure, making no distinction between the rising and falling phases of the curves. This graph illustrates the point made earlier, that a definite threshold value of hexamethonium in the plasma (about 1 $\mu\text{g. per ml.}$) is necessary before detectable changes in blood pressure occur. For each individual there is a surprisingly close relationship between the plasma concentration and the effects on the blood pressure; this relationship is unusual in that the effect of the drug varies directly with its concentration in the body rather than with the logarithm of its concentration. This regular relation for an individual subject contrasts strongly with a considerable variation in sensitivity between different subjects, and the latter accounts for the wide scatter in response to a test dose already shown for the whole group (Fig. 4).

It is possible to obtain an index of sensitivity for each individual from the slopes of lines shown in Fig. 8; this index is expressed as fall in blood pressure per unit concentration of hexamethonium in plasma. For the five subjects of Fig. 8 this index is respectively 3.45, 8.5, 11, and 25% fall in standing systolic B.P. for each $\mu\text{g. per ml.}$ It follows from this that there exists in normal individuals a basic variation in sensitivity to hexamethonium over at least an eightfold range, quite apart from differences in absorption, distribution, and excretion, or liability to "vagal" attacks of the kind mentioned earlier.

Dryness of the Mouth

This effect of hexamethonium was noticed by six of the subjects at minimum plasma levels of 2, 2, 3, 3.5, 4, and 8 $\mu\text{g. per ml.}$ In the other two subjects it was not present, but in neither of these did the plasma concentration exceed 3.5 $\mu\text{g. per ml.}$

Ocular Changes

Table II showed the relationship between dose of hexamethonium and interference with pupillary function. In the eight subjects in whom plasma levels of hexamethonium were estimated a more direct comparison of these changes with concentration of the drug can be made.

Increased pupil size was seen with plasma levels above 1, 1, 1, 1.5, 2, 4, and 5.5 $\mu\text{g. per ml.}$ In one subject no increase was seen, although the peak plasma value was 12.8 $\mu\text{g. per ml.}$

Interference with light reaction was observed in five subjects at threshold values of 1.5, 1.5, 2, 5, and 8 $\mu\text{g. per ml.}$, but failed to occur in three subjects in which peak plasma levels of 5.5, 6.4, and 12.8 $\mu\text{g. per ml.}$ were reached.

Interference with accommodation was observed in seven subjects at plasma levels above 1, 1, 1.5, 1.5, 3, 4, and 5.5 $\mu\text{g. per ml.}$, but not in the eighth subject, whose peak value was 6.4 $\mu\text{g. per ml.}$

These results are ranked in order of magnitude, as the three pupillary functions seem to be affected independently of each other in the individual subject; on the other hand, the ranges of thresholds for interference with the three functions are similar.

Discussion

The effects of hexamethonium in normal man have been examined in some detail because this substance may be regarded as a prototype of the drugs which, by paralysing autonomic ganglia, are likely to prove useful in the treatment of hypertension and certain other disorders.

In this study no effects of hexamethonium have come to light which cannot be explained on the basis of blocking of either sympathetic or parasympathetic ganglia, with the possible exception of the drowsiness which occurs in many subjects.

Under the conditions of this study and with initial test doses of 25–100 mg., the ganglia which appear to be most prominently affected are those of the sympathetic chain, since the fall of blood pressure with postural accentuation has been the earliest and most constant finding. After these blood-pressure effects the detectable actions of next importance are on the ciliary and salivary ganglia. With the doses used there was no subjective evidence of significant interference with intestinal or bladder autonomic nerve supply.

It is interesting to find that in a particular subject the pupillary resting tone, reaction to light, and contraction on accommodation may be affected to different degrees by hexamethonium, and also that the order of onset of interference with these functions may vary with the individual. Such differences in behaviour between ganglia, and also apparently between different pathways within the same ganglion, are already known in the response to nicotine, hexamethonium, and other substances in animals. The interest of these variations lies in the hope they offer that other ganglion-blocking agents may be found which will have an action directed more specifically towards ganglion pathways subserving different functions—for example, those controlling vasomotor tone.

Postural hypotension with hexamethonium has been recognized from the earliest reports, and all our subjects showed this phenomenon. Although the maximum blood-pressure fall was always seen in the standing position, the falls in the sitting and recumbent positions ran a parallel time course in each case. When the average maximal depressions in blood pressure for the whole group are compared, the falls in the sitting positions are about half and those in the recumbent positions are about one-third of those in the

standing position. It is interesting that the hypotension in the sitting position is not greater, and, in fact, that the blood pressure rises promptly on sitting down.

A great deal of attention has been paid in these experiments to recording blood pressure in the erect posture, using a fixed time limit as described. Standing systolic readings have proved to be a convenient measure of the total effect of the drug on the blood pressure, since the changes in these readings are bigger in proportion to the errors of technique than in the sitting or recumbent positions, and, moreover, they provide an important measure of the maximum effect of the drug.

The distribution of hexamethonium in the body and its excretion at a rate comparable to that of inulin correspond to its quaternary nature. Bases in general penetrate the cell membrane only in the un-ionized form (Höber, 1945). Salts of quaternary nitrogen when in solution are completely ionized, and hence can only traverse the cell membranes very slowly. Accordingly they must lead an extracellular existence in the body, and should be unable to be either secreted or reabsorbed by the kidney tubules.

The indication from clinical data (Fig. 4) that normal subjects vary considerably in their response to hexamethonium was borne out and further elucidated by the plasma-concentration curves. Part of this variation is obviously due to the differences in absorption, distribution, and excretion already described; but the main variation, and one that cannot be eliminated by changing the route of administration, lies in the actual response of different subjects to the same concentration of the drug in the plasma (Fig. 6). The immediate practical application is that it is not safe to give initial doses of more than about 30–40 mg. subcutaneously to ambulant patients, even though this dose may produce little response in many individuals.

The somewhat unexpected finding of a linear rather than a logarithmic relationship between the plasma concentration and the effect on the blood pressure has some practical importance in addition to its theoretical interest; when treating patients for hypertension the dose should not be increased too rapidly. Increments of not more than 25–50 mg. should be used according to the individual patient's sensitivity.

The manner in which these findings in normal subjects may be applied to hypertensive patients under treatment is being studied and will be reported later.

Summary

A detailed study of the clinical effects of a subcutaneous test dose of hexamethonium in 16 normal individuals is reported, and plasma-concentration curves are described in eight of these.

No effects have been observed which could not be attributed to ganglionic block, with the possible exception of drowsiness.

Calculations from the concentration-time curves of hexamethonium in the plasma indicate that the drug is evenly distributed through the extracellular fluid, and they are compatible with its excretion by glomerular filtration.

Considerable variation in the response of different individuals to hexamethonium has been shown to occur, in relation both to the dose given per kilogram of body weight and to plasma levels. The thresholds for reduction of blood pressure, for elevation of pulse rate, and for interference with three separate pupillary functions varied from subject to subject, independently of each other.

For a given individual there was a close linear relationship between the plasma concentration and the degree of blood-pressure reduction.

We should like to thank Professor J. McMichael for his advice and helpful criticism in the carrying out of this work.

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FARMER'S LUNG

BY

T. C. STUDDERT, M.D., M.R.C.P.

Assistant Physician, Cumberland Infirmary, Carlisle

A condition conveniently named "farmer's lung," readily recognized clinically and radiologically, has been reported in the medical literature in the past, but some confusion has existed about the causal mechanism and the natural history of the disease. The purpose of this paper is to review the literature, to present a small series of cases, and to advance a theory to explain its aetiology.

Review of the Literature

Campbell (1932) presented case histories of a small number of agricultural workers from North Westmorland who were referred to his clinic as possible cases of tuberculosis. All gave a history of sudden onset of intense breathlessness, cough, slight fever, and, in some, loss of weight following exposure to dust from mouldy hay.

The clinical picture in each case was of a distressed, blue, dyspnoeic patient, and clinical examination revealed widespread crepitations throughout the lungs. Radiologically the picture was of increased lung markings with superimposed soft shadows. Spontaneous recovery in one to two months occurred, but some residual fibrosis and emphysema were noted in a few cases. One patient subsequently died, but necropsy showed coincidental cystic disease of the lungs (Campbell, 1950—personal communication). Through the kindness of Dr. Campbell it has been possible to study the x-ray films of one of his original cases followed up for 18 years. Some fibrosis and emphysema were the only findings.

Fawcitt (1936, 1938, 1940) studied the condition in West Cumberland and concluded from culture of similar moulds in the sputum and the hay dust that this was a fungous infection of the bronchi and lungs. He used the term "bronchomycosis fenesciorum" and advocated treatment with iodides. It should be stated that the condition described by Campbell (1932) and that of many of Fawcitt's (1938) cases were clearly not true aspergillosis, which is a distinct and well described clinical entity (Sayers and Meriwether, 1932; Smith, 1947). "Thresher's lungs," if aspergillosis is excluded, is an analogous condition in workers exposed to mouldy corn dust, and presents a picture identical to farmer's lung.

Duncan (1945), in a review of fungous diseases, stated that he had received specimens of sputum relating to this disorder from physicians in rural areas stretching from Cumberland to Devon. He cultured many varieties of

fungus from the specimens, but came to the conclusion that this only indicated exposure of the patient to dust containing the relevant spores, and was no criterion of actual infection. He put forward a theory that the symptoms could be explained by an irritation of the lungs from a fine vegetable dust resulting from breakdown of hay fibres by the fungus, and that the disease was comparable to byssinosis.

The *Lancet* (1948) made a plea for further investigation of this and allied conditions, but the *British Medical Journal* (1950) still quoted the fungus theory and recommended iodide treatment.

Distribution and Frequency

The distribution of reported cases is of interest, as the condition appears to be most common in the North-West of England. Possible reasons for this are the high rainfall at hay-time, and primitive methods of harvesting and storage in closed barns. The old threshing barns with fixed installation are still in use, and many farmers remember cases of sudden death following acute chest symptoms in men working all day in some of the old ill-ventilated barns. Threshing engineers and farmers are familiar with the clinical picture of farmer's lung, and refer to being "moulded." The white irritant dust set up when mouldy hay is disturbed is locally referred to as "stour" and treated with respect. "Broken-windedness" in horses is attributed to the feeding of mouldy hay, and is largely prevented by dampening the hay before feeding.

The rarity of the disease in hospital practice was in contrast with the evidence of the farmers, and so it was decided to circularize the practitioners of the area asking for information. The response was excellent, and a clearer picture of its true distribution emerged. Family practitioners in the smaller market towns were quite conversant with both the clinical picture and the natural history of the disease, and could advise the farmer suffering from these symptoms of his probable progress and time off work. As there was no problem in their minds, these doctors did not, as a rule, refer their patients to hospital unless radiological confirmation was sought. It was from conversation with Dr. A. G. Abraham, of Cockermouth, Dr. E. Braithwaite, of Egremont, and Dr. H. P. Nelson, of Brampton, that many valuable facts about the disease were learned.

The present series consists of six cases—confirmed radiologically, and six probable cases—radiologically inconclusive.

Proved Cases

Case 1.—A farm labourer aged 22 had no history of chest trouble until January–March, 1950, when he had bouts of mild bronchitis, often following exposure to hay dust. On August 4 he worked all day stacking poor-quality hay from which there was a lot of white irritant dust. By evening he was distressed, coughing, and breathless. After a rigor he started to sweat, felt very feverish, and vomited. After six days of persistent breathlessness and distress, despite sulphonamide therapy, he was admitted to hospital. The clinical picture was that of a cyanosed, breathless, and ill man. Clubbing of the fingers was not noted, and chest examination revealed generalized fine crepitations, without any localized dullness or signs of consolidation. There was no evidence of cardiac enlargement or failure. An x-ray film of the chest taken on August 10 showed: "An overall opacity of both lung fields, excluding the apices and costophrenic angles, with the greatest density in the lower mid-fields, and extending to the extreme periphery of the lung. In the areas of least involvement the opacity fades to a

fine granular mottling. . . . The detail of the lung roots is almost completely obliterated. There is no pleural fluid, and no cardiac enlargement" (Figs. 1 and 2). The sputum was cultured and yielded a good growth of *Bacillus subtilis*, but no fungi. A differential white blood cell count showed

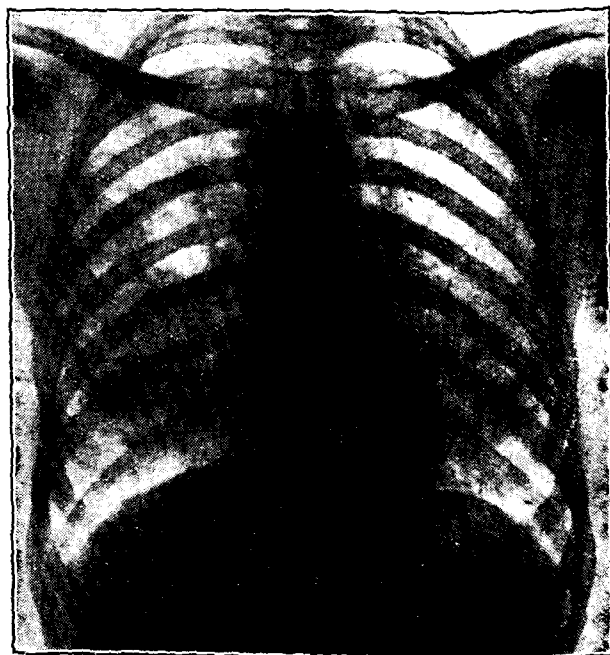


FIG. 1.—Case 1. X-ray film taken on August 10, 1950.

no eosinophilia. Dust from the barn grew *B. subtilis* and various aspergilli. Skin tests showed no specific reaction to dust extracts or mould cultures. Treatment with mepyramine maleate, 0.1 g. thrice daily, was instituted without obvious effect, but the patient gradually improved, and a follow-up x-ray film taken four months later showed normal lung fields.

Case 2.—A married woman aged 47 was admitted to hospital on December 17, 1947. She had been quite healthy until two weeks before admission, when she and her son (Case 3) swept out a closed barn in preparation for the storage of some newly threshed corn. She became very breathless that night, and symptoms persisted until she was admitted. She complained of slight fever, a dry cough, and intense breathlessness out of proportion to her other symptoms. On admission her temperature was 100.4° F. (38° C.), pulse 100, and respirations 56. There were widespread fine crepitations, maximal at the left apex, and an x-ray film showed: "An opacity mainly of the left upper zone, but, in lesser degree, of both lower zones. As in Case 1, the opacity extends to the periphery of the lung fields, and fades to fine mottling. The root shadows also show loss of detail, particularly the left." The white blood count was 7,200 per c.mm., with 4% eosinophilia, the sputum was



FIG. 2.—Enlarged view of part of Fig. 1.

mucopurulent, but yielded no significant organisms or fungi. She was treated with diphenhydramine hydrochloride, and improvement was gradual. On January 1, 1948, she was discharged home and continued to do well.

Case 3.—The son of Case 2, aged 24, was seen on December 17, 1947, as an out-patient, complaining of cough with mucopurulent sputum, nausea, night sweats, weight loss, and intense breathlessness. On examination he was cyanosed, with rapid respirations and generalized crepitations. An x-ray film of the chest showed: "A complete ground-glass opacity of all zones, extending to the periphery and showing the typical granular mottling in areas of least density. The detail of the root shadows in this case is not obliterated." He was not admitted to hospital, as the condition was recognized and progress at home was uneventful. Follow-up x-ray examination in 10 weeks showed almost complete clearing and he was clinically well.

Probable Cases

Case 4.—On October 13, 1950, a man aged 48 swept out his barn containing old corn and oats prior to threshing day. The dust was very irritant and white, and that evening he became breathless and ill. He had never had chest trouble before, but he described himself as being "broken-winded" and ill for the next month, with a dry cough and night sweats. He was referred as a possible case of tuberculosis and on December 13, but by then he felt better and clinical and radiological examination revealed only non-specific changes.

Other cases in this group gave a clear history of exposure, but could not be classed as definite without clear radiological confirmation. If practitioners become aware of the condition and refer such cases for early chest x-ray examination it is thought that many more cases will come to light.

Clinical Picture

The clinical picture emerges of a non-specific lung irritation which may follow exposure to mouldy vegetable dusts of any type, but mainly contact with poor-quality hay and corn. It may occur during stacking, baling, threshing, forking of hay for animal feeding, or sweeping out a barn in preparation for new grain or hay. Before the severe reaction there may be minor bronchitic episodes following short contact, but this is not invariable, and a clear distinction must be drawn between true farmer's lung and an asthmatic attack following exposure to mouldy dust (see Case 5).

The main feature of the disease is the intense breathlessness and cyanosis which develop within 12 hours of exposure. If symptoms are delayed for more than 24 hours an alternative diagnosis must be considered (see Case 6). The onset is sudden, and may be associated with a rigor, vomiting, a dry cough, and a feeling of suffocation. Irritation of the eyes and nose commonly occurs after contact with the dust, but is not a feature of the disease. The picture at this stage resembles that of a case of acute oedema of the lungs, but there is no evidence of cardiac embarrassment. Widespread fine crepitations are found on examination of the chest, but no localized area of consolidation is detected. Pleurisy is not a feature, and the finding of clinical or radiological evidence of this makes the diagnosis suspect. No case presented with haemoptysis.

The clinical course is fairly constant, and clearing of the radiological picture and physical signs is usual in six to eight weeks. After the first two to three weeks the breathlessness becomes less distressing, but during this period loss of weight and night sweats occur.

After three months the patient appears to be well, but there is a tendency for the condition to recur on re-exposure, and some evidence to suggest that there is a predisposition to the development of some degree of emphysema and fibrosis. No diminution in vital capacity has been noted in the follow-up of the present series over one to five years, but Dr. Campbell's case followed for 18 years showed some fibrosis and emphysema. Dr. W. G. Scott-Harden describes

the radiological picture in the acute phase as a ground-glass opacity extending to the periphery of the lung fields, and fading to a granular mottling in the areas of least involvement. Although the distribution is most commonly in the mid- and lower-lung fields, with the exclusion of the apices and costophrenic angles, this cannot be taken as invariable. Case 2 illustrates this point, and it is of interest that this patient is the only female in the series and to postulate the relationship between this and the greater frequency of thoracic, as opposed to abdominal, respiration in women. The detail of the root shadows is usually obliterated by the opacity, and return to normal lags behind peripheral clearing. There is no case in the series in which there were dense localized opacities in the lung or evidence of pleurisy, and there was no cardiac enlargement. Clearing is gradual, starting at the periphery, and is usually complete in three months.

Pathological Investigations.—The red blood cells and haemoglobin remain unchanged. The total and differential white-cell counts show no specific change, the maximum eosinophilia being 4% of 7,200 white cells per c.mm. in Case 2. The E.S.R. is normal or slightly raised.

Sputum examination in proved and probable cases yielded a mixed growth of aspergilli in five, penicillium in four, *B. subtilis* in four, and monilia in five cases, in addition to the usual commensals.

Examination of the incriminated dust showed a comparable growth of mixed fungi, but this similarity of cultural characteristics in dust and sputum was only taken as evidence that the patient had recently inhaled the dust, but not in any way as proof of active disease in the bronchi or lungs (see Cases 5 and 6). Assessment of average particle size of the dusts was found to present some difficulty, and is the subject of further investigation, but the impression gained from two samples was that the average diameter of particles was greater than 10 μ .

Animal experiments were carried out by Fawcitt (1938) on a limited scale in an attempt to demonstrate the pathogenicity of spore-laden dust to animals' lungs, without conclusive results.

Skin tests with extracts of the offending dusts and stock solutions of aspergillus, penicillium, and mucor were carried out without obtaining specific reactions in any case.

Differential Diagnosis

1. **Asthma and bronchitis** brought on by contact with mouldy hay or grain is not uncommon in farmers, and seven such cases were seen.

Case 5.—A farm worker aged 62 was seen on September 16, 1950. There was one year's history of dyspnoea and wheezing, made worse by working in a closed barn with poor-quality hay, but no single explosive episode of breathlessness. Examination of the chest revealed signs of chronic bronchitis, with dry rhonchi throughout the lungs, and x-ray films confirmed an emphysematous picture without specific changes. Culture of the sputum yielded a good growth of aspergillus and monilia. Dust from the barn showed aspergillus, monilia, and *B. subtilis*. Skin tests with dust extracts showed marked reaction.

The finding of mixed spores in the sputum of this group of cases was invariable and of no significance beyond demonstration of contact with a potential allergen.

2. **Coincidental Pneumonia.**—Most cases were initially treated as pneumonia by the general practitioner, and if any doubt exists this is a wise precaution. It would be a disservice to the farming community if the diagnosis of farmer's lung was made too lightly. The points to be stressed are the dramatic onset within a few hours of exposure, and the absence of signs of consolidation, pleurisy, or haemoptysis in farmer's lung; but confusion may arise in the case of virus pneumonia.

Case 6.—A farmer aged 42, whose previous health had been good, was working a baler and putting through poor-quality hay on February 6, 1952. He had no untoward symp-

toms until 48 hours later, when he felt feverish and breathless, and complained of left-sided chest pain. He was referred after two days as a possible case of farmer's lung. Clinically and radiologically there was evidence of a patchy virus pneumonia, and treatment with chloramphenicol produced a dramatic response. It was the time interval of two days, combined with the patchy radiological appearance, including a basal pleurisy, which made a diagnosis of farmer's lung untenable, despite the finding of aspergillus in the sputum. The risk of converting such a case into true aspergillosis by intensive treatment with chloramphenicol is appreciated.

3. *Miliary tuberculosis* is often clinically suspected, but the mistake can be made only if the history of exposure to dust has not been elicited: also the radiological features are quite different.

4. *Miliary diffuse granulomatous pneumonitis* of unknown aetiology has been reported in men cleaning out a water-tower in Cincinnati which was heavily contaminated with pigeon excreta (Felson *et al.*, 1950). Similar radiological appearances occurred in soldiers clearing out dusty barns in Missouri (Idstrom and Rosenberg, 1944); in soldiers spending some time in a deserted storm cellar in Oklahoma (Cain *et al.*, 1947); and in 21 men who visited a deserted chalk pit in Arkansas (Washburn *et al.*, 1948). All of these cases have been reported as specific entities, but it would appear that, with farmer's lung, they constitute a non-specific lung reaction to a variety of irritants. In each case clinical and radiological clearing occurred in one to twelve months.

5. *Aspergillosis* is an infection of the lungs with pathogenic strains of aspergillus, particularly *A. niger* and *A. fumigatus* Fisher, which may occur in grain handlers. It is a true fungous infection, with active branching hyphae in the sputum, severe illness, and dense infiltration or cavitation of the lungs. There is no spontaneous improvement when the case is removed from the source of infection. It is possible that it may present as a miliary lung picture without serious systemic upset, and proceed to scattered calcification, mainly at the lung bases (Sayers and Meriwether, 1932). Skin tests are variable. Confusion with farmer's lung is unlikely, provided that the finding of the spores of aspergillus in the sputum is taken at its true value.

Treatment

Treatment is largely symptomatic. Fawcitt (1936, 1938, 1940) advocated iodides, but his results differed little from the spontaneous clearing noted in untreated cases. Anti-histamine drugs have been used in this series without obvious effect, and antibiotics seem to have a limited value in preventing secondary infection.

As the initial condition has much in common with acute pulmonary oedema, mercurial diuretics may be tried, but in the absence of cardiac enlargement their value is doubtful.

Discussion

The currently quoted view that farmer's lung is an actual fungous infection of the lungs does not bear close examination. The explosive onset, spontaneous clearing, and radiological picture are totally unlike any true fungous disease, and no real evidence has been produced to support this theory. The silica content of vegetable dusts has been analysed with reference to hay dust (Fawcitt, 1936) and dust in cotton mills (Prausnitz, 1936) and found to be negligible, so this may be excluded as a possible factor. That the condition is not simply a severe asthmatic reaction is shown by the distinct clinical and radiological pattern, although it is possible that personal allergy may play a part.

The two remaining theories which explain most aspects of the disease are: (1) irritation of the lungs by fungus spores or some noxious breakdown product; and (2) a mechanical irritation of the lungs by a fine vegetable dust of sufficiently small average particle size to allow deep penetration: this dust may be formed from the action of the fungus on hay fibres, which subsequently disintegrate.

In examining these theories it was considered reasonable to compare the clinical picture of farmer's lung with diseases thought to fall within these two groups, and note points of similarity. Group 1: (a) coniosporiosis (Towey *et al.*, 1932); (b) weaver's cough (Collis, 1915); and (c) possibly the miliary granulomatous lung lesions already mentioned. Group 2: (a) byssinosis ("monday fever"); (b) bagassosis.

Group 1 (a) *Coniosporiosis*.—Towey *et al.* described this as a pneumonitis in lumbermen involving 10% of the men working on one camp as maple-bark strippers. The cork layer of the bark was heavily contaminated with the black spores of *Coniosporium corticale*, which rose in a cloud when the bark was stripped. The men became suddenly ill with severe dyspnoea, cough, cyanosis, and variable fever. Widespread crepitations were noted on examination of the chest, and x-ray films showed areas of soft infiltration, tending to spare the apices, with generalized increase of lung markings and reticulation. Spontaneous cure occurred in six to eight weeks, but recurrence of symptoms followed re-exposure. Sputum contained spores of *C. corticale* and mixed monilia, but the latter were non-pathogenic. Animal experiments with the black residue of the spores were not entirely convincing, but the extract caused toxic effects on guinea-pigs' lungs. The authors postulated an irritative lung lesion with local reaction and giant-cell formation, and regarded the two months needed for clinical clearing as a reflection of the time necessary for phagocytosis of the spores to be complete.

Group 1 (b) *Weaver's Cough*.—This is a comparable condition occurring in workers handling mildewed cotton, which gives off a white dust of aspergillus, penicillium, and mucor spores.

Group 2 (a) *Byssinosis*.—On beginning to work in the card-room of a cotton-mill a transient irritative cough known as "mill fever" used to be very common, but this cleared with continued exposure. After a variable time a certain number of workers developed a tendency to an irritant cough and attacks of breathlessness when returning to the mill after the weekend—hence the name of monday fever. At first the condition wore off on re-exposure, but gradually symptoms spread over the whole week, with severe disability. After a rest of weeks or months they felt quite fit, but return to the mill resulted in an overwhelming recrudescence of symptoms, and eventual disablement from byssinosis (Prausnitz, 1936). X-ray films showed non-specific fibrosis and emphysema. The cardroom dust was mainly less than 10 μ in average diameter, and this is regarded as the critical level for deep penetration of particles into the lung (National Silicosis Conference, 1937). In certain conditions the dust contained mixed fungus spores and minute amounts of histamine and a cotton-seed lipid called gossypol. The view generally held (Caminita *et al.*, 1947) is that monday fever and subsequent byssinosis may be due to sensitization of the lung tissues to irritation by proteins in the dust. Haworth and Macdonald (1937) postulated inhalation of histamine-allergen as the cause.

The clinical similarity of coniosporiosis, monday fever, and farmer's lung is striking, but the radiological analogy with byssinosis is less complete. Weaver's cough, however, again appears to be identical with farmer's lung, and I have reached the conclusion that all of these conditions represent a lung reaction to a non-specific irritant, probably some foreign protein. There is obviously some degree of personal sensitivity, as there may be only one case of farmer's lung in a group of farm workers handling the same batch of mouldy hay, or one case of coniosporiosis in a group of ten lumbermen. It is felt that no useful purpose is served in attempting to give specific names to the conditions, and that "hay-dust irritation of the lungs" would be an accurate description of some cases, and "corn dust," "cotton dust," or "coniosporium-spore dust" irritation of others.

Comparison of x-ray films of farmer's lung with other conditions is instructive, and there is a close resemblance to many diverse diseases, notably the "bat-wing" appearance of uraemic pneumonia. It seems probable that some similar interstitial lung reaction may play a part in the production of the radiological appearance of these conditions, however dissimilar their aetiological basis.

Further work on the nature of this reaction is necessary before any definite hypothesis can be advanced, and animal experiments on lung reactions to a variety of contaminated dusts may provide the answer. Lung puncture in the acute phase would also be enlightening, but could hardly be justified in a disease without any appreciable mortality. It is felt that, on clinical and radiological grounds alone, there

is enough evidence to support the theory that farmer's lung is not a specific entity, but only a single facet of a similar lung reaction to a variety of irritants.

Summary

A small series of cases of farmer's lung is described, stressing the acute onset and tendency to spontaneous recovery in six to eight weeks.

The close similarity to coniosporiosis, byssinosis, and diffuse granulomatous pneumonitis is stressed.

The theory is put forward that the condition is a non-specific interstitial lung reaction to some material in the fungus-laden dust, rather than a true fungous infection of the lungs.

My thanks are due to Dr. W. G. Scott-Harden for his advice on the radiological aspects of the paper, to Dr. J. M. Campbell for access to x-ray films of one of his original cases, to Dr. T. McL. Galloway for permission to include reports of Cases 2 and 3, to Dr. J. S. Faulds and his staff for pathological details, and to the general practitioners of Cumberland and Westmorland.

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INTRACTABLE GASTRIC CRISES RELIEVED BY CHORDOTOMY

BY

G. O. MAYNE, M.B., D.P.H.

Venerologist, Edinburgh Royal Infirmary

Stokes (1944) states that the figures of the American Co-operative Clinical Group show that 45% of patients with tabetic gastric crises are completely relieved by treatment and that an additional 22% are benefited. He adds that standard chemotherapy—that is, neoparsphenamine plus bismuth—is more effective than fever plus tryparsamide or intraspinal methods, and that "the whole surgical field for relief in gastric crises is at best a matter of last and desperate resort." Moore (1941) believes that routine treatment will produce relief of symptoms in 25% of cases, that tryparsamide is of little value, and that the use of fever in addition will relieve a further 25%. Of the 50% of cases thus benefited, however, only 10% may be regarded as cured, and he quotes Keidel's opinion that "if, as rarely occurs, severe attacks are almost continuous, operation may be the only alternative to starvation, morphinism, or suicide." He also states that later experience with penicillin suggests that it is inferior to fever therapy in the treatment of this distressing condition (Moore, 1947).

The following history demonstrates the extent of the problem presented by those cases which do not respond to antisyphilitic treatment and emphasizes the additional fact that neurosyphilitic patients may suffer from unrelated organic intra-abdominal disease.

Case History

A seaman aged 37 was first seen in September, 1947, having had intermittent "stomach pains" and vomiting during the previous nine months. The pains occurred approximately every three weeks, were not related to meals, but were alleviated by alkaline powders. During these periodic episodes the pain was not constantly present, but came in sudden bouts, each lasting about 15 minutes and recurring at frequent though irregular intervals. The pain consisted of a sickening steady ache in the epigastrium, and was accompanied by retching and vomiting. In the previous nine months he had lost 2 st. (12.7 kg.) in weight, and at the time of examination he weighed 8 st. 2 lb. (51.7 kg.). He also complained of shooting pains in both legs of about one year's duration.

On full clinical examination no abnormalities were found except for Argyll Robertson pupils. Serological examination of the blood showed: Wassermann reaction, weak to moderately strong positive (+ to ++); quantitative, five doses of complement fixed; Kahn, strong positive (+++). The cerebrospinal fluid showed: cells, 200 per c.mm.; Wassermann reaction, very weak positive ($\pm$); gold sol, 0111000000.

Antisyphilitic treatment was begun with penicillin, but as the condition was strongly suggestive of either peptic ulceration or neoplasm an exploratory laparotomy was performed on October 3 (Professor W. Mercer). No abnormality was found, but the opportunity was taken to remove a small fibrosed appendix.

Treatment with penicillin (100,000 units three-hourly) was continued to a total of 12,000,000 units, and on October 17 he was discharged from hospital. Thereafter he continued to attend for treatment as an out-patient while following his usual occupation of trawlerman, although symptoms recurred at intervals despite continuous treatment with oxophenarsine hydrochloride, tryparsamide, and bismuth. The attacks were the same as those previously described, and lasted sometimes for several days.

Serological examination on June 12, 1948, showed much improvement—blood: Wassermann reaction, weak positive (+); quantitative, four doses of complement fixed; cerebrospinal fluid: cells, 5 per c.mm.; protein, 20 mg. per 100 ml.; globulin, no increase; Wassermann reaction, very weak positive ($\pm$); gold sol, 0000000000.

In September, 1948, the patient ceased to attend after having received a total of 12,000,000 units of penicillin, 0.88 g. of oxophenarsine hydrochloride, 39 g. of tryparsamide, and 4.1 g. of bismuth. Later it was learned that in October a recurrence of crises had necessitated his admission to a distant hospital, where he was treated with 16,100,000 units of penicillin, 34 ml. of bismuth tryparsamide, and one session of inductopyrexia—five and a half hours at 104–105° F. (40–40.6° C.).

Between January and June, 1949, he received no treatment, but on June 28 he was again in hospital in a state of extreme misery after further crises. Serological investigation of the blood on June 27 showed quantitative Wassermann reaction ++ (six doses). On July 21 the cerebrospinal fluid showed: cells, 4 per c.mm.; protein, 40 mg. per 100 ml.; globulin, no increase; Wassermann reaction, 0.2 ml. $\pm$; 0.5 ml. +; 1 ml. ++; gold sol, 0000000000. On this occasion treatment consisted of penicillin (100,000 units three-hourly) to a total of 12,000,000 units, malaria (seven rigors), intravenous glucose-saline, pethidine (2 ml. intramuscularly as required). He returned home on September 2, but was readmitted on two further occasions for short periods (October 19 and

November 14) and treated symptomatically with intravenous glucose-saline, pethidine, and morphine.

In February, 1950, he was again in hospital, after another crisis which had lasted one week. Examination of the cerebrospinal fluid on February 17 showed: cells, 1 per c.mm.; protein, 30 mg. per 100 ml.; globulin, no increase; Wassermann reaction, 0.2 ml. negative; 0.5 ml. negative; 1 ml. negative; gold sol, 0000000000. At this time a test meal demonstrated histamine-fast achlorhydria, and a positive benzidine reaction was obtained with each specimen withdrawn. Radiography after a barium meal revealed a filling defect on the lesser curvature of the stomach, the appearance being more suggestive of carcinoma than of a simple lesion; gastroscopy confirmed the presence of an outgrowth on the lesser curvature (Dr. D. M. F. Batty).

Accordingly a second laparotomy was performed on March 24 (Mr. J. S. Jeffrey), and a diffuse area of thickening was found in the stomach wall on the lesser curvature with no enlargement of the associated glands. The distal two-thirds of the stomach was resected and subsequent histological examination showed the presence of a well-differentiated adenocarcinoma, with no evidence of spread. During convalescence the patient experienced further smouldering episodes of epigastric pain and vomiting.

He returned to his previous occupation and remained well until the first week of August, when continuous acute upper abdominal pain returned. On August 11 he re-entered hospital, and a further barium-meal examination showed a possible stenosis of the stoma. It was feared that there had been an extension of the neoplastic process, and a third laparotomy was performed (Professor Mercer), but no abnormality was found.

During the subsequent period of convalescence the crises continued to occur and were treated with morphine or pethidine hypodermically; neither drug gave complete relief from pain. Examination of the cerebrospinal fluid on December 27 showed: cells, 2 per c.mm.; protein, 50 mg. per 100 ml.; Wassermann reaction, negative; gold sol, 0000000000.

Finally, on January 8, 1951, the patient was admitted to the department of surgical neurology, where after a preliminary period of observation a right antero-lateral chordotomy was done at C. 3-4 level (Mr. F. J. Gillingham). This resulted in loss of pain and temperature sensation below the level of C. 8 on the left side, light touch remaining unimpaired. Five weeks later he left hospital and, after a short convalescence, resumed his former employment as a deep-sea fisherman. On March 27 the blood Wassermann reaction and Kahn test were negative. Nine months later he stated that he had had no further symptoms and had "never felt better."

Summary

A case of tabetic gastric crises is described which exhibited the following noteworthy features: (1) The occurrence of Argyll Robertson pupils as the only clinical sign of neurosyphilis in a patient with severe gastric crises. (2) A tendency for the crises to become more frequent and incapacitating, although both blood and spinal fluid became ultimately normal during adequate antisyphilitic treatment. (3) Suspicions of organic intra-abdominal disease strong enough to lead to laparotomy on three occasions and the discovery of a gastric carcinoma in a very early stage at the second operation. (4) Cessation of crises following unilateral chordotomy.

I wish to thank Dr. R. C. L. Batchelor for permission to publish this case.

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TOXIC EFFECTS OF PHENYLBUTAZONE

BY

J. R. NASSIM, B.M., F.R.C.P.

Physician, St. George's and the Royal National Orthopaedic
Hospitals, London

AND

THOMAS PILKINGTON, M.D., M.R.C.P.

Medical First Assistant, St. George's Hospital, London

Whilst the aetiology of rheumatoid arthritis remains an unsolved problem new therapeutic measures will constantly be tested for their power to alleviate its symptoms and in the hope of throwing some light on its causation. Phenylbutazone ("butazolidin") has lately been advocated as a drug which is likely to be a potent weapon in the treatment of rheumatic conditions (Currie, 1952).

Since the release of the drug for general use an increase in toxic reactions, occurring in from one-fifth to one-third of patients, has been reported (Loxton *et al.*, 1952; Kuzell *et al.*, 1952; Rhys Davies *et al.*, 1952; Cudkowicz and Jacobs, 1953). A warning of the dangers of its uncontrolled use was given by Hart and Johnson (1952). The principal untoward reactions are rashes, anorexia, nausea, abdominal pain, looseness of the stools, and reactivation of peptic ulcers with bleeding. As phenylbutazone is closely allied to amidopyrine chemically, it is not surprising that agranulocytosis, fatal in two instances, has been reported in several patients (*British Medical Journal*, 1952; Bershof and Oxman, 1953; Etess and Jacobson, 1953; Stifel and Burnheimer, 1953). Oedema due to sodium retention is a common but avoidable side-effect (Green and Williams, 1953).

Present Investigation

This paper is a record of our experiences with phenylbutazone during the past six months. The drug can be given either by mouth or by intramuscular injection, but as the majority of patients treated were out-patients the former route was usually employed. All patients were warned of possible side-effects and were asked to restrict their salt intake; those who gave a definite history of peptic ulceration or cardiovascular or renal disease were not treated with the drug. Three patients were suffering from diabetes, which was not affected by phenylbutazone.

The series consisted in 109 patients (79 women and 30 men), their ages ranging from 12 to 73 years (average age 49 years). Of these patients 86 suffered from rheumatoid arthritis, 19 from osteoarthritis, and 3 from gout. One patient had a ligamentous strain of the knee. In 18 patients phenylbutazone was combined with cortisone, but in only 4 was the effect good enough to allow the hormone to be completely withheld.

The drug was given to 102 patients by mouth in tablets containing 0.2 g. in daily doses ranging from 0.2 to 1.2 g. (average dose 0.6 g.). Seven received intramuscular injections of 1 g. on four alternate days, followed by weekly injections. All patients were seen first at weekly, then fortnightly, and, later, monthly intervals. A check was kept on the white blood count and the sedimentation rate.

Results

Symptomatically 59 patients were greatly improved by phenylbutazone, but in none was there any associated fall in the sedimentation rate. In 15 improvement was only slight, in 25 the drug had no beneficial effect, and in 10 toxic reactions occurred before any therapeutic effect could be noted.

Toxic side-reactions severe enough to necessitate stopping the drug occurred in 46 patients. The following reactions, usually in various combinations, were noted: (1) Twenty-one patients noticed severe anorexia and upper abdominal pain, one of these also having looseness of the bowels. (2) Seventeen complained of dryness of the mouth and throat, and were found to have redness of the anterior faucial pillars and uvula. Two of these had actual ulceration, which in one caused a submaxillary abscess requiring surgical drainage. Blood counts remained normal in this group. (3) Sixteen developed punctate erythematous rashes. (4) Two had enlargement of the glands in the posterior triangles of the neck. (5) One patient suffered from severe vertigo. (6) One developed granulopenia, recovering after the drug was withheld; white blood count 1,700, neutrophils 39%. The white count before treatment was 12,000, neutrophils 79%. Several patients showed a transient eosinophilia. (7) Three patients had exacerbations of the rheumatoid lesions of their hands.

Sodium retention was thought to be responsible for the slight gain in weight noticed in most patients, but only two developed pronounced oedema. This disappeared in one after salt restriction, which had not been carried out as requested, but persisted despite these measures in the other.

Response to Phenylbutazone Compared with Toxic Reactions

Response	No.	No. of Toxic Reactions Noted
<i>In All Patients Treated</i>		
Complete symptomatic relief	31	15
Marked	28	11
Analgesic effect, "similar to" aspirin	15	7
No symptomatic relief	25	3
Drug not given long enough to observe therapeutic effect	10	10
Total	109	46
<i>In Patients Suffering from Rheumatoid Arthritis</i>		
Complete symptomatic relief	28	14
Marked	20	8
Analgesic effect, "similar to" aspirin	11	6
No symptomatic relief	20	2
Drug not given long enough to observe therapeutic effect	7	7
Total	86	37

These reactions occurred on the average after three weeks, and in only two patients after three months. They were not related to dose or mode of administration, and promptly disappeared when the drug was omitted. A change from oral to parenteral therapy seemed to make no difference.

The most distressing aspect of phenylbutazone is apparent when its antirheumatic effects are compared with its toxic effects: the drug had to be withheld from nearly half the patients gaining most benefit from it, and those suffering from rheumatoid arthritis relapsed after its withdrawal (see Table).

Conclusion

Conclusion

We have found, as have most other authors, that phenylbutazone is a most effective weapon in combating the symptoms of rheumatoid arthritis and acute gout. However, it induced in nearly half of our patients toxic reactions severe enough to make further therapy dangerous. Nevertheless, its trial in chronic disabling conditions seems justifiable, since there are a large number of patients who derive benefit without toxic manifestations; scarce supplies of A.C.T.H. and cortisone may thus be conserved. It has recently been suggested that if used in doses not exceeding 0.4 g. every 1 to 10 days only transient rashes are likely to be encountered (Lawrence, 1953). This mode of administration certainly deserves further trial.

Summary

Summary
Phenylbutazone was given to 109 patients suffering from various rheumatic conditions. Forty-six patients suffered from toxic reactions. These occurred in nearly

half of those deriving great benefit. The diabetic condition of three patients receiving the drug was not affected by it. Its use is justifiable where careful and continuous control is possible.

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TOXIC EFFECTS OF PHENYLBUTAZONE WITH SPECIAL REFERENCE TO DISORDERS OF THE BLOOD

BY

J. C. LEONARD, M.D.

(From the Ipswich Borough General Hospital)

During the past nine months many reports on the use of phenylbutazone ("butazolidin") in rheumatoid arthritis and allied diseases have appeared in the literature. The incidence and severity of toxic reactions have varied widely, as may be seen from the Table printed overleaf. Thus Peebles-Brown and Currie (1952) described only five toxic effects out of 280 patients (an incidence of 1.8%). On the other hand, Cudkowicz and Jacobs (1953) reported an incidence of 52%, and Stephens *et al.* (1952) one of 44%. Details of the 356 reactions in 1,526 patients have now been reported—an average incidence of 22%. This figure agrees closely with the estimate of Loxton *et al.* (1952).

The most frequent complications are by now well recognized. Oedema occurred in 84 patients; it is due to retention of sodium and water, and has often precipitated cardiac failure. Various gastro-intestinal symptoms (nausea, vomiting, diarrhoea, "gastritis") are also common, but rarely have serious consequences; more grave, however, is the reactivation of peptic ulcer (17 patients) and haematemesis and melaena (13 patients). The latter was the cause of death in one case reported in the *British Medical Journal* (1952). Jaundice has been recorded in six patients. Skin rashes are common (51 patients) and seem to be protean in variety. Miscellaneous effects include vertigo, euphoria, conjunctivitis, haematuria, albuminuria, "haemorrhagic myelitis," and stomatitis.

The effects on the blood seem to include depression of any or all of the cellular elements. Thus Stephens *et al.* (1952) reported a fall in haemoglobin of 1 g. per 100 ml. or more in 18 out of 188 patients, and a fall in the platelet count below 100,000 per c.mm. was even more common (31 patients). Eleven cases of frank agranulocytosis, with one death, have so far been recorded, and there have been several other cases of granulocytopenia.

The case histories of two patients are described below; the first developed aplastic anaemia, and the second agranulocytosis, during treatment with phenylbutazone. The former seems to be the first case of this complication described in the literature, if one excludes the case of Kuzell *et al.* (1952a); this patient was already suffering

from monocytic leukaemia, and was receiving x-ray therapy simultaneously with phenylbutazone. One month previously he had also been treated with amidopyrine. The cause of the anaemia is therefore doubtful.

Case 1

A 64-year-old woman was admitted on September 16, 1952. Four years previously myxoedema had been diagnosed, and since then she had received 2 gr. (0.13 g.) of thyroid extract daily. In April, 1952, she complained of stiffness and pain in the knees, hips, shoulders, and neck. She was otherwise well. On examination there was swelling and limitation of movement in the affected joints, and rheumatoid arthritis was diagnosed. There was no clinical evidence of myxoedema, and her pulse rate varied between 80 and 100. Her erythrocyte sedimentation rate (Wintrobe) was 40 mm., and a blood count showed: haemoglobin, 77% (11.1 g.); white cells, 6,800 (polymorphs 75%, lymphocytes 25%). The serum cholesterol was 191 mg. per 100 ml. From October 11 to 26 she was treated with A.C.T.H., a total of 0.82 g. being given. This produced a satisfactory remission, but she relapsed immediately the drug was stopped. The haemoglobin on October 13 was 65% (9.3 g.). On October 28 she began a course of gold, receiving 0.44 g. in all. This produced a rash, and in view of the absence of symptomatic improvement the drug was discontinued on November 28. The white-cell count on November 25 was 5,400 (polymorphs 69%, lymphocytes 31%) and the E.S.R. 24 mm. She was discharged on December 2. When seen in the out-patient department on January 6, 1953, there was no rash, and, apart from general stiffness, she was well.

From January 14 she received 0.6 g. of phenylbutazone daily for 14 days. During this time there was slight bleeding from the nose and mouth, and on January 21 her doctor noted a purpuric rash on the legs. This was not thought to be of serious import and phenylbutazone treatment was continued, with satisfactory relief of pain. On January 28 she was found to be severely anaemic and breathless, and was readmitted as an emergency.

On examination there was evidence of bleeding from the nose, and her sputum contained small amounts of blood. There was slight congestion of the neck veins, but no oedema. Her pulse rate was 120. Her heart sounds were normal and blood pressure 124/60. Her respirations were rapid and laboured; there were coarse rales and rhonchi throughout the chest. Multiple petechial haemorrhages were present all over the body. Examination of the blood showed: haemoglobin, 26% (3.8 g.); white cells 3,200 (polymorphs 75%, lymphocytes 25%). A diagnosis of anaemic heart failure was made, and she was treated with a slow intravenous transfusion of packed cells. She died suddenly 24 hours after admission.

At necropsy a diffuse subdural haemorrhage was present, completely lining the dura in a thin layer. The lungs were deeply congested and firm. On the cut surfaces there

were many nodular areas, due to diffuse haemorrhage. Multiple haemorrhages were present beneath the surface of the pericardium. The heart muscle was pale and flabby. The stomach showed small haemorrhages beneath the lining, and contained a small amount of blood. The liver was extremely pale and rather flabby. The spleen was slightly enlarged. The thyroid showed replacement by homogeneous white fibrous tissue. The bone marrow of the sternum showed considerable fatty change. At the upper end of the femur the bone marrow was partly fatty; elsewhere in the femur and in the tibia it was completely fatty.

Microscopical examination of the bone marrow from the upper end of the femur showed that cells of the erythropoietic and megakaryocyte series were entirely absent. There was also complete cessation of leucopoiesis apart from the presence of occasional myelocytes. Most of the sinuses were filled with plasma cells; these were mainly of large size, with fine cytoplasmic vacuolation. Binucleate forms were frequent. Occasional larger cell aggregates were seen; these consisted of plasma cells, with lymphocytes and reticulum cells.

Case 2

A man aged 53 had had moderately severe rheumatoid arthritis for 35 years. He was treated with phenylbutazone for six weeks; during the first week he received 1.6 g. daily, and thereafter 0.8 g. daily. After five weeks his white-cell count was 8,700 (polymorphs 55%, lymphocytes 44%, basophils 1%). One week later he complained of a sore throat and was admitted to hospital.

On examination he was not severely ill. His temperature was 101° F. (38.3° C.). His throat was reddened, but there were no palpable cervical lymph nodes. The typical deformities of rheumatoid arthritis were present in the hands and feet. Subcutaneous nodules were present over both olecranon processes and along the posterior borders of the ulnae. The left supratrochlear gland was palpable. Examination of the blood showed: haemoglobin, 100% (14.5 g.); white cells, 1,600 (polymorphs 34%, lymphocytes 47%, mononuclears 5%, eosinophils 7%, myeloblasts and myelocytes 5%, plasma cells 2%); platelets "plentiful." Phenylbutazone was stopped and he was treated with penicillin; he made an uneventful recovery. He had received no other drugs known to affect the bone marrow.

Discussion

Case 1 immediately poses the problem of whether gold or phenylbutazone was responsible for the aplastic anaemia. In 1948 Fitzpatrick and Schwartz reported that 20 cases of aplastic anaemia due to gold had been described in the literature; one of the cases did not develop the anaemia until five months after gold treatment was stopped (Aubert, 1946). When one recalls how widespread has been the employment of chrysotherapy, it is evident that the condition must be exceedingly rare. It is possible that gold

was the cause of the bone-marrow aplasia in the patient under discussion. On the other hand, the patient was perfectly well (apart from arthritis) until treatment with phenylbutazone was begun; within one week she had developed epistaxis and a purpuric rash; and within two weeks a fulminating aplastic anaemia had led to death. It seems, on the whole, more reasonable to incriminate phenylbutazone, though it might be that in some way the patient had become sensitized to phenylbutazone by the previous course of gold.

Two further possibilities should be mentioned: that hypothyroidism or rheumatoid arthritis may have influenced the structure of the bone marrow in this patient. In hypothyroidism, hypoplasia of the bone marrow occurs, but the anaemia is not usually severe. As this patient had been adequately treated with thyroid extract for four years there is no reason to suppose that her myxoedema would affect the bone marrow. As regards rheumatoid arthritis, Leitner (1949) states that "in all our cases of rheumatoid arthritis we have observed plasma-cell proliferation" in the bone marrow. He cites Mester (1938), who "collected 75 cases and found an increase of plasma and reticulum cells in acute and chronic rheumatoid arthritis." Some relative proliferation of plasma cells is sometimes seen in idiopathic aplastic anaemia, but not to the same extent as in this patient. Infiltration of the bone marrow with plasma cells is, of course, a feature of multiple myelomatosis, of which there was no clinical or pathological evidence here. The relationship, if any, between plasma-cell proliferation and phenylbutazone remains to be determined.

Are the toxic effects of phenylbutazone due mainly to overdosage or to idiosyncrasy? With this question in mind, an attempt has been made to correlate the frequency of toxic reactions with the dosage of the drug administered. It seems, however, that no such broad correlation can be established, and this may indicate that idiosyncrasy to the drug is the predominant factor. Thus, on a dosage of 1 g. daily, Cudkowicz and Jacobs (1953) reported toxic effects in 26 out of 50 patients, whereas Currie (1952) reported no toxic effects in 81 patients. Loxton *et al.* gave doses varying from 0.4 to 0.8 g. daily, and reported toxic effects at each level. Of the patients with agranulocytosis, three had never received more than 0.8 g. daily, whereas two had received 1.2 g. daily. Of the present cases, Case 1 received 0.6 g. daily, a dosage normally regarded as safe, and Case 2 received 1.6 g. daily for the first week and 0.8 g. thereafter. It thus appears from these cases that the administration of small doses of phenylbutazone does not eliminate the possibility of developing serious blood dyscrasias. The possible dangers of phenylbutazone therapy are increased by its effectiveness, which encourages its employment in general practice. It would seem that its use should be closely controlled by frequent blood counts, and that it should be confined at present to patients in hospital.

Summary

Details of 356 toxic effects occurring in 1,526 patients treated with phenylbutazone have been collected from the literature (an average incidence of 22%).

A fatal case of aplastic anaemia is reported. Though the patient had also been treated with gold, it is contended that phenylbutazone was probably responsible for the anaemia.

A case of agranulocytosis due to phenylbutazone is also described.

The incidence of toxic effects does not seem to be related to the dosage of phenylbutazone, as reactions commonly develop in patients treated with small doses. It is suggested that the use of the drug should be confined at present to patients in hospital.

I wish to thank Dr. Ronald Jones for his help, criticism, and encouragement in the preparation of this paper, and for permis-

sion to publish Case 1; Dr. J. W. Paulley for permission to publish Case 2; and Dr. Trevor Shaw, who performed the necropsy.

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ETHOPROPAZINE HYDROCHLORIDE IN TREATMENT OF CEREBRAL PALSY

BY

R. G. MITCHELL, M.B., M.R.C.P.Ed., D.C.H.

(From the Westerlea School for Spastic Children,
Edinburgh)

The use of drugs plays only a small part in the treatment of cerebral palsy, and so varied are the conditions grouped under this comprehensive term that a single agent is unlikely to be of value in every case. Barbiturates, anticonvulsants, and the belladonna alkaloids are the only drugs in regular use, but reports on recently developed synthetic drugs hold out hope of more effective agents in the future. Jersild (1950) reported encouraging results in congenital spastic paralysis with the synthetic spasmolytic substance caramiphen hydrochloride ("parpanit"), while improvement has been noted in cerebral palsy treated with muscle-relaxants. Some of these, such as mephenesin, may establish a place in treatment (Berger and Schwartz, 1948), while the value of others, such as neostigmine, has not been confirmed (Perlstein and Barnett, 1950).

The beneficial effect of antihistaminic and related drugs in parkinsonism (Sigwald, 1949; Palmer and Gallagher, 1950) suggests their possible value in cerebral palsy, especially in cases in which extrapyramidal signs predominate. Opinions vary on the relative merits of these agents in the treatment of parkinsonism; Garai (1951) found that improvement with benzhexol hydrochloride ("artane") was greater than with ethopropazine ("lysivane"), whereas Gillhespy (1951) considered that ethopropazine was superior to all other drugs of this series.

Effron and Schultz (1951) reported that benzhexol hydrochloride was relatively ineffective in the treatment of eight patients with cerebral palsy. In the present investigation, ethopropazine was chosen because of the favourable impression created by the treatment of a few selected out-patients with this drug.

Details of the Investigation

The trial of ethopropazine was carried out at a residential school for children with cerebral palsy. The school is equipped with physiotherapy, occupational therapy, and speech therapy departments, all of which took part in the investigation.

Details of Toxic Effects of Phenylbutazone

	Cudkowicz and Jacobs (1953)	Davies <i>et al.</i> (1952)	Granirer (1952)	Hart and Johnson (1952)	Kuzell <i>et al.</i> (1952a)	Kuzell <i>et al.</i> (1952b)	Loxton <i>et al.</i> (1952)	Peebles- Brown and Currie (1952)	Shulman (1952)	Solomon (1953)	Stephens <i>et al.</i> (1952)	Others	Total
Oedema	8	8	6	3	17	24	3	2	2		9	2	84
Nausea, vomiting, diarrhoea	6	25		2	20	31					2		86
Haematemesis and melaena	2		1	3		2					2	3	13
Activation of peptic ulcer	2		1		4	3					7		17
Jaundice												4	6
Skin rashes	5	3	4	6	6	12	5	1			9		51
Anaemia			3		2	2					18		25
Agranulocytosis						2	1					8	11
Purpura and thrombocytopenia		1				2					31		34
Miscellaneous	3	3	5		3	6	1	2	1		5		29
Total No. of toxic effects	26	40	20	14	52	84	10	5	3	2	83	17	356
Total No. of patients treated	50	100	20	60	140	278	150	280	237	6	188	17	1,526

Observers included under "Others" column: Bourne (1953), Crowther and Elgood (1952), Hinz *et al.* (1953), Kuzell and Schaffarick (1952), and Ross and Baldwin (1953).

The 19 children at the school comprised 6 with spastic tetraplegia, 4 with spastic paraplegia, 7 athetoid, and 2 ataxic, their ages ranging from 5 to 14 years. None of them was mentally retarded and all were moderately to severely handicapped. The children were arranged in pairs of approximately the same age and type of palsy, and were then divided into two groups without further selection. The groups were therefore comparable in age distribution and in type and degree of disability; one group was given ethopropazine and the other constituted a control group.

The trial was confined to school terms, since in the holidays the children return to their homes, making supervision impossible. When the children return to school after the holidays some are usually found to have regressed slightly, so that the trial was not begun until three weeks after the beginning of term, to allow for the expected improvement. This left a period of about seven weeks for the trial, and it was decided to give the drug for four weeks in order to assess the child's performance before treatment and to ensure supervision for a week after stopping the drug, in case of possible withdrawal effects. Although four weeks is not a long period, it was thought to be long enough for any improvement to be evident.

The trial was divided into two parts, the 10 spastic children being tested in the first term and the 9 athetoid and ataxic children in the second term. This division was necessary because of the time involved in carrying out accurate tests, which imposed considerable extra demands on the staff of the school.

Dosage of Ethopropazine.—The ethopropazine was supplied in 10-mg. sugar-coated tablets, and the control tablets were identical in appearance but contained lactose. The tablets were administered in four divided doses during the day, each child in the control group receiving the same number of tablets as his equal in the trial group. In the first half of the trial the starting dose was 20 to 30 mg. daily, depending on age, and the dose was increased by 10 to 20 mg. a day at intervals of four days, until a maximum of 100 to 150 mg. daily was reached. In the second half of the trial the starting dose was 30 to 50 mg. daily, and the dose was increased by 20 to 30 mg. a day at intervals of four days, to a maximum of 200 to 250 mg. daily.

Methods of Assessment

Once a week, on the same day each week, the children's progress was assessed, using a number of tests designed to measure different activities. The time taken for each test was measured in seconds with a stop-watch, the final figure being the mean of at least three attempts. The tests used were as follows:

A tests measured ability to relax—for example, the time for which the child could maintain his lips together or could lie still without moving.

B tests measured balance—for example, the time for which the child could hold his head steady or could stand on one leg.

C tests measured active movement—for example, the speed of rising from supine to sitting or standing positions, or the time taken to flex and extend the elbow a given number of times.

D tests measured manual dexterity—for example, the time taken to transfer articles from one container to another, or to take out and replace pegs on a board.

E tests measured speed of rolling—for example, the time taken to roll a measured distance on the floor.

Every child was tested in at least three activities, and, although the tests were adapted to suit the individual child, each performed the same tests each week and did not carry them out at other times during the week.

Speech records were made before the beginning of the trial and again when the children were receiving the maximum dose. The school teachers were also asked to note any changes in ability in the class-room, and the children were under constant supervision by the resident nursing sister. The sister was the only person in the school who knew which children were receiving ethopropazine and which the control tablets.

Results

The results of the trial are presented in the accompanying table. A child's performance for each activity in which he was tested was recorded as having improved or as showing no change. An improvement was regarded as having taken place if either of two criteria was satisfied: (1) if progressive and uninterrupted improvement occurred while the child was receiving the tablets; or (2) if the mean performance during the trial period was at least 100% better than the mean performance when no tablets were being given.

Only one child, No. 3 in the table, improved in all tests. This was a girl of 13 years with severe spastic tetraplegia, and the improvement was maintained permanently after completion of the trial, so that it is difficult to attribute it to the ethopropazine. An assessment of improvement based on the total number of tests performed shows that 23.3% improvement occurred in the trial group and 22.2% improvement in the control group. When the different

Results of Trial

Type of Cerebral Palsy	Case No.	Improved	No Change
Group Receiving Ethopropazine			
Spastic	1	—	C D E
	2	—	C D E
	3	C E D	—
	4	—	C D E
	5	—	C D E
Athetoid	6	—	A B D
	7	A	C D
	8	A D	B
Ataxic	9	B	A D
	10	—	B C D
Totals of 30 tests on 10 patients		7 (23.3%)	23 (76.7%)
Group Receiving Control Tablets			
Spastic	11	D E	C
	12	—	C D E
	13	—	C D E
	14	C D	E
	15	—	C D E
Athetoid	16	—	A C D
	17	D	B C
	18	D	A B
Ataxic	19	—	B C D
Totals of 27 tests on 9 patients		6 (22.2%)	21 (77.8%)

types of cerebral palsy are considered, no consistent improvement in one type or in one activity is found, though the numbers in each group are too small for definite conclusions to be drawn.

The speech records made before and during the trial were carefully compared; two of the ethopropazine group and three of the control group were regarded as having improved slightly. The school teachers noted no unusual improvement in ability in any of the children.

Toxic Effects of Ethopropazine.—In the first half of the trial no toxic effects were noted. In the second half three children, aged 8½, 8, and 7 years, became rather drowsy and listless when a daily dosage of 140, 120, and 140 mg. respectively was reached. In none of these children were the symptoms severe enough to necessitate withdrawal of the drug. Total and differential leucocyte counts were carried out before and at intervals during the administration of the tablets. In no case did a significant reduction in the number of leucocytes occur. On completion of the trial, administration of the drug was stopped abruptly. None of the children showed symptoms of withdrawal except for one boy who developed severe constipation, which might possibly have been due to withdrawal. The three children who showed toxic symptoms became normally alert within 48 hours of stopping the drug.

Summary and Conclusions

The results of a trial of ethopropazine in the treatment of cerebral palsy are recorded. Ten children with various types of cerebral palsy were given ethopropazine and a comparable group of nine children received lactose control tablets.

There was an improvement of 23.3% in the children treated with ethopropazine, but a similar improvement occurred in those who received only lactose tablets. No evidence of a special effect of ethopropazine on any type of cerebral palsy or on any specific ability was obtained. It is therefore concluded that ethopropazine is of no value in the treatment of cerebral palsy.

This trial was carried out under the auspices of the Scottish Council for the Care of Spastics. I wish to thank the staff of Westerlea School for their willing co-operation and Messrs. May and Baker Ltd. for generously supplying the lysivane.

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ADRENALINE NECROSIS

BY

G. LESLIE, M.D.

Senior Registrar, Department of Dermatology, Royal Infirmary, Glasgow

AND

D. MCPHEE, M.D., B.Sc.

Tissue necrosis due to adrenaline injections is a rare occurrence when it is considered how often the drug is administered.

Urbach (1936) reported a case in which multiple areas of skin necrosis followed the self-administration of adrenaline by a female patient who suffered from severe bronchial asthma. To gain relief she often gave herself "intention tremor" at the time of injection, which often took as long as fifteen minutes to complete. When the injection was given to the patient he was unable to get the slightest reaction in the skin. Again, when the patient herself administered an injection of normal saline there were no visible changes in the skin. In this way it was shown that the damage produced by the adrenaline injections was not due solely to mechanical irritation. Urbach concluded that the trauma caused by the "intention tremor" combined with the constriction of the blood vessels, due to the adrenaline, produced a necrosis of the superficial skin.

Necrosis of the tips of two fingers of the hand of a patient operated upon for Dupuytren's contracture was noted by Hanke (1936). The local analgesic used was a 1% procaine-adrenaline solution, the adrenaline being added in the correct dosage just before the injection. He thought that the explanation of this was that the anaesthetic fluid had acted over a prolonged period on the tissue devitalized by the gradual contraction of the palmar aponeurosis which is a feature of the disease.

The most recent case of tissue damage due to the self-administration of adrenaline was reported by Robertson (1951). In his case the tissue reaction was that of keloid formation, which was presumably a personal skin characteristic and due to trauma with a hypodermic needle.

Delaunay *et al.* (1948) conducted a series of experiments, injecting adrenaline in various strengths (1,000 µg., 200 µg., 100 µg., 50 µg., 33 µg., 25 µg., 20 µg., and 10 µg.) under the skin of the abdomen of guinea-pigs. The stronger solutions (1,000–25 µg.) produced changes in the skin visible to the naked eye. With the weaker solutions reactions were noted microscopically. These workers think that adrenaline is not directly toxic to tissues, but that adrenaline necrosis arises rather from various vascular disturbances. They suggest that both vasomotor upsets and disturbance of the permeability of the vessels play a part by interfering with the oxygen supply to the tissues and by inhibiting the diapedesis of polymorphs.

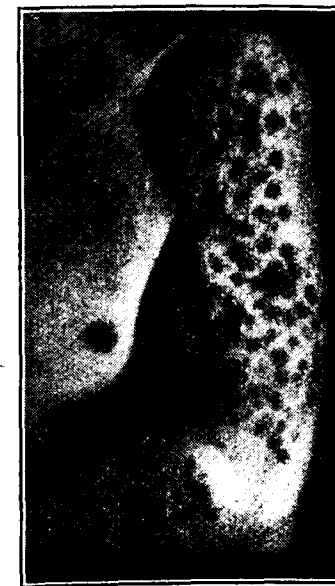
Because of the seeming rarity of skin reactions to the repeated use of adrenaline, and because trauma has apparently played some part in the causation of the cases reported, it was thought that the following case was worth recording.

Case Report

A joiner aged 35 developed asthma at the age of 14, and, after prolonged treatment with various remedies, he obtained relief only from injections of adrenaline. About five years ago his attacks became more frequent and severe, totally incapacitating him, and he found it necessary to give himself adrenaline by injection (1 ml. of 1/1,000 three or four times daily). He became so dependent upon the adrenaline that he administered it as a routine in anticipation of an asthmatic attack. These injections continued for two and a half years without any noticeable cutaneous reaction, the dose remaining the same. He first noticed, at the site of injection, a small red swelling which was painless and did not itch. The surface of the swelling then broke down and a necrotic central patch developed. A black eschar was eventually sloughed and a shallow ulcer remained. This sequence of events took seven to ten days. The ulcer healed slowly, leaving a foveated scar, which later became livid.

In spite of these reactions he continued to give himself the injections, in the same dose, for a further period of two and a half years, at which time he was seen by one of us (D. McP.).

On examination his appearance was startling. His buttocks, thighs, arms, and shoulders were covered by a multitude of active, healing, and healed necrotic areas of almost uniform size and shape. He was beginning to run short of accessible parts on the limbs and was encroaching on the chest (see Fig.). Until the onset of the skin reactions the right and left arms had been used alternately for the injection.



Photograph showing active, healing, and healed necrotic areas.

tions. His general condition was good and nothing abnormal was detected in any of the vital systems. During a series of readings the blood pressure remained in the region of 127/80.

Comment

Trauma does not seem to have played any part in the causation of the skin reactions in this case. The injections were administered for two and a half years without any visible skin change, and while, so far as the arms are concerned, trauma from repeated injections could have been a causative factor, this cannot be said of the new areas of skin used after the onset of the cutaneous reactions, as necrotic lesions developed on these even after the first injection into them, and continued to develop after each fresh injection until all accessible areas on the limbs had been exhausted and encroachment on to the chest wall had begun. This would suggest that the patient had developed a specific sensitivity to adrenaline, localized to the area of injection and affecting the blood vessels. This is in accord with Delaunay *et al.*, who considered, from their experimental work with guinea-pigs, that the skin reactions were of an allergic nature.

Summary

A case of necrosis of the skin after prolonged self-administration of adrenaline by injection, in an asthmatic patient, is described.

Trauma, which was a possible causative factor in some of the cases reported, did not seem to play a part in this case.

It is suggested that an allergy to adrenaline developed after repeated injections over a long period and that this is in accord with the experimental findings of Delaunay *et al.*

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Medical Memorandum

Torsion of a Mesenteric Lymphatic Cyst

Intra-abdominal lymphangiomas or lymphatic cysts seem to occur most commonly in the great omentum, and it is extremely rare for them to develop in the mesentery (Macnab and Menzies, 1950). As they are usually discovered accidentally during an exploratory laparotomy, the following case is of interest.

CASE REPORT

Abdominal pain began at 3.30 p.m. on October 2, 1951, in a boy aged 3½ years. After a normal bowel action the pain disappeared, but it came back at 8 o'clock the same evening. The child cried throughout the night and complained of pain in the abdomen and back, and said that he could not sit up in bed. He did not vomit but his appetite was poor. He also complained of pain in the abdomen while passing urine, and, although this was clear, his mother noticed that it had a strong odour.

The child was admitted to hospital at 2 p.m. on October 3 and was obviously ill. His temperature was 100.4° F. (38° C.), pulse rate 140, and respirations 28. Abdominal examination revealed some tenderness and rigidity on the right side, mainly below the umbilicus. The tongue was coated and a little "smelly." Rectal examination revealed some tenderness on the right side of the pelvis. The heart, lungs, and nervous system showed no abnormality, and the urine was normal. The history and physical signs at this stage suggested an acute appendicitis. A few hours later the abdomen became completely rigid on both sides, more so below the umbilicus, and a laparotomy was decided upon.

Operation.—As soon as the child was under the anaesthetic a swelling in the abdomen was visible to the naked eye. This was about 3 in. (7.5 cm.) in diameter, was hard, and was freely movable in all directions. Its position was approximately central in the abdomen, and a hand could be placed beneath it above the symphysis pubis. A right paramedian incision was made and the peritoneum was opened. A small amount of serous effusion was found, together with clots of fibrinous exudate, which appeared to be mainly present on the common and external iliac vessels on the right side. The appendix appeared normal. The swelling was seen in the hypogastrium and looked tense and purplish in colour, and on its delivery through the wound it underwent a spontaneous untwisting. It appeared to be a multilocular cyst in the mesentery of the ileum, approximately 2 ft. (60 cm.) from the ileo-caecal junction. The cyst was in actual contact with the intestinal wall, enveloping the ileum on three sides in a U-shaped manner. It did not extend into the retroperitoneal tissues, nor was there any evidence of communication between it and the mucous lining of the intestine. The locules intercommunicated, and contained a blood-stained clearish fluid, together with blood clots and flakes of fibrin; the walls of the cyst except those adjacent to the ileum were excised, and the cut edges of the mesentery brought together with interrupted catgut sutures. There was no evidence of intestinal obstruction, the colour of the ileum improving after the untwisting.

A course of "distaquine" penicillin and "cremomera-zine" was given, the clips being removed on the fifth day, and the child began to take a normal diet. Recovery continued uninterrupted.

The section showed a cyst wall composed of fibro-elastic tissue and lined by a single layer of flat endothelium. The wall showed congestion, degeneration, and polymorphonuclear and round-cell infiltration. The pathologist stated that the appearance was that of a strangulated lymphatic cyst of the mesentery.

COMMENT

Considering the clinical aspects of mesenteric cysts as a whole, Aird (1950) states that usually the only sign is that of a floating abdominal tumour, which is painless unless the cysts become infected from the bowel, when they lose their mobility and adopt the features of a well-localized abdominal abscess. In this case there was no infection, and the tumour was not palpable before the anaesthetic was given. Macnab and Menzies (1950) say that these cysts do not produce a constant clinical picture. They may present as an abdominal catastrophe, as in this case. Severe pain, vomiting, and abdominal rigidity may predominate, or there may be just an ill-defined malaise. The history of each case seems to be determined by the complications which have occurred. One-third of the cases produced intestinal obstruction (Waters, 1946). The cysts may undergo torsion, as in this case, or produce an intestinal volvulus. They may rupture into the peritoneal cavity and simulate acute peritonitis, or ruptured tubal gestation in women. They may become infected and present as an acute appendicitis or diverticulitis.

Regarding their aetiology, Lord Moynihan (1897) stated that they were simple dilatations of lymphatic vessels. Illingworth and Dick (1949) favour the view that they are dilatations of lymph vascular networks present in embryonic life, like cystic hygroma in the neck.

My thanks are due to Mr. P. H. Merlin, consultant surgeon, for permission to publish this case.

N. V. ADDISON, M.B., Ch.B.,
Dewsbury General Hospital.

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Reviews

CORTISONE AND A.C.T.H.

Cortisone and A.C.T.H. in *Clinical Practice*. Under the general Editorship of W. S. C. Copeman, O.B.E., M.D., F.R.C.P. With foreword by Lord Horder, G.C.V.O., M.D., F.R.C.P. (Pp. 255; 35 illustrations. £1 5s.) London: Butterworth and Co. 1953.

In the four years which have passed since Hench and his colleagues of the Mayo Clinic discovered the dramatic effects of cortisone in rheumatoid arthritis, verdicts on its ultimate role in therapy have ranged from "elixir vitae" to "glorified aspirin." In this book seven distinguished British authorities, who have had special opportunities for the clinical investigation of cortisone and A.C.T.H., record their own experiences and present a sober appraisal of the writings of others. Each article bears a personal stamp and reveals how the initial unrestrained enthusiasms have been tempered by time and experience.

The rheumatic and collagen diseases are discussed by Oswald Savage and W. S. C. Copeman, diseases of the eye by Mary Savory and Arnold Sorsby, endocrine disorders and respiratory and allergic diseases by F. Dudley Hart, and skin diseases by G. B. Mitchell-Heggs, and diseases of the haemopoietic system by J. W. Stewart.

The specific value of these hormones in the diagnosis and treatment of both primary and secondary adrenal insufficiency is illustrated by a wealth of clinical material, and the important part played by cortisone in the post-operative care of bilateral adrenalectomy for such conditions as hypertension and basophilism is established. All authors emphasize that, apart from substitution therapy, these cortisone and A.C.T.H. are not curative; that these hormones do not replace, but where helpful are complementary to, established therapeutic measures; that the individual response is very variable; and that before these drugs are exhibited the possible therapeutic benefits must be carefully weighed against the gravity and severity of potential toxic and withdrawal symptoms.

In a few diseases—for example, disseminated lupus erythematosus and pemphigus—cortisone may be a life-erythematosus and pemphigus—cortisone may be a life-saving or life-prolonging measure. In conditions of limited duration, such as iridocyclitis, it may abort or control the inflammatory process in such a way that grave risks to vision may be circumvented. In others it relieves immediate discomforts, as in some allergic states; while in yet others it preserves function and avoids crippling, as in rheumatoid arthritis. In rheumatic fever its value is still in doubt. In the vast majority of diseased states cortisone is without significant effect. In some indeed it aggravates the pathological process—for example, by disseminating tuberculosis or by the perforation of a peptic or colitic ulcer.

There is a brief but adequate account of the physiology and pharmacology of cortisone and A.C.T.H. and of the gaps in our understanding of many fundamental aspects of their mode of action. But this is essentially a clinical manual and the emphasis throughout is on practical rather than theoretical problems. The bibliography is extensive, well chosen, and up to date, and careful editing has avoided undue overlap. In short, this book provides an accurate, informed, concise, and lucid survey of current opinions on the value and limitations of cortisone and A.C.T.H. therapy. There is, however, a major lapse which, while not detracting from the technical merits of the book, grieves the literary purist. The quotation attributed to Alexander Pope on the verso of the preface reads:

Be not the first to cast the old aside,
Nor yet the first by whom the new is tried.

But Pope wrote in his *Essay on Criticism*:
Be not the first by whom the new are tried,
Nor yet the last to lay the old aside.

And most of us will prefer the original.
HENRY COHEN.

TEXTBOOK OF PAEDIATRICS

Pédiatrie. Volumes I and II. By Robert Debré and Marcel Lelong. (Pp. 2,260; 388 figures. 14,500 francs.) Paris: Les Editions Médicales Flammarion. 1952.

This massive two-volume work is the latest of the series of publications under the general editorship of Dr. Valléry-Radot which are arranged on the loose-leaf system for annual revision. The two editors, Professors Debré and Lelong, are both paediatricians of international repute, and they have the assistance of 38 contributors. Unfortunately, the individual contributors responsible for the different sections remain unknown, for the editors have modified each chapter so as to provide uniformity of style and teaching to fit in with their plans. The work is up to date and well presented. The paper and printing are excellent, and the books make easy reading. The illustrations, photographic, radiological, and tabular, are magnificent, being well chosen and perfectly reproduced. Each volume has a table of contents, but the index is in Volume II only. The attachment of the pages to the covers is inadequate for such heavy books, and it is to be hoped that the binding system may be improved at the next printing.

As might be expected, eponyms abound. More than 160 eponymous diseases are listed in the index—most of them French. Acute rheumatism, for example, is referred to as Bouillard's disease, rheumatic nodules are Meynet's nodules, erythema marginatum is Besnier's erythema, and chorea becomes "la danse de Saint-Guy." The sections on tuberculosis and the cardiovascular system in Volume I and on the blood and haematopoietic organs in Volume II are outstanding. Treatment advised is not always in accord with generally accepted principles. Rectal administration of sodium salicylate in milk is unlikely to be widely used in the treatment of rheumatism, nor is a fixation abscess the treatment of choice in acute encephalitis. The strict dietetic restriction in acute nephritis, in vogue in 1826, is still recommended, and venesection is advised for convulsions in this disease. The modern conception of coeliac disease is not discussed, and no reference is made to the work of Frazer, Sheldon, and Dicke in this field. Von Jaksch's anaemia and Hanot's cirrhosis still find a place, though they have disappeared from most other modern paediatric textbooks. It is a pity that the exanthemata are excluded, for they are essentially paediatric, but they have already been covered in another volume in the same series.

For the postgraduate student of paediatrics and for the general practitioner this work is a distinct asset, and if the annual supplements for insertion maintain the standard set in these initial volumes their value will be enhanced still further.

WILFRID GAISFORD.

MICROSCOPY

Handbook of Basic Microtechnique. By Peter Gray, Ph.D., D.I.C. (Pp. 141; 57 figures. 12s. 6d.) London: Constable and Co. 1953.

Lecture Notes on the Use of the Microscope. By R. Barer, M.C., M.A., B.Sc., M.B., B.S. (Pp. 76; 8 figures. 6s.) Oxford: Blackwell Scientific Publications. 1953.

Dr. Gray's book sets out the fundamentals of histological technique for university students and laboratory technicians, especially in zoology and botany. Part I is a general account of the materials and processes of slide-making. Its various chapters are on apparatus, fixatives, stains, dehydrating and clearing agents, mounting media, wholemounts, smears, sections, and the cleaning, labelling, and storing of slides. Part II—the last third of the book—consists of fifteen specific examples of slide-making, which collectively form a complete introductory course in plant and animal microtechnique. The author's policy was to select a few well-tried methods and reagents from the many available and to describe them in detail; alternative methods are to be given in the author's larger reference work on *Microtechnique*.

CHILD CARE

Child Care and Management: From Pre-Natal Days to Adolescence. By Patricia Edge. (Pp. 497. £1 10s.) London: Faber and Faber. 1953.

This is quite one of the best books I have read on the care of children and the help that can be given to them in preparation for adult life. It is well written in an attractive, sincere style, and the author gives sound advice on most of the questions that parents may find some difficulty in answering. The first section is on the health and hygiene of the expectant mother, and gives useful information about preparing for the baby's arrival. Subsequent sections deal with the first two years of life, the pre-school years, and then school life and adolescence. The author covers diet, hygiene, physical and mental health, and all the essential aspects of child health; in addition there are sensible discussions on such topics as homework and examinations, pocket money, hobbies, and punishments and rewards. The section on adolescence is full of wisdom and is presented in just the right form, without any unnecessary emotional colouring.

Later in the book there are sections on emotional development and character training, recreation, sickness in the home, and on choosing a career. These headings will give some idea of the breadth of the book, and the information is of the detailed kind that gives just the practical help that parents so often need. For instance, there are the addresses of appropriate organizations that may be approached in regard to the different types of career, with the approximate cost of training and so forth.

In the next edition I would like to see more specific advice about the type of cod-liver oil (p. 71) that should be given to infants, because there is a real danger of giving insufficient vitamin D; and Dr. Gesell's name is incorrectly spelt on pages 117 and 118.

This book is well worthy of recommendation.

NORMAN B. CAPON.

The second edition has now appeared of *Problems of Fertility in General Practice* by Mr. John Stallworthy, Mr. Kenneth Walker, Dr. Joan Malleson, and Dr. Margaret Jackson (Cassell, 18s. 6d.). The first part is on the investigation and treatment of sterility, the second on clinical contraception, and the third on genetical problems in general practice. In *To Define True Madness* Dr. Henry Yellowlees discusses many psychiatric problems in a form intended to appeal to the educated layman. His observations on medico-legal psychiatry would be of interest to medical as well as lay readers. The book is published by Sidgwick and Jackson for 12s. 6d. The authors of *Food Sense* describe for housewives and others the principles of sound diet, discussing in straightforward language such topics as cleanliness in preparing food, special diet in illness, and the constituents of food. Written by Dr. S. S. B. Gilder, Mr. G. M. Chapel, and Miss Louise Davies, the book is published by Ward Lock and Co. for 15s.

New editions of two well-known dictionaries have recently appeared—namely, *Black's Medical Dictionary* in its 21st edition, and *A Dictionary of Scientific Terms* in its 5th edition. New material has been added to "Black's" to bring it up to date, while pruning here and there has kept it within reasonable bounds. The dictionary had been completely revised in its previous edition, which appeared two years ago. It is published by Adam and Charles Black for 30s. The *Dictionary of Scientific Terms*, revised by Dr. J. H. Kenneth, Ph.D., covers the biological sciences and is complementary to a purely medical dictionary such as "Black's." It is published by Oliver and Boyd for 32s.

That excellent annual publication the *Commonwealth Universities Yearbook* has now appeared in its 30th edition. It gives detailed information about staff, organization, and arrangements for study and leisure in all universities in the British Commonwealth. It is published for the Association of Universities of the British Commonwealth by G. Bell and Sons, Ltd., for £3 3s. *Alumni Cantabrigienses*, Part II, Volume V, compiled by J. A. Venn, gives biographical details of all known students, graduates, and holders of office at the University of Cambridge from 1752 to 1900. The alphabetical list of names treated is Pace-Spyers. It is published by the Cambridge University Press for £10 10s.

The instructions for section-cutting would interest technicians in anatomy, pathology, and bacteriology, but the material, methods, and reagents are those of the zoologist and botanist. The author is obviously a stylist as well as a scholar, for the book is most elegantly written.

Dr. Barer's book, despite its modest title, is a miniature treatise on the microscope—its structure, theory, use, and maintenance. A description of the microscope is followed by an illustrated account of the formation of the image, and careful explanations of such concepts as numerical aperture, resolving power, visibility, and contrast. Objectives, condensers, and eye-pieces are next considered, and there is an interesting account of various ways of getting a desired magnification. The second half of the book deals with the use of the microscope, methods of illumination, the care and cleaning of the microscope, and hints on a variety of practical problems. The book ends with suggestions for further reading, and appendices on experiments with the microscope and on special microscope lamps.

The book is thus wider in scope than the excellent but more strictly practical pamphlets issued by microscope makers, and contains all that the ordinary microscopist need know. The book would interest not only its intended audience—university students and senior schoolchildren—but also research workers, apprentice designers, and technicians responsible for the routine care or professional servicing of microscopes.

RAYMOND WHITEHEAD.

MALTHUS READ AGAIN

The Malthusian Population Theory. By G. F. McCleary. (Pp. 191. 15s.) London: Faber and Faber. 1953.

To the average layman and to many doctors the word "Malthusian" brings to mind lectures on "family limitation" and price-lists in plain envelopes. It is many years since a manufacturer of "specialties" perpetuated a common error by attaching the name to one of his products. In fact, in 1798 when the Rev. Thomas Robert Malthus published his *Essay on the Principle of Population* contraception was ineffective in practice and the prerogative almost solely of loose women and French aristocrats. It formed no part of his thesis and he condemned it as unnatural and vicious, a view he held to the end of his days. Among more widely read people, including reputable specialists in economics, he is equally misunderstood and misquoted as a gloomy prophet who saw in the amelioration of social conditions after the French Revolution a vision of an unchecked and idle population outgrowing its food supply. In fact he never set up as a prophet at all but was one of the first men to apply the objective methods of science to the description of existing trends in human communities.

Dr. McCleary, with his pioneer experience of problems of social welfare, and himself a demographer, sets out to remind us of what Malthus really said and of the historical and philosophical background of his theories. To this he adds an appraisal of their application at the present time notable for its clarity and humour and the absence of either medical or sociological jargon.

When he went down from Cambridge Malthus said of himself, "I had not acquired that command over my understanding which would enable me to believe what I wished without evidence," and he proceeded without rancour to take to pieces the theoretical Utopias of Condorcet and Godwin which were being hailed in England at the time and regarded as just round the corner. His originality is perhaps indicated by the fact that Darwin wrote that he was first moved to think of natural selection after reading the *Essay*. Those of us who have subscribed to some of the many misapprehensions about Malthus's theories perhaps owe it to him to reorient ourselves with the aid of this most readable and timely book.

ALEXANDER KENNEDY.

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PROGNOSIS AND TREATMENT OF
HYPERTENSION

Essential hypertension is a progressive disease, and its variable rate of progression makes the prognosis in any individual case a difficult problem. In cases of severe hypertension with a diastolic pressure of over 130 mm. Hg the blood-pressure level itself will indicate a bad prognosis, but in the much commoner less severe cases the degree and rate of progression of the secondary cardiovascular, retinal, and renal changes are more helpful in deciding the prognosis than the level of blood pressure, to which too much attention is perhaps apt to be paid. In those cases with no evidence of myocardial damage, clinical or electrocardiographic, and only minimal retinal changes, the disease follows a benign course even if symptoms such as severe headache are present, and most of these patients will be alive at 65.¹ A faster deterioration is indicated by advanced retinal changes, cardiac enlargement, an electrocardiogram showing left ventricular hypertrophy or strain, or signs of previous cerebral accidents, and Hammarström and Bechgaard² found that only 38% of their male patients would survive for five years and only 13% for ten years; the corresponding figures for women were 70% and 45%. The presence of papilloedema and retinal exudates indicates a bad prognosis, fewer than one-fifth of patients of both sexes being alive after five years.

Leishman³ concluded that the stage which the hypertensive disease had reached could be best judged by the presence or absence of four clinical features—advanced retinal changes, albuminuria in excess of a trace, cardiac enlargement, and abnormality of the electrocardiogram. Malignant hypertension, whether the hypertension is primarily "essential" or renal in origin, is characterized clinically by papilloedema with a high diastolic pressure and pathologically by the presence of acute arteriolar necroses. Pickering⁴ has suggested that these arteriolar lesions are the consequence of the hypertension, and it has been shown that if the blood pressure can be lowered significantly the malignant phase of hypertension, whether essential or renal in origin, may be converted into the benign one with

retrogression of the retinal changes, improvement in the electrocardiogram, and presumed healing of the arteriolar necroses, with a considerable improvement in the survival rate. Good results have been reported from treatment with hexamethonium or the rice or low-sodium diets, and from surgical treatment such as sympathectomy, removal of a phaeochromocytoma or non-functioning kidney, or adrenalectomy. Morrissey, Brookes, and Cooke⁵ reported a striking increase in survival time after sympathectomy in cases of malignant or progressive hypertension, and pointed out that marked subjective and objective improvement may sometimes be seen even if the blood pressure does not fall much after operation.

In the opening pages of the *Journal* this week Dr. Brenda Morrison reports her results in a similar series of patients treated with parenteral hexamethonium. Five of her thirty-nine patients died during treatment, in four it was deliberately discontinued, six gave up treatment, and twenty-four continued with regular treatment. The results in this last group are impressive, for many were severely ill and steady deterioration would have been expected. Eighteen of the twenty-four patients treated for from three to fifteen months were able to lead practically normal lives, and the remainder were all much improved. A significant fall in both systolic and diastolic pressures was obtained, the degree of papilloedema diminished rapidly in every case of malignant hypertension, the electrocardiogram and signs of congestive failure were improved, and headaches usually disappeared. It is too soon to assess the effect of this form of treatment on survival time, particularly in view of the late occurrence of unusual pulmonary changes, but the immediate results are excellent.

The difficulties of hexamethonium treatment are well illustrated in this paper and in the accompanying one written in conjunction with Dr. W. D. M. Paton. A close study of these papers should discourage the indiscriminate or casual use of these drugs. Control of blood pressure with oral hexamethonium is unsatisfactory in most cases, and oral treatment might well be reserved for those cases with severe headache but without objective evidence of vascular degeneration in the hope that later remission of this symptom might occur. Morrison, and also Smirk and Alstad,⁶ have shown that adequate control of blood pressure even in severe cases can be obtained with parenteral hexamethonium, but the difficulties in controlling this

¹ Bechgaard, P., *Acta med. scand.*, 1946, Suppl. 172.

² *Amer. J. Med.*, 1950, 8, 53.

³ *British Medical Journal*, 1953, 1, 1131.

⁴ Pickering, G. W., et al., *Lancet*, 1952, 2, 952.

⁵ *Ibid.*, 1953, 1, 403.

⁶ *British Medical Journal*, 1951, 1, 1217.

method of treatment with a potentially dangerous drug are such as to limit its general use. The variable response to the initial doses and the development of tolerance necessitate close observation during the early stages, and the treatment demands a degree of co-operation by the patient for an indefinite period which will not often be easy to obtain. When secondary vascular changes have occurred and steady deterioration is to be expected, inadequate medical treatment will be disastrous, and then sympathectomy with its known good results in this type of case will probably be the treatment of choice for most of such patients. The use of parenteral hexamethonium as pre-operative preparation for surgery has been insufficiently explored, but it might well be that two to three months' intensive treatment on the lines described by Morrison followed by sympathectomy would give results better than with either method used alone.

The use of the ganglion-blocking drugs such as hexamethonium in the treatment of hypertension has stimulated the search for other drugs which will avoid the obvious difficulties and disadvantages of hexamethonium treatment, and it is to be hoped that an efficient oral preparation will become available. Meanwhile it is well to remember that cases of malignant or rapidly progressive hypertension form a very small proportion of the total hypertensive population, and it is only for these relatively few patients that drastic medical or surgical treatment is indicated.

DISEASE, RACE, AND CIVILIZATION

Medicine as it is known and taught to-day is largely concerned with disease in the civilized white man. When the world is considered as a whole the white men are a minority group, and civilized man is a recent phenomenon in history. The study of little-known races living in primitive environments in medically unexplored territory can be expected to reveal new manifestations of disease, if not new diseases, which may well prove important in the general advance of medical knowledge. Further study of the differences in the incidence of appendicitis in different West Indian island populations,¹ for instance, might clarify the aetiology of this condition. It is especially important that such work should be done now, since primitive ways of life and even the people themselves are in danger of dying out.

Structural differences between peoples probably play some part in determining the racial incidence of disease. Thus the tendency of the Negro to develop umbilical hernia has been ascribed to the frequency among negroes of the "skin" type of umbilicus with

a tubular projection of the peritoneum into the umbilical cord.² The wide nasal cavities of negroid and mongoloid peoples seem to be associated with a diminished incidence of infective and obstructive diseases of the ears, nose, and throat. Racial variations in the anatomy of the teeth³ and of the mastoid process influence surgical methods. The pigmented skin of the Negro protects him from the effects of the sun's rays in causing sunburn and skin cancer, which is common in albino Negroes.

The racial incidence of disease is sometimes due to quite simple genetic differences between peoples. This is the case in haemolytic disease of the newborn, which does not occur in those Oriental people who are entirely Rhesus-positive, and also in Cooley's anaemia and sickle-cell anaemia.⁴ Variations in susceptibility between races are found in many other diseases, but whether they are due to genetic or environmental causes remains obscure. Primitive communities from four continents have been found to be almost completely free from hypertension, for instance, the blood pressure remaining stationary or falling with advancing age.⁵

Racial variations in neoplastic disease lie mainly in the frequency of different types of tumour. Quaint habits, such as smoking cigars with the burning part inside the mouth, and walking about with a firepot pressed to the belly, are responsible for some of these differences, and others are due to more obscure environmental influences. There is some evidence for a predisposition to cancer of those organs, notably the liver, which are affected by kwashiorkor, a disease which occurs in populations whose traditional dietary habits have been disrupted by the production of cash crops.⁶

The problem of race and infectious disease has been extensively reviewed by Perla and Marmorston.⁷ No example of racial immunity to an infectious disease is known in man, though examples of this occur in some domestic breeds of animals. Different populations do, however, show widely different mortality rates when attacked by infectious diseases. The nearest approach to racial immunity seems to be the

lack of the scarlatinal response in the American Indian and the Malaysian peoples.

Infections usually cause a high mortality in populations which have never before experienced them, and introduced infectious diseases have probably been the greatest cause of depopulation among primitive peoples. Further exposure may lead to an increase of resistance among the population by the action of natural selection. Lack of nursing care and starvation are, however, important causes of this high mortality. Since common infectious diseases tend to be diseases of children whereas newly introduced epidemics affect all ages, apparent racial differences in susceptibility may be due to age variations in susceptibility. Thus the susceptibility of virgin races to tuberculosis is partly due to the seriousness of the primary disease in adults, and the apparent immunity to yellow fever of the Negro from endemic areas in Africa may be due to the mildness of yellow fever in childhood. The partial immunity to malaria of rural tropical communities is probably acquired at the cost of a grave mortality in childhood which is difficult to detect where medical services are rudimentary.

The student of race and disease should consult Schottky's book⁸ on that subject, though much of the information is anecdotal, and many of the opinions expressed are those which were current in Nazi Germany. Detailed accounts are available of the diseases of the African⁹ and the American Negro,¹⁰ the Eskimo,¹¹ the Chinese,¹² and the Australian aboriginal.¹³

It is easy for the medical practitioner working in the "back of beyond" to feel that he is stagnating in his isolation, and yet it is not difficult for him to produce really valuable researches. He can study a particular disease, collect vital statistics,¹⁴ or make a disease survey.¹⁵ These can give valuable information to governments in pointing out the true medical and nutritional needs of the people. Medical survey work should ideally be carried out in conjunction with workers in other fields, such as physical and social anthropology, agriculture, and nutrition. The main requirements are adequate description of the methods and descriptive criteria used, sufficient background information on the people studied, and the collection of data in a systematic manner. Work of this sort is being carried out on isolated African populations by the M.R.C. Field Research Station in the Gambia¹⁶ and on Malayan aborigines by the University of Malaya. In these days of air transport, lack of laboratory equipment and skills can often be overcome by sending specimens to acknowledged world experts, who may be only too glad to have this opportunity of carrying their researches into new fields.

DOCTORS ON EVEREST

The climbing of Everest is a triumph already acclaimed wherever the victories of the human spirit are prized above those of the market-place. The silent challenge of its peak has attracted eleven expeditions—not all intended to gain the summit—and sixteen lives have been lost in meeting it. If courage and resource are the qualities pre-eminently needed to explore those wastes of rock and snow, solutions to the physiological problems of living strenuously at high altitudes were no less necessary to the success that added a further touch of splendour to Coronation Day.

Medical men have contributed much to make these expeditions possible at all, both in helping to design suitable equipment and in accompanying, and sometimes leading, the climbing parties; they have also to carry out the essential but less spectacular duties of looking after the members of the expedition in the long approach to the mountain. The doctor in medical charge of the expedition, besides advising on camp hygiene, may have to deal with almost any medical or surgical emergency in one of the most remote parts of the world, from setting a broken limb to treating heatstroke or frostbite. His is the duty also—a familiar one to regimental medical officers during the war—of looking out for early signs of the mental disturbances that can have such serious consequences if allowed to develop and spread among strained and tired men. In giving advice on acclimatization the experience of a mountaineer-doctor is invaluable to the leader of the expedition. At Himalayan altitudes, and especially above 20,000 ft., the benefits of becoming acclimatized are apt to be offset by a deterioration in health whose cause is not clearly known. Individuals vary greatly in their response to these stresses, but after a time nearly everyone suffers a diminution of nervous control and a loss of weight which may be severe. There are in addition the hazards of a violently fluctuating temperature, which specially designed equipment can only partially mitigate. Bright sunlight by day may cause heavy sweating, to be followed by sub-zero temperatures at night, and perhaps even more difficult to overcome than the low oxygen tension is the dehydration that these altitudes cause.

The doctors accompanying this year's expedition have indeed earned the plaudits of the profession.* The medical officer in charge is Dr. Michael Ward, who qualified at the London Hospital in 1949, and gained his first experience of Himalayan climbing in the 1951 reconnaissance expedition. Also on medical work, though as a physiologist, is Dr. L. G. C. Pugh, a member of the Medical Research Council staff and, during the war, physiologist to a mountain and snow warfare training centre. The third medical member is Mr. R. C. Evans, who was chosen to accompany the expedition primarily for his climbing experience, much of which has been gained in the Himalayas. He and T. D. Bourdillon, whose father, Dr. R. B. Bourdillon, had constructed an experimental closed-circuit oxygen apparatus for the expedition, were the first to attempt the summit this year, reconnoitring a route with the new apparatus.

*See telegram (p. 1341) sent by Chairman of B.M.A. Council.

¹ Leacock, A., *British Medical Journal*, 1952, 1, 1347.

² Jelliffe, D. B., *Trans. roy. Soc. trop. Med. Hyg.*, 1952, 46, 428.

³ Tratman, E. K., *Dent. Rec.*, 1950, 70, 63.

⁴ *British Medical Journal*, 1952, 1, 426.

⁵ Polunin, I., *ibid.*, 1952, 1, 1190.

⁶ Trowell, H. C., *Nutr. Rev.*, 1950, 8, 161.

⁷ *Natural Resistance and Clinical Medicine*, 1941, Boston, pp. 31-126.

⁸ Editor, *Rasse und Krankheit*, 1937, Munich.

⁹ Gelfand, M., *The Sick African*, 1948, 2nd edition, Capetown.

¹⁰ Lewis, J. H., *The Biology of the Negro*, 1942, University of Chicago Press.

¹¹ Bertelsen, A., *Meddelelser om Grønland*, 1940, 117, No. 3.

¹² Snapper, I., *Chinese Lessons to Western Medicine*, 1941, New York.

¹³ Cleland, J. B., *J. trop. Med. Hyg.*, 1928, 31, 53 et seq.

¹⁴ See Edge, P. G., *Vital Statistics in the Tropics*, 1947, London.

¹⁵ Tropical medical exploration and survey work is reviewed in the section on Reports, Surveys, and Miscellaneous Papers in the *Tropical Diseases Bulletin*.

¹⁶ McGregor, I. A., and Smith, D. A., *Trans. roy. Soc. trop. Med. Hyg.*, 1952, 46, 403.

Though they failed to reach the top with it, they have the satisfaction of being indispensable members of a team whose efforts have met with success. And it is a team comprising not only the climbers now out there but those many who have tried their fortune on the mountain previously, for they brought back that information and advice—again much of it medical—which were the foundations on which Colonel Hunt's men, with trust and daring, built their success.

TOXIC EFFECTS OF PHENYLBUTAZONE

The use of phenylbutazone ("butazolidin") for the relief of pain in rheumatoid arthritis and osteoarthritis raises problems which are described in detail in the papers by Drs. J. R. Nassim and T. Pilkington and by Dr. J. C. Leonard on pages 1310 and 1311. Reports on the use of phenylbutazone make it clear that the drug can be used with benefit, certainly so far as the relief of pain is concerned, and that in this respect it is more effective than aspirin, either alone or in the usual mixtures. But phenylbutazone has toxic effects, and these have led Dr. Leonard to conclude that it should be given only to patients in hospital. Some recent papers published in the United States¹ add to the evidence on the serious accidents that may result from phenylbutazone therapy. One patient aged 54 received 400 mg. by mouth daily for one week; he was then put on 600 mg.; nine days later there was a perforation of the first portion of the duodenum. In other patients there was bleeding from ulcers during the use of phenylbutazone, and another patient died from agranulocytosis. The formula of phenylbutazone is sufficiently similar to that of amidopyrine to make it likely that cases of agranulocytosis will from time to time occur.

The incidence of toxic effects has varied very much with different observers, from 1.8% to 52%. How is this variation to be explained? It is difficult to suppose that those who have noted few toxic reactions have missed effects which were serious or dangerous to their patients, but it is reasonable to suppose that they have overlooked effects which were not serious. On the other hand perhaps those who have described a high proportion of toxic reactions have included minor disturbances some of which the patients themselves might not have reported. It seems probable that the variation in the incidence of toxic symptoms is a reflection of the difference in the observers or in the conditions of observation. If so, too much attention should not be paid to the percentage of toxic reactions as an indication of the risks of using the drug.

Toxic reactions in a minority of patients may be set aside as an inevitable disadvantage of any substance foreign to the body, and doctors may decide to use a remedy in spite of them. The matter is usually decided by the doctor's own experience with the remedy, and if he sees no ill effects in his first fifty patients he will be likely to blame the patient rather than the remedy when the ill effects are seen in the fifty-first. As reports of serious toxic disturbances accumulate, so the time may come when no one will be willing to use the drug for the first time. Only those doctors will give it who

have already found it to be beneficial and who have not yet observed toxic effects.

Many of the patients for whom phenylbutazone is prescribed are old and have suffered for many years. On general grounds they would seem more likely to show toxic symptoms than younger people, since their detoxicating mechanisms, in particular those of the liver and kidney, are less efficient, and the blood-forming apparatus is more sensitive to attack. Should a doctor refuse to use a remedy which gives relief to a majority of such patients because it causes side-effects in 20% of them? One answer to this is that the doctor should use it only if he is satisfied that he has sufficient opportunity of keeping the patient under supervision. Another answer is that he should refuse to use it and wait until the pharmaceutical firms have produced less toxic remedies. That this may be possible is evident from the success of mepacrine, proguanil, and pyrimethamine against malaria. All are remarkably non-toxic, though they are substances foreign to the body.

INFLUENZA AS A WORLD PROBLEM

The first report¹ of the World Health Organization's Expert Committee on Influenza, just published, contains a lucid account of the present state of knowledge about influenza, and where opinions conflict or information is incomplete it frankly says so. The Committee met in Geneva last September and consisted of nine members from six different countries. Though there is a place for independent research on many and various aspects of influenza, there are fields where international collaboration is needed and where progress will be difficult without it. For instance, we read that "recent studies . . . have shown two possible methods by which epidemics may be originated. Geographical spread of virus from one country to another has been indicated in some studies, but others rather favoured the development of an epidemic from an endemic state." In fact, there is increasing evidence that the "two possible methods" are not mutually exclusive but that both operate. Here is one important field where countries can help each other to discover how the common enemy, influenza, conducts its campaigns. Influenza viruses, more than any other, vary from year to year: newly emerging antigenic variants appear and may cause trouble when they find a population relatively susceptible. This variability makes it more difficult to be prepared with appropriate vaccines. On the other hand, we can follow the distribution and spread of new antigenic types and thus perhaps learn more about influenza's secret operations than if it were a wholly stable entity. The report describes the methods used in different laboratories for comparing the strains of virus which turn up. Were there more uniformity among these methods, more might be learnt sooner on this difficult subject.

The report gives sound recommendations on how material for study can be collected and distributed, and how information on outbreaks of influenza can be quickly gathered and made available. Two appendices

give details of methods in current use for preparing antisera of various kinds and for performing serological tests, both haemagglutination-inhibition and complement-fixation.

Much has been done since W.H.O. set up in 1948 the World Influenza Centre in London and helped to organize collaboration throughout the world; but clearly much remains to do. On the immediately practical questions of control the report has much of interest. Vaccines are discussed and the difficult question of what strains of virus to incorporate in them. There seems to be great hope for the future in the use of vaccines containing oily adjuvants. These are likely to give a stronger, more durable, broader antigenic response than has been possible before. But more knowledge is required about their safety before they can be generally recommended.

Influenza to-day causes great economic loss and kills many of the old and infirm. But its ravages are trivial compared with those of the lethal pandemic of 1918-19. Now we study vaccines, therapy, quarantine, and so forth partly for our immediate needs but even more because we do not know whether another killing influenza may not come upon us nor when it may do so. Because there are at present no indications of such a calamity we must not be lulled into unpreparedness; it is as well that the Expert Committee is aware of the danger and is not too complacent about the efficacy of antibiotics. What the report has to say about quarantine measures is worth quoting:

"Quarantine at a national level would be likely to be effective only in the case of islands and geographically isolated communities. The role of quarantine in regard to large countries or continents cannot be assessed while knowledge concerning the spread of influenza is still imperfect. There is no evidence, however, that in the case of such large areas quarantine could be applied effectively. The probable value of restriction of travel between countries can be judged in the light of the above remarks; and particularly in the case of mild epidemics of influenza, it is totally unjustified."

At the modest price of eighteen pence the report should prove a good investment for many people interested in what is referred to as "one of the most important infectious diseases still unconquered."

PUBLIC HEALTH AWARD

The salary increases awarded by the Industrial Court to assistant medical officers in the public health service are not all that was asked for, but at least they are substantial. They indicate some recognition of the increased cost of living that has so harassed professional people since the war, and bring the salaries into better relation with those earned both in the public health service and in comparable posts outside. The minimum salary in the scale is raised £100 from £850 to £950, and the maximum goes up £150 from £1,150 to £1,300. Medical officers at the maximum of the old scale and therefore earning £1,150 are to go immediately to £1,250 on the new scale and thence to the new maximum of £1,300; while officers at other points go to the corresponding points on the new scale. The award takes effect from June 1.

Fuller details of the award, which are reported in the Supplement at page 278, show that, while it falls short of

the profession's claim by £50-£100, it is a considerable advance on what the Management Side of the Whitley Committee "C" was offering. That was a kind of cost-of-living allowance adding £25 to the minimum salary and tapering off until the same maximum salary was reached after the same number of increments. The niggardly character of this offer must have been as evident to the Industrial Court as it was to the medical officers concerned, and the award bears no trace of being influenced by any part of it. The scale claimed by the medical officers represented a 100% increase over the pre-war scale. In comparison with many other claims, especially those outside the professions, it was therefore a modest one. Even so, the Court did not see fit to decide wholly in its favour. But it should do much to mitigate the hardship of which some assistant medical officers have justly complained in recent years.

THE PAINFUL SHOULDER

In 1934 Codman¹ drew attention to the degenerative changes which occur in the conjoined tendon of the supraspinatus, infraspinatus, teres minor, and subscapular muscle. These changes affect the supraspinatus tendon more frequently than its neighbours. They are common in women at the menopause and in men with cardiovascular disease, and are the essential precursors of painful lesions of the shoulder. These were discussed by Withers in our Refresher Course series last year.²

The painful shoulder syndrome may be started off by occupational strains and minor injuries, particularly those causing partial tears of the supraspinatus tendon, by immobilization for such conditions as fractures of the arm and operations on the breast, and by pain referred from the cervical spine. Another factor is what Coventry³ calls the "peri-arthritis personality." This comprises undue sensitivity to pain and certain constitutional and emotional characteristics common in patients with stiff and painful shoulders.

Two chief clinical lesions are recognized: the local tendinitis, usually confined to the supraspinatus tendon, and the diffuse capsulitis of the conjoined tendon. In cases of local tendinitis movement may be only slightly impaired, but there is pain in the mid-range of abduction when the supraspinatus tendon impinges on the acromion—the "painful arc syndrome." In cases of diffuse capsulitis gross restriction of movement is common—the "frozen shoulder." Pain may be severe in the early stages, but as movement diminishes the pain subsides. In severe examples of this type pain may radiate down the limb to the hand, and there may be swelling and stiffness of the fingers, giving what is described as the "shoulder-hand syndrome."

Radiological examination may reveal the presence of a calcified deposit. These deposits usually lie in the substance of the supraspinatus tendon, but may occasionally invade the subacromial bursa. Deposits confined to the tendon commonly produce the symptoms of a

¹ *The Shoulder*. Boston, Massachusetts: T. Todd. 1934.
² *British Medical Journal*, 1952, 1, 40.
³ *J. Amer. med. Ass.*, 1953, 151, 177.
⁴ *J. Bone Jt Surg.*, 1949, 31B, 436.
⁵ *Ibid.*, 1949, 31B, 433.

Eastern Provinces, the most heavily infected area, the incidence of the disease was estimated as being twenty times greater than in India.

Need for a Research Unit in East Africa

Dr. R. G. COCHRANE, medical secretary of the association, in his report, described his visit last autumn to East and Central Africa and to Nigeria, where the system of village colonies combined with large-scale out-patient work had been shown to be most suited to African conditions. Within the next decade the Eastern Provinces were likely to demonstrate complete control of the disease in that region. Dr. Cochrane paid a tribute to Sir Leonard Rogers, "architect and planner" of the association, to whom, and to whose successor, Dr. Ernest Muir, so much of the achievement was due. Thanks to Dr. Paul Brand at Vellore, South India, a new constructive approach had been made to the residual deformities of leprosy. The possibility of yet another effective line of attack was to be found in the recent attempt to increase resistance, particularly in children, by the use of B.C.G. Nevertheless, Dr. Cochrane added, any optimism about the control of leprosy must always be tempered with great caution; even the sulphone remedies had their drawbacks. The process of bacteriological cure was painfully slow, and there was difficulty in getting advanced cases to the stage at which they could tolerate an effective therapeutic dose of the drug. Many persons were found to be infective after years of treatment. For these reasons still more knowledge of the disease was needed, and there was call for further support to make the planned "Belra" Research Unit in East Africa an actual fact.

MEDICAL CORONATION HONOURS

The names of the following members of the medical profession were included in a Coronation Honours List published in *Supplements to the London Gazette* on June 1:

K.C.M.G.

Sir JAMES BENNETT HANCE, K.C.I.E., O.B.E., M.D., F.R.C.S.Ed. Lieutenant-General, I.M.S. (retired). Medical Adviser and President, Medical Board, Commonwealth Relations Office.

K.B.E. (Military Division)

JAMES MACCONNELL KILPATRICK, C.B., O.B.E., M.B., B.Ch., D.P.H. Acting Air Marshal, Royal Air Force. Honorary Physician to the Queen.

K.B.E. (Civil Division)

FRANCIS GORDON BELL, M.C., M.D., F.R.C.S., F.R.C.S.Ed. Formerly Professor of Surgery in the University of Otago, New Zealand.

Knighthood

The Hon. Mr. NICHOLAS ATTYGALLE, F.R.C.S., F.R.C.O.G. President of the Senate, Ceylon. For services to medicine.

DAVID CAMPBELL, M.C., M.D., F.R.F.P.S. President of the General Medical Council and Regius Professor of Materia Medica and Therapeutics in the University of Aberdeen.

FRANCIS MARTIN ROUSE WALSH, O.B.E., M.D., D.Sc., F.R.C.P., F.R.S. President of the Royal Society of Medicine. Consulting Physician to University College Hospital, London.

C.B. (Military Division)

JOSEPH CLINTON COLLINS, C.B.E., M.R.C.S., L.R.C.P. Major-General, late R.A.M.C. Honorary Surgeon to the Queen.

FREDERICK KNOWLES ESCRITT, O.B.E., M.R.C.S., L.R.C.P. Major-General, late R.A.M.C. Honorary Surgeon to the Queen.

C.M.G.

PHILIP STANLEY FOSTER, M.B., Ch.B., F.R.C.S., F.R.A.C.S. Consulting Surgeon, Christchurch Hospital. Chairman, New Zealand Medical Council.

GEORGE MACDONALD, M.D., M.R.C.P., D.P.H., D.T.M. Professor of Tropical Hygiene in the University of London and Director of the Ross Institute of Tropical Hygiene.

C.V.O.

JOHN NIGEL LORING, M.R.C.S., L.R.C.P. Apothecary to the Household of H.M. the Queen.

C.B.E. (Military Division)

KENNETH BARRON FRASER, E.D., M.S., F.R.A.C.S. Colonel, Royal Australian Army Medical Corps.

PATRICK BRUNTON LEE POTTER, O.B.E., M.D., D.P.H., D.T.M.&H. Air Commodore, Royal Air Force.

FREDERICK ELVY LIPSCOMB, M.R.C.S., L.R.C.P., D.P.H., D.T.M.&H. Air Commodore, Royal Air Force. Honorary Physician to the Queen.

SAMUEL GERALD WELDON, M.B., B.Ch., D.P.H. Surgeon-Captain, Royal Navy.

FREDERICK WILLIAM WHITEMAN, O.B.E., M.B., Ch.B. Colonel (temporary) Pakistan Armed Forces Medical Services.

C.B.E. (Civil Division)

WILLIAM GEORGE BARNARD, F.R.C.P. Dean of St. Thomas's Hospital Medical School and Director of Pathology at St. Thomas's Hospital. Professor of Pathology in the University of London.

GILBERT BROWN, M.B., Ch.B., F.F.A.R.C.S., D.A., of Adelaide, South Australia. For services in the development of anaesthetics.

THOMAS MORRIS DAVIES, M.R.C.S., L.R.C.P. Deputy Director-General of Medical Services, Ministry of Pensions.

ALAN TAYLOR HOWELL, M.B., B.Chir., D.T.M. Director of Medical Services, Tanganyika, Colonial Medical Service.

WILLIAM LESLIE, M.C., T.D., M.B., B.S., J.P. for the Borough of Penzance. For political and public services in Cornwall.

ARCHIBALD DANIEL MARSTON, F.R.C.S., D.A., F.F.A.R.C.S. Lately Dean of the Faculty of Anaesthetics, Royal College of Surgeons of England.

ARNOLD ASHLEY MILES, M.D., F.R.C.P. Director, Lister Institute of Preventive Medicine, London.

GILBERT INNES STRACHAN, M.D., F.R.C.P., F.R.C.S., F.R.C.S.Ed., F.R.C.O.G. For political and public services and for services as Professor of Obstetrics and Gynaecology in the University of Wales.

RICHARD ROBERTSON TRAIL, M.C., M.D., F.R.C.P. Medical Director, Papworth and Enham-Alamein Village Settlements for the Tuberculous.

M.V.O. (Fourth Class)

JAMES LAWRENCE BUNTING ANSELL, M.R.C.S., L.R.C.P. Surgeon Apothecary to the Household of H.M. the Queen at Sandringham.

O.B.E. (Military Division)

JOHN MANSEL REESE, M.R.C.S., L.R.C.P., D.P.H. Surgeon-Commander, Royal Navy.

O.B.E. (Civil Division)

FRANCIS WARD ALLINSON, M.B., B.S., F.R.C.S. Professor of Surgery, Medical College Hospital, Dacca, Pakistan.

CHARLES ANTHONY BOUCHER, D.M., D.P.H. Medical Officer, Ministry of Health.

CECIL BURNHAM, M.B., Ch.B., F.R.C.S.Ed. Lately Commandant, Star and Garter Home for Disabled Soldiers, Sailors, and Airmen, Richmond, Surrey.

WILLIAM JOHN HUGHES BUTTERFIELD, M.D., M.R.C.P. Member of the Scientific Staff, Medical Research Council.

RICHARD ALEXANDER SEYMOUR CORY, M.B., Ch.B. Senior Medical Officer, Colonial Medical Service, Tuberculosis Sanatorium, Jamaica.

KENNETH JOHN GRANT, M.B., Ch.B., D.P.H. Medical Officer of Health, Great Yarmouth. For services during the recent floods in the Eastern Counties.

EBEN STUART BURT HAMILTON, M.C., M.B., Ch.B., F.R.C.S.Ed. Commissioner, Duke of Lancaster's District, St. John Ambulance Brigade.

ALBERT JOSEPH HAWES, M.D., F.R.C.P., D.T.M.&H. Senior Specialist, Colonial Medical Service, Gold Coast.

GORDON KING, F.R.C.S., F.R.C.O.G. Professor of Obstetrics and Gynaecology in the University of Hong Kong.

JAMES SANDERSON MCGREGOR, M.D., D.P.M. Medical Superintendent, Saxondale Mental Hospital, Radcliffe-on-Trent, Nottinghamshire.

WILLIAM JOSEPH MOODY, M.B., B.Chir., F.R.C.S.Ed. Lately Medical Adviser to the British Political Resident and Chief Quarantine Medical Officer, Persian Gulf. Lieutenant-Colonel, I.M.S. (retired).

GEORGE RANKINE, M.C., M.B., Ch.B. General Practitioner, Dundee.

SARAH ANDERSON JAMIESON RANKINE, M.B., Ch.B. Medical Officer in charge of St. Margaret's Hospital, Poona, Bombay.

HENRY RICHARDS, M.B., B.S., D.P.H., D.T.M.&H. Assistant Director (Public Health), Sudan Government.

GEORGE ROBERTSON ROSS, Ph.D., M.B., Ch.B., D.P.H. Member of the Public Services Board, Southern Rhodesia.

EMRYS CADWALADR THOMAS, L.R.C.P.&S.Ed. Director of the Victoria Hospital, Damascus.

JOHN DUNCAN WHITE, M.B., Ch.B., D.M.R.E. Director, Radiodiagnostic Department, Hammersmith Hospital.

THOMAS MACFARLANE WILKS, M.B.E., T.D., M.R.C.S., L.R.C.P. Area Commissioner, St. John Ambulance Brigade, London. For services during the recent floods in the Eastern Counties.

DONALD BAGSTER WILSON, M.D. Director, East Africa Malaria Unit, Colonial Medical Service.

M.B.E. (Military Division)

JOHN WILLIS COOMBE. Lieutenant, Royal Australian Army Medical Corps.

M.B.E. (Civil Division)

HENRY SIDNEY ATKINSON, B.M., B.Ch. Chairman of Committee, No. 135 (Reigate and Redhill) Squadron, Air Training Corps.

DOROTHY DELBRIDGE, M.B., Ch.B., D.T.M. For medical services in Fiji.

FRANCIS JOHN GRAHAM, L.R.C.P.&S.I. For services to the community in New South Wales.

GEOFFREY BUCKLAND ORBELL, M.B., Ch.B., of Invercargill, New Zealand. For scientific work.

WILLIAM OLIVER PETRIE, M.B., Ch.B.Ed., D.T.M.&H. Medical Officer, Nyasaland, Colonial Medical Service.

RONALD REES POWELL, M.R.C.S., L.R.C.P. Chairman, Reigate Unit Committee and Southern Area Representative, Sea Cadet Council.

Soo HOY MUN, M.B. Honorary Medical Officer, Chinese Maternity Hospital, Federation of Malaya.

The Coronation Honours List includes also the appointment to the Order of the Companions of Honour of the Right Hon. Thomas Johnston, P.C., Hon.F.R.C.S.Ed., Secretary of State for Scotland from 1941 to 1945; Knighthoods for Alderman J. W. Bowen, C.B.E., chairman of the North-east Metropolitan Regional Hospital Board and the National Health Service General Whitley Council, Mr. H. N. Linstead, O.B.E., M.P., secretary of the Pharmaceutical Society, and Mr. Frederick Messer, C.B.E., chairman of the Central Health Services Council and lately chairman of the North-west Metropolitan Regional Hospital Board; and the C.B.E. for Mr. W. G. Senior, O.B.E., principal dental officer at the Ministry of Health.

MEDICINE UNDER THREE QUEENS

EXHIBITION AT THE WELLCOME MUSEUM

As part of its Coronation celebrations the Wellcome Historical Medical Museum has prepared an exhibition illustrating "Medicine Under Three Queens: Elizabeth I, Anne, and Victoria." The exhibition was formally opened on June 5. In introducing Sir Zachary, Dr. E. Ashworth Underwood, director of the Museum, explained that the three periods had been chosen because they brought out the characteristics of the British people: these characteristics were well shown by the medical men of the times.

Sir Zachary Cope, who gave a short address on "The Birth of Modern Medicine," paid a tribute to the trustees of the Wellcome Foundation for their maintenance of a museum and library invaluable to medical historians. He said that his theme was most appropriately illustrated by the progress of medicine during these three reigns. Progress was brought about by the effect of an idea on a fact. Up to the time of Elizabeth I no physician had acted upon this axiom, and true progress had been impossible. During

her reign modern anatomy and physiology had had their beginnings, the *De Fabrica* of Vesalius had been translated into English, and the first steps taken towards the conception of modern medicine. Harvey had been born, and his ideas on circulation had been formulated during this reign. English was being used considerably for the first time. During the next century little progress was made, and the quickening of modern medicine was left until the time of Anne. It was during her reign that Cheselden saw the need for the systematic teaching of anatomy. In 1711 he published a syllabus and gave lectures on the subject, and, with Hawksbee, on physics as related to the human body. There followed the foundation of more hospitals and medical schools. The Apothecaries Act of 1815 must be regarded as only a pseudo-gestation. The real birth of modern medicine occurred in 1858 with the passing of the Medical Act and the formation of the General Medical Council. In the same year Virchow had published his *Cellularpathologie* and Pasteur was completing his work on fermentation. A year later appeared Florence Nightingale's *Notes on Nursing*, and it could be said that nursing was born within a year of modern medicine. From the birth of Harvey to 1858 was a period of 280 years; the period of human gestation was 280 days. The last hundred years had covered the childhood, development, and adolescence of modern medicine, and to-day its position was greater and more powerful for good than it had ever been in any era of history. Sir Zachary wished that the reign of Elizabeth II had been included in the exhibition, for he felt that the present was a great moment in medicine. Revolutionary discoveries were on the way, and the fact that older members of the profession were often unable to understand papers now being published in the journals showed that something great might be pending.

A vote of thanks to Sir Zachary Cope was proposed by Sir Gordon Gordon-Taylor, and seconded by Sir Allen Daley. The exhibition, which includes books, portraits, instruments, etc., illustrating outstanding medical men and their achievements during the three reigns, will remain open until further notice.

CLIMBING EVEREST

SOME NOTES ON THE MEDICAL TEAM

The doctor in medical charge of the Everest expedition is Dr. Michael Ward. At the age of 12 he climbed the Matterhorn, and as a medical student at Cambridge he clambered round the roofs with its famous night climbers. In 1951 he went to the Himalayas with Shipton on the reconnaissance expedition which led to the present successful approach to the summit. He was the first then to see the footprint of the Abominable Snowman. Dr. Ward's main concern now is looking after the medical care of the party, and this duty has come first when it was thought he might be one of the men to reach the summit.

Dr. L. G. C. Pugh, a physiologist from the Medical Research Council, is not a climber, but accompanied the party in order to carry out tests on the physiological effects of high altitude. He accompanied Shipton's last expedition and was mainly concerned with the use of oxygen. Should it be given as a cocktail when deterioration is setting in, or should it be used all the time above certain heights, even when sleeping in one's tent? In this debate he has always been a firm supporter of the latter method. His duty has been to remain in the region of the base camp and perform physiological tests on climbers coming down from higher altitudes.

Mr. R. C. Evans, a surgeon in Liverpool, is regarded as one of the best climbers in this country, and has all the qualities of what experienced climbers call a "good executive technical mountaineer." A short, quiet, unobtrusive man, he learned his climbing in the Welsh mountains, and climbed in the Himalayas in 1950 and 1952. Strongly

fancied as one of the men most likely to reach the summit, he was selected with T. D. Bourdillon for the first attempt on it with a closed oxygen apparatus, but they failed to reach it.

Perhaps the most trying task has fallen to Dr. Ward. The medical problems appear the whole way from Khatmandu to the summit and back. In the swamps and jungles there are bites and stings and leeches, and a fair chance of contracting malaria. Proguanil was given to each man, and sulphaguanidine was part of the diet right up to the glacier, where water can be obtained from melted snow. On the way up Dr. Ward watched the acclimatization of the party and later deterioration, and took apparatus for testing the climbers at various levels. First and foremost came the job of caring for the health of the party. High on the mountainside sore throats and tonsillitis are a constant trouble—probably due to panting from oxygen-lack in an atmosphere of low humidity which can reach -20°C . Breathing apparatus used on previous expeditions failed in its purpose but cut down sore throats through retaining humidity. Carelessness can quickly lead to frostbite and snow blindness. A doctor on a previous expedition lost a finger-tip through pressing a camera-shutter with an ungloved hand.

For all the excitement in the Press, a good deal of the climbers' time has been spent in loneliness and monotony. They took books with them, and, according to Ward, their way of thinking and taste in reading changed greatly on Everest. Thought is mainly devoted to matters of food—hot meals being impossible when boiling water is only lukewarm. Over 17,000 feet one ceases to think of the opposite sex, he claims, and men who rarely read anything but crime stories crave for the classics. Dr. Ward took Jane Austen and the Brontës with him in order to defeat monotony, "because I have never been able to read them down here. On the last expedition we all read Trollope and enjoyed him, yet none of us had ever been able to read him before. It was because he gave such a vivid picture of the exciting everyday things."

CORMAC SWAN.

Nova et Vetera

A VANISHED CULTURE

Uttermost Part of the Earth. By E. Lucas Bridges. (Pp. 558; illustrated. £1 10s.) London: Hodder and Stoughton. 1951.

This unique book is the only one by its author. It appeared in his old age, shortly before his death, and took its place as a classic from the day of publication. Bridges was the last, and probably the first, educated Englishman who was born and reared among savages of a Stone Age culture. He acquired their language almost as early as his own, had an interest in their ways of life and thought, and travelled and lived with them for many of his adult years. He was a member of a family who, in their own ways, both boys and girls, were as intelligent and adventurous as himself. The book is long, but any one of the 48 chapters may be read separately, for each is a stirring tale of adventure. I know no better book for older boys and girls who love adventure, but it is also of great scientific interest. Medically it tells much of the powers of endurance of different races when long exposed to the most rigorous climatic conditions. It also tells of the reactions of different races to various medical and surgical conditions. Anthropologically it is not only by far the best record of a people now extinct but, above all, probably the only record of life among savages in terms of individual personalities. It displays the infinite variety of human character to be found no less among primitive peoples than among ourselves.

The "Uttermost Part of the Earth" is the irregular group of great islands known as Tierra del Fuego in the extreme south of South America and is the nearest to Antarctica of any permanently inhabited land. It is impossible to de-

scribe in a short space the pulse-stirring character of this book, and I shall confine myself to a few words first about the author's father—who is perhaps the real hero of the story—and then about the people among whom his life was passed.

Starting a Settlement

Thomas Bridges, father of the author, was adopted in childhood by a clergyman interested in missionary work among the Fuegians. Several missionary attempts had been made, but with considerable loss of life. At last it was suggested that a missionary base might be formed in the Falklands, and Keppel Island was given by the Government for the purpose. The clergyman with his wife and family, including Thomas Bridges still in his early teens, embarked in 1854 for Keppel in a schooner of 88 tons register. During the next years, with great difficulty and after repeated attempts, they persuaded a few Fuegians to settle in Keppel. These learned a few words of English and the missionary group learned a little of one of the native languages, but Thomas, still a stripling, applied himself to this task with special energy and skill. After some years it was decided to make another attempt to form a settlement on Tierra del Fuego. With a single exception the entire crew and the missionary party were murdered by the natives. After consideration the remaining missionaries on Keppel decided that the project was hopeless and returned to England. Thomas Bridges, now 18 but the only living expert in a Fuegian language, elected to remain and was left in charge of the settlement. He perfected his knowledge of the language and prepared in manuscript a dictionary and grammar of it which now, after many many adventures of their own—*habent sua fata libelli*—rest among the treasures at the British Museum.

Stone Age

He then made the voyage to Tierra del Fuego, where the natives were astonished to be addressed by a white man in their own tongue. By 1867 he had succeeded in establishing a small farm worked by a few natives on one of the outlying islands. Much of the best story-telling in the book is the life of this most gallant, able, and determined man. He returned to England, where he persuaded a lady to marry him and to go with him to Tierra del Fuego. They had three sons and three daughters, the remarkable lives of all of whom are indicated here. This splendid man died in 1898, apparently from haemorrhage from ulcer of the stomach, at a post that he had established in the land of his choice. He was about 57.

As to the people that he served: despite the severity of the climate and the tempests with which their land is swept winter and summer, they were normally naked, using mantles of skins only for special occasions. They were ignorant of metals, had no domestic animals, and did not cultivate the earth. They lived mainly on wild llamas that they were able to kill with their bows and stone-tipped arrows, combined with a few birds, plants, and fish that they gathered. The women fished and they alone could swim. The men seem normally to have had two wives. As between tribe and tribe they were very ferocious, making nothing of the life of one who could not speak their language, but they cared for their old people. They were not cannibals. Neither the author of this book nor his father was able to find a trace of anything that could be called a religion. They were expert in making their weapons, notably their complex bows and harpoons, on which they chiefly relied for their food.

The name of their country, "Land of Fire," seems to be due to the custom of small parties signalling to each other by lighting fires. They had no fixed settlements. An epidemic of measles that affected all the Bridges family led to the death of great numbers of the Fuegians. They were later practically exterminated by tuberculosis, syphilis, and alcohol. Hardly a memory of them can now survive, which makes this remarkable book at once a memorial of a people, of a language, of a family, and of a man.

CHARLES SINGER.

Correspondence

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

Misuse of Drugs in Tuberculosis

SIR,—May I make a plea for the more thoughtful use of the new drugs in the treatment of tuberculosis? It is a not uncommon experience at this hospital to receive patients from general hospitals who have already received a very large dosage of streptomycin, amounting in one case to over 170 g. Although great improvement in these cases may have occurred, it is achieved almost inevitably at the cost of the development of resistance to the drug, even though it may have been given in combination, and risks of permanent damage to the eighth nerve at this dosage cannot be negligible. I do not need to stress the disadvantages of the development of resistance, which are well known, except to mention that patients received here in this connection for whom major surgery is contemplated are, as a result, rendered hazardous subjects, particularly if resection is envisaged.

There has always been a proper strategy in the treatment of tuberculosis, which must essentially be unhurried, and it is important to integrate these new and effective agents with it. I would suggest that, except in a very acute or military case, in the present state of our knowledge, streptomycin should be given in 1-g. doses on alternate days or even every third day, combined with a total daily dosage of 12–15 g. P.A.S. and/or 200 mg. of isoniazid, until 30 g. of streptomycin has been given; radiological improvement will usually continue for some weeks after the end of such a course, and the patient can then be reassessed. He is unlikely to have developed resistance to any of these drugs, and they can be similarly given again in further courses either to secure more improvement, to cover major surgery, or to treat the relapses occurring at a later date. It may also prove that the middle-aged "chronic" who is unsuitable for collapse therapy may be kept reasonably fit and rendered temporarily non-infectious by similar periodic courses, provided resistance has not been allowed to develop by maldosage.

Greatly improved results are possible in the treatment of tuberculosis following the introduction of these new drugs, and it is essential, therefore, to use them to the best advantage.—I am, etc.,

W. E. SNELL.

London, N.W.9.

Anticoagulants in Myocardial Infarction

SIR,—I thought that the questions raised by Mr. John Fry (*Journal*, May 16, p. 1109) and further elaborated by Dr. R. A. Murray Scott and Dr. John C. Ryle (*Journal*, May 30, p. 1223) had been adequately answered in the joint paper and correspondence with Dr. K. Shirley Smith.¹ The conclusions reached in a series of 200 cases of cardiac infarction agree with Mr. John Fry's statement that the incidence of severity of the disease is about equal in general and of severity of the disease in hospital practice. We were also able to show that the mortality figures in untreated cases of slight and moderate cardiac infarction (that is, in patients without intractable heart failure) for the first two months following infarction were only 2%. These patients made up more than half of the whole series; this means that anticoagulant treatment may not be required in half of the cases. The assessment of treatment is done on clinical grounds and is in the province of any experienced general practitioner. The objection that a slight cardiac infarction may complicate into a severe one is valid, although this is an uncommon event; the patient then has recurrent angina following the bout of infarction pain, and this in itself is an indication for anticoagulant treatment.

Ethyl biscoumacetate ("tromexan") was a distinct advance over dicoumarol, and so is phenylindanedione ("din-

devan") over ethyl biscoumacetate.² However, all require laboratory control, although phenylindanedione less often. If the patient is reliable enough to report discoloration of the urine or lumbar pain—haematuria is by far the most frequent haemorrhagic manifestation—anticoagulant treatment can be safely carried out at home if twice-weekly prothrombin estimation is practicable during the first fortnight and once weekly later.

I agree with Dr. Murray Scott that shock following cardiac infarction needs energetic treatment; I am not sure if leptazol-ephedrine injections will always be effective. The danger of persistent shock is so great that it far outweighs the danger of removal to hospital where only it can be effectively treated with intravenous infusions and pressor drugs.—I am, etc.,

C. PAPP.

London, N.W.3.

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- ¹ *British Medical Journal*, 1951, 1, 1471.
- ² *Ibid.*, 1952, 2, 515.
- ³ *Ibid.*, 1953, 1, 650.

SIR,—Mr. John Fry in his letter on anticoagulant therapy (*Journal*, May 16, p. 1109) raises several interesting problems, to some of which there would appear to be no easy answer.

The results in all large series of treated and control cases of coronary thrombosis so far published in this country and America agree on the value of anticoagulants in reducing the mortality and morbidity of this disease. Therefore, would it not appear to be our duty to use these drugs in all cases wherever possible? I. S. Wright¹ has argued against those who would only treat the severe cases in this way by pointing to the fact that the minor attack may be the herald of the major catastrophe.

In the decision as to which cases are in urgent need of anticoagulants the laboratory may be able to provide some help. Rosenthal,² using a simplification of the Waugh and Ruddick heparin tolerance test,³ found that in 14 cases out of 19 of recent coronary thrombosis a result below the normal range was obtained (i.e., clotting was accelerated). At Withington Hospital we have been using a simple heparin retarded plasma clotting test for some time. In 37 of 50 cases of recent thrombo-embolic disease clotting was found to be "accelerated" at the initial test. Heparin in addition to dicoumarol has been immediately administered in such cases. This type of test may also be of value in determining when anticoagulant therapy may be safely discontinued.—I am, etc.,

L. POLLER.

Manchester.

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- ¹ *Circulation*, 1952, 5, 161.
- ² *Ibid.*, 1952, 6, 257.
- ³ *Canad. med. Ass. J.*, 1944, 51, 11.

Poliomyelitis in Copenhagen

SIR,—In December, 1952, I was privileged to visit the hospital in Copenhagen where the poliomyelitis cases were treated. It appears, from articles in the *Journal* of May 30 (pp. 1208 and 1216), that Professor Lassen has, unwittingly, given the impression that he was responsible for the introduction of a new method of treatment of cases with respiratory paralysis. I am sure he would wish this to be corrected.

When, last summer, 27 of the first 31 of these cases had died under the methods of treatment orthodox in Europe, Dr. Bjørn Ibsen, then chief anaesthetist at the neighbouring university hospital, attended a conference called by Professor Lassen. Dr. Ibsen's everyday experience of the artificial control of respiration and his knowledge of the American literature enabled him to suggest certain radical improvements. When, eventually, his suggestions were accepted, he and his anaesthetist colleagues from the other Copenhagen hospitals took over this aspect of the treatment of these cases and provided continuous supervision through the months of the emergency. Early tracheotomy has previ-

ously been advocated for the proper control of pharyngeal secretions; the use of a cuffed tracheal tube and of artificial respiration by manual compression of a bag (techniques employed daily by anaesthetists, but unfamiliar to epidemiologists) with a high rate of gas-flow and a to-and-fro carbon dioxide absorber (not "closed circuit") were introduced and adapted to the demands of this emergency by Ibsen and his colleagues. They also trained and supervised the large number of medical students employed by Professor Lassen. As the method they used is likely to be developed further, it would be better left unnamed; if a name is to be attached, it must be that of Ibsen.—I am, etc.,

London, S.W.1.

GEOFFREY ORGANE.

Acute Malaria Probably Precipitated by A.C.T.H.

SIR,—When about eighteen months ago I started the studies on the action of A.C.T.H. and cortisone in the complications of leprosy already recorded in the *Journal* of October 4, 1952 (p. 746), a correspondent informed me that it had been recorded that these hormones could precipitate an attack of malaria in a person harbouring a latent infection. In this area, malaria (*P. falciparum*) is highly endemic and many persons have latent infections. I have used A.C.T.H. and cortisone in many Africans, mainly adults, and, although a few of these patients have had malaria in the following days, I have seen no reason to ascribe these attacks to the hormone treatment. Recently, however, I have had occasion to give A.C.T.H. to a European who was taking pyrimethamine ("daraprim") as a malaria suppressant, and the hormone apparently provoked a fulminating attack of malaria. The details are here summarized.

A European woman, long resident in the Tropics, with a history of two attacks of malaria long ago, came to Nigeria in December, 1952, and had been taking pyrimethamine, one tablet once a week, as a malaria suppressant, with the complete absence of any signs of malaria. In April, 1953, she developed extensive inflammation and irritation of the skin, which here is frequently associated with filarial infection. Blood examination revealed no microfilaria, but eosinophils formed 38% of the white cells present. Local skin treatment brought no relief, and the condition was so distressing that a course of diethylcarbamazine ("hetrazan") was started. Within 48 hours there was, as usual, an intense exacerbation of the skin symptoms, which fact tends to support the diagnosis of filarial infection as the cause. Antihistamines gave little relief, so an injection of 50 mg. of A.C.T.H. was given, with immediate relief of symptoms. Diethylcarbamazine was continued, and three days later the dermatitis was markedly improved. Then, while diethylcarbamazine was still being given, there occurred a fulminating attack of malaria caused by *Plasmodium falciparum*; in addition to very high fever, there was intense purging and great weakness, and for 24 hours the patient's condition was critical. With prompt diagnosis and energetic treatment (quinine by injection, and chloroquine) the fever was controlled, and the patient is now convalescent. Some diarrhoea with mucus and many red blood cells in the stool has persisted for several days. Repeated examination for *Entamoeba histolytica* has given negative results; the diarrhoea has been completely uninfluenced by phthalylsulphathiazole. There is clear evidence of ulceration of the colon with slow healing. I am of the opinion that the bowel condition was caused by the malaria; profuse diarrhoea is a frequent manifestation of malarial infection here, particularly in children and non-immunes. In the present case the clinical picture from the onset of the fever was that of "choleraic malaria."

It is realized that it is unwise to argue from one case. This present case, however, was striking. A woman was, like many others, taking pyrimethamine for suppressing malaria, with very satisfactory results; she received one injection of A.C.T.H., and on the same day actually took, in my presence, a tablet of pyrimethamine. Three days later there was a fulminating malaria, with very severe intestinal symptoms, such as is seen only in non-immunes who are taking no suppressive treatment whatever. The evidence that the A.C.T.H. precipitated the malaria is, I feel, strong; moreover, the intestinal symptoms, if not due to malaria, could be due to the acute exacerbation by A.C.T.H. of a latent bowel infection. These ideas are in keeping with knowledge of the action of A.C.T.H., which can much reduce the tissue cell activity which is keeping an infection in check. So far, little A.C.T.H. or cortisone has been used in the Tropics; this is possibly the reason why incidents such as the present one have not been common.

This case indicates (a) that A.C.T.H. can give striking relief in the severe allergic reactions often seen in cases of filariasis being treated with hetrazan; (b) that it seems probable that A.C.T.H. can temporarily neutralize immunity to malaria (and possibly other infections) and provoke a fulminating attack in persons in whom such infections are latent; and (c) that therefore A.C.T.H. cannot be used with safety in such cases. It seems, however, possible that such dangers of giving A.C.T.H. can be overcome by the simultaneous use of energetic measures to combat such infections. If A.C.T.H. and cortisone are to be used in malarious countries, or in persons returning from malarious countries, this matter should receive consideration. Further studies of this matter are needed.—I am, etc.,

Uzuakoli, E. Nigeria.

JOHN LOWE.

Relief of Pain in Childbirth

SIR,—The letter of Mr. Ian Simpson (*Journal*, May 16, p. 1110) reminds us of Sir James Young Simpson's valiant attempt to help the woman in labour, and it is indeed fitting that just one hundred years after Queen Victoria received the benefits of analgesia, we should look more closely into the position of analgesia in labour to-day.

Recent correspondence in *Public Health*¹ and the *Medical Officer*² and the address of the late F. Neon Reynolds to the British Medical Association in Dublin, 1952, have shown that this position is far from satisfactory. I have received a number of letters from mothers in various parts of England, all telling a sad and sorry tale. One describes how she was given gas and air for her last pain only. This practice is not uncommon, and one cannot escape the conclusion that the gas-and-air machine is sometimes used as a face-saving device, as the patient who receives gas for only one pain goes down in the records as having received analgesia.

Another mother tells me that she did not get gas and air because the machine was empty. So the melancholy record goes on. It is perfectly clear to any honest and sincere observer that our girls are not receiving the attention which is their due. This, twenty years after the introduction of gas-air analgesia. Some hospitals have shown how great can be the benefits of modern analgesia to the woman in labour, and in domiciliary midwifery the County Medical Officer of Health for Hertfordshire has conclusively demonstrated what wonderful results can be obtained from his own inspiring leadership in this county. Taking England as a whole, the relief of pain in maternity falls lamentably short of what might reasonably be expected, and the help given under nationalized medicine compares very unfavourably, both in hospital and domiciliary midwifery, with that provided by the Hertfordshire County Council.

Let there be no misunderstanding. Whether we use chloroform or nitrous oxide or trichlorethylene, or any other thing, no satisfactory results can be expected until there is a genuine and sincere desire to provide relief from pain and unless the necessary organization for such a service is forthcoming.—I am, etc.,

New Barnet.

J. E. ELAM.

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- ¹ *Publ. Hlth (Lond.)*, 1953, 66, 79.
- ² *Med. Offr.*, 1953, 89, 75.
- ³ *Ibid.*, 1953, 89, 97.

Haemophilia with Respiratory Obstruction

SIR,—The paper by Dr. A. C. Macdonald and his colleagues (*Journal*, May 23, p. 1144) recalls a similar case in which I was involved about a year ago.

The patient was a healthy young man of 24, who was well known by his doctor and dentist to be a "bleeder." He had attended the local dental hospital for toothache and it was decided to fill the cavity in the tooth under a local anaesthetic inferior dental nerve block. Unfortunately the needle used for the injection transfixated the inferior dental vessels and rapid extravasation of blood developed in the soft tissues of the left cheek. The swelling developed so rapidly that the dental filling had to be abandoned. He was admitted to hospital 12 hours

later with difficulty in swallowing due to gross extravasation of blood in the tissues of the left cheek and the floor of the mouth. The tongue was purple in colour, oedematous and filled almost the whole of the oral cavity. There was no actual bleeding into the mouth, and the condition seemed to be entirely one of extravasation into the soft tissues.

During the next 12 hours the swelling increased steadily. The tongue not only filled the oral cavity, but protruded from the mouth. There was a large swelling in the left side of the neck, which appeared to be fluctuant in places. By this time difficulty in breathing was obvious and increased rapidly. Surgical treatment became imperative. As in the case quoted by Dr. Macdonald, it was decided to explore the swelling in the neck. To our dismay, no localized collection of blood was found, only a diffuse interstitial extravasation of blood in the tissues of the neck and the floor of the mouth. To provide an airway, a formal tracheotomy was performed. It was considered unwise by our anaesthetic colleagues to attempt tracheal intubation through the nose. The patient's recovery was complicated by persistent oozing from both wounds. The wound on the left side of the neck broke down, and even after packing with fibrin foam soaked in thrombin solution and closing the wound by suture, the oozing still continued for several days. It took some 10 weeks for the swelling of the face and tongue to subside and the wounds of the neck to heal soundly. In all, the patient was given 24 pints (13.6 l.) of blood in the course of one week. Nine pints (5.1 l.) of this blood was fresh, taken on the spot from volunteer donors and transfused almost immediately.

It is generally recognized that transfusion of even one pint (0.568 l.) of fresh blood will diminish materially even severe bleeding from a haemophilic patient. In our case it was alarming to find that transfusion of large amounts of fresh blood did not have this dramatic effect. Two factors may have contributed to this. Although we had asked specifically for fresh blood, not more than 24 hours old, some of the blood sent to us as "fresh" from the Regional Blood Transfusion Service was found to be over 48 hours old. The transfusion of large amounts of stored blood over a short period must necessarily increase the concentration of citrate in the circulating blood. This might affect the normal blood-clotting mechanism in a patient who has already lost a large amount of blood. Those of us who have assisted at emergency gastrectomies for persistent haematemesis have often remarked upon the unusual amount of bleeding which occurs during the operation. Since all these patients have had large amounts of blood transfused both before and during the operation, overdosage with citrate is a possible explanation. I am not aware, however, that any proof has been adduced to support this clinical impression.—I am, etc.,

Salisbury.

MICHAEL N. TEMPEST.

Treatment of Ringworm of the Scalp

SIR,—Dr. B. A. Thomas (*Journal*, May 9, p. 1052) in replying to my letter (*Journal*, April 4, p. 780) has found it necessary to base his criticism on a flagrantly inaccurate paraphrase of my words. I did not, as suggested by Dr. Thomas, claim that "the majority of authorities are in favour of x-ray epilation for *M. canis* ringworm." My actual words were: "Most authorities agree that topical treatment may prove inadequate in some cases of *M. canis* ringworm" and in this connexion I would refer Dr. Thomas to Duncan,¹ Ormsby and Montgomery,² and Sharp.³

Dr. Thomas explains that the "frequency of erythema reactions and also of coincident glabrous skin involvement as a means of diagnosing *M. canis* scalp infections" renders as a means of diagnosing *M. canis* scalp infections. This is not in examination by Wood's light unnecessary. Beare accord with the observations of other investigators. Beare and Cheeseman⁴ and Hayvatt⁵ found that little or no inflammation was present in approximately half of the cases examined by them. Furthermore, *M. canis* scalp infections are not invariably associated with glabrous skin involvement. In consequence, I contend that the use of Wood's light in the diagnosis of *M. canis* scalp infections can hardly be dismissed as "unnecessary." If, as would appear to be the case, Dr. Thomas relied on simple clinical inspection of the school populations referred to in his

article and omitted Wood's light examination in assessing the "cure" in his series of 24 cases, it would seem that his conclusions can at best be regarded as of doubtful validity.—I am, etc.,

Glasgow, W.2.

W. A. DEWAR.

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- ¹ *Modern Trends in Dermatology*, 1948, edited by R. M. B. MacKenna. Butterworth and Co. (Publishers), Ltd., London.
- ² *Diseases of the Skin*, 1948, 7th ed. Henry Kimpton, London.
- ³ *Aust. J. Derm.*, 1951, 1, 138.
- ⁴ *Brit. J. Derm.*, 1951, 63, 165.
- ⁵ *Aust. J. Derm.*, 1952, 1, 239.

Intestinal Reflux into the Bile Passages

SIR,—I should like to record the following case.

A frail lady of 71 was admitted with four days' history of central abdominal colic, vomiting, and intermittent abdominal distension. Four years before, a cholecystogram showed a failure to concentrate dye. Cystectomy had been advised but refused. Since then she had had mild recurrences of symptoms at intervals of a few months, the last attack being six months before admission to hospital.

Examination of the abdomen showed slight distension, no tenderness, presence of bowel sounds and waves of peristalsis from left to right across the upper sector. Splashing was elicited in the upper abdomen, while recumbent. A small left femoral hernia was reduced. Clinical findings suggested a pyloric stenosis. After a barium meal stomach and duodenum appeared normal, and barium passed as far as the ileum. Remarkably, however, the biliary tract filled with barium, outlining the common and hepatic ducts, and finer branches, in excellent detail (see illustration). The gall-bladder did not appear to fill.

The patient's condition was poor, and laparotomy was performed without delay. The obstruction in the small gut was not, as expected, a gallstone but a Richter's hernia in the neck of the left femoral canal. This was reduced. The patient's condition did not allow further exploration. There were no obvious adhesions in the upper abdomen. Recovery was uneventful except for tenderness over the liver for several days and a little pyrexia for about a week. A cholecystogram was done two months later. The gall-bladder concentrated poorly and emptied rapidly without the stimulus of a fatty meal. There was no indication of any abnormal communication between the biliary system and gut.

The interesting feature of this case was that x-ray examination after a barium meal showed a reflux of intestinal contents into the biliary passages. The clearness of the outline suggested that fluid had entered under slight pressure, presumably through a freely patent communication. The gall-bladder did not share in the reflux. The patient's mild symptoms did not suggest the earlier passage of a gallstone through the common bile duct. If a gallstone had quietly eroded its way into the small bowel from the gall-bladder, it is improbable that a widely open fistula would have persisted, and neither barium meal examination nor subsequent cholecystogram lent any support to this. On the other hand, a reflux of intestinal contents through the sphincter of Oddi may have occurred. The presence of an obstruction in the small bowel at the time, and the demonstration of a rapidly emptying gall-bladder subsequently, lend support to this. A subsequent barium meal was normal, and there was no evidence from the report of a barium meal four years previously of any reflux.

Should the diagnosis of retrograde flow into the common duct be correct, it raises the interesting possibility of this as a cause of cholangitis in obscure cases of cirrhosis.



My thanks are due to Mr. F. J. C. Matthews, under whose care the patient was admitted, for permission to publish this case, and to Dr. G. A. MacDonald and Messrs. Murphy, of the radiological department, for the x-ray investigations.—I am, etc.,

Covertry.

I. A. HARRIS.

Importance of Post-mortem Examinations

SIR,—In my experience, which extends to nearly 30 years in general practice, it is very rarely that the family doctor is informed even of the time at which a necropsy is to take place, let alone receives a report on the result—which in my case I can never remember happening. Is it not therefore time that someone was made responsible for seeing that this information was conveyed to the family doctor, for it is probably not always possible for him to attend in person? After all, he is much concerned in the matter. He may have attended the patient for many years, and he was in all probability called when the death took place. Furthermore, it was probably his decision that led to a post-mortem examination being carried out.

Post-mortem examination would no doubt sometimes throw interesting sidelights on the accuracy or otherwise of our diagnoses. Recently, when a myxoedematous woman of 75 died suddenly, and when perhaps a diagnosis of cerebral haemorrhage or coronary thrombosis would not have been unreasonable, the extreme and unusual pallor of the face, even in the dim light of the little scullery in which she was lying, led me to suggest that a post-mortem would be desirable. This eventually showed that my patient had, in actual fact, died of a ruptured aneurysm of the abdominal aorta; and this aneurysm was, in some way, probably the cause of the abdominal pain of which she had complained to her family for a fortnight before her sudden death.

In view of what Dr. F. E. Loewy (*Journal*, May 23, p. 1163) says upon the need for post-mortem examinations, one would like to ask him whether he is aware of the natural repugnance of people generally to post-mortem examinations on their deceased relatives. It is all very well to talk about the needs of medical science and educating the general practitioner. These are as nothing beside those feelings of sentiment and affection which are to be found in the generality of ordinary people.—I am, etc.,

Hove.

G. L. DAVIES.

Adrenaline Cream

SIR,—I have read with great interest the report (*Journal*, May 16, p. 1085) from the Walkden Clinic on the assessment of massage with adrenaline cream in the treatment of rheumatic disorders. At least one fact has emerged—that adrenaline cream has a definite therapeutic value as a palliative, thus refuting the findings of the Research Committee of the Empire Rheumatism Council, reporting on the controlled tests on 39 cases in all investigated at nine different centres in 1951. There are, however, certain observations I would like to make, as it is important to show why the results in recovery time obtained in this otherwise well-conducted trial differ from others previously reported (Moss¹ and Howell²).

It is a minimal dose of adrenaline acting in the skin that relieves muscle spasm and pain. I would refer future investigators on this subject to the work of Danielopolu³ on the double and antagonistic action of adrenaline in very weak concentrations on the intersympatho-parasympathetic mechanism, of Pasteur Vallery-Radot and Holzer⁴ and Morin⁵ on similar experiments using exceedingly weak concentrations of adrenaline, showing that it has a reversible action. I was therefore surprised to read that an adrenaline cream five times more concentrated than the one I have always employed has been used by this clinic in these tests.

In an assessment of recovery time the Walkden Clinic has based its trials on an early paper submitted to the *Lancet* in July, 1946, and published in the *Medical World* in 1949,⁶ and which dealt mainly with the treatment of "primary fibrositis." In all subsequent papers I stressed that all cases of osteoarthritis and cases of rheumatoid arthritis (the latter only treated in the rehabilitation stage) need a special technique of joint immobilization to get good results. I quote "patients should be treated daily in their homes and in their bed for the first few days. Freedom from pain and increased movements round the affected

joints are so marked, after five minutes of treatment, that if active movements are allowed a most severe 'tissue reaction' will follow (due to the stretching of muscular tissues and adhesions) after the 'anaesthetic' effect of the cream has passed off" (Moss⁷).

This technique has not been used and these cases have been treated only three times a week at an out-patient clinic, and, in all probability, walked home after treatment. It is not surprising that these patients took twice as long to recover compared with those treated with a simple cream which does not cause immediate relaxation and more freedom of movement. The treatment of disk lesions with adrenaline cream has never been suggested in any of my papers. The exciting factor in this condition causing pain and spasm is far too powerful to be beneficially influenced with adrenaline cream.

It would therefore appear that fully 60% of the cases treated for an assessment of recovery time with adrenaline cream (10 cases of disk lesions, seven cases of osteoarthritis, two cases of rheumatoid arthritis) have been treated by methods that would cause greater pain and further disabilities and delay considerably the recovery time and thus lead to a wrong assessment of the series as a whole.

The similarity of the findings with dry massage and adrenaline cream is of particular interest. It would appear that some "substance" is formed in the skin that blocks the pain chain mechanism. The theory advanced that the mode of action of the minute dose of adrenaline can be explained by systemic absorption has been discarded by the writer. If adrenaline cream is applied without massage to the skin (previously rubbed for a few seconds with a damp towel to remove surface impurities and weaken the horny layer) within a very few seconds pain is greatly relieved and the muscle can be felt to be relaxed. (Incidentally, the use of a simple cream will not have the slightest effect on pain or spasm.)

Furthermore, acting on my theory that it is very weak concentrations of adrenaline acting in the skin that produce these results, during the past 18 months I have been using intradermal injections of adrenaline 1/100,000 in association with adrenaline cream for the treatment of cases of rheumatoid arthritis—only in the rehabilitation stage—in cases of osteoarthritis and in those cases of fat and thick-set patients who suffer from primary fibrositis and who do not respond well to treatment with adrenaline cream (Howell²). Given subcutaneously, these injections have not the slightest effect upon pain or muscular spasm. Injections, in minimal doses into the skin, over the myalgic spots and referred areas of pain act almost within a second in the relief of pain and muscle spasm. It would be of interest to discover the weakest concentration of adrenaline that would have this effect.

A preliminary paper on this new technique, "Adrenalino-therapy Associated with Skin Therapy in the Treatment of Rheumatic Disorders," was the subject of a lecture demonstration that I gave to the Société des Praticiens de Paris on April 16 last.—I am, etc.,

London, W.1.

LOUIS MOSS.

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- ¹ *Med. Wld (Lond.)*, 1949, 70, 244.
- ² *Lancet*, 1950, 2, 395.
- ³ *Presse méd.*, 1947, 55, 214.
- ⁴ *C.R. Soc. Biol. (Paris)*, 1944, 138, 742.
- ⁵ *Ibid.*, 1944, 138, 611.
- ⁶ *Med. Wld (Lond.)*, 1951, 75, 288.
- ⁷ *Med. Press*, 1950, 223, 515.
- ⁸ *Clinique (Paris)*, 1953. In press.

Subcostal Pain Following Controlled Respiration

SIR,—Dr. T. T. Currie's medical memorandum (*Journal*, May 9, p. 1032) raises one or two important points. I was disturbed to read of the high incidence of apnoea lasting 5–10 minutes following the administration of both succinylcholine and gallamine triethiodide for such procedures as dental operations. I presume, although Dr. Currie does not specifically say so, that succinylcholine was given by the single-injection technique. Succinylcholine response varies so markedly from patient to patient in the lower-dose ranges (20–40 mg.), as far as both relaxation and apnoea are concerned, that I have largely abandoned this technique of single injections. I believe it to be a much more rational approach to titrate, as it were, the drug against each patient by the use of the continuous intravenous infusion of dilute solutions of succinylcholine, even when relaxation is needed for tracheal intubation only. In this way, excellent relaxation can be achieved with the minimum of succinylcholine for that particular patient, and with the avoidance of apnoea

in the very large majority of cases. If it does occur it is of extremely short duration (30 seconds or so). Although apnoea holds no dread for the well-trained anaesthetist, we must not lose sight of the fact that it is essentially an unphysiological state of affairs, as is the positive-pressure artificial respiration which must be instituted to maintain ventilation. Under certain circumstances, such as "bucking," restraining, and irregular patterns of respiration, manual respiration may be the lesser of two evils, but, on the whole, apnoeic states should be avoided unless specific indications exist.

My second point is one of semantics. "Controlled respiration" by our definition is that state wherein spontaneous respiration has been abolished by means of hyper-ventilation with oxygen, maximum elimination of carbon dioxide, overdistension of the lungs (inhibition of the Hering-Breuer reflex), and a varying degree of central respiratory depression, but in which spontaneous respiration will resume soon after manual ventilation has been discontinued. Paralysis with muscle-relaxants clearly does not come within this definition, as spontaneous respirations will not resume as long as the drug maintains its paralysing effects on the muscles of respiration and in particular the diaphragm. This type of respiration should be called what it has always been called—namely, "artificial respiration." The borderline between controlled and artificial respiration is not always too clear, and one may blend into the other; this occurs not infrequently after controlled respiration has been maintained for prolonged periods. Artificial respiration may not be as well-sounding a term as controlled respiration, but it is scientifically more correct in the case of apnoea from muscle-relaxants.—I am, etc.,

GORDON M. WYANT.

Chicago.

The Floating Spleen

SIR,—The case of a pedunculated cystic spleen described by Dr. A. H. Bartley (*Journal*, May 23, p. 1167) is so strikingly similar to a case of mine operated on in Northern Malaya some years ago that an interesting problem is raised.

This patient, a Malay woman of about 30 years, presented with a history of intermittent abdominal discomfort and a tumour so mobile that it was thought to arise from the pelvis. At operation a spleen measuring approximately 20 by 10 cm. was drawn out of the abdomen on a ribbon-like pedicle, the clear glossy surface of the organ being embossed with thin-walled cysts up to 4 cm. in diameter. Later, when the organ was cut, it was found that the bulk of the splenic tissue was replaced by isolated cysts as smooth inside as they were outside and containing clear straw-coloured fluid. There were no obvious cysts in the liver.

The point, then, is this. Is a cystic spleen more prone to become pedunculated than is the normal organ? Or do cysts develop secondarily in a mobile spleen through intermittent torsion of its pedicle?—I am, etc.,

Dundee.

J. F. RILEY.

Orthopaedics and Its Name

SIR,—There is a time when the original and accepted name given to a subject is no longer adequate or accurate and might usefully be changed. I feel this applies to the word orthopaedics, or -pedics in America. No doubt it has a good Greek origin from "the straight child" and I suppose was first applied to the correction of mechanical deformities in children. But now the subject covers a multitude of physical and mechanical disorders from the neck to the toes, and the name has long appeared inappropriate. This distortion of the meaning of words has been brought home to me recently by reading a most useful book entitled *Chiropodial Orthopaedics*—hands, feet, straight, children. This book is entirely devoted to adult feet. I gather that American "podalists" would be insulted by being called chiropodists, as the latter word stinks to them of chiropaxis.

But it is the word orthopaedics with which I am concerned. Why not orthosomatics, or some more accurately descriptive word? It could quickly and readily replace

the present word and would have an accurate meaning and sound well in the medical directory or telephone book. I feel seriously about the misuse of words, and wonder if the "orthopods" will agree to become "orthosomes" to their friends.—I am, etc.,

London, W.1.

R. D. LAWRENCE.

POINTS FROM LETTERS

Services Tobacco Concession

Dr. G. C. PETHER (Hitchin) writes: I recently examined for a job a youth of 20 years. He had just come out of the Army. He described attacks of bronchitis at intervals and also how he had smoked 180 cigarettes weekly while in the Services. He was still smoking 100 and was unable to calculate what it cost weekly or yearly. I took some trouble to instruct him in simple methods of calculation, which he had never learned at school. I submit that this "concession" of low-cost cigarettes is stupid, unnecessary, and most harmful to the exchange position, leaving the person supposed to benefit in worse health, reduced in pocket and even, as this case shows, incapable of estimating his outlay. Should not the Services sell tobacco at normal rates to those who want it, give a cash allowance in lieu, and spend a little more time in teaching simple arithmetic to those who need it?

Smoking and Cancer

Mr. GERALD SOLOMON (Manchester) writes: It is interesting to note that the statistics which are being used to show a relationship between lung cancer and tobacco smoking show that pipe smokers appear to be less likely to develop the disease than cigarette smokers. There is one implication of this state of affairs which I have not yet seen mentioned anywhere, but which does, I feel, merit investigation. The continual presence in the smoker's mouth of the stem of his pipe will surely stimulate the secretion of large volumes of saliva. Is it not possible that this solution takes up a carcinogen (or co-carcinogen) which the cigarette smoker inhales and the pipe smoker swallows? It would be interesting to see whether the incidence of carcinoma of the stomach is higher in pipe smokers than in cigarette smokers and non-smokers.

Barbiturate Poisoning

Dr. E. MACKERNAN (Birmingham) writes: In view of the increasing number of attempted suicides and cases of accidental poisoning by barbiturate tablets, capsules, etc., would it not be possible for the manufacturers to add 1–2 grains (65–130 mg.) of ipecacuanha to each so that in the event of a lethal dose of the former being consumed the emetic properties of the latter would take effect and the poison automatically vomited up? I believe some years ago I read a letter in the *Journal* from a Colonial member who adopted this method in his own dispensing practice.

Litigation Against Doctors

Mr. C. J. CELLAN-JONES (Swansea) writes: I agree with Mr. William Gissane (*Journal*, May 23, p. 1167) that increasing litigation against doctors menaces sound clinical medicine. Moreover, the happy relationship and the feeling of confidence which existed between the doctor and his patient are being replaced by mutual distrust. Recently, on reaching the theatre a patient said, as he waved an accusing finger at me: "They knocked my elbow as they wheeled me in. It may be nothing, but remember that I have warned you." The atmosphere of the operating-theatre is not improved nowadays by the gloomy thought that the surgeon, the anaesthetist, and the nursing staff must constantly regard themselves as potential criminals.

Asthma at Sea

Dr. G. L. ALEXANDER (Bristol) writes: In the *Journal* of December 10, 1949 (p. 1357), I commented on the sufferings of asthmatics in tourist liners to Australia. Even those who have not had attacks for months or years previously have frequent attacks during the voyage, and often go into status asthmaticus, which nothing relieves until they get off the ship. It is our experience that they suffer much less in the newer ships. In old ships, however high the standard, there is inevitably more dust from disintegrating paint, furniture, textiles, moulds, etc. Further, they are more heavily sprayed with compounds containing D.D.T. and pyrethrins to keep down cockroaches. I would therefore urge that practitioners should advise any asthmatic patient intending to travel by sea to book only in a relatively new ship, and to get the best first-class cabin they can possibly afford.

Obituary

C. B. LEVICK, O.B.E., M.B., Ch.M., F.R.C.P.

Dr. C. B. Levick, physician in charge of the cardiology department at St. George's Hospital, died at his home at Amersham on May 31 at the age of 56. He will be remembered first and foremost as a wise general physician. He was also a good teacher and skilled administrator.

Claude Blaxland Levick was born in New South Wales, Australia, in 1896. He was educated at Sydney Grammar School and Sydney University, where he held the Aitken and Cooper scholarships, the latter in classics, and the John West and Grahame medals. He qualified M.B. at Sydney in 1920 and Ch.M. in 1922. He then came to England, where he held house appointments at the Manchester Royal Infirmary before finally settling in London. Here he held a number of resident appointments at St. George's Hospital and at the Victoria Hospital for Children, Tite Street. In 1925 Levick was elected physician to out-patients at the Victoria Hospital and, in 1928, assistant physician to St. George's Hospital. His two main interests were in cardiovascular disease and diseases of children. He was one of the earlier physicians to use the electrocardiograph in clinical practice, and acquired remarkable skill in interpreting the standard leads. He always remained, however, a general physician, and saw each problem against the background of the whole patient; it was this, together with a remarkable care for detail, that made him such a valuable consultant.

Levick had a high reputation as a teacher, and instilled into his students a regard for fundamental facts which they never forgot. A keen and wise person, he was the most generous and helpful of colleagues, and a friend to his juniors.

C. P. P. writes: I knew Blaxland Levick for the 30 years he was associated with St. George's Hospital. He was a house-physician when I first came to St. George's, and was an excellent teacher with a precise mind: his students were trained to think and express themselves precisely and clearly. Later when he became resident assistant physician he showed that he was a first-class administrator, and this was constantly demonstrated throughout his life—both before and after the war with his advice over hospital matters and in committee, and during the war with the success that came to him in his Middle East appointment. Blaxland was a shy man, but as a friend he showed a variety of interests. In his early days at St. George's he was an enthusiastic skater and was often on the rink at Grosvenor House before the day's work began. He was a keen lawn tennis and squash player. He was fond of good music and had a large collection of classical records. He will be sadly missed by his colleagues and friends, with his sense of humour and devotion to work which remained until the end.

E. T. ROBERTS, M.D., F.R.C.P.Ed., F.R.F.P.S., D.P.H.

We record with regret the death of Dr. E. T. Roberts at his home at Portsmouth on May 11 at the age of 88. Appointed in 1909 on the inauguration of the school medical service as principal medical officer to the School Board (later the Education Authority) of Glasgow, he served in that city for over 20 years until his retirement at the end of 1929.

Born at Worcester, where his father was in practice as a solicitor, on April 24, 1865, Ernest Theophilus Roberts was educated at the cathedral and grammar

schools there and then went on to the University of Edinburgh, where he graduated M.B., C.M. in 1886, proceeding to the M.D. in 1889. After experience as resident physician and assistant (by competitive examination) to the professors of clinical medicine at the Royal Infirmary, Edinburgh, and as senior medical officer of the Children's Hospital and the City Fever Hospital, Birmingham, he entered general practice in 1892 at Keighley, Yorkshire, where he succeeded his uncle, Dr. Arthur Roberts, who then moved to Harrogate.

His interest in public health and children's diseases led him in 1909 to enter the field of school medicine at Glasgow, where under his guidance a comprehensive scheme of medical inspection and treatment was built up, including the provision of 10 special schools, mostly of the open-air type, for physically and mentally defective children as well as numerous special classes for blind, deaf, and myopic children. Exceptionally gifted and fond of study, he obtained the Cambridge D.P.H. in 1911 and the F.R.F.P.S. in 1918. He became a Member of the Royal College of Physicians of Edinburgh in 1929, and was elected Fellow in 1937. After retirement and at the age of 70 he passed the examination for the diplomas of M.R.C.S., L.R.C.P. in 1935 at the first attempt. He was examiner in public health for the Scottish triple qualification; for the Diploma in Public Health of the Scottish Conjoint Board; and in State Medicine for the F.R.F.P.S. When he retired in 1929 his staff, which was responsible for the health of nearly 190,000 children, numbered 14 medical officers, 5 dentists, and 70 school nurses. He was an honorary member and past president of the Association of School Medical Officers of Scotland. During the war of 1914-18 he served as a captain in the R.A.M.C.

Ernest Roberts was a handsome man of great personal charm. His wise counsel and ripe experience were at all times available to those who sought his help, while his quiet and never-failing courtesy endeared him to everyone. He had wide interests in church and social work, and was an eloquent speaker. He married Miss Rosa May Paddock, the youngest daughter of the late William Paddock, of Caynton Manor, Newport, Shropshire, in 1892, and Dr. and Mrs. Roberts celebrated their diamond wedding anniversary last year. Their son, Dr. T. E. Roberts, is medical officer of health for Portsmouth, and their daughter married Dr. J. C. Eaton, of Glasgow.—J. T. G. E.

HILDA J. GARDNER, M.B., B.S.

Dr. Hilda Gardner (née Florey) died on May 18 in the Royal Melbourne Hospital—the hospital which she served from the time of her appointment to the position of assistant bacteriologist in 1929.

Hilda Josephine Florey was born in 1890 at Malvern, South Australia, the daughter of Joseph and Bertha Mary Florey. She was one of a distinguished family, of whom her brother, Sir Howard Florey, is the best known. After leaving Miss Thornber's School for Girls in South Australia, she entered the University of Adelaide in 1908, and graduated M.B., B.S. in 1912. Her undergraduate course was brilliant: she occupied first place in her course for four of the five years, including the final year. Between 1913 and 1917 she held resident appointments at the Adelaide Hospital, the Adelaide Children's Hospital, and the Women's Hospital, Melbourne. In 1917 she married Dr. John Forrest Gardner, of South Australia, who practised at Richmond, Victoria,

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where he died in 1928. After her husband's death Dr. Gardner returned at once to professional practice and joined the staff of the then Melbourne Hospital as assistant bacteriologist, a position she occupied until 1934, when she was appointed bacteriologist and serologist to the Royal Melbourne Hospital. In 1951 she was awarded an honorary fellowship by the Royal Australasian College of Physicians in recognition of her distinguished service to Australian medicine.

Her career was characterized by an unswerving devotion to the fulfilment of her responsibilities, which, combined with her professional skill, brought her rapidly into the front rank of Australian clinical pathologists. Dr. Gardner made haematology her principal interest and study. Her opinion was always thoughtfully considered before being offered, and was supported by strict attention to the details of the case. Clinicians sought her advice because of these attributes. Alone, or in collaboration with others, she contributed many original papers, which, taken altogether, cover the fields of haematology and bacteriology in the widest sense. Her most important contributions, however, were not those she could record in medical journals.

Hilda Gardner's professional work invariably remained her first consideration, but, like every other great person, she maintained wide extramural interests. A sensitive discrimination, coupled with a keen appreciation, distinguished her contributions to artistic design; in other circumstances she might have contributed even more as expressions of her ideas.

She continued with her work to the end in the face of serious ill-health. It was typical of her courage that she spent her last hour in consultation about one of her patients. She is survived by her daughter, Dr. Joan Gardner, of the University of Melbourne.—J. H. L.

Sir ROBERT G. ARCHIBALD, C.M.G., D.S.O., M.D.

We are indebted to Sir ERIC PRIDIE for the following appreciation of the late Sir Robert Archibald, whose obituary notice was printed in the *Journal* of May 16 (p. 1112): Sir Robert Archibald established a personal reputation, which later became a tradition in the Sudan, for his devotion to duty, his consideration for others, and for inspiring men to try to follow in his footsteps. I first met him during the later stage of his Sudan career, when he had an international name in tropical medical research. His never-failing readiness to help those who needed his assistance, his enthusiasm for and brilliance in his work, and his deep sympathetic understanding of Sudan problems and of the Sudanese people made him the friend of all, deeply respected throughout the country. It was characteristic of him that after retiring from the Sudan he took charge of Chacachacare leper settlement in Trinidad. There can be few men who have exercised so great an influence over those with whom they have been associated, and Archibald's name will long be remembered with gratitude and admiration in the Sudan, which he served so faithfully, as representing all that is best in the British way of life.

Dr. MAXWELL SMELLIE died suddenly at sea on May 7 while on a voyage to the Far East and was buried at sea on May 8. Maxwell Smellie was born on January 10, 1902, at Hamilton, Lanarkshire, where his father was later to be at provost. He was educated at Hamilton Academy and at the University of Glasgow, qualifying by taking the Scottish triple qualification in 1931. He was a keen and active footballer, and captained the University's Association football team when it won the Scottish amateur cup. During the play in the final tie he sustained a fractured leg, and the consequent plating of the limb caused him a certain

amount of permanent inconvenience. His interest in the game, however, never declined, and he became president of the Dagenham Football Club. For over 20 years he practised in Dagenham and was a well-known and respected figure, a popular doctor, and a friend to many. During the last war he was a captain in the Home Guard and devoted all his leisure time to his unit. He returned to his native Scotland last year and before settling down decided to gratify his intense love of the sea. To his widow, sons, and daughter our deep sympathy is extended. Dr. Smellie's death will be keenly felt by all those who knew him or came into contact with him.—B. K.

Mr. E. R. DESOUTTER, whose light engineering firm until a few years ago was famous for the manufacture of artificial limbs, died on May 11 at the early age of 51.

We are indebted to Mr. K. I. NISSEN for the following appreciation: The death of Mr. Emile Robert Desoutter will be regretted by many surgeons and by thousands of patients who have worn the artificial limbs of that famous *marque de fabrique*. The Desoutter family have a remarkable record in modern engineering design and practice. As boys, Emile Desoutter and his four older brothers were all trained by their father in the art of making watches and repairing every type of antique timepiece. However, in 1912, one of them, Marcel, lost a leg in a flying accident, and it was the successful light-metal above-knee limb fashioned by another brother, Charles, that led rapidly to the establishment of an industry which flourished during and between the two wars and which set a new high standard of technical perfection in lower limb prostheses. Mr. Desoutter joined three of his brothers at the age of 19 and played an active part in the development both of the artificial limbs and of the light-weight pneumatic and electric tools which were at first designed for their assembly. He took part in the firm's unfortunate controversies with the Government of the day which arose first in 1933 and later in 1948, when he had reluctantly to discontinue the manufacture of artificial limbs. Among surgeons in general Mr. Desoutter will long be remembered for the keen personal interest he took in the fitting and training of amputees, particularly young children with congenital defects; for his support of surgeons practising the modified Syme's amputation; for his adaptation of a pneumatic tool to the needs of orthopaedic surgery, and for the sturdy electric plaster-saw now in general use in Great Britain. Those who knew him personally will remember his generous and kindly nature and his capacity for friendship. As the last of the four brothers of the original firm Mr. Desoutter latterly had heavy responsibilities, which were lightened by a very happy family life in the country at Little Gaddesden in Hertfordshire. His death came most unexpectedly, some ten days after a spinal operation, from which he appeared to be making a rapid recovery. He leaves a widow, a daughter, and two sons, one of whom is carrying on the engineering tradition of the family.

We record with regret the death at Shanklin on May 20 of Mr. J. A. GAYNOR, senior surgeon at the Royal Isle of Wight County Hospital, Ryde. He was 52 years of age. Joseph Alfred Gaynor was born on March 19, 1901. He studied medicine at Trinity College, Dublin, graduating M.B., B.Ch. in 1923, and winning the Houghton clinical medicine prize and prize for surgery at Sir Patrick Dun's Hospital in the same year. After graduation he went out to Newfoundland, where he was house-surgeon at the General Hospital at St. John's. When he returned to Britain he took the F.R.C.S.I. and settled in Shanklin, where he was surgical member of a group practice until the Health Service came into operation. Besides his appointment at the County Hospital, Gaynor was a consultant surgeon to the Shanklin Cottage Hospital and the Frank James Hospital, East Cowes.

We are indebted to H. S. H. W. for the following appreciation: It is difficult for one who has been a colleague and friend of Alfred Gaynor for over twenty years to write

of his passing at the early age of 52, when he was at the zenith of a brilliant surgical career. Benefiting from a sound surgical grounding at Trinity College, Dublin, and for many years at Shanklin, from the vast experience of John Cowper, doyen of Isle of Wight surgeons, Gaynor quickly gained the esteem and trust of practitioners throughout the island. After the death of Mr. A. A. Straton in an air raid during the last war Gaynor found himself, at an unusually young age, senior surgeon at the Royal Isle of Wight County Hospital, Ryde. He was of a cheerful and sympathetic disposition, and his Irish humour and sparkle endeared him to his many patients. He will be greatly missed, not only in his home town but throughout the island. To his colleagues his loyalty and helpfulness were invaluable. He never spared himself, and to every general practitioner with whom he came in contact he proved a friend and counsellor. His fortitude during a long and painful illness was an inspiration and example to us all.

Dr. PERCIVAL GEORGE QUINTON, who died suddenly on May 21 at the age of 59, received his medical education at University College Hospital and qualified M.B., B.S. in 1918, proceeding to M.D. in 1921 after service in the R.A.M.C. with the British Army of the Rhine. He was superintendent of St. Mary's Hospital, Paddington, before joining in 1924 the staff of the Royal London Homoeopathic Hospital, with which he was connected during the remainder of his professional career. At the time of his death he was physician with charge of out-patients and medical officer to the nursing staff, as well as secretary of the medical advisory committee of the hospital. He was a Fellow of the Faculty of Homoeopathy, which he served in many capacities, including that of secretary. He was in turn assistant editor of the *British Homoeopathic Journal*, hon. librarian, and vice-president. Dr. Quinton was a skilful physician, beloved by his patients and colleagues. He was also a pianist of talent and a good linguist—a gift which led him to a study of the methods of the French school of homoeopathy as represented by Dr. Leon Vannier. He was elected a vice-president of *Le Centre Homoeopathique de France*, and represented his colleagues in the United Kingdom at many congresses abroad. Two daughters survive him, one being a member of the medical profession.—W. R. McC.

Universities and Colleges

UNIVERSITY OF LONDON

The governing body of the British Postgraduate Medical Federation has approved the award of Postgraduate Travelling Fellowships for 1953-4, tenable for one year, to M. B. McIlroy, M.D., M.R.C.P., of St. Bartholomew's Hospital (respiratory function, U.S.A.); D. Marrack, M.D., of the Postgraduate Medical School of London (biochemistry, U.S.A.); T. A. J. Pranker, M.D., M.R.C.P., of University College Hospital (haematology, U.S.A.); and P. Story, M.D., of St. Bartholomew's Hospital (haematology, U.S.A.).

J. A. V. Butler, D.Sc., has been appointed to the Chair of Physical Chemistry tenable at the Institute of Cancer Research (Royal Cancer Hospital), from January 1, 1953.

Professor J. M. Mackintosh has been nominated for re-appointment as the representative of the University on the governing body of the Slough Industrial Health Service.

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *Charing Cross Hospital Medical School*, Mr. L. R. S. Taylor (Oto-rhinolaryngology); *Institute of Neurology*, Mr. Harvey Jackson (Neurosurgery); *Westminster Medical School*, Mr. P. D. Trevor-Roper (Ophthalmology); *Institute of Dental Surgery*, Dr. C. F. Ballard (Dental Surgery (Orthodontics)). Mr. A. G. Leigh, who is already recognized as a teacher of ophthalmology at the Institute of Ophthalmology, has been recognized also as a teacher of ophthalmology at St. Mary's Hospital Medical School.

The degree of D.Sc. has been conferred on Professor A. D. M. Greenfield, Dunville Professor of Physiology in Queen's University, Belfast, and on Professor C. L. Oakley, Brotherton Professor of Bacteriology in the University of Leeds.

Medico-Legal

VICARIOUS LIABILITY

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

In recent years some legal decisions on the allocation of responsibility between hospitals and doctors have provoked disquiet in the medical profession. Some medical men consider that the holding of a hospital authority to be vicariously responsible for a doctor's mistakes will diminish his sense of responsibility and his independence of professional action. And, some have added, the natural tendency of the hospital authority will be to try by rules and regulations to minimize the possibility of error by the doctor. The converse view has also been expressed that, if hospital authorities are not to carry the responsibility for errors made by their junior medical and surgical officers, the morale of these men will suffer and applicants for hospital posts will be hard to find.

If either or both these views are right, then the effect of the present state of the English law will be disastrous both for the profession and for the community, which the profession exists to serve. It is therefore important to examine whether these views result from a failure to appreciate the true nature of the principle of law concerned, or whether the law is such as to justify them. If it is, then the sooner it is changed by Parliament the better.

Acts of Servants and Agents

The responsibility of the governing bodies of hospitals for the acts of their agents is one of the many examples of the fundamental principle of English law—*qui facit per alium facit per se*. In anything he does a man must take reasonable care not to harm his neighbour. His neighbour is anyone who he ought to realize will be affected by that particular activity. If a person chooses, or is obliged by circumstances, to carry out the particular activity through the medium of someone else, whether the someone else is in his employment as a servant or simply engaged as an agent to do that particular thing, that person cannot thereby divest himself of the duty to take reasonable care not to do his neighbour harm. And if the servant or agent fails to take reasonable care, and in fact does harm, not only is he personally responsible, but the employer is vicariously responsible also.

The owner of a ship that carries passengers from Capetown to London is accordingly under a duty to exercise reasonable care towards them in doing so. This is an activity which he cannot carry out himself. He employs the master of the ship to navigate her as far as Dover. From Dover to Tilbury he employs a Port of London pilot with the necessary specialist knowledge of the Thames and its estuary. The master of the ship is his servant; the pilot is his agent to pilot the ship on that particular voyage up the river. If the ship is cast away and the passengers are injured through the failure of the master to exercise reasonable care in navigating the ship between Capetown and Dover, or the failure of the pilot between Dover and Tilbury, the shipowner is in law just as responsible to the injured passengers as is the pilot or the master. The fact that he is vicariously responsible in no way diminishes the personal responsibility of his servant or agent.

In the same way the governing body of any hospital is under a duty to exercise reasonable care towards people in the hospital. This duty is owed not only to the patients but to its own staff. In so far as the patients are concerned, its duty is to exercise reasonable care over their nursing and any treatment which it sets out to give them or operation which it sets out to perform. None of these activities does it carry out with its own hands, any more than does the shipowner with his own hands navigate his ship. Nurses, physiotherapists, radiographers, house-men are all its servants, just as the master is the servant of the shipowners. Consultants, even if honorary and unpaid, are its agents, just

as the pilot is the agent of the shipowner. If the patient is injured through the failure of any one of them to exercise due care towards him according to the current state of medical knowledge and practice, then the hospital is in law just as responsible to the injured patient as is the nurse, the physiotherapist, the house-man, or the consultant whose failure caused the injury. But the fact that the hospital authority is vicariously responsible in no way diminishes the personal responsibility of doctor or nurse.

An Old Principle

There is nothing new about this principle. That it has recently been reaffirmed in its application to hospital authorities has in law nothing to do with the National Health Service Act, 1946, but is purely coincidental. In our report in these columns of the case of *Cassidy v. Minister of Health*¹ the original error stemming from *Hillyer v. St. Bartholomew's Hospital* in 1909 and its correction have already been described. In Cassidy's case the court was careful to rest its decision that the Minister as hospital authority was vicariously responsible for the negligence of the consultant on the broad principle stated above, not on the particular statutory duty imposed on the Minister or any particular statutory duty imposed on the Minister or the hospital authority by the 1946 Act. The principle of vicarious liability is as old as the Common Law, and probably originates in the responsibility of the master for the acts of his slave, who had no independent legal standing, but was absorbed in the family which his master represented and for which in primitive legal systems his master had to answer.

The personal responsibility of the agent and the vicarious responsibility of the principal for the same act exist side by side. The practical result is that the injured person can sue one or other or both, and the consideration dictating which he sues is: Which will be able to satisfy any judgment he may obtain?

Before the era of widespread insurance it was usually the principal who was sued, because it was usually he alone who was worth powder and shot. Where the principal is the hospital authority, and where personal responsibility for the injury rests on a nurse or a physiotherapist or a hospital servant, who is not likely to be wealthy or insured, the hospital authority is the obvious target. Where the personal responsibility rests on the doctor, who is almost certainly insured whether he is a recently qualified casualty officer or a distinguished consultant, it does not matter to the injured person which he sues. If he is in any doubt whether the doctor is insured or where the personal responsibility will be found to rest—and this may be a difficult question—he will doubtless sue both.

Indemnifying the Principal

Sometimes a judge, having found a house-officer personally and the hospital authority vicariously responsible for a disaster, orders the house-officer to indemnify the authority as to the whole or part of the damages and costs. At Common Law an agent for whose fault his principal has been found vicariously liable is bound to indemnify his principal on the grounds that he ought not to fail to use reasonable care when about his principal's affairs. Under the Law Reform (Married Women and Tort-feasors) Act, 1935, where two people are responsible for the damage caused by the same failure to take reasonable care the court has power to order the one which it thinks to be really as well as legally responsible to indemnify the other, or to contribute to what the other has to pay to the plaintiff.

The result is that the plaintiff can sue whichever he thinks fit, and if he gets his judgment against both can execute it against whichever he thinks will be good for the money. His interests are therefore fully safeguarded. As between those legally responsible for the damages, the one who has to pay the plaintiff can, to the extent of the contribution or indemnity which has been ordered against the other,

¹ *British Medical Journal*, 1951, 1, 480.
² *Ibid.*, 1953, 1, 461.

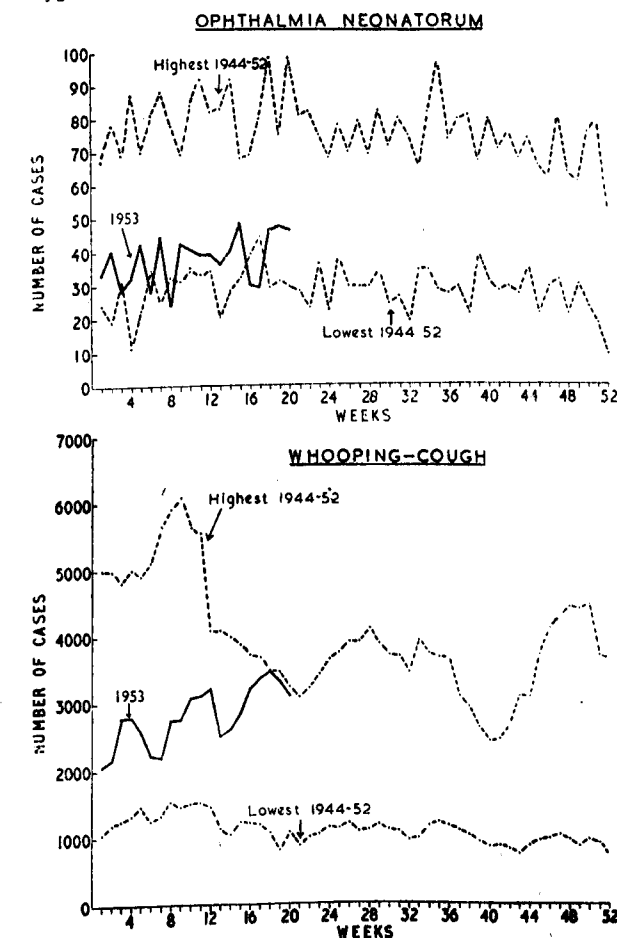
recoup himself from that other, if the other has sufficient assets to recoup him. Moreover, the court has the opportunity to mark where in its view the blame as opposed to the legal responsibility really lies.

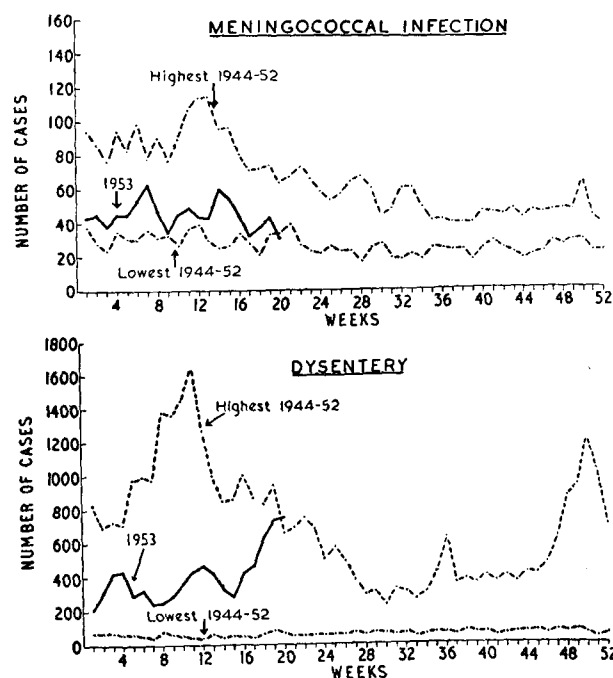
Such then is the state of the law in England, subject to the possibility that the Court of Appeal may hold that by virtue of the provisions of the National Health Service Act, 1946, and the Public Health Act, 1875, hospital management committees cannot be sued for negligence towards their patients at all.² But, whatever the law, a doctor's professional standards are imposed on him by the traditions of his profession and his conscience. The sanction for his failures is not that he may get judgment given against him. Since he can insure against the financial implications of a judgment, it does not matter to him financially how the responsibility may be apportioned between him and the management committee. The power of the court to mark where it thinks the blame lies is surely a salutary power. But in the ultimate analysis the relation between doctor and patient, and the standards of conduct the doctor sets himself, must be matters not of law but of conscience.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

Only small variations occurred in the trends of infectious diseases in England and Wales during the week ending May 23. The largest were an increase of 243 in the number of notifications of measles, from 10,034 to 10,277, and a decrease of 209 for whooping-cough, from 3,312 to 3,103.

The largest increases in the incidence of measles were 138 in Lancashire, from 1,489 to 1,627, and 63 in Somersetshire, from 295 to 358; the largest decreases were 102 in Durham, from 387 to 285, 100 in Sussex, from 413 to 313, and 90 in Gloucestershire, from 627 to 537. The largest falls in whooping-cough were 60 in Middlesex, from 219 to 159, 49 in Surrey, from 146 to 97, and 48 in Durham, from 153 to 105. 1,306 cases of scarlet fever were notified, being 20 more than in the preceding week. The largest local variation was an increase of 28 in Yorkshire West Riding, from 108 to 136. 19 cases of diphtheria were notified, 2 more than in the previous week.

29 cases of acute poliomyelitis were notified. These were 3 fewer for paralytic and 4 fewer for non-paralytic cases than in the preceding week. The largest returns were Surrey 5, Yorkshire West Riding 5 (Doncaster C.B. 2, Sheffield C.B. 2), and Essex 3 (Romford M.B. 2).

754 cases of dysentery were notified during the week, 18 more than in the preceding week. This is the fifth consecutive week that the incidence of dysentery has risen. The largest centres of infection during the week were London 123 (Westminster 42, Islington 13, Chelsea 12), Lancashire 78 (Liverpool C.B. 25, Manchester C.B. 13, Preston C.B. 10), Leicestershire 65 (Leicester C.B. 65), Bedfordshire 62 (Luton M.B. 40, Bedford M.B. 16), Durham 46 (Stanley U.D. 37), Norfolk 43 (Great Yarmouth C.B. 26), Essex 29 (Walthamstow M.B. 7), Yorkshire West Riding 29 (Huddersfield C.B. 7), Cambridgeshire 19 (Cambridge M.B. 19), and Northumberland 18 (Newcastle-upon-Tyne C.B. 9).

Week Ending May 30

The notifications of infectious disease in England and Wales during the week included scarlet fever 1,084, whooping-cough 2,476, diphtheria 21, measles 9,012, acute poliomyelitis 52, dysentery 505, paratyphoid fever 8, and typhoid fever 2.

A commentary on the national statistics for the years 1948 and 1949 is published in the Registrar General's Statistical Review of England and Wales 1948-9, Text, Medical (H.M.S.O., 10s.). It includes a tabulation of 1949 deaths in accordance with the 1948 International Statistical Classification of causes of death.

INFECTIOUS DISEASES AND VITAL STATISTICS
Summary for British Isles for week ending May 23 (No. 20) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	19	2	5	1	2	27	6	10	0	1
Dysentery ..	754	123	93	2	2	328	41	81	2	2
Encephalitis, acute ..	7	0	0	0		4	0	0	0	
Enteric fever: Typhoid ..	3	0	0	1		1	0	0	0	1
Paratyphoid ..	4	0	0	0		22	0	1(A)	0	
Food-poisoning ..	155	15		5		134	17		1	
Infective enteritis or diarrhoea under 2 years ..				15	25				14	25
Measles*	10,277	345	403	319	331	5,749	320	470	237	404
Meningococcal infection ..	31	1	12	1		43	2	12	2	1
Ophthalmia neonatorum ..	46	1	6	0		36	9	9	0	
Pneumonia†	505	34	155	9	5	432	36	208	5	4
Poliomyelitis, acute: Paralytic ..	22	1			2	25	0		2	1
Non-paralytic ..	7	0				12	1			
Puerperal fever§	267	30	10	0		245	36	23	2	
Scarlet fever ..	1,306	88	149	44	66	1,088	65	183	15	36
Tuberculosis: Respiratory ..			161	41				151	31	
Non-respiratory ..			39	10				23	4	
Whooping-cough ..	3,103	213	454	53	145	2,905	155	176	102	69

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0		0	0	0		0	0
Dysentery ..	0	0				0	0		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0			1	0		0	
Infective enteritis or diarrhoea under 2 years ..	4	0	3	3	1	5		2	1	2
Influenza ..	4	0	0	0	2	7	2	1	0	1
Measles ..		0	0		0		0		0	3
Meningococcal infection ..		0	0				1			
Pneumonia ..	187	24	14	8	5	195	30		7	12
Poliomyelitis, acute ..	4	0			0	1	1			0
Scarlet fever ..		0	0		0		1		0	0
Tuberculosis: Respiratory ..	103	12	14	1	6	141	21	15	5	8
Non-respiratory ..		1	0	2	1		2	3	0	3
Whooping-cough ..	2	1	0	0	0		4	0	0	0
Deaths 0-1 year ..	228	26	31	7	16	211	20	28	3	13
Deaths (excluding stillbirths) ..	4,935	711	569	111	172	4,926	695	550	99	196
LIVE BIRTHS ..	8,349	1237	948	246	462	8,228	1277	953	249	424
STILLBIRTHS ..	211	15	25			172	21	18		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

§ Includes puerperal pyrexia.

Medical News

The Everest Doctors.—The Chairman of Council of the B.M.A. has sent Dr. L. G. C. Pugh the following telegram: "British Medical Association shares general delight at success of expedition and offers you and your medical colleagues warm congratulations."

Anaesthetists Honour Lord Nuffield.—The Faculty of Anaesthetists of the Royal College of Surgeons of England paid tribute to Lord Nuffield's great services to anaesthesia when he was presented with the diploma of Honorary Fellowship of the Faculty at a meeting of the board on June 3. At a luncheon at the Royal College of Surgeons after the presentation, Dr. B. R. M. Johnson, the Dean of the Faculty, proposed Lord Nuffield's health. He referred particularly to the great benefits to mankind which had accrued from the establishment of the Nuffield chair of anaesthesia at Oxford, and to the department of anaesthetic research which was to be housed in the Nuffield College of Surgical Sciences at the Royal College of Surgeons. Wearing the gown of the Faculty which Dr. Johnson had asked him to accept as a gift, Lord Nuffield said that anaesthesia was a subject near to his heart, for he had had some bad anaesthetics in his time. Although he had not established the department of anaesthesia at his plan to establish the department of anaesthesia at Oxford was not welcomed wholeheartedly at the time, "in Oxford they think to-day that I was right." It was the job of the surgeon to carry out the operation and leave the rest to the anaesthetist. Sir Cecil Wakeley, President of the Royal College of Surgeons, brought the agreeable occasion to a close by calling for three cheers for Lord Nuffield.

Corneal Grafting.—The British Red Cross Society has offered its services for conveying eyes to be used in corneal grafting. Details are given in a recent memorandum from the Ministry of Health (No. 95022/1/16/2, dated May 27). Eyes will usually be conveyed by rail or road, and if hospitals are unable to provide their own transport for any journey or part of a journey assistance from the British Red Cross Society can be obtained on application to the Society's local representatives. For journeys between hospitals and railway stations the Society will provide transport without any charge. For direct journeys between hospitals and the corneal-grafting centres the Society may seek payment from hospitals at the local hospital car service mileage rates. The Society has asked its county branches to get into touch with hospital authorities to settle local arrangements.

Disablement Benefit.—Relaxation of the conditions under which disablement benefit may be paid is the principal proposal of the National Insurance (Industrial Injuries) Bill, 1953. This Bill was presented to Parliament by the Minister of National Insurance, Mr. Osbert Peake, at the end of last month, and the text has now been published. At present disablement benefit can be obtained only if the damage resulting from the accident is substantial (assessed at over 20% disablement) or likely to be permanent. The new Bill allows benefit to be paid for any period during which the disablement is assessed at 1% or more irrespective of whether it is likely to be permanent. The additional cost of this and other changes proposed in the Bill is estimated at £140,000 a year.

Films on Rodent Control.—By arrangement with the United States Public Health Service a remarkable series of films on rats and their control was shown at the Royal Sanitary Institute in London on June 11. The five films, "The Rat Problem," "The Roof Rat," "The Norway Rat," "Rat Proofing," and "Rat Killing," were made by the American Army, with the advice of the Communicable Disease Centre of the American Public Health Service. In

order to make the films the rats in a heavily infested building were subjected to the glare of arc lamps for weeks ahead; and to allow every aspect of rat behaviour to be fully displayed the building was sliced in half, down to and below the foundations, and the exposed end covered with glass. The camera could then follow the rats into their burrows. The splendid pictures that have resulted amply repay the trouble taken to get them. One of the best sequences is a close-up of the birth of a litter; another highlight is a fight to the death between a brown rat and a black rat. The technical information is sound, and the only serious criticism is that the poison baits, wrapped in coloured paper, look remarkably like toffees. This could be dangerous if the baits were accessible to children. The films are intended for showing to technical audiences and not to the general public.

"Beauty and Health."—The American Medical Association is co-operating with Druggists Promotion Services, Inc., of Chicago in the production of a new popular health magazine, *Beauty and Health*. This 48-page magazine will be distributed by druggists to their customers. It will publish health educational articles and will stress the dangers of self-medication. Medical information for articles will be supplied by the A.M.A., which will also check copy for medical accuracy. The A.M.A. also publishes its own monthly popular health magazine, which began as *Hygeia* in 1923 and changed its name to *To-day's Health* in 1950.

London's Ambulances.—One section of the London Ambulance Service deals solely with emergency calls. It has 38 ambulances at 18 accident stations. The other and much larger part of the Service is responsible for the routine conveyance of sick persons to and from hospital. Last year the accident section was busier than ever before: it answered 87,691 calls. Of these 13,655 were to street accidents, and on average the ambulances took 7.2 minutes to arrive on the scene. Most of the street accidents occurred between 5 p.m. and 6 p.m. There were nearly 600 calls to attempted suicides, and over 1,600 to victims of assault. In about 5,500 of the calls answered an ambulance was found to be unnecessary. During the year the general section of the Service carried 660,206 patients a total of nearly 3½ million miles. The present strength of the Service is 249 ambulances, 10 ambulance-buses, 39 single-stretcher ambulances, and 21 sitting-case cars.

New Professor at Cardiff.—Dr. Archibald Sutherland Duncan has been appointed the first whole-time Professor of Obstetrics and Gynaecology in the Welsh National School of Medicine (University of Wales) as from October 1, 1953, on the retirement of Professor G. I. Strachan. Dr. Duncan qualified in 1936, and is at present Senior Lecturer in Obstetrics and Gynaecology in the University of Edinburgh and obstetrician and gynaecologist to the Western General Hospital, Edinburgh.

A Jacobite Physician.—The bicentenary of the death of Dr. Archibald Cameron was commemorated by a service at the Queen's Chapel of the Savoy, London, on June 7. Cameron, who is buried in the chapel, was a close friend of Bonnie Prince Charlie and one of the outstanding personalities of the '45. For his part in the rising he was condemned for high treason and hanged at Tyburn on June 7, 1753.

Register of Speech Therapists.—The 1953 *Register of Speech Therapists* has now been published, and can be obtained free on application to the secretary and registrar, Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, London, W.C.1. Speech therapists are classified on a geographical basis, and, besides address and telephone number, information is given on qualifications, the type of appointment held, and whether private practice is undertaken.

Dr. Bernard Johnson and Dr. Cecil Gray have been elected respectively Dean and Vice-Dean of the Faculty of Anaesthetists of the Royal College of Surgeons of England.

states that in a factory where chlorine, sulphur dioxide, hydrofluoric acid, and combinations of phosgene with phosphorus oxychloride and phosphorus trichloride were manufactured "enough [hydrofluoric acid vapour] escaped into the atmosphere so that men with glasses could not work in the rooms, and the window panes were etched to the extent that the wind blew them out of their frames. The films of these men, employed at such work for four to ten or more years, showed no trace of reaction attributable to gas, and the incidence of tuberculosis was no greater than in persons employed in other parts of this large plant. Repeated examinations failed to demonstrate evidence of reactivation of several cases of latent apical disease that occurred in the group." He concluded that there was no evidence that any of the more common industrial fumes or gases alter susceptibility to tuberculosis.

REFERENCE

¹ *Occupational Medicine and Industrial Hygiene*, p. 403. St. Louis: C. V. Mosby Company, 1948.

Physiological Clocks

Q.—What part of the central nervous system is concerned in estimating the passage of time? Normal man is capable of estimating the passage of, say, half an hour with remarkable accuracy, provided that he maintains his concentration. Apart from the disturbances of consciousness (coma, stupor, mescaline intoxication, etc.), are there any known organic neurological disorders in which appreciation of time becomes so distorted that a second passing seems like a millennium?

A.—Nothing is known of any localized centre in the brain acting as a timekeeper. There is no particular reason why the brain as a whole, or many parts in semi-independence, should not act in this way, if their function tended to vary with time. Apart from sensory appreciation of changes in the external world, the body is provided with a number of possible clocks—for instance, the filling of the bladder or colon, the exhaustion of glycogen stores in the liver, etc. Subjective appreciation of the passage of time is, as is well known, strongly influenced by emotional attitudes. Did not Shakespeare comment on this point? "Who doth he gallop withal? With a thief to the gallows." (*As You Like It*: Act III, Sc. 2.) Appreciation of the passage of time is grossly altered in most disturbances of consciousness, deliria, etc. It is also very dependent on the formation of recent memories, and is therefore affected in Korsakoff's psychosis and similar states. A Korsakoff patient, after an hour's intensive investigation in an interview, may think he has been with the doctor for only a few minutes. There is a condition in which the passage of a second may seem a millennium—mescaline intoxication—but the mechanism is unknown.

Psoralens and Vitiligo

Q.—What are psoralens, and what is their place in the treatment of vitiligo?

A.—Reports, particularly in Egyptian and American literature, indicate that certain extracts of the fruit of the plant *Ammi majus*, which grows in Egypt, are effective in the treatment of vitiligo. Attempts are being made to synthesize these substances—ammoidin, ammidin, and majudin. They may be applied to the depigmented areas or may be taken internally, and subsequent exposure to ultra-violet light produces redness and blistering which is followed in a large proportion of cases by normal pigmentation of the affected areas.

Pains in the Feet in Addison's Disease

Q.—Are severe constant pains in the feet ever a feature in mild Addison's disease? If so, what are their cause and treatment?

A.—It cannot be said that severe constant pains in the feet are ever a feature of mild Addison's disease. Muscular cramps, usually in the calves, occur as a result of loss of sodium chloride and clear up with treatment with deoxycortone acetate and salt. It is possible that pains in the

feet may similarly arise, although it is unlikely in mild Addison's disease. Another suggestion is that the pains in question may be due to flat feet, produced by the muscular weakness which is a characteristic feature of Addison's disease.

Sleep-walking and Epilepsy

Q.—Is there any relationship between sleep-walking and the later development of epilepsy? What treatment is advised for sleep-walking of very recent origin in a boy of 6?

A.—It is obviously possible that in an individual case sleep-walking might occur as a post-epileptic automatism after a nocturnal fit. Such an occurrence would be most unusual, and it must be remembered that sleep-walking is very common. So far as is known, there is no general relationship between sleep-walking and epilepsy.

Often the best treatment of sleep-walking is no treatment at all. This is so when it occurs only on isolated occasions in an otherwise well-adjusted child. The doctor's job is then to reassure the over-anxious parents. He can tell them that about 50% of children walk in their sleep once or twice in their lives, that it is in fact normal, and very rarely indeed likely to involve a risk. If reasonable safeguards are taken against such dangers as falling downstairs, there need be no concern. If sleep-walking is frequent and persistent, rather more notice should be taken. It may then be but one sign of a more general nervousness—caused by an element of emotional discord in the home, for instance—which will need investigation and treatment. The symptom itself often responds to hypnosis and post-hypnotic suggestion.

NOTES AND COMMENTS

Heavily Furred Tongue.—Dr. A. LOWNDES YATES (Canford Cliffs) writes: The clinical picture described in this question ("Any Questions?" May 9, p. 1061) would apparently correspond to that found in invasion of the epithelium of the tongue with the penetrating form of monilia and/or with the fungus torula, since both not infrequently exist together. The forms of monilia and torula which are present in normal healthy mouths produce no symptoms, but in the penetrating forms the spores invade first the superficial and later the deeper layers of epithelium, and in the latter case cause ulceration. Such an invasion of the epithelium by the spores is often accompanied by the symptoms of oesophagitis, with which certain of the symptoms mentioned in the clinical history of the case would correspond. A smear taken from the tongue and stained would, if the diagnosis of monilial or torula infiltration is correct, show some of the cells derived from deeper layers of epithelium which have been invaded by the spores. If this provisional diagnosis is confirmed by microscopical examination of a smear, the most satisfactory though messy treatment is by means of application of coloured dyes to the surface of the tongue, while about three grains of sulphathiazole applied as powder to the contact surface of the dentures may hasten the disappearance of the symptoms, which, however, do not yield with great rapidity to any form of treatment with the exception of radiation, which latter is apt to be followed by distressing dryness of the mouth which lasts for weeks or months.

Correction.—In our leading article "Homage to Lind" (June 6, p. 1265) we should have added that the Royal Navy was also represented by Surgeon Vice-Admiral Sir Alexander Ingleby-Mackenzie, medical director-general, who took the chair at the afternoon session on May 22 and read an address on Lind.

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OXFORD EPIDEMIC OF BORNHOLM DISEASE, 1951

BY

J. F. WARIN, M.D., D.P.H.
Medical Officer of Health

J. B. M. DAVIES, M.D., D.P.H.

Deputy Medical Officer of Health

(From the City of Oxford Health Department)

AND

A. D. VIZOSO, B.Sc.

F. K. SANDERS, M.A., D.Phil.

(From the Virus Research Laboratory, Department of Zoology, University of Oxford)

Sylvest (1934) gave a very full description of the recorded outbreaks of Bornholm disease up to 1931. Since that time there have been many valuable reports, but most of them have dealt only with the clinical features of the disease (Pickles, 1937; Howard *et al.*, 1943; Nichamin, 1945; Scadding, 1946; Hamburger and McNeil, 1947). Practically all the large outbreaks, reported have occurred in relatively closed communities, although Harder (1936) described an epidemic in the general population of Cincinnati, Ohio. So far as can be ascertained there has been no published report of any extensive outbreak occurring in the general community in this country.

This article is based on experience obtained during an epidemic of Bornholm disease in Oxford from September to November, 1951, a preliminary report of which was given (Davies and Warin, 1951) when the epidemic was still in progress. Following this preliminary report, several letters appeared in the correspondence columns, giving experience elsewhere, and from these, together with a number of private communications and information obtained through the Public Health Laboratory Service, it would appear that this country experienced a high incidence of Bornholm disease from about April until November, 1951. A total of 277 Oxford cases were eventually collected, of which 262 were visited by one of us (J. B. M. D.) or by the health visitor seconded to the investigation. From this material it has been possible to obtain useful information on the epidemiological, clinical, and virological aspects of the disease.

By following fortunate clues we were able to recognize the existence of the outbreak soon after it started, and so were able to draw the attention of the local medical profession to this largely unfamiliar disease, at the same time requesting the notification of all cases. There was a most gratifying response, and the notifications were received from more than half the doctors practising in the city. One doctor notified 26 cases, the next highest being 14, and there were 25 doctors who notified 5 cases or fewer. We believe that we were informed of most of the cases which sought medical advice. However, about half our cases never went to a doctor but were found by members of the

medical or health-visiting staff of the Health Department, and there is no doubt that many more mild cases remained undiscovered.

Epidemiology

It is now known that a few sporadic cases occurred in Oxford in August, but the epidemic began abruptly in the second week of September and extended over a period of six weeks, until the fourth week of October, when it ended as suddenly as it had begun, although a few cases were reported during the next three weeks. The incidence is shown in Fig. 1, and it will be seen that the peak occurred in the first week of October, with 53 cases.

The weekly incidence of cases given by Harder in the outbreak in Cincinnati (population 455,000) is

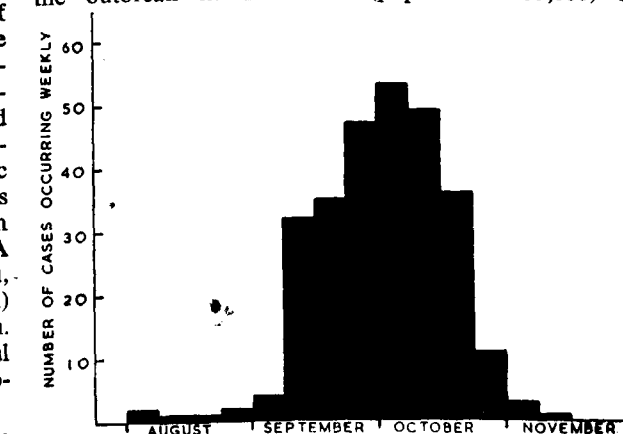


FIG. 1.—Weekly incidence of cases of Bornholm disease in Oxford during August–November, 1951.

remarkably similar to that observed in Oxford (population 106,400). It is of interest to note that the Oxford epidemic showed the same seasonal incidence as described by Sylvest and others.

Cases were spread throughout the city, but there were five distinct areas of high incidence. Two of these (North Oxford and Central Oxford) were situated on the west side of the Rivers Cherwell and Isis, which divide the city from north to south, and the other three (East Oxford, Marston, and Barton with Risinghurst)

tenfold dilutions into five one-day-old mice per dilution of $10^{-7.2}$. The LD_{50} of the second strain (Virus II) was $10^{-6.9}$. The two strains differed in incubation period, Virus I having an incubation period of four days in mice of this age, while that of Virus II was two days.

Both viruses caused lesions in the brains and viscera of young mice. The lesions included inflammatory and degenerative lesions of the brain, myositis, lesions of the fat pads between the shoulder-blades, myocarditis, and signs of damage to the liver as described by Godman *et al.* (1952). These lesions are all typical of those caused by Coxsackie viruses of Dalldorf's histological Group B (Gifford and Dalldorf, 1951), and in other respects our viruses also resemble them. Both kill mice readily up to the tenth to twelfth day of life; in older mice infection is sporadic, and mice more than 21 days old only occasionally succumb to inoculation by any route. Pappenheimer *et al.* (1951) found experimentally that injection of Coxsackie virus Group B, antigenic type 1 (Conn.-5) into older mice causes extensive lesions of the acinar tissue of the pancreas. This is also a characteristic of both the Oxford viruses, although they differ from Conn.-5 immunologically. However, two viruses isolated by Forrester and Tobin (1951) from cases of Bornholm disease did not cause pancreatitis in adult mice. Further study of the two Oxford viruses showed that they were of the same immunological type, and therefore they will hereafter be referred to as the Oxford virus.

Serological Tests

Paired sera taken in the acute and convalescent stage from each of 13 patients in which a definite diagnosis of Bornholm disease had been made were tested for the presence of neutralizing antibody against the Oxford virus. The technique of the neutralization test used was that of Melnick and Ledinko (1950). All sera were inactivated by heating to 56° C. for 30 minutes before use. Serum diluted 1/5, 1/50, and 1/500 was mixed with an equal volume of virus, so that each mouse dose contained 1,000 paralyzing doses of virus, and serum diluted 1/10, 1/100, or 1/1,000. The serum-virus mixtures were allowed to stand at room temperature for one hour and were then put up individually in sealed tubes and stored at -70° C. in a carbon-dioxide-ice cabinet. Mice approximately 24 hours old were used throughout the test. Litters born on the same day were pooled and the animals redistributed at random. Five to eight mice were given to each mother and one such batch was injected intramuscularly with each virus-serum mixture. As mice became available the appropriate virus-serum mixture was removed from the ice-box, thawed, and injected.

The results obtained in the 13 cases in which paired sera were available are shown in Table V.

In eight cases the sera taken during the acute phase of the disease showed little or no neutralizing power against the

TABLE V.—Neutralization of Oxford Virus by Sera Taken from Cases of Bornholm Disease

Case	Serum Antibody Titre		Type of Antibody Response
	Acute Serum	Convalescent Serum	
E. B.	< 10	100	+
R. C.	< 10	100	+
R. D.	< 10	1,000	+
P. D. S.	< 10	1,000	+
M. S.	< 10	100	+
P. R.	10	1,000	+
R. W.	10	1,000	+
J. L.	10	1,000	+
L. D.	100	100	—
J. S.	1,000	1,000	—
A. McL.	100	100	—
S. S.	1,000	1,000	—
M. W.	1,000	100	—
D. C.	—	< 10	—
J. L.	—	100	—
H. L.	—	100	—

Serum antibody titres are expressed as the highest dilution of serum which will protect mice against 1,000 LD_{50} of virus.

* Cases from which virus was isolated.

virus, but the serum specimen taken two to three weeks later showed a high content of antibody compared with that present in the first serum. It will be noted that this group of cases contains two individuals (R. D., P. D. S.) from whom viruses were isolated.

The other five cases had high antibody titres in both sera. This group included three patients (L. D., A. McL., and S. S.) from whom viruses were isolated. It is interesting that a similar occurrence of high antibody levels in both sera was found by Cheever *et al.* (1950) in an epidemic of "non-paralytic" poliomyelitis in Worcester, Mass.

A further group of three sera taken from children convalescent after Bornholm disease were tested for neutralizing power against the Oxford virus. Two cases showed a significant antibody titre, whereas in the third even the lowest serum dilution failed to protect infant mice against infection with the virus. It is interesting that this last case (D. C.) was the patient from whose faeces the Virus I strain was originally isolated. Nevertheless, this virus was undoubtedly concerned in the epidemic, since a clear-cut rise in antibody against it could be demonstrated in 8 out of 13 cases.

The findings place the viruses isolated from the Oxford epidemic in Group B (Dalldorf, 1950), which also includes those viruses which have been shown in the United States to be associated with epidemic myalgia. Preliminary cross-neutralization tests have been performed, using the Conn.-5 strain of virus—a strain of type B1 (Melnick *et al.*, 1949)—and the Oxford virus. Antisera against both viruses were prepared in hamsters by the technique described by Sickles and Dalldorf (1949). The results show that the Oxford virus does not belong to the same immunological type as the Conn.-5 virus. An epidemic of pleurodynia in the State of Washington studied by Lazarus *et al.* (1952) was associated with a virus of Group B antigenic type 3. Further tests are in progress to determine whether the Oxford virus corresponds to any of the four known antigenic types in Group B; but preliminary results indicate that it is not identical, although slight cross-reactions with type 1 may be shown by the use of high-titred antisera. Thus, while it is possible that Bornholm disease is always associated with Coxsackie virus of Group B there is now clear evidence that more than one immunological type of virus may be concerned.

Summary

A description is given of an epidemic of Bornholm disease which occurred among the general population of Oxford in the late summer and autumn of 1951. Detailed histories were obtained from 262 of the 277 cases traced.

The weekly rate of incidence rose rapidly to a peak in about four weeks and was followed by an equally rapid fall. Although cases occurred throughout the city, the epidemic was characterized by local areas of very heavy infection. The incidence was highest in young children. Spread within the family often occurred, but one-third of the cases were found to be single infections in a household. No connexion was found between cleanliness or overcrowding of the home and density of infection. Spread within schools was not a feature of the epidemic, but the experience of one infant school attacked is described.

The incubation period varied from 1 to 18 days, with the majority between two and five days. Symptoms were very diverse. The most useful single feature in diagnosis was the characteristic spasmodic nature of the pain. Pyrexia was usually present and severe headache was a common complaint. Other less frequent symptoms included vomiting, photophobia, shivering, sore throat, pain in the limbs or neck, dizziness, delirium, hyperaesthesiae, and paraesthesiae. In seven cases proved benign meningitis occurred as a complication, but the more probable figure was 16 (6%).

Orchitis was a complication in 3 out of 30 adult males infected. Relapses, both early and late, were a characteristic feature of the outbreak.

Viruses pathogenic for infant mice were isolated from the faeces of 6 out of 17 cases examined. Attempts to isolate virus from C.S.F., blood, and throat washings failed. The strain of Coxsackie virus isolated was identified as belonging to Dalldorf's Group B on account of the pathological lesions in mice. These included of the pathological lesions in mice. These included of muscle, fat-pad, and cerebral lesions in infant mice, and extensive lesions of the acinar tissue of the pancreas in adult mice.

Paired acute and convalescent sera were obtained from 13 patients and tested for the presence of neutralizing antibody against the Oxford virus. A marked rise in neutralizing power in the convalescent serum was demonstrated in eight patients, whilst the other five cases had a high titre of antibody in both sera.

Preliminary cross-neutralization tests, using the Oxford virus, indicate that it may be a previously unrecognized antigenic type.

The laboratory investigation of the Oxford epidemic of Bornholm disease was made possible by the generosity of the Nuffield Foundation, to whom we wish to express our gratitude. Our thanks are due to Dr. R. L. Vollum and Dr. G. T. Cook, Director and Deputy Director of the Oxford Public Health Laboratory, for their interest and practical help. The epidemiological study would have been very incomplete without the whole-hearted co-operation of the medical profession in the city. It is a pleasure to pay tribute to the thorough work of Miss H. Spickernell, the health visitor seconded to assist with the field investigations.

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An Australian tree, the Duboisia, has become an important source for the production of atropine and hyoscyamine. Before the last war the Duboisia was little more than a botanical curiosity, but when other sources of supply of these alkaloids were interrupted in 1940 Australian scientists found that the Duboisia leaf had considerable possibilities. A chemical processing method was developed, and soon the major requirements of the Allies were being met. Present exports of the leaf, although exceeding 100 tons a year, do not completely satisfy the demand. Steps are being taken to make good the heavy inroads on the natural growth of the trees during the war. It has been shown that commercial yields of more than half a ton of dry leaf per acre are possible.

BORNHOLM DISEASE IN CHILDREN

BY

M. E. DISNEY, M.D., M.R.C.P.

E. M. HOWARD, B.Sc.

AND

B. S. B. WOOD, D.M., M.R.C.P., D.C.H.

With the assistance of the late

G. M. FINDLAY, C.B.E., M.D., Sc.D., F.R.C.P.,

under whose direction the virological study was begun

(From the Dudley Road Hospital, Birmingham, and the Pharmacy Laboratory, London University)

Now that one or more strains of the Coxsackie virus have been shown to be involved in Bornholm disease (Curnen *et al.*, 1949; Shaw *et al.*, 1950; Findlay and Howard, 1950), it should be possible by virus sampling to delineate more clearly the clinical features of the condition. Although the earlier literature suggested that Bornholm disease bred true to type, it has been suggested that "benign lymphocytic meningitis" (Macdonald *et al.*, 1937; Dummer *et al.*, 1937), encephalitis (Howard *et al.*, 1943), and pneumonitis (Hopkins, 1950) may be superimposed upon pleurodynia. From virus studies it appears that at least three other syndromes have been described as due to the Coxsackie infection—non-paralytic poliomyelitis (Dalldorf and Sickles, 1948), herpangina (Huebner *et al.*, 1951), and three-day fever (Webb and Wolfe, 1950). On the question of whether one strain of virus can give rise to several different syndromes, the evidence is inconclusive, though Bury and Tobin (1952) suggest that it can.

During the 1951 Bornholm epidemic in Great Britain 104 children with the clinical appearances of Bornholm disease were admitted to Dudley Road Hospital, Birmingham. This communication describes the clinical features of these typical cases and reports the results of a search for the Coxsackie virus among them; it also discusses the virological findings in 26 atypical cases which had clinical features differing slightly from true Bornholm disease but which for various reasons were thought possibly to be related.

Typical Cases

We have taken the following features as necessary to make the diagnosis: pain in muscles, usually of chest or abdomen; brief or recrudescence course, absence of demonstrable pulmonary or other lesions; and occurrence in epidemic form. We have therefore excluded all cases showing definite radiological changes in the chest.

The Epidemic.—On June 2, 1951, a girl aged 13 was admitted to the ward with a history of sharp stabbing pain in the right side of the chest for the past 18 hours. Although there were no abnormal chest signs she was treated as a case of pneumonia with penicillin and a sulphonamide. Next day she was much improved; the temperature was normal and the chest x-ray film clear, and the diagnosis of Bornholm disease seemed more likely than the original one of pneumonia. In the next few days further similar cases showed that we were in the midst of an epidemic, while retrospective examination of notes led us to discover a further six cases which had been labelled pleurisy, pneumonia, P.U.O., and the like. On June 12 one of us was asked to see a boy of 7½ who had been admitted to a surgical ward on June 9 with one day's history of sharp stabbing pain in the upper abdomen, nausea, and anorexia. His case was similar, and it caused us to take an interest

in the children's surgical ward, where admissions were subsequently seen to be on roughly the same scale. Table I summarizes the clinical findings in these cases.

TABLE I.—Clinical Findings in Typical Cases

Symptom or Sign	Medical		Surgical		Total	
	Cases	%	Cases	%	Cases	%
	55	100	49	100	104	100
History of contact ..	16	29	9	18	25	24
Average age ..	6½ Years		4½ Years		5½ Years	
Onset acute ..	38	69	46	94	84	82
Site of pain:						
Chest ..	9	16	0	0	9	9
Abdomen ..	36	65	48	98	84	81
Both ..	10	18	1	2	11	11
Red throat ..	33	60	14	29	47	45
Follicles on tonsils ..	3	5	2	4	5	5
Cervical glands enlarged ..	18	33	22	44	40	38
Respiratory system:						
Dyspnoea (including grunting) ..	30	55	8	16	38	36
Cough ..	3	5	5	10	8	8
Alae nasi active ..	9	16	6	12	15	14
Pleural rub ..	7	13	0	0	7	7
Crackles ..	7	13	3	6	10	10
Abdominal signs:						
Generalized tenderness ..	20	36	15	30	35	34
R.I.F. tenderness ..	3	5	10	20	13	13
Subjected to laparotomy ..	0	0	9	18	9	9
C.N.S.:						
Headache ..	15	27	1	2	16	15
Drowsiness ..	4	7	0	0	4	4
Meningism ..	6	11	0	0	6	6
Average duration of acute phase ..	4½ Days		5½ Days		5 Days	
Recrudescence ..	27	49	21	43	48	46
White count less than 10,500 per c.mm. ..	35/38	92	12/14	86	47/52	90

* Seven cases (including the six with meningism) had cerebrospinal fluid examinations, and in only one was it abnormal, with 40 cells per c.mm.

Virus Studies.—Attempts were made to collect stools, nasal washings, and sera as early in the disease as possible, and then to take another specimen of blood a few weeks later.

Isolation of Virus from Faecal Specimens.—Suspensions of faeces were prepared according to the method of Dalldorf *et al.* (1949); newborn mice were inoculated intracerebrally and intraperitoneally, approximately six mice being used for each sample. After 48 hours, mice showing weakness, tremors, or paralysis were killed; samples of brain and muscle were removed for passage, while further specimens were removed for section. The histological changes in positive cases were found to be typical of Coxsackie Group B virus infection; this has been confirmed by Dr. Dalldorf, who kindly examined the virus strain from Case D and found it to be Group B, type 3.

Neutralization Tests.—A virus strain from one of the cases (Case D) was used. The dilution of serum which protected 50% or more of the mice against 100 M.L.D. virus was taken as the end-point. The results are shown in Table II.

TABLE II.—Results in the Typical Cases

1. Virus isolation in stools: 17 tested	..	..	9 positive (53%)
2. Neutralization tests:	{	Case	
		A ..	1st Serum .. 2nd Serum ..
		B ..	1/10 (31) .. 1/1000 (65)
		C ..	1/10 (5) .. 1/100 (35)
		D ..	Not tested .. 1/100 (47)
		E ..	" " .. 1/1000 (69)

All four cases had positive stool findings. The numbers in parentheses following the serum dilution figures, both in this and subsequent tables, indicate the time in days from the onset of the illness on which these particular sera were taken.

Atypical Cases

The cases occurring at the height of the epidemic and resembling on clinical grounds some of the variants reported in the literature fell into four groups, which we have called: neurological, P.U.O. type, pneumonitis, infantile. They were investigated virologically in the same way as the typical cases.

1. **Neurological Group.**—These seven children had symptoms suggestive of encephalitis or meningitis; pain other

than headache was not a feature (see Table III). The sera of all but one (Case 7) were further examined as follows: (i) leptospiral agglutination with *L. icterohaemorrhagiae*, *L. canicola*, *L. sejeoe*, *L. grippotyphosa*, *L. bataviae*, *L. pomona* all negative; and (ii) complement-fixation tests for lymphocytic choriomeningitis negative. Complement-fixation tests for mumps virus were also performed on Cases 2, 3, and 4, and were negative.

2. **The P.U.O. Group** consisted of 10 rather heterogeneous cases in which there was a history of abdominal pain, vomiting, or headache, together with a sore throat and a generalized lymphadenopathy (see Table IV).

3. **Pneumonitis Group.**—There were four cases which would have been considered typical Bornholm disease but for the presence of radiological changes in the lungs (see Table V).

4. **The Infantile Group** are mentioned as possible examples of the young child's response to the infection, with screaming attacks, fever, malaise, and recovery unaffected by treatment (see Table VI).

Discussion

Our findings in the typical cases suggest that this epidemic was caused by Coxsackie virus Group B, type 3. Dalldorf (1952, personal communication) has found this strain to be associated with Bornholm disease in widely separated sections of the United States. The immediate diagnosis, however, remains a clinical one, and it is often necessary, especially in children, to treat each case at first as one of serious organic disease.

In the 26 atypical cases the virus was recovered from only 3 out of a total of 13 stool specimens examined, while neutralization tests showed the presence of antibody in 11 out of 17 children whose convalescent sera were tested.

Neurological Group.—While there is some evidence that Coxsackie virus can cause meningo-encephalitic changes (Curnen *et al.*, 1949), such reports with adequate virus study are infrequent; of 10 accidental infections in laboratory workers (Shaw *et al.*, 1950) only one showed a meningitic response, while of our typical cases only one had an abnormal cerebrospinal fluid. We have found no satisfactory evidence that an identical strain of virus has been isolated concurrently both from cases of epidemic pleurodynia and cases with meningo-encephalitic type of illness shown by a pleocytosis in the cerebrospinal fluid.

Cases of benign lymphocytic meningitis (Brown and Prinsley, 1951) and benign meningo-encephalitis (Galpine and Macrae, 1953) occurring in the United Kingdom at about the time of the Bornholm epidemic cannot necessarily be regarded as causally related. It may be that these syndromes were of different aetiology running alongside the other epidemic. It is interesting to note from Table III that Case 6, with a very strong contact history of Bornholm disease, had a turbid fluid with polymorphs predominating, as also did Case 4, whose neutralization tests showed the highest titre. It is possible that these two might have been examples of infection with the Coxsackie virus. The other neurological cases seem to be unrelated to the epidemic; the neutralization tests in Cases 3 and 5 are against a recent Coxsackie infection, and despite the contact history in Case 2 the bizarre symptoms and absence of virological support point the same way.

P.U.O. Group.—This would include the cases of herpangina (Huebner *et al.*, 1951), three-day fever (Webb and Wolfe, 1950), and the febrile illness of Kenyon *et al.* (1952). Even these, however, bred true to type within the epidemics and did not seem to produce variants; the two American reports found a Group A virus, while the Coventry cases were apparently due to a Group B type. Ours are probably a mixture of several different conditions, such as glandular fever, tonsillitis with abdominal pain, and other short-term fevers. Only towards the end did we suspect them to be related to the Bornholm epidemic; we therefore had only one stool examined virologically from a patient in the acute

TABLE III.—Neurological Group

Case	Age (Years)	History	Physical Examination	Course (Days)	Contact	C.S.F.	W.B.C.	Virology Faeces	Neutralization Tests (Conv. Sera)
1	3	7 days of lassitude, vomiting, headache, fever	Signs of meningism. T. 101° F. (38.3° C.)	7	Neg.	Clear; cells, 275 per c.mm. (lymphocytes); protein, 25 mg./100 ml.	11,600	Not done	Not done
2	4	7 days of chill and malaise; 4 days of headache, vomiting; 2 days of weakness and ataxia of legs	Afebrile; signs of ataxia of lower limbs and reeling gait	10	Pos.	Clear; cells, 6 lymphocytes per c.mm.; protein, 10 mg./100 ml.	—	Neg.	No result
3	9	12 days of vomiting, lassitude, headache; 24 hours' coma	Flaccid type of coma with absent reflexes; bilateral papilloedema	4	Neg.	Clear; pressure 300 mm. H ₂ O; cells, 23 mononuclear per c.mm.; protein 20 mg./100 ml.	—	Neg.	1/10 (43)
4	5	2 days of lassitude, headache, drowsiness	Febrile, T. 100° F. (37.8° C.); drowsy, signs of meningism	10	"	Turbid; cells, polymorphs; protein, 35 mg./100 ml.	8,000	"	1/1000 (62)
5	8	7 days of vomiting, nausea, lethargy	Afebrile, lethargic, dehydrated, slight meningism	5	"	Clear, colourless; cells, 12 mononuclear; protein, 15 mg./100 ml.	12,300	Sample missing	1/100 (50)
6	8	4 days of lassitude, vomiting	Febrile, T. 102.8° F. (39.3° C.); red throat, meningism	4	Pos.	Turbid; cells, polymorphs; protein, 40 mg./100 ml.	12,200	Neg.	1/100 (26)
7	6	5 days of vomiting, headache, nausea	Febrile, T. 100° F. (37.8° C.); red throat, meningism	7	Neg.	Clear; cells, 340 per c.mm. (lymphocytes); protein, 25 mg./100 ml.	—	Not done	Not done

TABLE IV.—P.U.O. Group

Case	Age (Years)	History	Physical Examination	Course (Days)	Contact	Investigation	Virology
8	4	2 days' abdominal pain	Follicular tonsillitis	2	0	W.B.C. 12,000; throat swab negative	None
9	5	4 days' pain throat and abdomen, drowsiness, and vomiting	Follicular tonsillitis; generalized lymphadenopathy	Recrud. 6	0	W.B.C. 7,600; throat swab negative	"
10	8	2 days' abdominal pain	Generalized abdominal tenderness	Recrud. 14	0	W.B.C. 10,700; Paul-Bunnell negative	"
11	9	28 days' malaise; 1 day acute pain in abdomen	Generalized epigastric tenderness; herpes on lips	1-2	+	W.B.C. 7,700	"
12	6	2 days' abdominal pain and vomiting	Generalized tenderness; generalized lymphadenopathy	Recrud. 14	0	W.B.C. 6,000	"
13	3	4 days' coryza with vomiting; 2 days' abdominal pain	Generalized abdominal tenderness; generalized lymphadenopathy	Intermittent 6	0	W.B.C. 15,100	Pos. stool 1st serum 1/10 (21) 2nd serum not tested
14	11	14 days' headache; 1 day's pain in abdomen and right arm	Follicular tonsillitis; cervical adenitis; tenderness in groins	Recrud. 3	+	W.B.C. 7,300; haem. strep. in throat swab	Neg. stool 1st serum <1/10 (16) 2nd serum <1/10 (50)
15	7	5 days' headache and neck pains	Tender neck muscles; lymphadenopathy; follicular tonsillitis	Recrud. 5	+	W.B.C. 9,500; Paul-Bunnell negative	2nd serum <1/10 (76)
16	10	5 days' pain in abdomen, neck, and head	Follicular tonsillitis; tender neck muscles	5	0	W.B.C. 17,100; Paul-Bunnell negative	Neg. stool 1st serum—not tested 2nd serum 1/1000 (42)
17	4	1 day's abdominal pain and vomiting	Generalized lymphadenopathy; tenderness in R.I.F.	1	0	W.B.C. 5,400; C.S.F. 10 cells	None

TABLE V.—Pneumonitis Group

Case	Age (Years)	History	Physical Examination	Course (Days)	Contact	W.B.C.	X-ray	Virology
18	6	Sudden onset pain left chest, delirium, tachypnoea	Dyspnoea, slight cyanosis, dim. movement left base	3	0	16,410	Small area consolidation left base	Conv. serum 1/100 (66)
19	10	8 days' headache, drowsiness, and acute abdominal pain	Pleural friction and crackles left base	9	0	17,200	Slight congestive changes left base	Stool +; rising titre: 1/10 (23) 1/1000 (62)
20	6	1 day's severe abdominal pain	Dyspnoea, red throat	4	0	7,900	Small area consolidation L.L.L.	None
21	11	3 days' severe pain in chest	Alae nasi active, herpes	4	0	10,600	Slight congestion R.U.L.	"

TABLE VI.—Infantile Group

Case	Age	History	Physical Examination	Course (Days)	Contact	Investigation	Virology
22	6/52	1 day's sudden onset sweating, dyspnoea, drowsiness	Ill-looking, feeble cry, slight meningism, offensive stool	Recrud. 7	0	X-ray consolidation L.L.L.; W.B.C. 15,300	None
23	18/12	14 days' drowsiness, vomiting, anorexia	Febrile	5	0	Throat swab N.A.D.; W.B.C. 2,700	"
24	22/12	3 days' screaming intermittently, anorexia, heavy breathing	Follicular tonsillitis	3	0	W.B.C. 11,900; C.S.F. N.A.D.	Conv. sera <1/10 (40). Neg. stool
25	9/52	1 day's crying as if in pain	Slight meningism, tense abdominal relaxed stool	12	0	W.B.C. 6,600	Conv. serum >1/1000 (21). Positive stool
26	17/12	Acute onset screaming, restlessness, fever, 11 days before admission	Febrile, injected pharynx				

* This patient's mother had a typical attack of Bornholm disease a week before he was admitted to hospital.

stage, though this was in fact positive. The findings in Table IV suggest that, of the four cases tested virologically, two may have had a recent Coxsackie infection.

Pneumonitis Group.—Although pneumonitis has not been generally recognized as a complication, it has been described (Hopkins, 1950), and in the one case tested here the virus was found and a rising titre demonstrated in the neutralization test. In view of the occurrence of virus pneumonia in measles and other virus diseases, its occurrence in Coxsackie infection is also possible.

Infantile Group.—Howard *et al.* (1943) reported eight children under 2 years presenting with convulsions amidst an epidemic of pleurodynia. We noted no increase in babies admitted to our wards at this time with convulsions, and, as Howard's adult cases (22) included five of encephalitis, it is possible that these authors were dealing with another disease running alongside the true pleurodynia. Both the patient reported by Forrester and Tobin (1951), aged 19 months, and our Case 26, aged 17 months, with a positive stool and a convalescent titre of 1/1000, had very atypical features and a prolonged course. Perhaps the human infant's response to the infection is, as in the mouse, quite different from that of the adult.

Conclusion

We recognize that our findings are rendered inconclusive by the small percentage of cases tested for virus, but the same criticism applies to most of the reported work. This is largely owing to the heavy demands of virological study upon both time and animals. Taking the isolation of virus from the stool as perhaps the most reliable guide, it is significant that over half (9 out of 17) of the typical cases tested were positive, while in less than a quarter (3 out of 13) of the atypical cases was the virus isolated. These findings in the latter group might be due to chance owing to the wide occurrence of the virus in nature (Huebner *et al.*, 1950); alternatively, the truth may be that a minority of these atypical cases were indeed caused by the Coxsackie virus and that the remainder were of different aetiology. Review of the case records in these atypical cases does not reveal any special features differentiating those with suggestive virological findings from those with completely negative results.

Until virus investigation can be applied more widely and to a much higher proportion of any clinical group, strong supportive clinical and epidemiological evidence is needed to maintain claims that virus findings from a small number of cases can be applied to a whole group; meantime, in the words of Dalldorf (1950), "we should be satisfied to observe and describe and suspend judgment."

Summary

The clinical findings of 104 typical cases of Bornholm disease in children are described. Nineteen of these have been investigated for evidence of virus infection.

Twenty-six cases suspected of atypical Bornholm disease are described and the virological findings in 17 of these are discussed.

A Coxsackie virus, group B, has been isolated from the faeces of patients in this epidemic.

The evidence in the atypical cases is inconclusive, the findings being briefly discussed in the light of recent published work.

We wish to express our gratitude to Professor G. A. H. Buttle for advice and criticism and for allowing the virological work to be carried out. We are indebted to Dr. G. Dalldorf for help in identifying the virus, and to Dr. A. D. Macrae for examining the sera of the neurological cases. We would also like to thank our house-physicians, Drs. A. Lerpinière, P. K. Murphy, A. Moffatt, and A. Freedman, for their careful note-taking and help with the collection of specimens. Finally, we are grateful to our surgical colleagues at Dudley Road Hospital for the opportunity of examining their cases and reporting on them.

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THE ISOLATION OF A COXSACKIE VIRUS FROM TWO CASES OF BORNHOLM DISEASE

BY

R. H. A. SWAIN, M.D.

Senior Lecturer in Bacteriology, University of Edinburgh

AND

R. G. MITCHELL, M.B., M.R.C.P.Ed., D.C.H.

Registrar, Royal Hospital for Sick Children, Edinburgh

In the summer of 1951 South-east Scotland, in common with many other areas of the country, experienced an outbreak of Bornholm disease. A series of 24 cases occurring in May, June, and July was reported in West Fife by McNeish and Stewart (1952), and Sandilands (1951) saw many cases in general practice in Kirkcaldy.

During these same three months many children suffering from the disease were seen in the out-patient department of the Royal Hospital for Sick Children in Edinburgh, and 18 cases were admitted to the wards of the hospital. The principal clinical features of the latter group have already been reported (Mitchell, 1951), and the purpose of the present paper is to record the results of virus studies carried out on 2 of the 18 patients. The two children were not specially selected except in so far as they were quite typical of the group.

Case 1

A boy aged 3 years and 7 months was admitted to hospital on July 10, 1951. Four days before admission he had a sudden attack of upper abdominal pain on the right side, severe enough to make him scream. The pain continued intermittently for one day and then subsided. For the next three days he appeared well, though his appetite was poor, but on the day of admission the severe pain recurred. He did not vomit and his stools were normal. He had no cough.

Examination revealed a flushed feverish child with diminished air entry at the base of the right lung on auscultation. No friction rub was heard and his throat was not inflamed. A leucocyte count on admission was 8,800 per c.mm. with 79% polymorphonuclear leucocytes, the haemoglobin was 13 g., and the erythrocyte sedimentation rate was 32 mm. in the first hour. An x-ray film of his chest on admission showed no abnormality. His urine was normal and a

Mantoux test (1 in 1,000) was negative. The symptoms continued for a few hours after admission to hospital and then subsided. Recovery was rapid and complete.

The course of this child's illness was characteristic of the group, the only unusual feature being the rather high erythrocyte sedimentation rate, the average for the group being 19 mm. in the first hour. Specimens of blood were taken from an arm vein on the sixth and twentieth days after the onset of the first symptom, and a third specimen was taken eight months later. At this time the boy was very well and had had no further illness. A specimen of stool was taken at the same time as the first blood specimen.

Case 2

A girl aged 4 years and 4 months was admitted to hospital on July 11, 1951. Three days before admission she suddenly complained of severe pain in the upper abdomen, which continued intermittently all day, and then subsided. During the following day she had no pain but did not eat very much. On the day of admission the pain recurred and she also complained of pain in the shoulders. She did not vomit and had no diarrhoea.

Examination showed a rather thin flushed child, with a temperature of 100.4° F. (38° C.). There was a slight faucal injection; slight dullness to percussion, with diminished air entry, was found at the lung bases. No friction was heard. A leucocyte count on admission was 10,000 per c.mm., with 76% polymorphonuclear leucocytes, the haemoglobin was 12.6 g., and the erythrocyte sedimentation rate was 24 mm. in the first hour. An x-ray film of her chest on admission was negative, her urine was normal, and a Mantoux test (1 in 1,000) was negative. The symptoms disappeared rapidly after she was confined to bed, and she made an uneventful recovery.

Specimens of blood were taken from an arm vein on the fifth and nineteenth days after the onset of the first symptoms, and a third specimen was taken eight months later. At this time the child was very well and had had no illnesses since discharge. A specimen of stool was taken at the same time as the first blood specimen.

Virus Studies

A fresh sample of faeces was ground with physiological saline in a mortar to make a 20% suspension. Coarse particles were removed by centrifuging at 1,800 r.p.m. for 10 minutes and 20% of ether was added. After standing at 2° C. overnight the ether was removed by evaporation and the remainder was spun in an angle centrifuge at 4,000 r.p.m. The supernatant fluid, which was bacteriologically sterile, was used for animal inoculation.

Litters of suckling mice, not older than 24 hours, were used, and at first each animal received 0.01 ml. intraperitoneally, and at first each animal received 0.01 ml. intraperitoneally. Between the cerebra and 0.025 ml. intraperitoneally about one-sixth and eighth days after the first inoculation about one-quarter of the sucklings were found to be smaller than their litter-mates. The hind limbs, which were involved in the spasms of uncontrolled tremors, were dragged behind the animals when they walked. The limbs were capable of some movement, however, and were not paralysed. Mice so affected were sacrificed and used for transmission experiments.

A 10% suspension of the skinned and eviscerated carcasses of infected mice was prepared and penicillin and streptomycin were added. These suspensions, clarified by centrifuging, were used for subsequent passages. After the third passage all the animals inoculated were infected, and it was necessary to use only the intraperitoneal route (Table I).

In sections of the muscle of the affected limbs of the sucklings small foci of hyaline degeneration were seen. Necrosis of the muscle fibre was accompanied by proliferation of the sarcolemma and by infiltration with histiocytic phagocytes, some of which were seen to contain the products of tissue damage. The muscle lesion varied in extent; in some mice the lesion was quite small and easily overlooked, while in others large numbers of muscle fibres were

TABLE I

Passage	Route	No. of Sucklings Infected No. of Sucklings Inoculated	
		Case 1	Case 2
1	I.C. + I.P.	9/40	9/32
2	I.C. + I.P.	7/22	10/15
3	I.P.	13/13	6/9
4	I.P.	12/12	9/9
5	I.P.	11/11	
6	I.P.	5/5	
7	I.P.	5/5	

Virus isolations: I.C. = intracerebral; I.P. = intraperitoneal.

involved. The lesions were present in all of 20 mice examined histologically, and occurred in the masseter, and in the muscles of the thigh, the shoulder, and the abdominal wall.

The interscapular pad of fat in the majority of the mice was red and congested in appearance, and, histologically, areas of necrosis were observed at the periphery of the lobules. Similar areas of necrosis were present in the sucking pads and in the subcutaneous fat of the limbs and the abdominal wall.

In 3 out of 10 sucklings examined histologically a marked infiltration of the meninges with histiocytes and lymphocytes was seen and many small areas of necrosis were found in the subjacent brain tissue. No evidence of involvement of the spinal cord was obtained. The examination of the liver, pancreas, spleen, kidney, and heart muscle of these 10 animals revealed no lesions.

The virus was inoculated in a dose of 1,000 LD₅₀ into six 3-months-old mice by the intraperitoneal route; the animals all survived unharmed. Similarly, a litter of eight 3-day-old sucklings were unaffected by the injection intraperitoneally of 100 LD₅₀ of the virus. Preservation of the virus was achieved in buffered saline pH 7.4 at 2° C. for seven days; it was, however, more usually kept with the addition of 50% glycerol at -20° C. or by freeze-drying. The virus passed through a Seitz E.K. pad.

These findings indicate that the virus belongs to Group B of the Coxsackie viruses (Dalldorf, 1951). Since, even after repeated examination, no evidence of pancreatic necrosis following the injection of the virus was obtained, it is probable that the strain is not related to the Conn.-5 strain of Pappenheimer *et al.* (1951)—it may therefore belong to type 2 or 3. Thus the virus resembles strains associated with Bornholm disease in the United States, and appears to be similar to the strain isolated by Metcalfe Brown *et al.* (1952) during the outbreak in Manchester which occurred simultaneously with that in Edinburgh.

Neutralization tests were performed in which 100 LD₅₀ of the virus isolated from each child was exposed to the patient's own serum for one hour at room temperature. Samples of serum taken during the acute and convalescent phases of the illness, and again after nine months, were used. The results (Table II) show that antibodies to the

TABLE II.—Results of Neutralization Tests

Case	Days After Onset of Symptoms	Serum + 100 LD ₅₀ Virus No. Infected/No. Inoculated at a Serum Dilution of		
		1 in 5	1 in 25	1 in 125
1	6 20 247	9/9 0/7 8/8	6/6 0/6 7/7	10/10 0/8 —
2	5 19 244	6/6 0/7 6/6	9/9 0/7 8/8	— 0/8 —

virus had appeared by the sixteenth and twenty-second days. The mice were protected against both the virus strains isolated.

Attempts to prepare an active antigen for use in a complement-fixation reaction met with no success. The failure may have been due to the fact that extracts of the muscle never had an infective titre of over 10⁻⁵ and that no effective method of concentrating the virus was available.

An interesting finding was that gamma globulin prepared in January, 1952, from the pooled plasma of blood donors in the Edinburgh district had considerable power to protect mice against the virus. This activity was at least as great as the capacity of this sample to protect against measles, and thus there appears an indication that a considerable proportion of the adult population of Edinburgh had at some time been infected with the virus.

Unfortunately, no sample of gamma globulin taken before the epidemic was available for comparison. Before any epidemiological significance can be placed on this finding it will therefore be necessary to examine a further series of samples of gamma globulin obtained during non-epidemic times.

Discussion

Since neutralizing antibodies appeared in the serum, reached a titre of 1 in 125, and disappeared after eight months, it seems justifiable to conclude that both children were infected by the virus isolated.

The illnesses experienced by the two children were quite typical of Bornholm disease, being characterized by the sudden onset of severe intermittent pain in the upper abdomen, a short recrudescence course ending in complete recovery, and no evidence, radiological or otherwise, of an underlying pulmonary lesion. Occurring as they did during an epidemic, they fulfil all the criteria for the diagnosis of Bornholm disease (Scadding, 1951).

No sign of meningeal involvement was present either in the two children investigated or in the 16 other members of the group. In this there is a resemblance to the two cases described by Metcalfe Brown *et al.* (1952), but it is interesting to note that, in the epidemic which occurred at about the same time at Oxford, Davies and Warin (1951) reported a series of 79 cases, 4 of which had definite signs of meningitis. Bornholm disease may present a variable clinical picture with meningitic or myalgic symptoms predominating. It is possible that different strains of virus are associated with different clinical features, and that the Oxford epidemic was caused by a virus differing from that current in Manchester or Edinburgh at the time. On the other hand, it is well known that the same virus may cause both myalgic and meningitic illnesses.

The understanding of the epidemiology of Bornholm disease, of aseptic meningitis, and of non-paralytic poliomyelitis in this country may be expected to advance rapidly when more strains of the Coxsackie virus are isolated and their immunological characters are worked out.

Summary

In an outbreak of Bornholm disease a Coxsackie virus of Dalldorf's Group B was isolated from the faeces of two of the children affected. A rise and fall in the titre of antibodies in the patients' sera indicated that they had suffered a recent infection with this virus.

Our thanks are due to the physicians of the Royal Hospital for Sick Children in Edinburgh under whose care the children were; to Professor T. J. Mackie for help and advice; to Professor A. Murray Drennan for help with the histology; to Dr. R. A. Cumming for samples of gamma globulin; to Mr. J. Sutherland for technical help; and to Mr. J. Isaacson for the supply of suitable litters of mice.

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THE BACTERIAL CONTENT OF THE HEALTHY HUMAN SMALL INTESTINE

BY

JUDITH CREGAN, B.Sc.

AND

NANCY J. HAYWARD, M.Sc., Ph.D.

(From the School of Bacteriology, University of Melbourne.

This work was undertaken to determine the number and kind of bacteria that inhabit the healthy human small intestine. The results showed that their number is so small that they must be regarded as transient contaminants passing through with the ingesta rather than a resident flora colonizing the tract. They are chiefly those Gram-positive species that are usually found in the mouth and throat.

Experimental

Clinical

Patients undergoing gynaecological operations without any history of disease of the intestinal tract or of its associated organs were selected for the investigation. In every case no inflammatory process was proceeding in the abdomen; the general health of the patients was good, and they were fasting for six hours before the operation.

Collection of Specimens

In order that the sampling should be as precise as possible, intestinal contents were taken direct from the bowel with a syringe when the abdomen was open at operation. The syringe needle was inserted obliquely into the antimesenteric border of the small bowel.

Generally the bowel contained so little material that a sample of its contents could be obtained only as a washing. This was procured by injecting 2 ml. of sterile Ringer's solution (chosen because of its low toxicity for micro-organisms) into the lumen of the bowel while constricting the bowel with the fingers about 1 in. (2.5 cm.) above and below the site of injection; washing the bowel lumen with the fluid by sucking it back and forth with the syringe; and then removing the resultant diluted intestinal contents. Although these samples were diluted they were satisfactory because interest centred only on the relative numbers of organisms at various anatomical levels of the intestinal tract. It was necessary only that the technique should be uniform; therefore the same volume (2 ml.) of Ringer's solution was used for every washing, both for the small intestine and for the mouth and large intestine when they were sampled as controls.

This technique was first practised by our colleague Mr. E. E. Dunlop, honorary surgeon to the Royal Melbourne Hospital, who concluded that it was not prejudicial to the post-operative progress of the patient. This was confirmed by Professor Townsend in the present investigation; the post-operative course of the patients showed no evidence of leakage into the peritoneal cavity from the puncture of the bowel.

Bacteriological Examination of Specimens

The same technique was used for all specimens, and was designed to give both quantitative and qualitative information about the flora of the small intestine. Within a few

hours of taking the sample the following media were each inoculated with two drops (about 0.06 ml.) of the bowel washings:

Incubated at 37° C. in air	Sheep-blood agar
	Sheep-blood potato extract* agar
Incubated at 37° C. anaerobically with 5-10% carbon dioxide	MacConkey's agar
	Beer-wort agar
	Sheep-blood agar
	Sheep-blood potato extract* agar

The range of media inoculated and the methods of incubation were devised to provide the growth requirements of all species of bacteria likely to be found in the intestine, including non-sporing anaerobes which have been reported to be in large numbers in faeces (Sanborn, 1931; Torrey and Montu, 1931; Eggerth and Gagnon, 1933). Generally the particular species present in only small numbers was positively avoided because an overall picture of the flora was desired, most importance being attached to organisms present in largest numbers. However, MacConkey's agar and beer-wort agar were included to detect coliforms and yeasts respectively.

The method of inoculation was to spread the original two drops over an area at one side of the plate (A) and then to make three successive sets of four or five strokes at right angles (B, C, and D), thus covering the whole area of the plate. The media were examined at intervals up to at least four days, and the degree of growth was recorded as follows:

Growth in areas A, B, C, and D	..	..	..	+++
Growth in areas A, B, and C, not D	..	..	..	++
Growth in areas A and B, not C and D	..	..	..	+
Growth only in area A	..	..	..	±
No growth	..	..	..	-

All species isolated were identified as fully as possible. The systematic table recommended by Swift (1948) was used for streptococci. Three combinations of characters that did not fit any named species were encountered, and the strains with these characters were called varieties 2, 3, and 4 (Cregan, to be published). Staphylococci were named according to the classification of Shaw, Stitt, and Cowan (1951); and for *Candida* the classifications of Benham (1931) and Martin, Jones, Yao, and Lee (1937) were followed.

Direct smears of all specimens were made by allowing four or five drops to dry *in situ* on a microscope slide. They were stained by Gram's method, and the numbers and morphological types of organisms were recorded. These observations and the results of culture generally agreed. The results by direct smears were not included in the final assessment of the flora, but they provided a check on the adequacy of the media used for culture.

Results

In assessing the quantitative results it was of theoretical importance (see Discussion) to decide the maximum number of viable organisms that could be interpreted as transient contaminants unable to multiply in the environment of the part of the intestine sampled. For example, in view of the part of the intestine sampled during sampling, it was necessary to know whether as large an amount of growth as + indicated a transient flora or whether it must be taken to indicate a resident flora. To this end the contents of two parts of the alimentary tract known to harbour a resident flora—the mouth and the large intestine—were examined quantitatively. The large intestine was sampled in the same way as the small intestine, in two cases from the caecum and in one from the transverse colon; and the mouth was sampled in five cases by gentle rinsing with 2 ml. of Ringer's solution. All the samples were examined by the same technique as was used for the small-intestine specimens. It was found that the minimum degree of growth was ++. It

*Slanetz and Rettger (1933).

was concluded, therefore, that + or ± growth could be interpreted as transient flora and ++ or +++ growth must be regarded as indicating a resident flora at the site sampled.

The decision that + and ± growth are not due to the effect of dilution during sampling has been strengthened by later experience in tests of samples from the small intestine in diseases of the digestive system (Cregan, Dunlop, Harrison and Hayward, to be published). In some diseases the small intestine yielded +++ growth, showing that the method of sampling does not over-dilute the intestinal contents when a flora is resident.

Fourteen cases were included in the present investigation, and the sites sampled were the upper jejunum, the mid-gut, and the lower ileum within 8 to 12 in. (20 to 30 cm.) of the ileo-caecal sphincter. The sites were determined by the anatomical appearance of the bowel and mesentery. The results are shown in the Table.

Flora of the Small Intestine

Site of Sampling	No. of Subjects	Quantitative Results			Qualitative Results	
		Sterile	Transient Flora	Resident Flora	Gram-positive Species	Gram-negative Species
Upper jejunum	14	12	2	0	<i>Lactobacillus</i> sp. (1) <i>Candida albicans</i> (1)	
Mid-gut (lower jejunum or upper ileum)	14	10	4	0	<i>Str. salivarius</i> (2) ,, <i>s.b.e.</i> (2) ,, <i>mitis</i> (2) ,, <i>acidominimus</i> (1) ,, <i>sp. variety 2</i> (1) ,, " " 3 (1) ,, " " 4 (1) <i>Lactobacillus</i> sp. (1) <i>Candida albicans</i> (1)	<i>Bact. coli</i> Type 1 (1) <i>Veillonella gazogenes</i> (1)
Lower ileum	14	7	5	2	<i>Str. salivarius</i> (3) ,, <i>s.b.e.</i> (2) ,, <i>mitis</i> (2) ,, <i>sp. variety 3</i> (1) <i>faecalis</i> (1) <i>Cl. welchii</i> (1) <i>Lactobacillus</i> sp. (1) <i>Candida albicans</i> (1) <i>Staph. aureus</i> (1)	<i>Bact. coli</i> Type 1 (3) <i>Bact. aerogenes</i> Type 1 (1) <i>Veillonella gazogenes</i> (4) Anaerobic Gram-negative bacilli (1)

Sterile = no growth. Transient flora = ± or + growth. Resident flora = ++ or +++ growth. The figures in parentheses indicate the number of times each species was isolated.

The maximum growth in any of the samples from the upper jejunum and mid-gut was +. In 22 of the 28 samples no growth at all occurred. It can be confidently concluded, therefore, that these sites in the healthy individual are virtually sterile. Twelve of the 14 samples from the lower ileum yielded + or less growth, indicating that in most cases the normal lower ileum contains only transient organisms.

The qualitative results set out in the Table show that the few bacteria that contaminate the small intestine are predominantly Gram-positive species of the general type more commonly associated with the mouth than with the lower intestinal tract. However, in the two cases in which there was a resident flora in the lower ileum the organisms found there were of faecal type.

Discussion

The technique of sampling intestinal contents with a syringe at operation in order to determine the flora of the small intestine has four advantages: (1) samples are taken by a direct route, so that the risk of contamination is at a minimum; (2) the level of the intestine sampled can be anatomically defined by direct observation; (3) patients whose digestive tracts are completely normal can be included in the investigation; and (4) investigations can be made on the living subject.

There are numerous reports of investigations of the flora of the small intestine in health and disease using other techniques sharing some but not all of these advantages. For

the majority—for example, most of the 14 references in German published between 1912 and 1928 and quoted by Licht, 1929–30; Venables and Knott, 1924; Bogendörfer, 1924; Knott, 1927; Thomson, Einhorn, and Coleman, 1930; Kanzler, 1932; Nichols and Glenn, 1939; and Frazer, 1949—samples have been obtained indirectly with tubes of different kinds passed via the mouth. A disadvantage of this technique is that it is exceedingly difficult to ensure that a specimen from the depths of the intestine is not contaminated with organisms from a higher level. In addition, it is evident, from published reports of relative lengths of tubing and intestine, that the intestine creeps up on the rubber tubing, making it difficult to ascertain, even approximately, the anatomical level of the intestine sampled.

A number of investigations have been made of specimens taken direct from identified levels by swabbing the lumen of the small bowel when it has been exposed at or after operation for removal of a diseased adjoining part of the tract (Cushing and Livingood, 1900; Hewetson, 1904; Paulson, 1929; Barber and Franklin, 1946). Although this technique is inapplicable to normal bowel, for the types of bowel disease to which it is applicable the results are reliable and informative. Normal bowel has been examined by direct methods within twenty hours of death (Garrod, 1925; Blacklock, Guthrie, and Macpherson, 1937) but it appears (see below) that reliable information could be expected only within a few hours of death.

The techniques used in former investigations are all open to objections which are overcome by the technique used in the work reported here.

The quantitative results (see Table) showed that the normal small intestine is exceedingly sparsely populated or unpopulated along its whole length. This finding is at variance with the results of studies of normal subjects using intestinal tubes.

By intubation the duodenum was found to be often sterile or to contain very few micro-organisms (Venables and Knott, 1924; Knott, 1927; Licht, 1929–30; Kanzler, 1932), but at other levels of the small intestine organisms were found to be numerous, of the order of millions per millilitre of intestinal contents (Bogendörfer, 1924; Thomson and others, 1930; Nichols and Glenn, 1939). If one accepts the findings with the direct sampling technique reported here, the results of intubation studies for the lower small intestine must be judged to be erroneous. They have misled the teaching over the last 30 years, presenting a picture of the small intestine as an organ containing virtually no organisms at its upper end, but along its length progressively acquiring a flora, including coliforms, until at its lower end it is very heavily populated. Thus Stevenson (1950) was misled into suggesting that *Bact. coli* D433 (O 111) might be the normal inhabitants of the duodenum or jejunum, and Walther and Millwood (1951) carried out a serological investigation of strains of *Bact. coli* isolated from the duodeno-jejunal junction of 51 subjects after death when in fact no type of *Bact. coli* is an inhabitant of the upper or middle healthy living small intestine.

Our findings are confirmed, in part at least, by the results of other workers with samples removed direct from the bowel lumen at or after operations for intestinal disease. These consistently point to the conclusion that generally the small intestine is either sterile or contains very few organisms along its whole length. The most interesting of these studies were carried out 50 years ago by Cushing and Livingood (1900) in the United States and by Hewetson (1904) in Great Britain. On the basis of very careful bacteriology both investigations led to the conclusion that the upper and middle small intestines are generally sterile, Cushing and Livingood distinguishing between permanent and transient organisms. Hewetson recorded some cases in which the jejunum was sterile although the stomach was contaminated.

Later, by direct swabbing, the ileum in three cases of ileostomy was found by Paulson (1929) to contain only a

few Gram-positive bacteria, and Barber and Franklin (1946) found that the duodenum was infected in only 7 of 50 cases of peptic ulcer or gastric carcinoma.

The upper jejunum and mid-gut were found to contain, if anything, organisms of oral type, predominantly streptococci not belonging to any of Lancefield's groups (see Table). In the lower ileum a similar population was found except in a minority of cases (2 out of 14) in which organisms of faecal type were present. This also is at variance with the findings of most intubation investigations, in which coliforms, although rare in the duodenum, were increasingly common at progressively lower levels of the small intestine.

The results of Blacklock and others (1937), who used the same sampling technique as ourselves, but who directed their attention almost solely to the detection of coliforms, are in agreement with our findings. They found that bacteria were scanty in the small bowel and failed to detect coliforms in all of nine specimens from the upper jejunum and in 12 of 18 specimens from the lower ileum. Samples taken within 12 hours of death contained coliform organisms in 11 of 36 duodenal specimens, showing that almost the entire length of the small intestine is invaded by organisms from the large intestine within a short time of death.

Since the small intestine is invaded so soon after death an antibacterial mechanism must operate in the living small intestine. The results of an investigation of the flora of the small intestine in cases of disease of the stomach (Cregan, Dunlop, and Hayward, to be published) show that the antibacterial mechanism of the small intestine is independent of the secretions of the stomach.

The nature of this antibacterial mechanism has not been investigated by us. Bogendörfer (1924) reported that there is a thermolabile antibacterial substance, of lipoidal nature and of molecular size similar to egg albumen, in the juice and mucous membrane of human small intestine. This has not been confirmed. Blacklock and others (1937) investigated the claim that bacteriophages were responsible, but their results were negative. Having discussed the literature they could draw no definite conclusion, and supposed that many factors combined to keep the small intestine fairly sterile.

Whatever the mechanism—chemical, mechanical, or cellular—it ceases to be effective in the region of the ileo-caecal sphincter. As in a minority of cases a profuse flora of faecal type was found in the lower ileum, it seems that the precise anatomical level at which the mechanism ceases to be effective varies from person to person and possibly also from time to time in the same person. It does not operate either in the environment of the large bowel or in the small bowel within a few hours of death.

Summary

The bacterial flora of the healthy small intestine has been investigated, using samples removed from the lumen of the bowel with a syringe at gynaecological operations.

The results have shown that the whole length of the small intestine contains only a transient flora, chiefly of Gram-positive species that are more commonly associated with the mouth than with the large intestine.

From the apparent inability of these organisms to become resident in the small intestine it is deduced that an antibacterial mechanism, distinct from the stomach mechanism, must be operating there.

Our thanks are due to Professor S. L. Townsend, professor of obstetrics and gynaecology, University of Melbourne, for taking the samples of intestinal contents for us. Without his willing co-operation this investigation would not have been possible. We also thank Professor S. D. Rubbo, professor of bacteriology, University of Melbourne, for his constant helpful advice, and the staff of the Women's Hospital, Melbourne, and Miss Marjorie Krohn for technical assistance. One of us (J.C.) was in receipt of a personal grant from the National Health and Medical Research Council.

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CHLORAMPHENICOL IN PROPHYLAXIS OF INFANTILE GASTRO-ENTERITIS

BY

R. McLAREN TODD, M.D., M.R.C.P., D.C.H.
Senior Lecturer in Child Health, University of Liverpool

AND

EDWARD G. HALL, M.B., B.Sc.
Pathologist, Alder Hey Children's Hospital, Liverpool

Infantile gastro-enteritis is a condition which usually affects infants under the age of 1 year. It is characterized by diarrhoea and vomiting, but other features such as anorexia and loss of weight may be present. In some cases diarrhoea may be the only symptom, and in others toxæmia and dehydration may be marked, and in others diarrhoea and vomiting tend to recur. After reviewing the recorded outbreaks of neonatal gastro-enteritis, Kirby *et al.* (1950) concluded that the term "gastro-enteritis" had been applied to at least six different clinical syndromes.

In some patients with clinical gastro-enteritis, *Salmonella* or dysentery organisms may be the causative agents, but in others no specific organisms have been isolated. Since 1945 increasing attention has been paid to the occurrence of specific serological types of *Bacterium coli* in both sporadic and epidemic infantile diarrhoea and vomiting. In some outbreaks there has been a relatively high correlation between the incidence of the disease and the isolation of these specific types of *Bact. coli*. Kirby *et al.* studied an epidemic of neonatal gastro-enteritis associated with *Bact. coli* O 111 (D433) and showed that this organism might appear in the stools one to nine days before the onset of symptoms. Preliminary reports (Rogers *et al.*, 1949; Smellie, 1950) suggested that chloramphenicol was of value in the treatment of gastro-enteritis, and our own experience over the past two years has confirmed the value of the drug in established gastro-enteritis.

Present Investigation

This paper records our experiences with chloramphenicol as a prophylactic agent in infants from whom *Bact. coli* O 111 had been isolated, but in whom diarrhoea had not

developed. The investigations were undertaken between November, 1950, and August, 1951, in two of the wards of the Liverpool University Department of Child Health, at Alder Hey Children's Hospital, Liverpool. These wards, each containing 14 single cubicles, are used primarily for the treatment of infants under the age of 1 year suffering from gastro-enteritis, but infants with other diseases such as respiratory-tract infections are also admitted when beds are available.

Rectal swabs taken from all infants on admission, and at intervals of not more than four days thereafter, were examined for *Bact. coli* O 111 according to the technique employed by Kirby *et al.* (1950). Patients becoming cross-infected with this organism but who had not developed diarrhoea were included in the investigation, and alternate patients ("trial" group) were given chloramphenicol in a dosage of 75 mg. per lb. (165 mg. per kg.) body weight per day, in divided doses three- or four-hourly, for a period of seven days. The remaining cases ("control" group) received no chloramphenicol. The day on which *Bact. coli* O 111 was first isolated is referred to as day 0.

Sixty patients were observed, 30 in each group, but four patients in the trial group were subsequently excluded because chloramphenicol was not given until more than three days after the rectal swab became positive for *Bact. coli* O 111.

The first dose of chloramphenicol was given on day 0 in one case, on day 1 in 15 cases, and on day 2 in 10 cases. In the one patient who received chloramphenicol on day 0 the drug was initially prescribed because of symptoms suggestive of whooping-cough. The details of age, diagnosis on admission, antibiotic therapy, etc., are recorded in Tables I and II.

TABLE I.—Control Group

Age	Diagnosis on Admission	Specific Therapy for Primary Illness	Days Between Admission and First Rectal Swab	Days Between First Positive Swab and Onset of Gastro-enteritis	Gastro-enteritis
3 wks	Respiratory infection	Streptomycin; penicillin	4	6	Severe
5 "	U.R. tract infection	—	16	3	Mild
6 "	Acute otitis media	Penicillin	13	—	—
7 "	Bronchopneumonia	Sulphadimidine; streptomycin	4	7	Mild
7 "	Bronchitis	Penicillin	12	4	"
8 "	Congenital pyloric stenosis	—	15	14	"
8 "	Meningococcal meningitis	Sulphadiazine	8	5	"
10 "	Diarrhoea and vomiting	Aureomycin	20	—	—
10 "	Vomiting, ? cause	—	8	3	Severe
10 "	Hypoplastic anaemia	—	32	8	Mild
10 "	Bronchitis	—	12	1	"
10 "	Feeding disorder	—	23	2	Severe
3 mths	Diarrhoea and vomiting	—	9	2	Mild
3 "	Pylorospasm	—	12	2	"
3 "	Oral thrush and conjunctivitis	Sulphadimidine	8	5	"
3 "	Diarrhoea and vomiting	—	12	2	"
4 "	Bronchopneumonia	Aureomycin	12	—	—
4 "	Pylitis	Streptomycin	36	—	—
4 "	L.U.L. pneumonia	Streptomycin; penicillin	8	5	Mild
5 "	—	—	9	—	—
6 "	Acute bronchitis	Sulphadimidine	8	4	Mild
6 "	Hydrocephalus	—	30	—	—
6 "	Bronchopneumonia	Penicillin; streptomycin	8	1	Severe
6 "	Meningococcal meningitis	Sulphadiazine; penicillin	8	6	Mild
7 "	Acute bronchitis; acute otitis media	Sulphamerazine; penicillin	4	—	—
7 "	Intussusception	—	12	3	Mild
9 "	Tuberculous meningitis	Streptomycin	12	—	—
9 "	Primary tuberculosis	—	12	3	Severe
11 "	Hydrocephalus	—	12	1	Mild
12 "	Oesophageal chalasias	—	28	2	"

TABLE II.—Trial Group

Age	Diagnosis on Admission	Specific Therapy for Primary Illness	Days Between Admission and First Rectal Swab <i>Bact. coli</i> O 111	Days Between First Positive Swab and Onset of Gastro-enteritis	Gastro-enteritis	First Dose of Chloramphenicol*
3 wks	Laryngo-tracheitis	Streptomycin; sulphamerazine	4	—	—	Day 2
3 "	Thrush; prematurity	—	12	—	—	" 2
3 "	Haemolytic disease	—	12	—	—	" 1
3 "	Septicaemia	Penicillin; sulphadimidine	12	—	—	" 2
5 "	Bronchopneumonia	Streptomycin	4	19	Mild	" 2
5 "	R.M.L. pneumonia	Sulphadimidine; streptomycin	8	—	—	" 1
6 "	Feeding problem	—	4	—	—	" 2
6 "	Meningococcal meningitis	Penicillin; sulphadiazine	12	—	—	" 2
2 mths	Feeding problem	—	4	—	—	" 1
2 "	L.L.L. pneumonia	Sulphadimidine; penicillin	3	1	Mild	" 0†
3 "	R.L.L. pneumonia; thrush	Sulphadimidine; penicillin	8	12	—	" 1
3 "	U.R. tract infection	—	5	—	—	" 1
3 "	Primary tuberculosis	—	28	—	—	" 2
3 "	Bronchitis	—	12	—	—	" 1
3 "	U.R. tract infection	—	4	—	—	" 1
4 "	Acute bronchitis	Sulphadimidine; penicillin	4	—	—	" 1
4 "	Pyelitis	Sulphadiazine	8	11	Mild	" 1
4 "	Diarrhoea and vomiting	—	8	—	—	" 1
4 "	Bronchopneumonia	Penicillin	12	—	—	" 1
5 "	—	Penicillin; streptomycin	13	—	—	" 1
6 "	Acute otitis media	Penicillin; sulphadimidine	9	1	Mild	" 1
6 "	Tuberculous meningitis	Streptomycin	12	—	—	" 2‡
6 "	Hirschsprung's disease	—	7	—	—	" 1
7 "	Meningococcal meningitis	Sulphadiazine; penicillin	15	—	—	" 1
7 "	Bronchitis	Sulphadimidine	10	—	—	" 1
9 "	Bronchopneumonia	Penicillin; sulphadimidine	20	—	—	" 2

* Day 0 = day of first positive swab for *Bact. coli* O 111. † Given chloramphenicol for spasmodic whoop: ? whooping-cough. ‡ Developed no diarrhoea, but lost weight from day 3 to day 12; vomited twice on days 3, 4, and 5; anorexia days 3 and 4.

Of the 26 cases in the trial group, 21 (80%) did not develop gastro-enteritis and 5 developed a mild form. The onset of symptoms in three of these five cases was 11, 12, and 19 days after the first rectal swab positive for *Bact. coli* O 111, and 3, 4, and 10 days after chloramphenicol had been discontinued. In two cases diarrhoea developed before the second day of chloramphenicol therapy. In a further case, although no diarrhoea occurred, there was anorexia on days 3 and 4, loss of weight from days 3 to 12, and vomiting twice daily on days 3, 4, and 5. We have found that these symptoms often precede diarrhoea in patients from whom the organism *Bact. coli* O 111 is isolated.

Of 30 cases in the control group, 8 (26.6%) did not develop gastro-enteritis and 22 did; of the latter, 17 were mild at the onset and 5 were severe. Patients with mild symptoms were those in whom dehydration was not pronounced and who responded to oral glucose-saline followed by graduated milk-feeding, whereas severe cases received intravenous fluid therapy. In addition, some cases in both mild and severe groups received chloramphenicol after the development of diarrhoea. Statistical analysis shows that the difference between the trial and control groups is highly significant ($\chi^2=14.2$, $P<0.001$) and indicates that chloramphenicol had a marked therapeutic effect. The clinical features of the 22 patients in the control group who developed diarrhoea are recorded in Table III. This table

TABLE III.—Time of Appearance of Symptoms and *Bact. coli* O 111 in Stools in Relation to Onset of Diarrhoea in 22 Cases of the Control Group who became ill

Day:	No. of Cases													
	-14	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2
Diarrhoea												22	5	2
Loss of weight		1	1	2		1	5	3	1	1	3	3	1	
Anorexia		1	1	1	1	1	1	1	1	1	1	3	3	1
Vomiting														
<i>Bact. coli</i> O 111	1			1	1	2	3	2	4	5	3			

shows that loss of weight and anorexia preceded the onset of diarrhoea in a high percentage of cases. Loss of weight was recorded in 20 patients, and in 13 of these it was observed before the onset of diarrhoea. Anorexia occurred before the diarrhoea in 5 out of 9 cases. In only 7 out of 18 cases did vomiting occur before diarrhoea.

Bacteriology

It is interesting to compare in the two series the variations both in the total *Bact. coli* flora and in the isolation of *Bact. coli* O 111. The day on which *Bact. coli* O 111 was

first isolated being day 0, further swabs were taken so far as was possible on days 2, 4, 6, 9, 13, and subsequently at four-day intervals thereafter until the patient was discharged. If diarrhoea and vomiting developed, swabs were taken at more frequent intervals. In the trial series, five patients were not swabbed after day 13, as they had been discharged well and remained so. In the control series, two patients did not develop symptoms and were discharged before day 13, and 12 were treated with antibiotics because they developed diarrhoea. The remaining 21 patients in the trial group and 16 in the control group were followed up until three consecutive negative swabs had been obtained.

In the trial group, the seven-day course of chloramphenicol was begun as soon as preliminary identification of the organism had been made.

A rough assessment of the number of colonies of *Bact. coli* type (as profuse, moderate, or scanty) was made visually from the initial MacConkey plates. Disproportionate inhibition was not observed at the site of inoculation when examining plates from patients under treatment, and it was not thought that carry-over of antibiotic from the faeces appreciably affected the results, an opinion reinforced by our repeated failure to detect the antibiotic in the tubes of broth in which the swabs were dispersed after inoculation of plates.

Of 121 swabs on days 0-13 inclusive in the control series, 8 gave a scanty growth of *Bact. coli* type colonies, and from 149 swabs in the trial series 32 gave a scanty growth.

From the fourth to the ninth day, at a time when one might expect any effect due to chloramphenicol to be most noticeable, there was a considerable difference between the two groups, in the proportions of swabs falling into the three classes mentioned above. In the control series, 54 swabs were taken, 45 showing profuse, 6 moderate, and 3 scanty growths of *Bact. coli* type colonies; in the treated series the corresponding figures were 70-23, 28, 19.

The two series showed differences in the isolation of *Bact. coli* O 111 similar to the differences in the total *Bact. coli* flora. These are shown in Table IV. From the fourth to the ninth day, only 5 of the 54 swabs in the control group were negative for *Bact. coli* O 111, compared with 36 of 70 in the trial group.

In the control group 16 patients were followed up after the thirteenth day. Of these, three were already negative for *Bact. coli* O 111, and remained so; the other 13 were positive for varying periods up to day 40. In the trial group, of the 21 patients, only 11 were positive after day 13, and later remained so for periods up to day 37. The average

TABLE IV.—Incidence of Isolation of *Bact. coli* O 111 from Rectal Swabs at Similar Periods in Control and Trial Groups

Day:	0	1-2	3-4	5-6	7-8	9-10	11-13
Control series:							
No. of swabs	30	11	25	10	15	12	18
No. positive for <i>Bact. coli</i> O 111	30	11	23	9	14	10	16
Percentage positive	100	100	92	90	93	83	89
Trial series:							
No. of swabs	26	17	25	25	9	23	24
No. positive for <i>Bact. coli</i> O 111	26	15	18	12	5	4	6
Percentage positive	100	88	72	48	56	17	25

period for which cases in the control series were positive for *Bact. coli* O 111 was 22 days; in the treated series it was 14 days.

These results suggest that the administration of chloramphenicol was associated with a moderate reduction of the total *Bact. coli* flora and a more striking reduction in the isolation rate of *Bact. coli* O 111. It is worthy of note that all except one of the trial group became negative for *Bact. coli* O 111 on one or more occasions during the days when chloramphenicol was given, but 11 of these became positive again shortly after the end of treatment.

Discussion

The dangers to the life and health of young babies which result from their admission to hospital are well known, and usually follow the development of respiratory, gastro-intestinal, skin, or mucous membrane infections. Epidemic diarrhoea is often the most serious of these infections, and may carry a high mortality, especially in babies who are already debilitated by their primary illness. In our experience during the past three years, in Liverpool, there has been a fairly close correlation between bacteriological cross-infection with *Bact. coli* O 111 and the development of gastro-enteritis. In addition, certain clinical features such as loss of weight and anorexia may be observed before the onset of diarrhoea, and often before the rectal swab is positive for *Bact. coli* O 111.

In spite of the application of the measures recommended for the prevention and control of cross infections (Medical Research Council, 1951) we have experienced from time to time small outbreaks of diarrhoea and vomiting. Our experience with chloramphenicol in established gastro-enteritis has been encouraging enough to warrant the trial of this drug as a prophylactic agent. Though in an attempt to obtain a representative control and treated cases we used as the criterion the appearance of *Bact. coli* O 111 in the stools, this was done only because at the time there was a clear association between cross-infection with *Bact. coli* O 111 and the onset of diarrhoea. We do not suggest that this is always so. In other circumstances the value of prophylactic chemotherapy would be much more difficult to assess. The administration of chloramphenicol is not a substitute for other precautions, but is an additional measure which might be tried when the generally accepted methods for control of cross-infection have failed.

No toxic effects from chloramphenicol have been observed with a dosage of 75 mg. per lb. (165 mg. per kg.) per day for seven days, but it is probable that a lower dosage for a rather longer period might prove equally effective. Three of our cases which received chloramphenicol developed mild diarrhoea 3, 4, and 10 days after the drug had been discontinued, and rectal swabs were positive for *Bact. coli* O 111 during this period. In the light of this experience we suggest that chloramphenicol should be given for 10 to 14 days in a daily dosage of 50 mg. per lb. (110 mg. per kg.).

The bacteriological data, though compatible with the suggestion that *Bact. coli* O 111 may be the cause of one form of infantile gastro-enteritis, are equally explicable on the basis that their occurrence is non-specific and that their suppression during treatment with chloramphenicol is merely a reflection of the general effect of this drug on the *Bact. coli* group. In our experience, so far, the occurrence

of *Bact. coli* O 111 has been so closely associated with the disease that we have felt that infants cross-infected with this organism should be closely observed for prodromal signs of gastro-enteritis.

Recent experience with small numbers both of clinical cases of gastro-enteritis and of those cross-infected with *Bact. coli* O 111 suggests that sulphadiazine may be as effective as chloramphenicol.

The prophylactic use of chloramphenicol or sulphadiazine is not considered necessary when isolated cases of cross-infection (both clinical and bacteriological) arise, but in the presence of widespread cross-infection not prevented by the usual measures the use of these drugs may be valuable.

Summary

Chloramphenicol was given to alternate patients in a consecutive series of 56 infants under 1 year who became cross-infected with *Bact. coli* O 111 after admission to hospital. The results in this small series suggest that this antibiotic might be of value in preventing the development of clinical gastro-enteritis.

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TESTS FOR GLYCOSURIA

A COMPARISON OF BENEDICT'S TEST, CLINITEST, AND GLUCOTEST

BY

C. H. GRAY, M.D., D.Sc., M.R.C.P., F.R.I.C.

AND

H. R. MILLAR, A.I.M.L.T.

(From the Departments of Chemical Pathology and Diabetes, King's College Hospital, London)

Benedict's qualitative test is extensively used in clinical medicine, but its accuracy depends on the correct proportions of urine and Benedict's solution and on heating without "bumping" for the correct time. While these form no obstacle in a laboratory, many years' experience in our large diabetic clinic has shown how dubious the results may be when the test is performed by nursing staff, medical officers, and practitioners not connected with the clinic. Reducing substances have been found to be absent in innumerable urines referred to us for confirmation of a positive Benedict test found elsewhere. Such errors have been diminished but not eliminated by heating for five minutes in a boiling water-bath instead of two minutes over a flame.

In recent years the detection of reducing substances in urine has been simplified still further by the commercial production of tablets containing copper sulphate, sodium hydroxide, citric acid, and sodium bicarbonate in such proportions that when a tablet is dissolved in a measured amount of diluted urine enough heat is generated by solution of the sodium hydroxide, and by neutralization of part of it with the citric acid, for reduction of the copper to take place, giving green, yellow, or orange cuprous oxide colours, just as in Benedict's test. Such a test has many advantages, for with the commercial set of tablets a glass dropper is provided of such a size that the requisite volume is given by 5 drops of urine and 10 drops of tap-water. Under these conditions

the two cases reported here the intravenous injection of distilled water, first suggested by Leriche, was used with striking effect.

Case 1

A married woman aged 73 was admitted to hospital on November 29, 1949. Twelve days before admission she stumbled and struck her head on a rockery stone in her garden. She was slightly dazed, but walked about afterwards for a week, although headache of increasing severity appeared. She had been in bed for five days before admission, and during the past three days had become very drowsy and incontinent of urine and faeces.

On examination she could be roused, but answered questions inaccurately and with difficulty, being very confused in time and space. There was no papilloedema and the cranial nerves were normal. Movements of the left arm and leg were weak and clumsy, and the tendon reflexes were increased on the left side. The left plantar response was doubtfully extensor and the abdominal reflexes were absent. The cardiovascular system was normal: B.P. 150/100, pulse rate 64, temperature 98° F. (36.7° C.). A lumbar puncture showed: C.S.F. pressure 150 mm.; fluid faintly yellow; red cells, 425 per c.mm.; leucocytes, 22 per c.mm. (56% polymorphs, 44% lymphocytes); protein, 150 mg. per 100 ml.; globulin present, glucose, 61 mg. per 100 ml.; chlorides, 720 mg. per 100 ml.; Wassermann reaction negative.

A diagnosis of right-sided subdural haematoma was made and on November 30 bilateral parietal burr-holes were drilled under local analgesia. On the right side a recent subdural haematoma consisting of dark fluid blood containing a few clots was found and evacuated, about 60-70 ml. in all, and the cavity was washed out with warm saline. The surface of the brain was depressed to about 0.5 cm. below the dura.

On December 1 the patient's level of consciousness was higher, but she was still very confused and disorientated. Next day she was stuporous, only just rousable, and incontinent; no focal neurological signs were present. On the third the stupor was deeper. The C.S.F. pressure on lumbar puncture in the lateral position was zero and fluid could be obtained only in small amount by suction with a syringe. Respirations were 18 and shallow, pulse was 80, Temperature 97° F. (36.1° C.), B.P. 120/70. Her extremities were cold and cyanosed. The deep stupor persisted for the next three days, but no focal neurological signs appeared. On December 6 she was in deep coma and unrousable. Respirations were 16 and very shallow, extremities cold and cyanosed; temperature was 97° F. (36.1° C.), pulse 60, and B.P. 80/?. Still no focal neurological signs were present. The C.S.F. pressure was still zero.

In considering the possible causes of the coma and other symptoms it was thought that intracranial hypotension might be the explanation, and it was decided that the very simple procedure of injecting distilled water intravenously or saline intrathecally should be tried before reopening the skull to look for further haemorrhage. At 12 noon 30 ml. of distilled water was injected intravenously and within ten minutes there was a noticeable improvement in the grave condition of the patient. The first change was an improvement in the peripheral circulation; the coldness and cyanosis of the hands and feet disappeared and the blood pressure rose to 100/70. The coma rapidly became less profound and there was a feeble response to painful stimuli. At 3 p.m. the patient could be roused with difficulty and a further 40 ml. of distilled water was given intravenously. At 4 p.m. she was fully conscious and drank a cup of tea without assistance. At 4.30 p.m. the C.S.F. pressure was 60 mm.

On December 7 she was fully conscious, but complained of slight headache; B.P. 145/95; extremities warm; no neurological signs; C.S.F. pressure 80 mm. No further symptoms developed and the patient was discharged from hospital after 10 days. She has remained well since.

Case 2

A married woman aged 49 was admitted to hospital on March 13, 1950, complaining of severe frontal headache and noises in the head. The noises were described as buzzing in the ears on both sides, and had begun about one month before. Two weeks after this she developed pain in the frontal region and behind the eyes, which was constant and gradually increased in severity. She also complained of pain in the right ear on hearing loud sounds. She had been in bed for two weeks before admission with no relief of her symptoms. During the week before admission she noticed a weakness of her right hand and leg, but did not complain of any disability on the left side. She had been adequately treated for Addisonian anaemia for the previous eight years.

On examination she was slightly confused, with considerable delay in answering questions and in performing requests. There was a marked defect of memory for both recent and remote events. Her pulse was 84, B.P. 135/85. There were no abnormal physical signs in the heart or chest, and no signs of Addisonian anaemia. The cranial nerves were normal. There was no papilloedema. Clumsiness and weakness of movement of both arms were present. She had slight loss of motor power, more evident on the right side, but there was astereognosis and gross loss of position sense on the left side of which the patient appeared to be unaware. Fine finger movements were grossly impaired in the left hand and there was also a tendency to a grasp reflex on this side. The left leg also showed gross loss of position sense. The tendon reflexes were slightly increased on the left side as compared with the right, but the left plantar response was definitely flexor and the right extensor. The abdominal reflexes were absent.

A lumbar puncture showed: C.S.F. pressure 60 mm.; fluid faintly yellow, with a slight coagulum; 83 cells per c.mm. (polymorphs 44%, lymphocytes 56%); protein 340 mg. per 100 ml.; globulin present; Wassermann reaction negative. A blood count showed: red cells, 3,393,000; Hb, 78%; C.I., 1; white cells, 5,600; E.S.R., 60-103 mm. (Westergren).

A diagnosis of subdural haematoma was made and bilateral burr-holes were drilled in the posterior parietal region on March 14. A large right subdural haematoma was found, consisting of dark-brown fluid and many clots, about 120 ml. in all. It was washed out with warm saline. The brain surface was compressed to about 1 cm. below the dura. The protein content of the haematoma fluid was 8.12%. On March 15 the patient was rather drowsy, but much less confused. Minimal neurological signs were present in the limbs, but the right plantar response was still extensor. Severe headache was still present. The C.S.F. pressure was 10 mm. Next day she was much more drowsy, but rousable. Confusion was again marked. Her pulse was 64, B.P. 140/90, respirations 20, temperature 99° F. (37.2° C.). There were no focal neurological signs. The C.S.F. pressure was 30 mm. The lumbar puncture needle was left in position and 30 ml. of distilled water given intravenously. Within ten minutes the C.S.F. pressure had risen to 50 mm. and there was a definite lessening of the drowsiness, confusion, and, later, the headache. Later in the day she was quite alert and uncomplaining. On the 17th the headache had entirely gone, and she was alert and feeling well. On March 18 there were no symptoms or neurological signs. The right extensor response had disappeared. C.S.F. pressure was 110 mm.; the fluid was straw-coloured, and contained 120 cells per c.mm. (polymorphs 51%, lymphocytes 49%); protein, 430 mg. per 100 ml.

The patient returned home on March 25 and has remained well since.

Discussion

The clinical picture of intracranial hypotension is seldom clearly defined, and it is usually impossible to make the diagnosis unless a lumbar, cisternal, or ventricular puncture

is done and a low pressure is found. Whenever possible it is preferable to measure the ventricular pressure, as a falsely low manometric reading may be obtained on lumbar puncture in cases in which a tentorial or medullary pressure cone is present, and the withdrawal of fluid by lumbar puncture may be extremely dangerous (Krebs, Puech, and Brunhes, 1937). It is improbable that the diminished volume and pressure of the cerebrospinal fluid is in itself the cause of the many and varied symptoms associated with hypotension, but it is the only objective sign which will confirm an otherwise presumptive diagnosis.

Morice (1944) has classified the symptoms of hypotension under the following headings: (1) Disturbances of consciousness of a progressive nature, slowly changing from stupor to a more or less deep coma. (2) Affective disorder to a more or less deep coma. (3) Diffuse often of a depressive type, but rarely maniacal. (4) Headache of increasing severity, accompanied by nausea and vertigo. (5) Dehydration, characterized by dryness of the skin, shrunken facies, ocular hypotension, and polydipsia. (6) Normal respiration and deglutition and absence of bulbar involvement.

This list is not complete and other symptoms may be found. The temperature may be subnormal, as in my first case. Stiffness of the neck and Kernig's sign may occur. Hypothalamic symptoms are common, such as alterations in the pulse rate and blood pressure, diabetes insipidus, and even alterations in the depth and rate of respiration. Paralytic Cheyne-Stokes respiration has been described. Some French authors and convulsions sometimes occur. Some French authors say that papilloedema has been seen (*Proc. roy. Soc. Med.*, 1948), but it is difficult to imagine why this should occur. Chorobski (1950) says that the alteration in consciousness is distinct from the coma or semi-coma of intracranial hypertension and likens it to the state of "arrested consciousness" sometimes found in tumours of the hypothalamus. We must agree with Leriche that such varied symptoms, however they may be grouped together, cannot be regarded as pathognomonic of hypotension. They could equally well be associated with increased intracranial pressure or with cerebral softening or haemorrhage. In spite of this an awareness of the conditions in which hypotension is likely to occur should enable the clinician to suspect its presence when a clinical picture comprising some of the above-mentioned symptoms is encountered.

The associated pathological conditions are almost as numerous as the symptoms, and were originally classified under the following headings (Leriche and Wertheimer, 1921): (1) Lumbar puncture, especially for spinal anaesthesia, with loss of cerebrospinal fluid into the soft tissues. (2) Closed or compound craniocerebral injuries, with or without loss of cerebrospinal fluid. (3) Cranial operations. (4) Various medical or neurological diseases.

It must be seldom, if ever, that severe symptoms associated with hypotension follow lumbar puncture, but in this connexion Pickering (1948), in a study of lumbar puncture headache in 11 cases, found a low pressure on repeating the lumbar puncture. He ascribes the symptoms to a caudal displacement of the base and posterior parts of the brain, with tension on the anchoring structures, particularly the large arteries at the base. This mechanism may well play an important part in producing the symptoms associated with hypotension and is mentioned later, when the pathogenesis is discussed.

The association of hypotension with closed or open craniocerebral injuries is difficult to determine. The symptoms may be indistinguishable from those of the brain injury which may be present or of cerebral oedema. It is important to make the distinction, as it is dangerous to give hypertonic intravenous infusions when hypotension is present, as was first shown by Clovis Vincent (Krebs, Puech, and Brunhes, 1937). These workers in Vincent's clinic favour the diagnosis being made by ventricular puncture through burr-holes, owing to the previously men-

tioned danger of lumbar or cisternal puncture should a pressure cone exist. These aspects of head injury have not been widely recognized in this country and are worthy of further study. It is still a common practice to give hypertonic solutions intravenously without consideration of the possible harm it may do.

Intracranial hypotension following operations on the brain for the removal of space-occupying lesions is more widely recognized, and most of the recent literature on the condition stresses this association. As stated before, hypotension seems to be much more commonly associated with subdural haematoma than with other space-occupying lesions, and Gerlach (1949) puts forward the theory that the hypotension may actually precede the formation of the haematoma and facilitate bleeding into a potentially empty subdural space. The hypotension is then further increased by the osmotic attraction of fluid into the effused blood.

It is stated by some French authors that hypotension occurs in a large number of apparently unrelated neurological conditions. At the Anglo-French conference in 1948 it was stated that its incidence was 7.2% of all neurosurgical cases, but this is difficult to accept. It has been found in lymphocytic meningitis by Fontan, Verger, and Dabadie (1946) and in meningococcal meningitis by Debré, Thieffry, and Doumic (1946). Puech *et al.* (1942) describe a case in which the hypotension was apparently due to sclerosis of the capillaries of the choroid plexus and absence of C.S.F. production. Gloor (1951) is of the opinion that hypotension may be "primary" and apparently not associated with any other pathological process. Gloor also states that hypotension may be an accidental finding in almost any nervous disease; but as he regards a C.S.F. pressure of below 100 mm. on lumbar puncture in the lateral position as his criterion of hypotension the statement is unconvincing. Pressures of below 50 mm. would probably be a more acceptable criterion to most British neurologists.

Pathogenesis

The decreased volume and pressure of the C.S.F. observed in intracranial hypotension is probably only a secondary manifestation, and other causative mechanisms must be sought to explain the graver forms of the syndrome. "Hypotensive state" would perhaps be a better descriptive term, in that there is less implication that the hypotension is primarily concerned in producing the symptoms.

The simple loss of cerebrospinal fluid may cause hypotension (Jacobaeus and Frumier, 1923; Alpers, 1925; Kunkle *et al.*, 1943; Pickering, 1948), but the symptoms rarely consist of more than severe headache and perhaps neck rigidity. It is also rare to find severe symptoms following the loss of large amounts of C.S.F. from repeated drainage by lumbar puncture or from leakage through cranial fractures. It seems clear that the simple loss of C.S.F. is not a factor in producing serious symptoms such as occurred in my first case.

The rapid reversibility of the symptoms by the methods originally suggested by Leriche suggests that vascular mechanisms are very largely involved. Leriche suggested that spasm of the cerebral vessels following injury and a consequent ischaemia of the choroid plexuses was responsible for the diminished production of C.S.F. The distortion of cerebral vessels and pressure upon them by large tumours and subdural haematomata could easily produce ischaemia, and the tension on vessels produced by displacement of a brain unsupported by its normal bath of cerebrospinal fluid could easily perpetuate the deficiency of cerebral blood flow, particularly in the basal regions. Pickering (1948) invoked this explanation of lumbar puncture headache.

Chorobski (1950) suggests that the secretion of C.S.F. is controlled by nervous influences from the hypothalamus and that disturbance of blood supply to the hypothalamus may be responsible for the lack of C.S.F. production. It is certain that hypothalamic disturbances accompany the

hypotensive state, but it is not clear whether they are primarily responsible for the diminished secretion of C.S.F. or merely due to a general deficiency in cerebral circulation. Overt signs of hypothalamic dysfunction are found only in the more severe forms of the hypotensive syndrome.

In the present state of our knowledge of the syndrome it seems reasonable to speculate that impairment of cerebral circulation is the most important factor involved in its production, but the mechanisms are still obscure, apart from the possibility of spasm produced by trauma and vascular compression from space-occupying lesions. "Primary" diminution of cerebrospinal fluid production must be a rare occurrence, and it seems likely that in most cases it is a secondary effect of disturbed intracranial haemodynamics, particularly in the choroid plexuses. A brain reduced in size from collapse of the ventricles and lying in a relatively "dry" subarachnoid space could produce further circulatory impairment either by compression of vessels by its unsupported weight or by tension on them from its shifting in the cranial cavity. There is support for this idea in the fact that the symptoms of hypotension are often much relieved by lowering the patient's head by raising the foot of the bed, as, for example, in lumbar puncture headache.

Summary

Two cases of intracranial hypotension following the drainage of large subdural haematoma are described. The treatment, symptomatology, and pathogenesis of the hypotensive state are briefly discussed.

The syndrome is so far little recognized in Great Britain, and most of the literature is continental.

It is suggested that although intracranial hypotension is a definite clinical entity it is not a disease *sui generis*, and is probably a secondary effect of a disturbance of cerebral circulation, particularly in the basal vessels.

ADDENDUM.—Since this paper was written, a full account of intracranial hypotension has appeared in a paper by Page (*Lancet*, 1953, 1, 1). Four illustrative cases are described, including one following the drainage of a subdural haematoma and similar in most respects to my two cases. Page also describes a case with severe symptoms, including deep coma, following a lumbar puncture in which only 7 ml. of C.S.F. was removed. This contradicts what I have said above, but such cases must be very rare. There is an interesting reference to a statement made in 1825 by Magendie, who attributed symptoms following the removal of C.S.F. to pressure of the unsupported brain on basal vessels.

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Half a million dollars will be spent on the first phase of a cholera control campaign in East Pakistan, under an agreement signed recently by the World Health Organization and the Government of Pakistan. The first part of the campaign will include demonstrations of cholera control methods, and will be followed by the extension over the entire endemic area of those methods shown to be most successful.

THE LONG-TERM PROGNOSIS IN INFANTILE ECZEMA

BY

M. J. PURDY, M.B., M.R.C.P.Ed.

(From the Department of Dermatology, the Royal Infirmary, Edinburgh)

It has long been known that some cases of infantile eczema are liable to develop asthma or chronic skin lesions or both. The particular skin lesions concerned are grouped under various names such as Besnier's prurigo (described by Besnier as "prurigo diathésique" in 1892), asthma-eczema, disseminated neurodermatitis, and atopic dermatitis of Coca and Sulzberger. Taylor (1899) first noted that cases of infantile eczema are liable to become asthmatic, but it was not until fairly recently that attention was drawn to the association of Besnier's prurigo with asthma (Rasch, 1914). In a review of cases of infantile eczema Abt (1909) said: "As regards the aetiological relationship existing between [infantile] eczema and asthma, several striking instances in confirmation of such a view have been noted" (my italics). Modern knowledge would regard such a statement as a fair illustration of meiosis.

Besnier's prurigo is often simply termed chronic or recurrent eczema by others than dermatologists, and may briefly be described as a chronic, pruritic, lichenified cutaneous disease with a predilection for the anterior aspects of the elbows and posterior aspects of the knees, and also usually, but not always, the fronts of the wrists, the forehead, the sides and back of the neck, and the upper part of the chest and back. During remissions there is merely lichenification to view, but during exacerbations itching is intolerable, the lesions may become widespread, papules with surmounting post-traumatic blood crusts are evident, and there may be a superimposed acute eczema from infection.

The literature contains no reference to any investigation aimed at discovering what proportion of babies with eczema of the restricted type implied but inadequately defined by the adjective "infantile" are destined to suffer from the above recurrent or chronic disorders. Consequently, authors of textbooks and articles on this subject are obliged to use vague terms such as "a minority" or "a few" when discussing the prognosis. Hill and Sulzberger (1935), who have contributed much to the knowledge of atopic dermatitis, can only say, "A great many infants with atopic dermatitis recover entirely towards the end of the second year . . . and are bothered no more with atopic symptoms of any sort the rest of their lives."

Bamber (1931) interrogated cases of Besnier's prurigo regarding previous history of infantile eczema and found it present in 51 of the 83 cases examined. The results provide no figures useful for prognostic purposes.

Thus it was thought that an investigation with a primary object of demonstrating what proportion of a group of former victims of infantile eczema has progressed to manifestations of asthma and Besnier's prurigo might prove of some general prognostic value *per se* or, at worst, might be used for such a purpose in later years in conjunction with similar surveys conducted elsewhere.

The Investigation

Edinburgh, with its environs, was chosen as a satisfactory area in which to attempt a long-term follow-up of infantile eczema cases for these reasons: the population is relatively static both by nature and because there was negligible war-time damage to homes; the department of dermatology of the Royal Infirmary has been in existence for over sixty years; and the necessary case records have been carefully preserved. Therefore accurate information about the details of eczema in infancy was available and there was a probability of finding many of the former sufferers at or through their addresses of fifteen to twenty-one years ago.

Consequently letters were sent to those patients who attended this department for infantile dermatitis during 1931-7 inclusive. The letter and interrogation were kept as simple as possible. As the youngest of the group would be only 14 years of age, mention was made in the letter of the desirability, when answering the questionnaire, of seeking the help of a parent or other person in a position to recall forgotten facts.

The following was the questionnaire:

1. Since you were last seen at the skin department, Royal Infirmary, Edinburgh, have you suffered from any of the following complaints? (a) Asthma; (b) frequent chest colds with wheezing; (c) bronchitis with wheezing; (d) migraine (sick headache); (e) hay-fever (running at the nose and eyes with much sneezing, especially in the morning).
2. Since last seen at the skin department, Royal Infirmary, Edinburgh, have you had any skin disorder? (a) At what age(s) have you had it? (b) How long did the attacks last? (c) If you saw your doctor about it, what was it called? (d) What parts of the body were affected? (e) Will you be willing to see me at the Infirmary if I make an appointment for you?
3. Have you suffered from any nerve troubles? If so, what kind?
4. Do you and others think you tend to worry unnecessarily?
5. What has been your usual position in examinations at school?
6. If left school, what is your occupation?
7. What other illnesses (of any sort) have you had?
8. Please give your present address if it is other than that to which I have sent this.

It will be seen that no inquiry about urticaria was made specifically. It is a diagnosis which may readily be reached only when an actual attack is present, and is a manifestation too vague to be put in writing for the laity.

The following criteria alone were followed in the selection of cases from the records: (1) the diagnosis must have been either "infantile dermatitis" or "dermatitis" unqualified by adjectives such as venenata, seborrhoeica, medicamentosa, etc. (note: the term "eczema" was not then in use here); (2) the face must have been clearly involved; (3) the baby must have been 24 months of age or younger when first seen with the disease; (4) the baby must have been 12 months of age or younger at the onset of the disease; (5) there must have been no apparent acquired predisposing disease such as scabies, pediculosis, antecedent napkin erythema.

In support of the above criteria I would claim that it is now generally conceded that classical infantile eczema almost always afflicts the face initially and that it begins in the first year of life. Hall (1908), in a study of 100 cases, found that 80% began in the first four months and cases, that the eruption started on the cheeks, forehead, temples, scalp, or ears in 96%. However, some of his cases may have been seborrhoeic or infective, and in the present series cases with only scalp and temples or ears afflicted were excluded in order that the cases selected might conform more to modern concepts.

Despite the above precautions it is conceivable that a few of the cases included may be classed now by some dermatologists as seborrhoeic, because it is doubtful if a sharp distinction was drawn here fifteen years ago and more similar distribution) in infants. It has yet to be shown that

the concept of the latter disease where there is frank involvement of the face is altogether safe and sound; moreover, as Russell Thomas (1950, personal communication) says, many cases which appear seborrhoeic in origin at first are undoubtedly allergic in the end. Hill (1942), in a survey, found that seborrhoeic dermatitis composed less than 4% of cases of infantile eczema. Thus it seems that failure to segregate the odd case of seborrhoeic dermatitis masquerading as one of infantile eczema is unlikely to affect this investigation seriously.

The question of heredity was not raised, as it was felt that it would complicate the questionnaire and reduce the number of responses. Moreover, it would be impossible to record the influence of various "strengths" of allergic family history upon the analyses. The usual evocation of a strong family history of hay-fever, asthma, or eczema in cases of Besnier's prurigo is an almost daily clinical experience. In assessing the final results no case was accepted as one of Besnier's prurigo without being interviewed personally or unless it had recently been seen by a consultant of this department.

Results and Discussion

An attempt to locate by letter persons whose last known address is that of 15 or more years ago is likely to meet with much frustration. This considered, the total reply rate of nearly 30% (Table I) is not unsatisfactory. Of the

TABLE I.—Result of Questioning

Total number of letters sent out	329 (246 males, 83 females)
"Dead" letters returned	165
Useful replies	93 (62 males, 31 females)
Useless replies (deaths at early age)	4
Not returned	67

letters supposedly received in the main by the addressees, nearly 60% evoked responses in the form of a questionnaire returned completed, many accompanied by a useful letter of added information. This, too, is satisfactory when it is realized that many would never even have heard before that they once had infantile eczema, and that subsequent good health renders them little disposed to "waste time" recording that fact.

Throughout the figures there is the modifying factor of the 67 unanswered and unreturned letters. It may with fairness be argued that those who have one of the disorders mentioned are more likely to answer the questionnaire, in the hope of receiving help, than those who are free of such diseases; the latter are therefore more likely to be represented among the 67 "lost" letters. It is most unlikely that these 67 persons should show a higher incidence of the sequelae studied than is displayed by the group of 93 who supplied answers. Therefore the figures throughout the tables are probably artificially high and represent the maximum incidence in this series. The theoretical minimum can be derived by assuming that none of the 67 suffers from any of the diseases. By this method the possible range of incidence of each disorder is computed below.

Table II gives the incidence of the generally accepted sequelae. The overall figure for asthma is nearly 40%,

TABLE II.—Results of 93 Replies (With Confirmatory Examination Where Advisable) to Questions 1 and 2

	Total No.	Asthma	Asthma Denied. Wheezing Admitted	Hay-fever	Besnier's Prurigo	Migraine
Male	62	25 (40.3%)	7 (11.1%)	24 (38.7%)	18 (29%)	7 (11.1%)
Female	31	12 (38.7%)	3 (9.7%)	15 (48.4%)	5 (16.3%)	0 (0%)
Total	93	37 (39.8%)	10 (10.7%)	39 (41.9%)	23 (24.7%)	7 (7.5%)

with no practical difference for the sexes. The minimum (calculated as above) is 23.1%. These figures are startling as they stand, yet do not embrace the figures for "frequent chest colds with wheezing" and "bronchitis with wheezing."

Many patients with asthma are not aware, for reasons of concealment by their doctor or by reason of ignorance, of their true diagnosis. This is a common experience in general practice, and was often found during interviews in this survey. Wheezing in the above circumstances is unlikely to be due to any disease other than asthma in the age group under study, and it will, I think, be agreed that the majority of the 10.7% so afflicted are asthmatics of some grade. Thus we reach a final range for asthma of 23.1 to 50.5%, the minimum figure being absurd, as it entails the conception that none of the wheezing group of 10 people and none of the "lost" group of 67 people are asthmatic. If it is conceded that the wheezing group are asthmatics we reach what must be a more nearly exact minimum of 29.4%. The final range is thus roughly 30 to 50%, representing the proportion of infants with eczema which, in this series, have developed asthma.

Comparable figures for the general population are difficult to obtain. McGregor (1950) analysed the incidence of various diseases about which he was consulted in a general practice in a small Scottish industrial town. Asthma represented 2.4% of the population embraced in the 5-14 years age group and 1.3% in the 15-40 years age group. These figures represent only patients who were treated during that year and not those who did not consult him, and are useful here therefore only as a rough comparison. Kurtz (1950) found 1,043 cases of asthma in 300,000 people. There were 212 cases under the age of 11 years, the male:female ratio being 1.5:1, whereas in the 78 cases aged between 11 and 20 years the ratio was 1:1.3 in favour of females. This reversal may be partly due to the incidence of post-eczema asthma in the first decade, which, as found in the present series, is so much commoner in males, and which may tend to spontaneous cure in the second decade. (Fourteen cases in this series volunteered such information, and it is regretted that the question was not specifically asked in the questionnaire.) Thus, for all ages, Kurtz found the incidence of asthma to be 0.35%. Derbes and Engelhardt (1943), analysing 151,040 admissions to the Charity Hospital of New Orleans in five years, found the admission rate for asthma to be 0.66% of all admissions. Ellis (1933) describes the examination of 518 schoolboys in Port Sudan (where the asthma incidence is thought to be high in adults), only one with a history of asthma being found.

The figures for hay-fever include many cases of asthma and have been divorced from these in Table III, where it

TABLE III.—Regrouping of Cases from Table I

	Total No.	Asthma (or Wheezing Attacks) but No Besnier's Prurigo	Besnier's Prurigo but No Asthma (or Wheezing)	Both Asthma (or Wheezing) and Besnier's Prurigo	Hay-fever but No Asthma (or Wheezing)
Male ..	62	19 (30.6%)	5 (8.1%)	13 (21%)	9 (14.5%)
Female ..	31	8 (25.8%)	(1 probable) (3.2%)	7 (+2 probable) (22.6%; ?+6.4%)	5 (16.3%)
Total ..	93	27 (29%)	5 (?+1) (5.4%; ?+1%)	20 (?+2) (21.5%; ?+2.1%)	14 (15%)

is seen that 15% of those replying claim to have hay-fever without asthma. The range here would be 8.8 to 15%. Comparable figures for the general population are unobtainable in default of an investigation devised for that purpose. McGregor's (1950) figures are not applicable, because not all sufferers from allergic rhinitis ever consult doctors, let alone in any given year.

The figures for Besnier's prurigo are slightly complicated by the presence of three females who could not attend for interview. One describes persistent dry itching areas in the classical sites; another says the infantile eczema persisted to the age of 12 years and the arms and legs are still dry; and a third gives an account of eczema lasting to the age of 7 years, especially behind the knees. Although these three are assuredly cases of past or present Besnier's prurigo the figure representing them is placed after a query in parentheses. The total figures provide a range of 14.8 to 28%;

the minimum again presumes a complete absence of the complaint among the 67 who did not reply. This figure is likely to be artificially low, as the assumption is improbable. Among those who failed to reply there would be some with what they simply regard as a dry skin and of little importance and others who have been told that nothing can be done. Among cases seen in the course of this investigation were several who complained only of dry skin, who had never sought advice, and who were more-than-mild cases of Besnier's prurigo (whom treatment could markedly alleviate). However, for want of more accurate information the figures as stated must be accepted.

Migraine is a very doubtful outcome of infantile eczema. The range is 4.4 to 7.5%. The numbers are insignificant, but the complete monopoly by males is of interest when the average preponderance of females with migraine is recalled. Comparable figures are not available, and the self-diagnosis of sick headache by patients is as likely to be erroneous as correct.

Table III further analyses Table II. It indicates that asthma without skin involvement (other than the original infantile eczema) forms the most important isolated sequela from the frequency point of view, with a range of 16.9 to 29%. Asthma in conjunction with Besnier's prurigo is next, with a range of 12.5 to 23.6% (again with an improbably low minimum). Only 5 out of the 23 cases of Besnier's prurigo were free of asthma, as may be seen. Bray (1937) has postulated that at least one out of four cases of infantile eczema going on to Besnier's prurigo develops asthma. A survey to-day among large numbers of cases of Besnier's prurigo would, I think, show figures nearer to four out of five.

The incidence of hay-fever has been discussed above. In reference to the cases of Besnier's prurigo the impression was gained of the strong tendency for the skin condition to improve in many cases about the middle of the second decade, although no one would now agree unreservedly with Sabourand's observation that the malady disappears about the twelfth to fifteenth year. However, this study in no way attempts to determine the prognosis of cases of developed Besnier's prurigo, asthma, or allergic rhinitis, for this would entail a separate investigation.

Table IV gives further confirmation of the original manifestation of the asthma-xeroderma syndrome as infantile eczema. Indeed, it is but a step from dry skin of this type—which involves the flexures, whereas true ichthyosis spares

TABLE IV.—Other Dermatoses

	No. of Cases
Past brief attack of some vague disorder ..	12
Persistent dry skin (all with asthma) ..	4
Atypical, mild, transient neurodermatitis (and asthma) ..	1
Furunculosis ..	1
Urticaria ..	1
Alopecia areata ..	1
Tinea ..	1

them—to Besnier's prurigo, in which disorder a dry hypohidrotic skin is the rule. Of interest in this regard were two patients who have been five years without signs of prurigo, who have dry skin, and who often develop intense itching in the bends of the elbows and knees but, by virtue of experience, refrain from scratching. They found (as is again common experience) that the pruritus always came first and that the acute or chronic eruption developed only if they scratched or rubbed. With abstinence from such mechanical balm the lichenification also has subsided. One, however, might argue soundly that only patients in whom the condition tends to clear spontaneously could possibly refrain from scratching, especially during sleep, in that reflex manner which is so much an integral characteristic of the neurodermatitis.

It is usually alleged that sufferers from infantile eczema are of somewhat higher intelligence. I believe this. Sequeira, Ingram, and Brain (1947) wrote: "The affliction [infantile eczema] is the expression of a sensitive skin and of a sensitive and therefore bright, lively, intelligent, and

alert child who is likely to outstrip his fellows in the battle of life, provided he is not hampered by disabilities resulting from such reactions as eczema." Questions 3, 4, 5, and 6 were asked in an attempt to support or refute such statements. Failure to do either was certain unless the figures argued strongly one way. They did not, and therefore any method short of thorough psychological examination of each case cannot help in the matter. It is interesting to note that the only males confessing inadequacy of emotional make-up were those afflicted by asthma or Besnier's prurigo, or both.

The opinion is often quoted that the scalp is not usually affected in cases of infantile eczema which are destined to progress to Besnier's prurigo. In this series 12 of those with Besnier's prurigo had had scalp involvement as infants and 11 had not. However, almost 90% of the cases of Besnier's prurigo had had infantile eczema on the trunk and limbs (as well as on the face and/or scalp).

Conclusions

When the figures for hay-fever only, asthma only, Besnier's prurigo only, and both asthma and Besnier's prurigo are added together it is found that out of the 93 prurigo replies received, 63 describe at least one of the recognized sequelae of infantile eczema. Of these 63, 52 have had sequelae of no minor severity. Thus we find that, of the group of infants with eczema under study, between 33 and 56% were destined to many years or a lifetime of grave disability. This, when one is confronted with a case of infantile eczema, is a sobering thought. May it stimulate the continued untiring investigation of the problem.

Considerations of the restricted locale, the moderate numbers, the isolated period, and the wide range of percentages, which are all unavoidable components of this investigation, preclude generalization.

Sneddon (1951), in an excellent contribution, has emphasized the effect upon prognosis of a strong family history of eczema and asthma, the psychological background of the family, and over-protection. In an article which attempts to educe actual figures these undeniably important influences are relatively imponderable and have therefore not been considered.

It is hoped that others will find opportunity, in different centres, to follow up the cases of infantile eczema of years ago, so that eventually the figures will be large enough to give a high degree of accuracy.

Summary

An investigation of the incidence of sequelae following infantile eczema of fifteen to twenty-one years ago is described.

Between one-third and one-half of the cases studied have sequelae sufficient to encumber at least their first fifteen to twenty years of life.

Spasmodic asthma leads the field, affecting between one-quarter and one-half of the cases.

Besnier's prurigo has afflicted roughly one-fifth of the cases.

Allergic rhinitis is found in one-tenth.

I wish to record my gratitude to Professor G. H. Percival and Dr. Robert Aitken for permission to use their cases and for their advice and encouragement. I wish also to thank Dr. G. A. Grant Peterkin for suggesting the investigation in the first instance and for his subsequent invaluable help and criticism.

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A CASE OF MALE PSEUDOHERMAPHRODITISM

BY

D. C. BEATTY, M.D., M.R.C.P.

Senior Medical Registrar, Royal Free Hospital

C. J. CHAMP, M.D., M.R.C.O.G.

Gynaecological Registrar, Royal Free Hospital

AND

G. I. M. SWYER, D.M., D.Phil., M.R.C.P.

Consultant Endocrinologist, Department of Obstetrics, University College Hospital

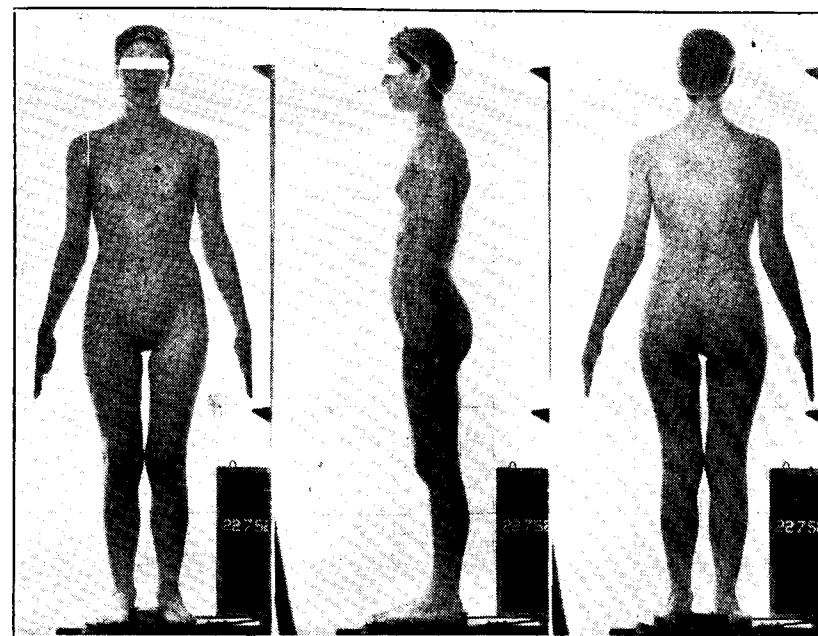
Schneider, Van Ommen, and Hoerr (1952) have refocused attention upon the condition of male pseudohermaphroditism. Williams (1952) refers to the condition as "intersex males with purely feminine external genitalia and bodily habits." These patients have a normal feminine mentality and normal or greater than normal libido. Breast development is normal, though the nipples and areolae tend to be small. The external genitalia are normal, but the labia are small. Axillary hair is absent and the pubic hair scanty or absent. There is a short vaginal pouch which ends blindly, the cervix is absent, and the uterus is absent or rudimentary. The gonad is usually intra-abdominal, most often in the position of the ovary, but not infrequently it is in the inguinal canal, when it may be associated with a hernia. A moderate degree of vaginal cornification is present and the 17-ketosteroid output is at the normal feminine level. There is often a familial incidence.

Schneider *et al.* laid down definite criteria for the diagnosis. These are: feminine habitus, primary amenorrhoea, absence or almost complete absence of axillary and pubic hair, blind vaginal pouch with absent cervix, and intra-abdominal testis. They could find only 12 cases in the literature which fulfilled their criteria, and reported six cases of their own. We would like to report a further case which was diagnosed clinically before the result of the previous operation was known.

Case Report

A single woman aged 25 was admitted on May 7, 1952, complaining of epigastric pain half an hour after meals and of backache of three weeks' duration. She had not vomited and her appetite was good. She had lost 14 lb. (6.4 kg.) in weight during this time. Recently she had become paler and had noticed that the stools were dark. She had a dry cough since the age of 18 which she attributed to smoking.

She had never menstruated. Breast development and some pubic hair appeared at the age of 16. At the age of 17 she was 5 ft. 2 in. (157 cm.) in height and weighed 9 st. (57.2 kg.). From then until the age of 21 she grew rapidly to 5 ft. 8½ in. (174 cm.), when she weighed 9 st. 7 lb. (60.3 kg.). Growth then ceased. She has a normal feminine outlook and was recently engaged to be married. The engagement was broken off by her fiancé because he found her sexually unresponsive. This led to her becoming somewhat introspective. There are no



Photographs of the patient

Past History.—She had measles and mumps as a child. At the age of 5 (in 1932) an operation was performed at Newcastle Royal Infirmary for left inguinal hernia. At the age of 18 she was again seen at that hospital. An examination under anaesthesia was carried out and the uterus was found to be absent.

Family History.—Her father died eight years ago from a cerebral haemorrhage. Her mother is alive and well, apart from indigestion. One uncle died from a stroke, one suffers from indigestion, and another is in Australia. One aunt died aged 26 years (cause unknown) and the other suffers from Bright's disease. She has one brother, who is married. One sister died from meningitis at the age of 5. Three other sisters are alive and well, married, and have families. Their periods did not begin until the age of 17 or 18. Pubertal development occurred between the ages of 13 and 14.

On admission the patient's height was 5 ft. 8½ in. (174 cm.); weight 8 st. 10 lb. (55.3 kg.); vertex to symphysis, 35 in. (89 cm.); symphysis to ground, 33½ in. (85 cm.); span of outstretched arms, 69 in. (175 cm.); feminine habitus. The voice was rather low-pitched and husky. The mucous membranes were pale. Numerous freckles were present over the face and arms. Axillary hair was absent; pubic hair fine and scanty. The nipples and areolae were small. The breasts were small, but mammary tissue was present. The external genitalia were normal, though the labia were small. **Cardiovascular system:** blood pressure, 130/70; heart sounds normal. **Respiratory system:** normal. **Abdomen:** tender in the epigastrium, but no mass or viscus felt. There was a scar from a left inguinal hernia operation; no herniae present. **Central nervous system:** retinal veins somewhat tortuous and slight filling of the optic cup; there was no other abnormality. **Rectal examination:** no uterus or cervix was felt.

Investigations.—Blood count: red cells, 4,400,000; haemoglobin, 9.2 g. (62%); colour index, 0.7; white cells, 12,500 (polymorphs 65%, lymphocytes 32%, monocytes 3%). Thorn's test—eosinophil count before A.C.T.H., 60 per c.mm.; four hours afterwards, 40 per c.mm. B.M.R., +5%. Plasma cholesterol, 150 mg. per 100 ml. Fractional test meal, normal acid curve. Occult blood, positive. Barium meal: there is a large ulcer crater on the posterior wall in the pars media and a small one just above the first. The duodenal cap is normal. Glucose-tolerance test (100 g.): fasting, 81 mg. per 100 ml.; after ½ hour, 121 mg.; 1 hour, 144 mg.; 1½ hours, 126 mg.; 2 hours, 126 mg. No glycosuria. Skull: no abnormality seen; sella turcica

of normal appearance. Wrists and knee-joints: epiphyses have fused. Output of 17-ketosteroids, 9.2 mg. in 24 hours. Urinary gonadotrophin output, less than 10 units in 24 hours. Urinary oestrogens: oestrone, 1.5 µg. in 24 hours; oestradiol, 2.5 µg.; oestriol, 2.0 µg. Vaginal smear: moderate cornification (++ to +++).

Discussion

On clinical examination this patient seemed to fulfil the criteria of Schneider *et al.* She was tall and slim, quite unlike the short stocky build resulting from ovarian agenesis. Furthermore, breast development was present. Ovarian agenesis was also excluded by the degree of vaginal cornification present and because the output of urinary gonadotrophin was not increased. Her height, her freckled appearance, and the presence of some pubic hair were equally unlike a primary pituitary dysfunction. This was confirmed by the normal basal metabolic rate, glucose-tolerance curve, and urinary output of 17-ketosteroids.

Exploratory laparotomy was contemplated to confirm the diagnosis. This proved unnecessary, however, as Professor Duguid kindly lent us the histological sections of the gonad removed at the operation for inguinal hernia when the patient was 5 years old. This showed the typical appearances of a cryptorchid testis.

The diagnosis of male pseudohermaphroditism should be considered whenever a patient with primary amenorrhoea is found to have absent axillary hair and absent or scanty pubic hair with nearly normal breast development and normal external genitalia, and in whom an examination under anaesthesia shows the uterus to be absent. Although there was no family history in our case, the condition is often familial. The presence of an inguinal hernia or the scar of a previous operation for the repair of one is common in this condition. The vaginal smear provides a simple means of demonstrating some degree of oestrogenic activity and of thereby excluding primary ovarian failure, as in ovarian agenesis, as the cause of the amenorrhoea. The diagnosis can generally be confirmed only by laparotomy and gonadal biopsy; it is probable that cases have been missed through the assumption that the gonad found on laparotomy was an ovary. As the testis is the source of oestrogens, castration is contraindicated: Williams described a case in which castration was followed by the development of menopausal symptoms and genital atrophy.

Summary

A case of male pseudohermaphroditism is presented. The clinical features of this condition are reviewed and suggestions made regarding methods of diagnosis.

Our thanks are due to Dr. Una Ledingham and Miss J. Moore for permission to publish the case, to Professor Duguid for kindly lending us the histological section, and to Dr. J. M. Tanner for the photographs of the patient.

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Among those included in the Coronation Honours List was Sister Catherine Dynes, who was awarded the M.B.E. Sister Dynes has been Night Superintendent in charge of the Royal Victoria Hospital, Belfast, since 1909, and her award will be welcomed by a wide circle of Belfast medical men.

ORAL THROMBIN IN THE TREATMENT OF HAEMATEMESIS

BY

VINCENT EDMUNDS, M.D., M.R.C.P.

Assistant Physician to Charing Cross Hospital Unit,
Mount Vernon Hospital; Medical Registrar,
Central Middlesex Hospital

(From the Department of Gastro-enterology, Central Middlesex Hospital)

The clinician is always interested in new methods of producing local haemostasis in cases of internal bleeding where the surgical principle of local treatment by pressure or suture is unfortunately not applicable. Various thromboplastins for enteral or parenteral use have been produced, but none have been convincingly successful in practice. The example of intravenous Congo-red solution in haemoptysis can be instanced, as also may the oral administration of adrenaline for haematemesis.

Thrombin is a substance which for many years has been much used in all branches of surgery, and particularly in neurosurgery, for the production of local haemostasis, and there is a sound scientific basis for this in that it is capable of clotting fibrinogen directly to fibrin in a few seconds. Needless to say, it is effective only when the bleeding is in the nature of a capillary ooze, and cannot be expected to work in the presence of severed vessels of any size.

Daly (1947) has recommended the use of thrombin orally in cases of gastric haemorrhage. Certain technical difficulties are involved in that the thrombin must be present in sufficient concentration in the stomach to produce clotting of fibrinogen; also the pH of the medium is important, since its action is impeded at pH 6.5 and the substance itself is completely destroyed at pH 4.3. Daly obviated this difficulty by administering orally an M/7 phosphate buffer solution five minutes before and again with the thrombin. Using this method, he was able to show that in a normal individual adequate raising of the pH and adequate thrombin activity were present for at least 15 minutes after the oral administration of 10,000 units of thrombin in 30 ml. of buffer.

Subsequently, Daly *et al.* (1949) published a series of 100 cases of upper gastro-intestinal bleeding treated with oral thrombin. The series was uncontrolled, though their impression, gathered from their previous experiences, was that "the method is a valuable adjunct in the treatment of upper gastro-intestinal haemorrhage."

Rogers (1948) reported dramatic improvement in two cases of severe continued haematemesis following the administration of thrombin in saline and without buffer solution. Unpublished favourable results in this country have been brought to our notice, and as a mode of treatment it would seem to have become an accepted practice, at least in some American centres (Wechsler and Odle, 1950).

In a review of the treatment of haemorrhage from peptic ulcer Crohn and Janowitz (1951) use these words: "... the use of 'gelfoam' and of buffered thrombin has been advocated. ... The administration of these substances by mouth during haemorrhage is very simple and is often followed by a cessation of haemorrhage;

this was the case in a few cases, and whether this was merely the result of coincidence remains to be established."

In view of the absence of any controlled investigation into the value of oral thrombin in the treatment of gastro-duodenal haemorrhage it was felt that such a survey should be attempted. Dr. Savage, of Messrs. S. Maw Son & Sons Ltd., kindly supplied us with thrombin and also an inert substance conveniently made up in doses of 1 g. (10,000 units) in separate bottles and ready for solution in phosphate buffer. These bottles were labelled with code letters and their identity was not revealed until the end of each stage of the investigation.

Method

The method adopted was based on that evolved by Daly, who had found that valuable information could be learned about the patients' progress if periodic gastric aspirations were made and the presence or absence of fresh blood was noted. Accordingly a Ryle tube was passed whenever possible on patients admitted with a history of recent haematemesis, and perfodic (usually hourly) aspirations were made. This had the added advantage that we were able to make regular pH readings and thus ensure that the buffering was adequate.

At the beginning of the investigation the stomach was aspirated and emptied hourly from the time of admission. If the stomach contents proved to contain fresh blood 50 ml. of phosphate buffer was administered down the tube followed after five minutes by 2 g. of powder—A (thrombin) or B (inert control substance)—dissolved in a further 30 ml. of buffer. In cases of fresh blood-staining this procedure was to be repeated at half-hourly intervals until either no further evidence of fresh blood appeared or it became obvious that successive doses of powder were not arresting the haemorrhage. Cases in which recent blood could not be aspirated from the stomach were not included in the series.

This method was later modified, using a fresh batch of powders—K (thrombin) and N (inert substance). On this occasion all cases with a history of haematemesis within the past six hours were given a dose of buffer followed by test substance on admission. A Ryle tube was then passed. Three hours were then allowed to elapse before a further aspiration. If on aspiration three hours after admission there was still evidence of fresh gastric haemorrhage, the method was proceeded with as previously.

Experience over some years at this hospital has shown that about 25% of cases of gastro-intestinal haemorrhage have episodes of recurrent bleeding after hospital admission, and it was felt that if we could reduce this percentage in our cases it would be a point in favour of thrombin therapy.

Cases on admission were allotted to alternate groups without any selection whatsoever.

Results

In spite of using a controlled series treated with an inert substance it was often found very difficult in assessing the results to decide whether or not a patient had benefited from the therapy. This is discussed later, but in any case in which there was the slightest suspicion that the subject might have gained even temporary benefit from the treatment then this was recorded as a success. The Table

Summary of Results

Substance	Success	Failure	Doubtful	Total
Thrombin A ..	2	4	0	6
Control B ..	1	3	1	5
" N ..	0	5	0	5
" N ..	4	1	1	6
Total ..	7	13	2	22

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INCIDENCE OF NEONATAL INFECTION IN HOSPITAL AND DOMICILIARY MIDWIFERY

BY

V. MARY CROSSE, O.B.E., M.D., D.P.H.

Consultant Paediatrician, Birmingham

AND

JEAN M. MACKINTOSH, M.D., D.P.H., D.P.A.

Administrative Medical Officer of Health for Maternity
and Child Welfare, City of Birmingham

A great deal has been written about the risk of infection to which the infant born in hospital is exposed. It is usually assumed that the hazard in this respect is less in domiciliary midwifery. It was felt that it would be of interest to study a series of infants from this point of view, some of whom were born in hospital and some in their own homes.

The Investigation

Records were kept of all infants born in Sorrento Maternity Hospital over a period of 12 months (Group A) and of all infants born over the same period in the practices of 22 domiciliary midwives in Birmingham, these midwives being recognized as district teachers by the Central Midwives Board (Group B). In Group A all attendants were masked, and visitors saw the infants only through glass. Mothers were not masked. Reasonable precautions were taken to prevent infection by contact or dust. In Group B the midwives were masked, but the mothers, relatives, etc., were not. Here, too, reasonable precautions were taken to prevent infection by contact or dust. The comparison was possible for only the first 10 days of life, as the majority of hospital patients were discharged on the tenth day. All babies under observation in both groups were seen daily for that period.

In Group A there were 1,459 births, of which 41 were stillborn. In Group B there were 1,846 births, 21 of them being stillborn. In Group A, 61 premature infants under

TABLE I

	Group A	Group B
Total births	1,459	1,846
Babies removed from observation:		
Stillbirths	41	21
Transfers within 48 hours:		
Prematures	61	21
Mature domiciliary births to hospital	—	9
Mature hospital births to home	13	—
Deaths under 48 hours among remaining births	8	7
Total removals	123	58
Babies exposed to risk of infection	1,336	1,788

4½ lb. (2 kg.) were transferred to the premature baby unit and 13 infants over 5½ lb. (2.5 kg.) were discharged for home nursing within 48 hours of birth. In Group B, 21 premature babies were transferred to premature baby units within 48 hours of birth and 9 babies over 5½ lb. (2.5 kg.) were transferred to hospital for various reasons. For the purpose of this investigation only babies in Group A who were nursed in the ordinary nurseries and those in Group B who were nursed at home were considered. Table I gives the numbers involved in each group.

The following definitions of infection were used. Discharging eyes: discharge from the eye, either watery (lasting for 24 hours) or purulent. Skin infection: sore buttocks or one single spot or blister. Umbilical infection, however slight. Otitis media or otorrhoea: in Group B this could be diagnosed only by discharge from the ear.

If a baby had more than one type of infection each was counted. On this basis it was found that there were 140 infections in Group A and 259 infections in Group B, giving a rate of 10.48 infections per 100 babies in Group A and 14.48 infections per 100 babies in Group B.

Table II shows the incidence and time of onset of each type of infection in each group.

TABLE II

Type of Infection	Day of Onset										Total
	1	2	3	4	5	6	7	8	9	10	
Group A:											
Discharging eyes	8	23	13	11	2	9	7	9	8	5	95
Skin infection	3	2	2	3	10	4	3	3	1	3	34
Paronychia	—	—	—	—	—	—	—	2	1	—	3
Nasal discharge	—	—	—	—	—	—	—	—	—	—	—
Respiratory infection	—	—	—	—	—	—	—	—	—	—	—
Otitis media	—	—	—	—	—	—	—	—	—	—	—
Thrush	—	—	—	—	1	—	—	2	1	1	5
Infected umbilicus	—	—	—	—	—	—	—	—	1	—	1
Abscess	—	—	—	—	—	—	—	—	—	1	2
Total	11	25	15	14	13	13	10	17	12	10	140
Group B:											
Discharging eyes	5	29	36	26	25	22	19	14	10	10	196
Skin infection	—	1	1	4	1	2	2	3	1	—	15
Paronychia	—	—	—	—	—	—	2	—	—	4	7
Nasal discharge	—	1	6	—	3	—	5	2	1	1	19
Respiratory infection	—	—	—	—	—	—	—	—	—	—	—
Otitis media	—	2	1	—	1	—	1	1	1	—	7
Thrush	1	—	—	—	—	—	1	—	—	—	2
Infected umbilicus	—	—	—	1	—	—	4	1	—	4	10
Abscess	—	—	—	—	—	—	—	—	1	1	2
Total	6	33	44	31	31	24	34	21	14	21	259

Table III compares the risk from various types of infection in the two groups.

TABLE III

Type of Infection	Group A (1,336 Babies)		Group B (1,788 Babies)	
	No. of Infections	Incidence per 100 Babies at Risk	No. of Infections	Incidence per 100 Babies at Risk
Discharging eyes	95	7.12	196	10.97
Skin infection	34	2.54	15	0.84
Paronychia	3	0.22	7	0.39
Nasal discharge	—	—	19	1.06
Respiratory infection	—	—	7	0.39
Otitis media	—	—	2	0.11
Thrush	5	0.37	10	0.56
Infected umbilicus	1	0.08	2	0.11
Abscess	2	0.15	1	0.05
Total	140	10.48	259	14.48

The most prevalent type of infection in both groups was discharging eyes, the majority of which were very slight. None resulted in permanent damage. In Group A there was a greater preponderance of skin infections owing to the increased risk of contact infection. In Group B there were more nasal discharges, discharging ears, and pulmonary infections, all of which might easily be explained by the greater hazards to which the infant born at home is exposed by visitors, small children, and others who are not masked.

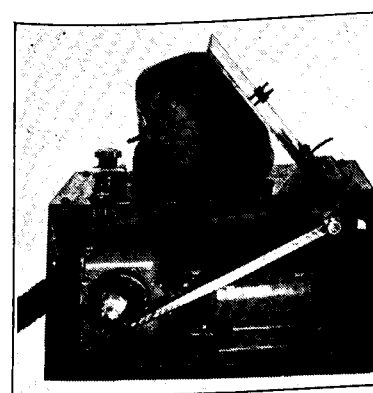
Although in Group A the skin infection was minor in character and there was no diarrhoea, yet the potential danger of cross-infection inherent in hospitalization was always present. It is, of course, well known that the infant born in hospital is exposed to risks of this nature even when reasonable precautions are taken. It is not so well appreciated that the advantage which the baby born at home has in being less exposed to the hazard of cross-infection may be nullified by the danger he runs from respiratory infection acquired from unmasked relatives and visitors, and this fact should be impressed on all those responsible for the care of the newborn baby in his own home.

We should like to express our thanks to the staff of the Sorrento Maternity Hospital and the domiciliary midwifery staff for their assistance in this investigation.

Medical Memoranda

A Simple Pneumoflator

Though many anaesthetists may doubt the necessity for or value of full pneumoflator anaesthesia, I think all would agree on the convenience of frequent mechanical assistance during controlled respiration.



The machine illustrated was designed to act as a "mechanical hand" on the many occasions when the anaesthetist, working alone, had to relinquish the bag to fill syringes, etc. The prototype shown here was built of pressed steel by Mr. T. Eames, of Paddington. Further

machines have been constructed in the workshops of the National Hospital, Queen Square, and are enclosed in an outer casing, thus producing almost complete silence.

The motors used have been R.A.F. disposals predictor motors of the 10 KB/565, 230 A.C. type with worm drive gear-boxes. These motors run at 3,000 r.p.m., reduced to 23 r.p.m. on the output shaft. They give ample power. Suitable motors for further machines can be obtained from Messrs. Klaxon, 201, Holland Park Avenue, W.11.

The whole machine has been kept as simple as possible, and there is only one control—a rheostat that adjusts the rate of the motor. A 1-gallon (4.5-litre) bag is used. The pressure can be varied according to the flow of gas and consequent inflation of the bag. With a manometer it has been found that a pressure of 15–20 cm. of water may be obtained, which normally is ample.

The prototype has now run for about 100 hours and has shown no weaknesses. It has been used for its proper purpose as a mechanical hand and also continuously as a full-scale pneumoflator in many cases at the London Chest Hospital and the National Hospital, Queen Square. There may be a use for such an inexpensive and simple device in various fields, including the prolonged treatment of poliomyelitis.

The motor runs absolutely cool, but at present it is not suitable for use with explosive mixtures; in practice this is no disadvantage. Should such use be envisaged, both motor and rheostat must be of suitable type, and these are easily obtainable.

I would like to express my thanks to Mr. T. Holmes Sellors, Mr. Harvey Jackson, and Mr. C. H. Bateman for their kindness in allowing me to develop this machine during treatment of their cases.

R. ATWOOD BEAVER, B.M., F.F.A. R.C.S.
Senior Anaesthetist, London Chest Hospital.

Repeated Narcosis in a Young Child

It was decided to expose a child of 16 months to deep x-ray therapy for a retinoblastoma. The exposures were to be made on 10 occasions at two- to three-day intervals, and each treatment was to be for 24 minutes. The x-ray applicator was to be held in position by a plastic mask which fitted over the child's face, and during therapy the child had to be isolated in the treatment-room, under observation from a small window. We were asked to provide narcosis at the appropriate times. It was clear that inhalation anaesthesia was unsuitable and that the desiderata were: minimal disturbance of normal feeding and routine; certain response to narcosis; low toxicity; ease of administration; and non-inflammability. We felt that these conditions were best met by administering thiopentone sodium rectally. This method of narcosis has been described by Weinstein (1939), Schotz (1942), Burnap *et al.* (1948), and others.

TECHNIQUE

Diet was normal up to three hours before the treatment. A rectal washout was given one hour before induction on the first three occasions only. Its subsequent omission caused no inconvenience. Atropine, 1/150 gr. (0.43 mg.), was given subcutaneously half an hour before induction. The injection of anaesthetic solution was given slowly, per rectum, through a rubber catheter, which was then clamped and left *in situ*. The child fell asleep in four to ten minutes and remained asleep during the subsequent therapy, at the end of which any residual solution (amounting to 0–4 ml.) was allowed to drain away through the catheter. The treatment, including the time taken for adjustment of mask and refocusing on the contralateral eye, lasted for approximately 40 minutes. A paper flag placed on the child's abdomen during therapy facilitated our observation of the respiration. Oxygen was available in case of need, but was not required.

Dosage.—The child's weight was 25 lb. (11.3 kg.). The recommended dose of 0.5 g. was made up in 2½% solution. After the first three administrations the periods of undisturbed sleep were, respectively, two and a half, three and a half, and four and a quarter hours. We then felt that a residual effect was occurring. This was attributed to accumulation of thiopentone in the body-fat, as described by Lief (1951) and by Brodie (1951). Accordingly, the dosage was gradually reduced in subsequent administrations from 20 to 12 mg. per lb. (44 to 26.4 mg. per kg.). With these doses the period of undisturbed sleep varied from two and a half to three hours.

Complications.—The child developed a cold between the second and third administrations. This was not, in the circumstances, regarded as a contraindication to narcosis. It cleared up in a few days. There was no sign of rectal irritation. Bowel movement continued regularly and normally. The child was fed half an hour after awakening. No ill effects were observed.

Eight months later a second course of deep x-ray therapy was instituted, six treatments being given in 14 days. The dose of thiopentone required at first was 61 mg. per kg. This was gradually reduced first to 53 mg. and later to 45 mg. per kg.

Conclusion.—It seems to us that the technique described is safe and satisfactory for repeated narcosis in small children.

Our acknowledgments are due to Professor W. J. B. Riddell for permission to publish this case, and to Dr. H. H. Pinkerton for his encouragement.

R. CECIL BROWN, M.B., Ch.B., D.A.,
Senior Registrar Anaesthetist, Western Infirmary, Glasgow.
J. BRIAN LISTER, M.B., Ch.B., D.A.,
Junior Hospital Medical Officer (Anaesthesia),
Western Infirmary, Glasgow.

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Reviews

THORACIC ANAESTHESIA

The Principles of Thoracic Anaesthesia: Past and Present. By William W. Mushin, M.A., M.B., B.S., M.R.C.S., F.F.A.R.C.S., D.A., and L. Rendell-Baker, M.B., B.S., M.R.C.S., D.A. (Pp. 172; 217 figures. 42s.) Oxford: Blackwell Scientific Publications. 1953.

This book is probably unique in tracing the history of man's endeavours to overcome the great mechanical and physiological difficulties in opening the chest for the performance of major operations. The more one studies accounts of medical history, the more one is impressed by the truth of the Preacher's statement made some 3,000 years ago: "There is no new thing under the sun. Is there anything whereof it may be said, see this is new? It hath been already of old time which was before us." To quote two instances from this book: In 1555 Vesalius was able to keep animals alive after their chests were opened by insufflating air into the lungs through a tube inserted into a tracheotomy opening. Again, in 1788, Charles Kite clearly described nasal and oral intubation and advocated inflating the lungs through an endotracheal tube to resuscitate the apparently dead patient.

This book is full of instances of ingenious instruments and methods which were in use long ago, but which had fallen into desuetude and have recently been revived as original ideas by modern workers. The full title of the book correctly describes its contents, but we fear that many readers will be disappointed when they find that no detailed techniques are described for dealing with thoracic cases. Nevertheless, every anaesthetist should read it in order to broaden his outlook on his specialty and to realize how the many complicated appliances now at his disposal have been evolved.

The illustrations are profuse, and include many which have not hitherto been obtainable. Each chapter closes with a list of references, and there is a comprehensive index at the end of the book together with biographical notes of many of the surgeons, physicians, and anaesthetists who did pioneer work on the subject. This is a real contribution to medical literature.

C. LANGTON HEWER.

SIR JOSEPH BANKS

Sir Joseph Banks, K.B., P.R.S. The Autocrat of the Philosophers (1744-1820). By Hector Charles Cameron, M.D., F.R.C.P. (Pp. 341; illustrated. £1 5s.) London: The Batchworth Press. 1952.

It seems curious that the name of Sir Joseph Banks is to-day so little remembered. In the eighteenth century there was no one quite like him. A young man of wealth with great estates in Lincolnshire, he transferred himself at the age of 15 from Harrow to Eton and developed there his lifelong passion for botany. After leaving Oxford, in place of the conventional grand tour he undertook an expedition of exploration to Newfoundland and Labrador, returning with much botanical knowledge which was new, and which earned him an F.R.S. at an early age.

Two years later he persuaded the Admiralty to allow him to fit out an expedition under the command of his protégé Captain Cook to visit the South Seas. Not only did they explore Australia and New Zealand and bring back in the *Endeavour* much information that was new to science, but on Banks's mind a vision was formed of these unknown lands grown rich and prosperous because peopled by men of his own race—a dream which many years later he was to be chiefly responsible for transforming to fact. With these ideas of future Empire in mind he used his great influence with King George III to make of the Royal Garden at Kew a place of interchange of useful plants for these and all future dependencies of the Crown. To this

end he employed agents in all parts of the world, and at his own expense sent on botanizing and exploring expeditions to far countries such men as Mungo Park, Matthew Flinders, and Captain Bligh (of the *Bounty*). Later, when the first colony in New South Wales had been founded at his suggestion, he arranged by somewhat doubtful methods to obtain a small flock of the famous Royal Spanish Merino sheep, examples of which that country had resolutely refused previously to allow other countries to obtain. These he shipped to Australia, thus founding its present great industry.

At the age of 35 his influence and learning were such that he was elected President of the Royal Society, an office which he continued to fill until his death at an advanced age. During these years he invariably presided clad in court dress and wearing the Order of the Bath, a magnificent and formidable figure, as can be seen from Phillip's well-known picture, which is reproduced in this book.

Banks acted throughout life as the unofficial adviser to a succession of Governments. He resolutely refused to accept office, however, feeling that this would necessitate a partisan outlook on the problems of science and life, in which his views were generally accepted as final. His great Adams house in Soho Square (which was recently pulled down to make way for the offices of a film company) constituted the gathering-place for all the national and international men of science of his time, and his vast botanical and zoological collections under their learned and popular curator, Dr. Solander, were always at their service.

This is a fascinating book, and Dr. Cameron has not only rescued the reputation of this great man from near oblivion, but has had access to sources of fresh knowledge. It is well produced and well illustrated, and should be read by all who are interested in the story of science.

W. S. C. COPEMAN.

INJURIES TO THE NERVOUS SYSTEM

The Treatment of Injuries to the Nervous System. By Donald Munro, M.D., F.A.C.S. (Pp. 284; illustrated. £1 17s. 6d.) Philadelphia and London: W. B. Saunders Company. 1952.

The author informs us that this book is primarily for the use of the general surgeon and the general practitioner. As he points out, patients suffering from severe head or spine injuries cannot always be transferred to an appropriate special centre, however desirable it may be. In which case a surgeon may have thrust upon him the responsibility of dealing with a dangerous traumatic lesion in a field where he may have had little or no experience.

There is doubtless a need for a book which discusses simply (and if necessarily didactically) injuries of the nervous system. In such a book emphasis would be placed on the clinical diagnosis of the common surgical emergencies, whether of the cranium or the spine, and their proper treatment by operation or otherwise. And a careful judgment would be needed in apportioning space to the various sections. But to allot 50 pages to craniocerebral injuries, 126 to spinal injuries, 8 to cranial operations, and 14 to spinal operations (including lumbar and cisternal punctures) seems quite unbalanced. The presentation of the subject-matter here makes it very difficult to find, say, what would be the indications for exploring a patient suspected of an extradural haemorrhage. One reads the text and a sort of tabulated guide to diagnosis, but learns little about that particular patient. If the patient shows a "significant change for the worse" one is told to suspect temporal lobe herniation. Dr. Munro is a firm believer in routine lumbar punctures, though he admits that if temporal lobe herniation—due, say, to an extradural clot—is developing, then a lumbar puncture will have grave consequences. So he gives a list of five characteristics of what he calls a "critical" lumbar puncture, the first three relating to hydrodynamics and the last two to worsening clinical features. This "critical lumbar puncture" clearly constitutes for him the most reliable method of diagnosis. And to relieve herniation he describes an operation for the division of the

tentorium—a most difficult operation for even a highly trained neurosurgeon. He agrees that it may be impossible to predict beforehand "which patient is going to be adversely affected by lumbar puncture and therapeutic drainage." But this risk to life he confesses to accept because of the beneficial and life-saving effect of lumbar drainage in others. Beneficial—in many cases, yes. That it has ever saved a life is highly improbable; that it has killed patients when injudiciously carried out is certain; and in any case its risks are greatly diminished if postponed for a day or so, when the chances of clot compression have receded.

In the opinion of the reviewer the serious subject of head injuries is quite inadequately discussed, and some of the advice is dangerous for anyone except Dr. Munro to follow.

In the section on spinal injuries the advice on the care and rehabilitation of the paraplegic is excellent. Dr. Munro describes this in detail, including nursing care, and care of the bladder (36 pages, compared with a mere 6 pages on the compression of the brain); and various orthopaedic appliances are fully illustrated. It is unfortunately marred by a lack of clinical neurological advice in diagnosis, a fault evident throughout the book. It is difficult to see the value of an exploratory laminectomy to stimulate the cord electrically in order to determine whether there is total or only partial interference with cord conduction. Whether this is carried out in the stage of spinal shock, or many months later, a careful neurological examination would surely give the required information.

The reviewer's advice, therefore, is: Do not buy this book in order to obtain information on head injuries; but there is much useful advice on the care of patients with spinal injuries.

D. W. C. NORTHFIELD.

HYPNOSIS IN MEDICINE

Hypnosis in Modern Medicine. By Jerome M. Schneck, M.D. (Pp. 323. £2 14s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

The object of this book is to present to specialists in different branches of medicine an account of how hypnosis can be used in their particular field, either by themselves or with the aid of a psychiatrist accustomed to the technique. The point is made at the outset that the medical hypnotist must know enough about physical illness for him to pay attention to detailed symptoms and the attitude of the patient towards them. The intention, therefore, is that each article should be proof against reasonable criticism from experts in hypnosis, in the medical specialties concerned, and in psychiatry.

The basic plan of the book is excellent and it is beautifully printed. The editor's introduction and chapter on hypnosis in psychiatry are clear and well-informed. There is also a most practical article on instruction in hypnosis by Professor Heron. Unfortunately most of the other contributors fall far below this standard and it is doubtful if medical and surgical specialists will be able to read some of the chapters without irritation. There is little evidence of co-ordination of effort and much duplication and irrelevance. Some of the chapters abound in uncritical acceptance of the sort of case report which characterizes the lunatic fringe of psychiatric literature. Works on psychopathology quoted have not always been fully digested, and some surprising theoretical constructs are illustrated by the triumphs of the writers' own consulting-rooms. The two articles by British contributors, in which the words "trance" and "cure" appear frequently, are on hypnosis in child psychiatry and in anaesthesia. These articles do not fairly represent British medicine. We are told to "detensionize the child with hypnosis and the anxiety will fall to pieces," and in the chapter on anaesthesia it is said of alcoholics that "their odd behaviour, somewhat violent at times, is really due to a form of autohypnosis." The unusual view is expressed that the subject who is under the influence of sedatives, or is drunk, is easier to hypnotize.

It is unfortunate that Dr. Schneck's idea in producing this book has been vitiated by the poor support he has received. Few of those for whom the book has been written will be likely to call in a hypnotist, and one fears that they may, after reading it, think that psychiatry as a whole has less to contribute than is actually the case.

ALEXANDER KENNEDY.

BLOOD PRESSURE

Normal Blood Pressure and Hypertension: New Definition. By A. M. Master, M.D., C. I. Garfield, M.D., and M. B. Walters, M.D., F.R.C.P.(Can.). (Pp. 144; 36 illustrations. £1 10s.) London: Henry Kimpton. 1952.

From time to time we are startled by having some well-established belief undermined by new work, and when the subject is so fundamental as the normal blood pressure our appreciation is sharpened. The book opens with a grand account of the history of sphygmomanometry. The contributions of Stephen Hales, Poiseuille, Magendie, Ludwig, Herrison, Vierordt, Marey, Gärtner, von Basch, Bloch, Potain, Mosso, Riva-Rocci, Hill and Barnard, Korotkow, and many others, are described in detail and with fascinating illustrations. This chapter alone deserves high praise. How the current standards of normal blood pressure came to be accepted is then explained. This is followed by useful information about the influence on the blood pressure of age, sex, emotion, sleep, weight, race, food, and other factors.

According to present-day standards, the majority of women over 50 and of men over 60 have hypertension, and yet many such men and women lead a normal life without complications related to blood pressure. The authors therefore believe that these standards should be revised. In the rest of the book they offer new evidence for what should be regarded as a normal blood pressure with reference to the age, sex, and weight of the individual, and discuss some of the clinical applications of the new standard suggested. There is much to be said in favour of the views expressed.

PAUL WOOD.

THE OPHTHALMIC SERVICES

The Ophthalmic Services under the National Health Service Acts, 1946-1952. By G. H. Giles, F.B.O.A.(Hons.), F.S.M.C., D.O.Rth. (Pp. 503. £3 3s.) London: Hammond, Hammond and Company. 1953.

The claims for the usefulness of this book that its author makes are somewhat wider than the book itself justifies. I have no doubt of its accuracy and of its usefulness to those predominantly engaged in the administration of the Acts and regulations governing the Service, but to the ordinary medical practitioner engaged in his daily work there is little of interest. It is a purely factual résumé of all the Acts and schedules and regulations under which the ophthalmic services are run, and it is made by a man whose double qualifications for writing it are that he is a barrister-at-law and secretary of various professional optical organizations. He has eschewed any temptation to express opinions of his own or to discuss any of the many discontents that the various unilateral alterations in terms of service have given rise to.

The book would have been equally useful and much more interesting if the author from his wide experience of the facts had added a section of his own on the disputes and grievances which have arisen since the beginning of the Service, and perhaps another speculative chapter on the future. We all know that both the medical practitioners and the opticians have been subjected to violent changes, ranging from opulence to penury and from gross overwork to relative unemployment, but there is no word of all this. Within the limits of his own intention I suppose the author has adequately performed his task, but I felt when I read the book rather as if I had opened a book on the Railways of Britain and found I was reading Bradshaw.

RICHMOND MCINTOSH.

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THE LAW, THE HOSPITAL, AND THE DOCTOR

Doctors, especially those working in hospitals, have become increasingly alarmed at the growing number of actions for negligence against them. Have doctors in fact become more negligent? Are patients more litigious? Has the law changed or become more harsh in its judgments? Has the introduction of the N.H.S. any bearing on the matter? Possibly answers to these questions will vary according to whether they are given by a doctor, a patient, or a lawyer. The medical profession has undoubtedly had an increased burden of work on its shoulders since the appointed day in 1948, and if a man has too much work to do the possibility of human error is increased. But this does not mean negligence, and indeed it might reasonably be argued that the N.H.S. has enhanced rather than lessened the sense of professional responsibility. What has changed, and is changing, is the complexity of the doctor's work. Within the past two decades the therapeutic revolution has gone apace at an uncomfortable rate. The placebo has given way more and more to the potent drug. The old "rag and bottle" of the anaesthetist has been replaced by complicated machines and a range of powerful drugs that simplify the task of the surgeon, vastly ease the patient, and correspondingly test the skill of the anaesthetist. The new drugs and techniques, along with their brilliant promise of comfort and cure to the patient, have as their "side-effects," through accidental overdose or unpredictable sensitivity, co-incident hazards sometimes of great severity. Every medal has its obverse side. In the old days house-physicians and house-surgeons gave, and were expected to give, anaesthetics, but in a recent case the learned judge held that a hospital board should not have allowed a recently qualified doctor to administer thiopentone without the supervision of a senior practitioner. It must be asked at what moment in time after registration a qualified doctor is to be judged, and by whom, competent to perform this or that medical skill. Faced with such a precedent, what house-man will feel confident in giving any anaes-

thetic, however apparently simple; because in the event of any unforeseen accident the simplicity is immediately called into question. And when that house-man, avoiding giving anaesthetics during this year's or half-year's term of office, goes into general practice and has perforce to give an anaesthetic, is the passage of time after registration sufficient, in the eyes of the law, to give him competence? The medical student learns his craft and art under close supervision, a supervision reaching its climax at the qualifying examination. According to law he is on registration as a doctor competent to practise his profession. Of course, supervision of varying degree will continue during his postgraduate work in a hospital, and according to the nature of the work. Every doctor, at whatever age, must be a student, for he always has new things to learn. But if the law is going to determine the duration of tutelage in respect of the use of this or that drug or technique then medicine will be in a sorry state. One effect of this is already being noticed by teachers—a tendency among house-men to narrow the range of their responsibility for their patients.

Lawyers believe that the public is becoming more "compensation-minded," and the Legal Aid and Advice Act of 1949 makes it possible for an increasing number of persons to give expression to this. The citizen of the Welfare State is very conscious of his rights. The doctor and the nurse may save a patient's life, and in the process the patient may accidentally sustain a burn from a hot-water bottle—and subsequently win an action for damages. This is justice, but to some it may seem tinged with ingratitude. Many cautious observers see a changed public attitude to the doctor and the hospital in a State-provided health service. In some cases the patient's sense of rights appears to outweigh his sense of obligation. Or it may be he feels that the impersonal State which provides the service is fair game, and that it just cannot be helped if in the process of law the doctor gets knocked about a bit. This in itself is working a subtle change in the doctor-hospital-patient relationship—and a change for the worse.

The law, our legal colleagues constantly remind us, has not changed. But Dr. T. Lloyd Hughes,¹ in a recent thoughtful review, shows that the new administration of hospitals since 1948 has presented hospital authorities and workers with a new set of problems. Regional hospital boards, boards of governors of teaching hospitals, and hospital management committees are corporate bodies. They are liable in law as if they were principals. In the Hillyer case in 1909 it was held that the hospital governors of St. Bartholomew's were not liable for the negligence of their

medical staff. The patient's arm was burned during an examination on the operating table. When the theatre doors were closed, the learned judge maintained, the nurses and porters were under the orders of the surgeon and ceased to be servants of the hospital. "A narrower ground," Dr. Hughes writes, "on which the decision was supported was that the hospital authorities were not liable for the negligence of the consultant surgeon because he was not employed by them and that no case of negligence had been proved against the nurses and carriers." This view of liability was changed in 1942, when the Court of Appeal held that a local authority owning a hospital was liable for the negligence of its servants: in this case the radiographer (thought to be negligent) was under a contract of service. In 1947 a learned judge, finding negligence on the part of a house-surgeon and a part-time surgeon, held that the county council owning the hospital was liable for the negligence of the house-surgeon, but thought it was not liable for the part-time surgeon. "The liability of the hospital authority for the house-surgeon," Dr. Hughes says, "was said to arise from the contract of service . . . between the authority and the doctor, and distinction was drawn between a contract for services and a contract of service in that in a contract for services the master can only order or require what is to be done, while in a contract of service he can not only order or require what is to be done but direct how it should be done." (Our italics.) In the Cassidy case (1951) Lord Justice Denning, however, expressed the opinion that the hospital was liable for the negligence of a doctor on its permanent staff "whether he is employed under a contract of service or under a contract for services. It depends on who employs him. . . ." Doctors on State hospital staffs are now paid, and so are affected by this judgment. The Ministry of Health has issued a circular to the effect that hospital boards and committees, authorized to see to the legal defence of other staff, are not so authorized in respect of their medical staff. Moreover, the Ministry has instructed hospital authorities to take action to obtain from the doctor in question part or whole of the damages or costs awarded when the authority has been made responsible for the alleged negligence. (This matter is now under discussion between the Joint Consultants Committee and the Ministry.) Not only has the doctor-patient relationship been affected adversely, but also the doctor-hospital relationship. No wonder the medical profession is feeling uneasy about the situation, and little comforted by the assurance of lawyers that the law is unchanged.

Scotland in this respect seems to stand on less ambiguous ground than does England. As Dr. Forbes

put it in the discussion on Dr. Hughes's paper, the Scots appear "to regard the doctor as standing on his own feet and responsible in law for his own mistakes." It would seem to the non-legal mind that unless this is so the doctor patient relationship—on which all sound medical treatment must be based—is impaired to the extent that medical responsibility is shared with a third party—the hospital authority. If present English precedents are broadened then we may yet see hospital authorities not only requiring what should be done but directing how it should be done, and by whom. Any ambiguous diffusion of responsibility means that in the last resort no one knows just where responsibility lies, and so the tendency grows to avoid it. "Passed to you" may be a satisfactory watchword in administrative circles, and the law may delight in discovering who "you" are; but in the treatment of a sick person complete responsibility must rest on the medical man or woman.

BORNHOLM DISEASE IN BRITAIN

In 1930 Dr. Ejnar Sylvest,¹ a general practitioner in Denmark, recorded his observations on an unusual epidemic of myositis on the island of Bornholm in the Baltic. In a monograph published a few years later he presented² a detailed account of this disease, which he suggested should be called epidemic myalgia (Bornholm disease) by virtue of the two cardinal features, epidemicity and intermittent muscle pain. Subsequent reports, and they are numerous, showed that epidemic myalgia had a world-wide distribution.

The aetiology remained in doubt until 1949, when Curnen, Shaw, and Melnick³ made a preliminary report on the isolation of a Cocksackie virus from the faeces of four cases with a febrile illness resembling epidemic myalgia. Viruses of this type characterized by pathogenicity only for infant mice were first isolated by Dalldorf and Sickles⁴ in 1948 from two cases with paralysis. Although subsequent work showed that these viruses were widely distributed in nature and could frequently be recovered from patients with febrile illnesses resembling mild poliomyelitis,⁵ lack of information on the pathology of the disease, and the fact that both Cocksackie and poliomyelitis viruses could be recovered from the same patient, made it difficult to assess the exact part they played in human disease. More conclusive evidence of the causal relationship between Cocksackie viruses and epidemic myalgia has since been forthcoming. Shaw, Melnick, and Curnen,⁶ investigating different strains of the virus in cases of laboratory infection where symptoms of epidemic

¹ *Med. Legal J.*, 1953, 2, 17.

myalgia were present, were able to recover the particular strain and to demonstrate an increase in type-specific neutralizing antibody. Similar findings in the natural disease have since been made in the U.S.A.,^{7, 8} and now corroboration comes from this country. Three articles appearing in this week's issue of the *Journal* describe epidemics of Bornholm disease, associated with Cocksackie virus infection, which occurred in Great Britain in the second half of 1951. Reports already published indicate that Bornholm disease was epidemic in 1951 throughout Western Europe.^{9, 10}

In their appreciation of the clinical findings on 262 cases seen in the city of Oxford, Dr. J. F. Warin and his colleagues stress, as others have done in the past, that the most useful single aid in diagnosis is the nature of the pain, which is characteristically spasmodic. Pain was present in 91% of cases, and in over half was confined to the abdomen. As a high proportion of those infected were young children, the differential diagnosis from acute appendicitis or other acute abdominal emergency needing surgical operation was a real problem. Other features favouring a diagnosis of Bornholm disease were the epidemicity and symptoms of pyrexia often with severe headache. Vomiting and other symptoms were less common. Essentially similar findings on 104 cases (average age 4-6 years) in the Birmingham area are reported by Dr. M. E. Disney and his colleagues. Here again spasmodic muscle pain was the symptom of diagnostic importance. It is perhaps significant that until the nature of the first cases was recognized equal numbers were admitted to medical and surgical wards.

Bornholm disease was then also prevalent in South-east Scotland,¹¹ and in the third paper Drs. R. H. A. Swain and R. G. Mitchell report the result of virological investigations on two patients from whom they were able to recover a Cocksackie type B virus and to demonstrate an increase in neutralizing antibody. Similar findings on selected cases are reported in both the Oxford and Birmingham epidemics. In a number of cases antibody was found to be present in both acute and convalescent specimens, and as antibody may make its appearance very early in the disease, as it does also in poliomyelitis, acute-phase samples of blood should be collected as early as possible.

Kraft and Melnick¹² have shown that the neutralization test is more specific than the complement-fixation test.

Cocksackie viruses can broadly be classified into two groups on a histological basis.¹³ In type A the essential lesion is diffuse hyaline degeneration of skeletal muscle. In type B destruction of brain tissue is predominant, with focal necrosis in muscle and different viscera. Within these two groups there are many immunological types varying in tissue pathogenicity.¹⁴ Preliminary reports suggest that minor differences in the type B strain isolated in these three epidemics may exist. It is too early to ascribe with any certainty any of the individual disease conditions associated with Cocksackie virus to a particular strain type, but current work suggests that type B virus is found more often in epidemic myalgia (except for laboratory infections) and type A in paralytic and non-paralytic poliomyelitis. Additional evidence of this causal relationship has been produced by Lépine, Desse, and Sautter.¹⁰ Biopsy of affected muscle in two cases showed histological changes similar to those seen in the experimental disease; a Cocksackie virus was also recovered by the same procedure. Significant though these findings are—and they confirm Sylvest's¹ clinical appreciation of the pathology—this is a procedure which is better not repeated because of the possibility of dual infection with poliomyelitis virus.

Recognition of the sporadic, early epidemic, or atypical case is always a problem in communicable disease, and epidemic myalgia is no exception to the rule. Early notification of infectious disease and careful observations of this sort are of the greatest value. But diagnosis must first and foremost be a clinical one; the laboratory can assist by confirming it and working out the details.

MR. MACLEOD ON THE DRUG BILL

The cost of the national drug bill has given concern to all who have watched the National Health Service develop since 1948. The seriousness of this was underlined by Mr. Iain Macleod, the Minister of Health, when he addressed the Annual Conference of Representatives of Local Medical Committees on Wednesday this week. We publish elsewhere an account of what he said and of the response made by Dr. Talbot Rogers, chairman of the G.M.S. Committee. Mr. Macleod stressed that the Exchequer could not be expected to continue paying something like £40m. a year for drugs prescribed by general practitioners unless they were in fact essential for the proper treatment of patients. The drug bill for 1949-

50 was £31½m., and for the year 1953-4 it was estimated the cost would be £46½m. The factors in this rise in cost were an increase in the total number of prescriptions, an increased use of proprietary preparations, the introduction of new but expensive drugs, and a rise in the cost of ingredients. Last year 26% of the total number of prescriptions were in the form of proprietary preparations, which accounted for 44.5% of the drug bill. The Minister mentioned in particular a proprietary slimming preparation. If the standard preparation in the *National Formulary* had been prescribed instead, this would have effected a saving of nearly £250,000 in 1951. (It may be of interest to record that the discovery of the sympathomimetic substance which is now being used so extensively was discovered by Barger and Dale in 1910.) After giving other examples, the Minister went on to say that many preparations had no exact official equivalents, but he issued a special plea that doctors should make careful use of preparations in the *National Formulary* and also of the "Prescribers' Notes" issued by the Ministry of Health. He urged doctors to resist pressure from patients to prescribe particular preparations, and to refrain from ordering large quantities of a drug or dressing. To give further help to general practitioners the Ministry, he said, proposes to issue a price list of *Formulary* preparations and proprietary preparations frequently used so that doctors may be aware of the cost of what they were prescribing. Dr. Talbot Rogers said that the Minister's words would be most carefully studied by general practitioners, and added that the G.M.S. Committee had not been unmindful of the mounting costs of the drug bill. For example, the Committee had urged the Ministry to introduce a system of stock order forms as far back as 1948. It had also urged the Ministry to reintroduce the system of "area averages" so that the prescribing costs of a doctor could be compared with the average for the area. Finally, he assured the Minister that the G.M.S. Committee would do all it could in co-operation with the Minister's officers to stabilize the cost of the pharmaceutical service so long as this was not incompatible with the needs of the patient.

Undoubtedly the medical profession and the pharmaceutical industry will do all they can to grapple with this serious problem. Undoubtedly, too, the facts now being disclosed will make the doctor, whether in general practice or working in hospitals, more conscious than before of the cost of drugs. The reintroduction of "area averages" would go a long way to controlling excessive prescribing. Yet in comparing costs it must be borne in mind that the initiative of the pharmaceutical

industry has made the introduction of cheaper standard preparations finally possible; to some extent comparison of costs may be misleading because it takes no account of the initial cost and risks incurred by the industry. Again, every practising doctor knows that the ingredients of a placebo medicine will do little if anything to readjust a patient's disordered physiology; but he knows, too, that if the patient has a firm belief that he or she will benefit from such and such a remedy then some benefit will be experienced. For the patient there is much "magic" in a bottle of medicine, and in this respect the sick Briton is as primitive in his reactions as the sick savage. All this is not to deny that something can be done and will be done to reduce the cost of the drug bill, but the problem is not an easy one and all the answers to it have not yet been found.

PROBLEM FAMILIES

Speaking of a "militant approach" to the problem, the Minister of Health said¹ last week that maternity and child welfare workers must seek out problem families, not wait for them to come. He was opening the annual conference of the National Association of Maternity and Child Welfare in London. Many mothers did not take advantage of these services, he said, and "it is here, essentially, that our problem lies." These problem families, once the "submerged tenth" of Charles Booth, are now perhaps a fiftieth or a hundredth. But they still merit inquiry and investigation as a difficult group comprising a host of families and individuals who are shiftless, lazy, backward, incorrigibly ineducable, and who present a continuous problem to the medico-social worker. The extent of the problem, the conditions associated with it, how far it is preventable, and what preventive and remedial measures are necessary and practicable are questions which have occupied the attention of investigators before and after the second world war, and knowledge is accumulating about social-problem families and their characteristics. A useful addition to this work is an account of five inquiries sponsored by the Eugenics Society² and undertaken in different parts of the country under the general guidance of a Problem Families Committee.

Five areas differing in their social, geographical, and population characteristics were selected for survey, and the medical officer of health undertook the general supervision in each area. The main theme of the inquiry was an assessment of the varied antisocial characteristics of problem families, and an endeavour was made to enlist the co-operation of all agencies, statutory and voluntary, which might help in dealing with social problems of this nature. Essentially the work was an attempt

¹ *The Times*, June 11.
² Blacker, C. P., *Problem Families: Five Inquiries*. Eugenics Society, London, 1952.
³ *Report of the Mental Deficiency Committee, Part III*, p. 39, H.M.S.O., 1929.
⁴ *The Social Survey of Merseyside*. University Press of Liverpool, Hodder and Stoughton, London, 1934.
⁵ *Med. Offr.*, 1946, 75, 252.

¹ *Ugeskr. Laeg.*, 1930, 92, 778.
² Sylvest, E., *Epidemic Myalgia*. London: Oxford Univ. Press, 1934.
³ *J. Amer. med. Ass.*, 1949, 141, 894.
⁴ *Science*, 1948, 108, 61.
⁵ Melnick, J. L., and Curnen, E. C., in *Virus and Rickettsial Diseases of Man*. Edited by T. M. Rivers. Philadelphia: J. B. Lippincott & Co., 1952.
⁶ *Ann. intern. Med.*, 1950, 33, 32.
⁷ Weller, T. H., et al., *J. Immunol.*, 1950, 65, 337.
⁸ Lazarus, A. S., et al., *Amer. J. publ. Hlth.*, 1952, 42, 20.
⁹ Brown, C. Metcalfe, et al., *Lancet*, 1952, 1, 445.
¹⁰ Lépine, P., et al., *Bull. Acad. nat. Med. (Paris)*, 1952, 136, 66.
¹¹ Mitchell, R. G., *British Medical Journal*, 1951, 2, 1032.
¹² *J. Immunol.*, 1952, 68, 297.
¹³ Gifford, R., and Dalldorf, G., *Amer. J. Path.*, 1951, 27, 1047.
¹⁴ Godman, G. C., et al., *ibid.*, 1952, 28, 223.

at ascertainment, and much useful information has been collated. The Wood Committee³ recognized in 1929 the existence of a subnormal or problem group, and, although its findings mainly concerned the incidence of mental defect, they focused attention on a section of the community comprising socially inadequate individuals or families. Other inquiries before the second world war, notably that of Caradog Jones⁴ on Merseyside, revealed the existence of a social-problem group which included not only families with one or more mental defectives but the unemployables, the shiftless, and the chronic slum dwellers.

The findings of the Problem Families Committee in relation to the intelligence of male heads of families and housewives largely confirm the conclusions of other observers that mental subnormality alone does not make a problem family. The observations were not based on formal tests; but the experienced investigators probably erred on the side of caution, and the conclusion that just over half the male heads of families and two-thirds of the housewives were classed as subnormal probably presents a fair picture. The bearing of mental deficiency in the mother on rehabilitation of the family is of prime importance, and Savage⁵ believes that it is not possible to reclaim the families where the mother is mentally defective within the meaning of the Mental Deficiency Acts. Fortunately mental deficiency of this degree is not synonymous with mental subnormality, and, as the valuable work of the Family Service Units among others has shown, rehabilitation is possible in more families than is indicated by the finding of subnormality among two-thirds of the housewives.

The incidence of problem families has been variously estimated as between one per thousand of the population and three per thousand. The estimate is complicated to some extent by difficulty in definition. The proportion of problem families per thousand families in the five inquiries with a presumably common basic definition varied between 1.2 per thousand in one area and 6.2 in the area with the highest proportion. The committee outlines difficulties in comparing these with normal families and is of opinion—on doubtful premises—that the proportion would probably be found somewhere between 1.5 and 15 per thousand. This investigation again draws attention to a matter of much concern to the medical profession as well as to others. The time would appear to be ripe for a complete inquiry at national level into the whole subject of social-problem families—their definition, incidence, and distribution, what preventive and remedial measures may be taken, and how the effort of all interested agencies, statutory and voluntary, should be directed.

SUPERINFECTIONS DURING ANTIBIOTIC TREATMENT

We referred last year¹ to the sometimes lethal condition which has come to be known as "superinfection"—the development during chemotherapy of a fresh infection by a micro-organism resistant to the drug being used. The subject has recently been reviewed afresh by D. T. Smith,² who takes the view that in those areas of the

body more heavily populated by bacteria each element plays a part in keeping others in check, not only by competing for pabulum but by some kind of antibiotic action. It is certainly true that, for instance, salivary streptococci form substances noxious to other species, either merely hydrogen peroxide or sometimes a more complex substance, and there is even some evidence that such action by the normal flora tends to defend their habitat against attack by pathogens from elsewhere. If an antibiotic therapeutically administered is present in this area for long enough, some part of the normal flora is suppressed: the balance, however maintained, is upset, and an abnormal proliferation of resistant organisms follows, sometimes causing actual lesions. When penicillin is given in large doses it escapes in saliva and pharyngeal and bronchial secretion in amounts sufficient to suppress most of the Gram-positive flora of the upper air passages, and coliform bacilli are apt to take their place. At the worst, *Ps. pyocyanea* or *Bact. Friedländeri* may in these circumstances attack the lung. Streptomycin, in general more active against Gram-negative than Gram-positive species, has occasionally, as Smith points out, been seen to have just the opposite effect. On the other hand, if both are given together, or any of the newer "broad spectrum" antibiotics, there is a more general suppression of bacterial growth, and the field is left clear for a class of micro-organism totally resistant to all the major antibiotics. These are the fungi, of which *Candida albicans*—a common mouth commensal—is much the most likely to make its appearance. Oral thrush and even pulmonary moniliasis, and extensive proliferation of the same organism in the bowel, usually with no worse result than pruritus ani, are now well recognized as possible consequences of giving aureomycin, chloramphenicol, or terramycin for more than a very few days.

Organisms proliferating in these circumstances usually belong to naturally resistant species, but there is at least one example of such activity following apparently acquired resistance. M. Finland and his colleagues^{3,4} describe the occurrence in patients treated with terramycin of superinfections due to resistant staphylococci. Although a few of these took the form of pneumonia, most presented as an acute enteritis, which was sometimes fatal. Possible examples of the same condition are now reported in two papers from Switzerland. G. Bernhart⁵ gave 1.5 g. of terramycin intravenously daily post-operatively for three days to two patients with a suppurating thyroid adenoma and gangrenous appendicitis respectively. After three and five days of satisfactory progress each suddenly developed severe watery diarrhoea and fever, proceeding to dehydration and vasomotor collapse, which proved fatal despite all obvious restorative measures. F. Meier⁶ had three patients who were given similar doses of the drug pre-operatively—in preparation for colonic resection for carcinoma in two and diverticulitis in the other. Each of these succumbed rapidly to a similar condition, the

¹ *British Medical Journal*, 1952, 1, 537.
² *Ann. Intern. Med.*, 1952, 37, 1135.
³ *Ibid.*, 1951, 35, 1175.
⁴ *Arch. Intern. Med.*, 1952, 89, 240.
⁵ *Schweiz. med. Wschr.*, 1952, 82, 1335.
⁶ *Ibid.*, 1952, 82, 1337.

onset of which was three days after operation. Neither of these authors had heard of Finland's observations at the time, and none of the patients' stools were examined for staphylococci. In the light of those observations they now consider that an acute staphylococcal enteritis must have been the cause of death in their cases. Both emphasize that they have often given terramycin in much larger total doses than this without ill effects. They suggest that the factors leading to this devastating complication were a major operation and advanced age: the ages of Bernhart's patients were 71 and 66, and of Meier's 47, 54, and 60. On this somewhat conjectural evidence it cannot be finally concluded that infection by a terramycin-resistant staphylococcus was the cause of these patients' deaths. Nor is it clear that terramycin therapy alone can have this consequence. It is nevertheless important that these observations should be widely known in order that surgeons generally may be on the look-out for this condition. Diarrhoea and circulatory collapse are banal and apparently non-specific conditions which may readily be attributed to other or unknown causes in a patient who has recently had a major abdominal operation. If they can in fact result from a specific superinfection after the use of a particular drug—a possibility which would not readily occur to anyone—the sooner this is widely recognized the better.

THE MEDICAL INSURANCE AGENCY

For nearly 50 years the Medical Insurance Agency, as many well-satisfied clients will stoutly affirm, has rendered to the medical profession services and benefits such as no other competitor in this field has approached. Founded, as it is pleasing to recall, by the then Editor of this *Journal*, Sir Dawson Williams, in conjunction with the then Editor of the *Lancet*, Sir Squire Sprigge, the Agency has two outstanding merits. It is entirely unbiased; the only guiding principle is the interest of the client. It can and does select from among the numerous first-rate offices that one whose rates and policy conditions are best suited to the client's needs. This is not a simple matter, for in the field of life assurance offices differ widely in their practice, and much depends upon the individual special factor—whether it be the age or sex group, endowment assurance as compared with a whole-life policy, a non-profit or profit-sharing plan, a damaged life, and so forth. The complexity of this quest on the client's behalf is illustrated by the fact that life assurance alone is distributed by the Agency among some thirty companies, of which about a dozen get the lion's share between them. The second advantage (almost but not quite so important) is that the Agency has no shareholders or proprietors to take profits out of it. Consequently clients obtain in most cases substantial rebates on their premiums (or on the amount payable when the policy is first taken up), and all surplus after the payment of overheads is given to medical charities. The board of management, all of whose members are doctors, get no fees and never have had them from the start. All this is fairly well known, but perhaps not so much as it should be—at all events to the most

junior members of the profession, who sometimes find themselves in the sphere of proprietary agencies whose activities, not in the least improper in themselves, are dictated by motives less altruistic than those of the M.I.A.

The charities chiefly benefiting are the Royal Medical Benevolent Fund and its Ladies' Guild, and the Royal Medical Foundation of Epsom College. The large sums these have received from the Agency have completely transformed their scales of relief and benevolence, and have enabled their managements to distribute help which seems princely compared with what was available only a few years ago. Another point emerging from the Annual Meeting of the Agency (briefly reported on page 1401) is that the sums assured under life policies completed in 1952 exceeded four million pounds for the fourth successive year. It is a matter for satisfaction that our profession is as alive to the necessity for adequate life assurance as these figures clearly indicate. But life assurance is only one facet of the Agency's work, which includes motor and fire insurance, third-party risks, and, in fact, every form of insurance; further, the Agency provides special house-purchase and car-hire-purchase services, which have proved a great boon to many practitioners in recent years.

THE ANNUAL MEETING

"Cardiff is once again eagerly waiting to welcome the B.M.A." With this warm promise Mr. Robert D. Owen concluded his account¹ in our pages last week of the great city where this year's Annual Meeting is to be held in July. A large and varied programme has been drawn up, and it is hoped that as many doctors as possible will be able to spare a few days, or even a day only, to take part in the discussions. Last year's experiment of plenary sessions was found to be a great success, and they are to be held again this year. Three subjects have been chosen, all prominent for the problems they raise in clinical practice—coronary disease, fibrositis, and overweight. The opening speakers take their various approaches to the theme, and anyone is then free to contribute his views. Participants at Dublin last year showed how instructive and fruitful such discussions can be. These plenary sessions and the Scientific Sections, which equally offer a welcome to all comers, provide a valuable meeting-ground for doctors from all branches of the profession. They may be seen indeed as a healthy corrective to those too many divisions that the times have wrought in what ought to be a single profession. As usual many diversions are being offered, some light and some more serious. One in particular—again introduced last year—is the scientific exhibition, at which many hospital and other departments will illustrate current research. It is good to know that Sir Russell Brain, P.R.C.P., will give the popular lecture on "Dr. Johnson as Scientist and Patient." The programme, published in the *Supplement* this week at page 282, gives a full list of the meeting's events. To its evident attractions must be added that other of which Mr. Owen reminded us—"the Welsh gift of hospitality."

¹ *British Medical Journal Supplement*, June 13, p. 273.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

MYXOEDEMA

BY

A. W. SPENCE, M.D., F.R.C.P.

Physician to St. Bartholomew's Hospital, London

Myxoedema is caused by hypothyroidism, but most patients with hypothyroidism are not myxoedematous. This statement probably needs an explanation. The term "myxoedema" was proposed in 1878 by W. M. Ord, physician to St. Thomas's Hospital, because a deposition of a mucinoid substance was observed in the skin of one of his patients on whom a necropsy had been performed. Subsequent analyses of the skin of a number of patients with myxoedema showed that their skin contained no more mucin than that of normal subjects. In fact, true myxoedema is uncommon; most cases thus termed should, strictly speaking, be referred to as suffering from hypothyroidism, but common usage for so many years has universally established the term myxoedema, irrespective of whether the skin contains an excess of mucin or not. Hypothyroidism which arises secondarily to hypopituitarism should not be called myxoedema.

Aetiology

The usual cause of spontaneous myxoedema in Britain is an idiopathic degeneration and fibrosis of the thyroid gland, a disturbance which arises more often in women than in men, and most commonly at the time of the menopause. Juvenile myxoedema is due to a similar cause operating in childhood. Hypothyroidism occurs in about 4% of patients subjected to subtotal thyroidectomy for toxic goitre, but sometimes it persists for only a few months. It not uncommonly arises as a result of the treatment of toxic goitre with radioactive iodine, on account of the difficulty in determining the correct dosage. Chronic fibrosis of the thyroid gland (Riedel's or Hashimoto's disease) is usually accompanied by hypothyroidism, but malignant disease of the gland only rarely gives rise to it. In regions of endemic goitre myxoedema may be the end-result of simple goitre, and is then caused by exhaustion atrophy of the glandular epithelium.

Overdosage with antithyroid compounds—for example, methylthiouracil—in the treatment of toxic goitre may result in myxoedema; their action is to inhibit the synthesis of the thyroid hormone. Myxoedema has been reported as arising through the use of resorcinol ointment for ulcers of the legs, and occasionally during the treatment of pulmonary tuberculosis with *p*-aminosalicylic acid. Both of these substances seem to act similarly to the derivatives of thiouracil. The disorder was occasionally observed when potassium thiocyanate was used in the treatment of essential hypertension, a method of therapy, however, which has now been generally discarded. Thiocyanate causes hypothyroidism by preventing the accumulation of iodine in the thyroid gland, thus reducing the amount of thyroid hormone synthesized. In all instances of myxoedema caused by antithyroid drugs the condition gradually subsides when their administration is stopped.

Diagnosis

The clinical picture of myxoedema is well known and its description needs no repetition here. The complaints of the myxoedematous patient are often vague on account of the slowness of the mental processes, and information of greater value may be obtained from relatives who are aware of the change in the patient's appearance and demeanour. Early cases do not present the typical facies,

while some patients have a heaviness of the features and a slowness of thought which are part of their natural make-up and are not due to hypothyroidism.

It is commonly thought that thinning of the hair of the eyebrows, especially of the outer third, is almost pathognomonic of myxoedema, but this is erroneous, for it may occur in normal subjects of middle age. Another fallacy is that patients with obesity are suffering from hypothyroidism; analysis of large numbers of patients with proved hypothyroidism have demonstrated that only a small proportion of them are fat, while in the experimental field thyroidectomy performed on laboratory animals results in a decrease, not an increase, of body fat.

Myxoedema may present itself in a variety of ways. A clue to the diagnosis in the case of one patient attending hospital for some other condition was the large amount of clothing that she was wearing. Puffiness of the face may suggest nephritis, and evidence of impairment of renal function may of course be found in a myxoedematous patient as a fortuitous accompaniment. At the time of the menopause it may be difficult to decide whether the symptoms complained of are those of the climacteric or are due to hypothyroidism, or the clinical picture may be complicated by the presence of symptoms of both conditions. The possible existence of hypothyroidism should be borne in mind in women presenting with menorrhagia for which no local cause can be found and in sterility in both sexes. Rarely, anginal symptoms may be the presenting feature, and there may be no other clinical evidence of myxoedema apart from the typical changes in the basal metabolic rate and blood cholesterol.

Anaemia.—Anaemia may be a prominent feature of myxoedema and may mask the underlying disturbance. The anaemia of myxoedema is a simple hyperchromic anaemia in which the colour index is slightly above 1 and the haemoglobin rarely below 60%. It may or may not be associated with achlorhydria. It is thought to be caused by the increased oxygen tension in the tissues which arises as a result of the low metabolic turnover and which leads to decreased erythropoiesis; it is thus analogous to the anaemia which may be produced by exposing animals to atmospheres with a tension of oxygen greater than normal. Not being caused by a deficiency of iron or of vitamin B₁₂, it does not respond to the administration of either of these substances, but it improves slowly on prolonged treatment with dried thyroid. Two other types of anaemia occur less frequently: (1) hypochromic anaemia, which resembles an iron-deficiency anaemia, may be associated with a glazed tongue, brittleness of the nails, splenomegaly, and achlorhydria, and the administration of iron as well as thyroid is necessary to procure a complete remission; and (2) Addisonian hyperchromic anaemia, which is rare in combination with myxoedema, responds rapidly to combined treatment with thyroid and liver extract (or vitamin B₁₂), but not to thyroid alone.

Psychoses.—It is important to recognize that psychological disturbances may be so severe in myxoedema that they may dominate the clinical picture to such an extent that the underlying cause—hypothyroidism—may be overlooked. Failure to appreciate this may have unfortunate results. The psychoses which may arise consist in a wide variety of mental changes, and include disorientation, hallucinations, dementia, acute or chronic mania, melancholia, and paranoid and schizophrenic states.

Hypopituitarism.—Hypothyroidism which is secondary to hypopituitarism may closely resemble myxoedema: there are the same lethargy, dryness of the skin, thinning of the hair, increased sensitivity to cold, bradycardia, subnormal temperature, and decreased basal metabolic rate; amenorrhoea and anaemia may be present in both conditions. The differentiating points are as follows: in hypopituitarism the skin of the face may be finely wrinkled and it has a slightly yellowish tinge more often than in myxoedema; the malar flush which is often seen in myxoedema does not occur; there is loss of body hair due to reduced secretion of adrenal and (in men) testicular androgens; the blood pressure is low as a result of diminished adrenal cortical secretion, whereas in myxoedema it is normal or raised; hypothyroidism arises usually late in the course of the disease; there is often evidence of a pituitary lesion, such as a pituitary tumour, or a past history suggestive of a post-partum necrosis of the anterior lobe; there may be hypoglycaemia, whereas in myxoedema the fasting blood sugar is generally normal; and there is increased sensitivity to the injection of insulin, whereas this test is normal in myxoedema.

Laboratory Investigations.—In all cases in which myxoedema is suspected it is advisable, if possible, to have the basal metabolic rate and the blood cholesterol estimated before treatment with thyroid is begun. The basal metabolic rate is typically lowered in myxoedema; in the completely thyroidless person it is minus 40%, which may be termed the myxoedema level. The basal metabolic rate, however, is not always a reliable guide in the diagnosis of myxoedema. For instance, healthy persons may normally have a very low basal metabolic rate and, on the other hand, sometimes in undoubted cases of myxoedema the reading is normal. This latter finding may be because basal conditions were not obtained or because of the considerable variation which is found in the basal metabolic rate of normal persons, though this statement is denied by some authorities. The blood cholesterol (normal: 150 to 200 mg. per 100 ml.) is a more reliable index of the presence and severity of hypothyroidism than is the basal metabolic rate. It is invariably raised in myxoedema, an average figure being between 300 and 400 mg. per 100 ml.

Treatment

The treatment of myxoedema with thyroid substance affords a perfect example of effective replacement therapy. As there may be some variation in the potency of different brands of dried thyroid on the market, it is advisable to adhere to one particular preparation, for changing from one brand to another of different strength may lead to difficulties. Tablets of thyroid, B.P., contain 0.1% of iodine combined as thyroxine. Since the disorder is solely due to deficiency of thyroid hormone, no advantage is obtained by using preparations in which thyroid is combined with other substances.

With regard to the frequency of administration of thyroid, it is a tenet of therapeutics that those drugs which are rapidly destroyed in the body or are rapidly excreted should be given at frequent intervals, whereas in the case of those which exert a prolonged action this is unnecessary. As the action of thyroid hormone is prolonged, the preparation need be given only once daily, preferably after breakfast.

It is customary to begin treatment with small doses of thyroid and gradually to increase the amount until the optimal maintenance dose is reached. Starting treatment with a full dose of 3 to 5 gr. (200 to 320 mg.) daily may



FIG. A

FIG. B

Myxoedema: (A) Before treatment, (B) after six months' treatment with thyroid.

cause precordial discomfort, or even anginal pain, and muscular pain, and cramps. This is because the oxygen requirements of the tissues are increased beyond the capabilities of the heart and circulation at this stage to supply them: this relative inefficiency is caused by the hypotonicity of the myocardium, the anaemia, and the narrowing of the capillaries which has been observed in hypothyroid subjects. The daily dose of thyroid should initially be $\frac{1}{2}$ gr. (32 mg.), and should be increased each week by $\frac{1}{2}$ gr. (32 mg.) until signs of overdosage, such as tachycardia and irritability, begin to appear. Treatment should then be stopped for two weeks, and should be resumed in doses of 1 gr. (65 mg.) a day less than the overdose. The maintenance dose of tablets of thyroid, B.P., varies from 3 to 5 gr. (200 to 320 mg.) daily.

In patients with coronary sclerosis anginal symptoms may arise before the full dose of thyroid is reached as a result of the increased oxygen requirements of the myocardium. Such patients should be kept slightly hypothyroid, at a level at which angina does not arise. In the rare case in which angina is present before treatment is begun it disappears with thyroid therapy, but it may recur when the larger doses are reached. Striking the correct balance may be difficult.

Adequate treatment with thyroid causes the myxoedematous symptoms to regress. As mentioned above, the simple hyperchromic anaemia of myxoedema gradually disappears with thyroid alone, but the hypochromic type requires a preparation of iron in addition, and the Addisonian type requires liver extract or vitamin B₁₂. Another feature which disappears with thyroid therapy is the cardiac enlargement which is sometimes found in myxoedema and which may be due to myxoedematous changes in the myocardium and to generalized dilatation. If reduction in the degree of cardiac enlargement is not obtained the condition is due to some other cause.

Laevo-thyroxine Sodium.—Laevo-thyroxine is the form in which thyroxine exists in the thyroid gland. It was synthesized a few years ago and was found to be highly active when given by mouth. Before the synthesis of laevo-thyroxine, the thyroxine available on the market was the racemic form, which being relatively insoluble is much less active than dried thyroid when given by mouth; it had, therefore, to be administered by intravenous injection and consequently was not adopted as a method of therapy. Laevo-thyroxine sodium is as effective in the treatment of myxoedema as dried thyroid substance, and the principles of its use are the same. For practical purposes 0.1 mg. of

laevo-thyroxine sodium is equivalent in effect to approximately 1 gr. (65 mg.) of tablets of thyroid, B.P. As it is a pure substance there is no variation in its potency.

Juvenile Myxoedema

The term "juvenile myxoedema" is applied to hypothyroidism when it arises during childhood. It differs from cretinism in that the causative factor is not present at birth. When the condition arises during infancy the clinical features resemble those of cretinism, in later childhood those of adult myxoedema.

The treatment of juvenile myxoedema is the same as in the adult type; the dose of thyroid should be small at first and should be gradually increased. For a child aged 4 years the daily dose of tablets of thyroid, B.P., should initially be $\frac{1}{4}$ gr. (16 mg.) and should be increased each week by $\frac{1}{4}$ gr. (16 mg.) until the maintenance dose is reached; this is about 2 gr. (130 mg.) daily for a child of this age. Children require in proportion rather more thyroid than adults on account of their growth, and as growth proceeds the dose should be slightly increased each year. If evidence of hyperthyroidism is seen the administration of thyroid should be stopped for three or four days and should be resumed in smaller dosage. For no other reason should treatment be interrupted.

The prognosis of treatment in respect of juvenile myxoedema is better than in cretinism, because in the latter disease the disturbance arises *in utero* at a vital period of growth and development, when some of the damage inflicted may be irreparable. From the point of view of prognosis, therefore, it is important to differentiate juvenile myxoedema from cretinism, but this may be impossible when the disorder arises in infancy. The two conditions are distinguished by inquiring carefully into the early development of the child and by observing the degree of mental deficiency, dwarfing, and bone development.

Localized Pretibial Myxoedema

Localized pretibial myxoedema is characterized by irregular indurated swellings of the skin occurring symmetrically over the antero-lateral aspect of the lower half of the legs. The skin itself is erythematous or yellowish white, and the dilated dimpled hair follicles produce an appearance resembling pigskin. The swellings are due to deposits of mucin. The condition may be a complication of toxic goitre, and occasionally it disappears after subtotal thyroidectomy, but more often it develops after this operation. Treatment so far has on the whole been ineffective.

The cause of the disorder is unknown; it has been suggested that it is due to excessive secretion of the thyrotrophic hormone of the anterior pituitary lobe, and that it is thus analogous to exophthalmos, which is caused by oedema of the orbital tissues presumed to be due to the same factor.

Next Refresher Course Article.—"Breast-feeding Difficulties," by Dr. F. Charlotte Naish.

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

The report of the Regius Professor of Physic, Cambridge University, for the year 1951-2 includes attendance figures for the monthly symposia for medical practitioners held during the year. The symposia, which took the form of lecture-discussions and case demonstrations, were attended by practitioners from a wide area. The total attendance for the year was 241, as against 209 the previous year, and of the individual symposia the most popular were those on diseases of the lung (41), obstetrics and gynaecology and cardiovascular diseases (38 each).

ROYAL MEDICAL BENEVOLENT FUND

The annual meeting of the Royal Medical Benevolent Fund was held on June 9, with Lord Webb-Johnson in the chair. The annual report, presented by the hon. secretary, Dr. R. Cove-Smith, stated that almost £12,000 had been received during the year by way of legacies. A similar figure had once again come in from the Medical Insurance Agency, whose generous donation of £6,420, being given by deeds of covenant, ensured a regular income of £12,000 until the covenants expired. Dr. Cove-Smith recalled that 20 years ago the maximum annuity that the Fund was able to provide was limited by lack of money to £40 per annum, which was often woefully inadequate; to-day the maximum annuity in payment was £200. At present there were 221 beneficiaries on the books to whom annuities were paid. In addition there were 418 beneficiaries who received gifts or yearly allowances; of these 97 were new applicants. The total number of individuals benefited, however, was considerably in excess of these figures, for in some cases the beneficiaries were married couples, others were widows with families, and money had been given towards children's education and support. The amount distributed as a result of the Christmas gifts appeal was £2,368. The total charitable distribution made during the year on all accounts, including the various trust funds, amounted to £44,410. This extensive work had been carried out within a working expense figure of 7½%.

Lord Webb-Johnson was re-elected president of the Fund, Mr. F. A. Juler honorary treasurer, and Dr. R. Cove-Smith honorary secretary, and the retiring members of the committee of management were re-elected as follows: Dr. H. A. Clegg, Sir Zachary Cope, Dr. D. F. Hutchinson, Mr. F. A. Juler, Miss E. C. Lewis, Sir Arthur MacNalty, Mr. W. H. C. Romanis, and Dr. P. Montague Smith.

In a brief address Lord Webb-Johnson said that the Fund deserved more general support from the profession, and this could only be secured by personal approach. He spoke with gratitude of the service of the auditors, Messrs. Deloitte, Plender, Griffiths and Co., who for 50 years had served the Fund in an honorary capacity. Others to be thanked were the Medical Insurance Agency, the Charities Committee of the British Medical Association, and the medical press, which, he said, always gave space to the Fund's appeals. He also paid a tribute to the Ladies' Guild, through which it was possible to give material assistance in the way of clothing, domestic and nursing help, and educational training.

CENTENARY OF WARLEY HOSPITAL

The Minister of Health, Mr. Iain Macleod, spoke at an Open Day at Warley Hospital, Brentwood, on June 9, held to celebrate the hospital's centenary. The hospital was opened in 1853 as the "Essex County Lunatic Asylum"; later it became the "Brentwood Mental Hospital." Mr. Macleod said that he regarded the mental health service as having first call on the increased capital expenditure which he hoped to see available in the near future. The Ministry was already allocating substantially larger sums to the mental health service. He had called urgently on regional boards for their plans. The first thing he did on becoming Minister was to ask the architects and administrators to find methods of building the accommodation needed. Overcrowding existed in practically every mental hospital in the country. Speaking of the waiting-list of nearly 9,000 mental defectives, Mr. Macleod said that it must never be forgotten how much mental distress was caused to families, particularly mothers, if they had to care for a mentally defective child.

The Minister was welcomed by Alderman C. E. S. Blackmore, chairman of the hospital management committee, who said that during the last five years the regional board had done all in its power to help the hospital. Alderman G. H. Spackman, the vice-chairman, thanking the Minister, said that, although the Essex County Council's scheme in 1939

for a new hospital was now impossible, he hoped they would be able to go forward with some scheme for a modern building.

In his speech the Minister drew applause when he praised an illustrated booklet written by Dr. G. S. Nightingale, the physician-superintendent, entitled *The First Hundred Years of Warley Hospital*. This book had been produced entirely in the hospital itself. Dr. Nightingale, speaking at the meeting, said that it was not conceived when the hospital was built that it would ever exceed 450 beds; now it had 2,000. The different styles of architecture of the buildings reflected the therapeutic outlook of their period. Dr. Nightingale referred to his predecessor, Dr. W. G. Masefield, whose term saw many improvements.

Warley Hospital admits 700 new cases a year, 54% voluntary, a lower proportion than at some hospitals, but, said Dr. Nightingale, they had not made a fetish of admitting patients on a voluntary basis simply for the sake of doing so. The figure did not include certified patients who on discharge stayed on as voluntary patients. It was also stated that since 1947 over 200 leucotomies had been performed. Referring to the shortage of nursing staff, which he thought was to a considerable extent owing to financial reasons, Dr. Nightingale said that the hospital could not have carried on without the large number of part-time nurses. They had also recently recruited 25 French student nurses, who were doing good work.

On display were some of the archives of the hospital. These included the earliest clinical record-book (male), 1853. The first entry concerned the case of a farm labourer "labouring under an attack of melancholia caused, as reported, by disappointment in love. On admission he was quiet and sulky and disinclined to answer questions. His mind seemed in a very weak state, but his bodily health was good." That entry was dated October 10. A further entry on March 16 of the following year was, "Mind quite lost."

Preparations and Appliances

FIRST-AID DEVICES IN COLLIERIES

Dr. T. A. HUNT, Area M.O., No. 5 Area, East Midlands Division, National Coal Board, writes: In the mining industry the employment of good first-aid men has been of paramount importance. There is, however, an important part of first aid which has recently received a great deal of attention here—namely, the transport of the patient—and a review was undertaken of the methods of getting a patient from the coal-face to hospital.

Single-bearer Stretcher Carriage.—The four-wheel stretcher carriage has many practical disadvantages in use underground, particularly when the road is full with loaded coal tubs and other obstructions common in underground workings. The advantages of a two-wheel device (Figs. 1 and 2) were apparent to many mining men.

The stretcher and carriage can, if necessary, be carried past obstructions or on the coal-face. The carriage can be further dismantled in two parts and rapidly reassembled. The stretcher carriage should be pulled. In this way the leading first-aid man can see where he is walking. The loaded stretcher carriage can be easily lifted over or round obstructions by two first-aid men.

Air Pillow Carrier.—Some support to the back of the head and neck is often needed, but the storage of pillows underground presents many practical difficulties. These have been solved by the use of a rubber air pillow, which should be stored with the stretcher. If stored loosely with the stretcher it may be lost or overlooked. The method used is to fasten a scrap piece of metal tubing to the middle of the stretcher. This tube will hold and preserve, ready for use, the rolled-up air pillow, which is further secured to the stretcher by a small length of chain to prevent its accidental loss.

Stretcher Rack Modification.—Most stretchers in general use in the pits have wooden side supports with a covering canvas sheet. When wood is stored under damp conditions it tends to warp and twist, and the legs of the stretcher splay either inwards or outwards. Ambulances are usually fitted with metal U-shaped grooves into which the legs of the stretcher are placed, and one or more legs of a warped stretcher may not fit into them. This problem has been solved by replacing one of the U-shaped runners in the ambulance by a flat strip of metal, as shown in Fig. 3. This modification has proved very satisfactory and has been in everyday use for over a year.



FIG. 1



FIG. 2

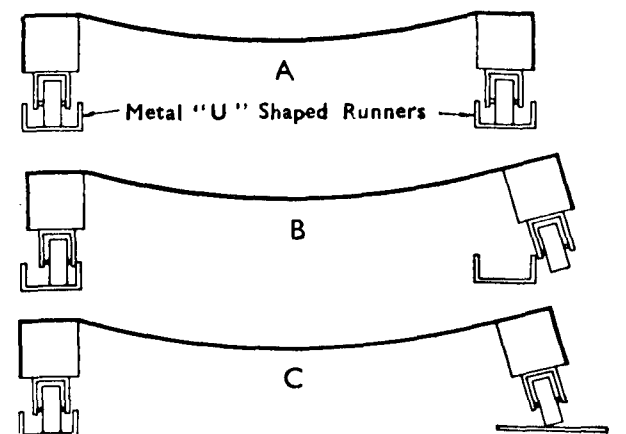


FIG. 3.—(A) Section of stretcher showing a good fitting. (B) A warped stretcher, where leg(s) will not slide securely into U-shaped runners. (C) Single U-shaped runner will secure legs of stretcher against lateral movement while the broad flat runner will support the twisted legs caused by warping of wooden stretcher supports.

a bed-pan, but did not complain of any dizziness or other symptoms. About ten minutes after the completion of the injection he began to regain his colour and by this time his bleeding had stopped.

When the patient was last seen about nine weeks after the injection of pituitrin, he had had no further haemoptysis nor even any staining of his sputum.

It is, of course, possible that this control was purely coincidental, but when the suddenness of the arrest of the haemorrhage is considered, together with the case reports of Rist and Trimble and Wood, it appears that this therapeutic measure is the only effective method available in the control of haemoptysis without resorting to ligation of the vessels, and even that is practicable only if the side from which the bleeding takes place is known.—I am, etc.,

Watford.

N. D. J. DE S. WJESKERA.

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- ¹ Arch. intern. Med., 1911, 8, 17.
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Reversible Diabetic Sixth Nerve Palsy

SIR,—The sixth is the cranial nerve most easily paralysed in intracranial disorders, especially in conditions of increased intracranial tension or basal meningitis. Diabetic neuritis has also been a recognized cause of a sixth nerve lesion, but considering the wide incidence of diabetes mellitus such involvement is a rarity. Even in India, where the vast majority of diabetics still spend a lifetime of uncontrolled and untreated diabetes and are often brought to light only when some surgical or medical complication forces them into a hospital, the cranial nerve lesions are hardly ever seen. The following case is reported from a hospital of over 3,000 admissions to medical wards yearly, and over 47,000 medical out-patients. Even in these numbers this nerve lesion is rare.

A man aged 50 years was admitted for diplopia of six weeks' standing. He had typical right-sided rectus paralysis. No other neurological lesion was elicited. There was no history of headache. He had had symptoms of polyuria, increased appetite and thirst for about two years, but he had never sought medical advice. He was of average build without any cachexia, but complained of some pain in his calf muscles. Dextrose tolerance test showed a mild diabetic curve with a fasting level of 140 mg.% rising to 240 mg.% after one hour and maintaining a blood-sugar level of 220 mg.% after two and a half hours of administration of 50 g. of oral glucose. He had glycosuria of 6% at the height of the blood-sugar curve. The Wassermann reaction and Kahn test were negative, and the blood count was normal. The field of vision of both eyes was normal. The vision of the right eye was 6/60 and the left eye 6/36, and there were old trachomatous follicles in both eyes. The urine was albumin free.

Treatment consisted of a diet of 300 g. carbohydrate, with fats 66 g. and proteins 76 g., insulin 30 units a day, and vitamin B₁ 50 mg. once a day. This kept the patient sugar-free and cured his sixth nerve paralysis within a period of four weeks as well as the pain in his calf muscles. He remained symptom-free for the next four weeks of observation.—I am, etc.,

Lucknow, India.

N. N. GUPTA.

Indian Medicinal Plant in the Treatment of Hypertension

SIR,—Cases of hypertension are fairly common, and the condition is seen in all age groups. Treatment is usually palliative, and consists of both medical and surgical measures. It is not possible to use one particular drug for a prolonged period because of the tachyphylactic nature of most drugs. Synthetic chemical compounds having sympatholytic and adrenolytic properties are used along with sedatives of the central nervous system.

Lately a medicinal plant growing in certain parts of India is gaining considerable importance in the treatment of hypertension. The plant is *Rauwolfia*, and belongs to the natural order *Apocynaceae*. Two varieties are now being extensively investigated for

hypotensive properties—(a) *serpentina* and (b) *canescens*. The writer has worked on both the varieties and has found them to be adrenolytic; *R. canescens* is a more powerful adrenolytic than the *serpentina*. The roots of *serpentina* and leaves of *canescens* are used, and several active alkaloids have been isolated. Besides its adrenolytic property, the plant is markedly sedative and has been found to induce sleep. For its central sedative action the plant is used in some forms of insanity associated with insomnia. *R. serpentina* appears to have more marked hypnotic action than the *canescens*. The hypotensive action of the plant is due to its depressing or paralysing the sympathetic component of the autonomic nervous system, the vasomotor centre of the medulla (as seen from the depression of the carotid sinus reflex), the myocardium, and relaxing the arterioles. Large doses or prolonged administration of preparations of *Rauwolfia* produce nausea, vomiting, bradycardia, and respiratory depression. In animal experiments I have found the usual mode of death to be due to respiratory failure. Another drawback of this drug is that it is without effects when used clinically for a prolonged period.

Preparations of *R. serpentina* sold in the Indian market consist of the alcoholic tinctures or liquid extracts with dosage varying from 10 to 30 minims (0.6 to 1.8 ml.) t.i.d., or tablets prepared from the roots of the plant containing all the active principles.—I am, etc.,

Calcutta.

M. D. CHAKRAVARTI.

New Rh Antibody

SIR,—The Hr factor recently described by Rosenfield *et al.* (*Journal*, May 2, p. 975) fits readily into the scheme of the Rh-Hr types, though it causes further difficulties and paradoxes for workers using the C-D-E notations and sponsoring the cross-over hypothesis. The new antiserum is said to cross-react with agglutinogens rh and Rh₀, determined by the corresponding genes *r* and *R*⁰, so that it simulates the reactions of anti-hr' and anti-hr'' sera, though pooling of the latter sera would give quite different results. Thus we are dealing with an antiserum for a new kind of Hr factor. We propose to call the new antibody anti-hr and the corresponding factor hr. Since the new antibody merely defines a new cross-reaction between agglutinogen rh and Rh₀ not shared by any of the other agglutinogens, and does not differentiate any new varieties of agglutinogens, no change in the names of the agglutinogens or genes is called for. If anti-hr serum becomes available for use as a diagnostic reagent, it would largely take the place of anti-hr' and anti-hr'' combined, though pooling the latter two sera would largely nullify one another's reactions.

For those using the C-D-E notations the situation becomes quite complex. Race proposes calling the new factor f, the absence of which he indicates by the symbol F. This is the reverse of the procedure generally followed, and here the C-D-E workers again become inconsistent, since they sometimes use small letters to indicate the absence of a factor designated by them with a large letter—for example, little *c*, *d*, and *e* to indicate the absence of large C, D, and E. Race states that the "simplest" genetic explanation entails postulating a new pair of genes *F* and *f*, so the rhesus "chromosomes" formerly supposed to contain triply linked genes now are postulated to contain quadruply linked genes. The supposed "advantage" of the C-D-E notations that they include all the Rh blood factors found in a blood now becomes more obviously a disadvantage, since type rh blood must now be called type cdef/cdef, or ccddeff_r (— — — + + +), etc., depending on the whim of the C-D-E worker of the moment. As many as 20 different methods of designating the Rh-Hr types in terms of C-D-E are in use. Race and Sanger's book uses five different symbols for the same Rh-Hr types, while the most recent issue of *Annals of Eugenics* gives three different C-D-E notations in three articles, though two of these are by the same author. As a result the C-D-E nomenclature not only says too much (by including little *d*, for which there is no test) or too little (by using symbol CwDe instead of CCwDe in the case of Rhw blood), but in addition the C-D-E nomenclature must be subjected to a complete revision each time a new blood factor is found, so that it becomes more and more cumbersome as more facts become available. The basic cause of the state of confusion prevailing among C-D-E workers is their failure to distinguish between blood factors and agglutinogens (Wiener and Wexler). Since the number of blood factors characterizing an agglutinogen depends mainly on one's industriousness

in preparing and studying antisera (Stormont *et al.*)² such workers will find it necessary to stretch the Rh-Hr "chromosomes" to accommodate more and more linked "genes," in addition to postulating more and more "deletions" and "duplications."

The cross-over hypothesis when applied to the new factor hr (or f) gives rise to still another paradox. According to Race *et al.*³ "chromosome" Dce (R⁰) (D, C, E is the arrangement postulated by Fisher and Race for the supposed "genes" D, C, E in the chromosome) arose in caucasoids by crossing-over of genotypes DCE/dce, DCE/dce, and DCE/dCE. However, in the last-named case (now DCEf/dCEf) this would result in the production of "chromosome" DceF instead of Dcef. It can readily be shown that crossing over in the other cases also yields "chromosomes" in addition to those listed in the article by Rosenfield *et al.* For a more complete presentation of the evidence against the cross-over hypothesis the reader should consult the recent articles by Wiener,⁴ Simmons *et al.*,⁵ and Rife.⁶ One of the main objections to the C-D-E notations is that no two workers use the symbols in the same way, and, in fact, the same worker may use several variations of the nomenclature in the same book or article. The first step to clearing up this confusion would be for the C-D-E workers to get together and agree on a single, uniform nomenclature. Editors of journals, at the same time, should insist that if the C-D-E notations are to be used at all in articles they conform to a uniform recognized standard.

An important question is whether the various Rh-Hr blood factors represent different chemical substances or structures within the same molecule. That they probably do not represent different chemicals is indicated by the interference between the reactions of the blood factors of the same agglutininogen. For example anti-rh' sera generally have a higher titre for type rh' blood than for type Rh₁ blood, and, similarly, anti-rh'' sera have a higher titre for rh'' than for Rh₂. Nevertheless, Rh₀ seems to be a structure separate from rh' and rh''. For example, shortly after the Rh₀ blocking antibody was discovered (Wiener⁷) we found that it was possible to block the Rh₀ reaction of type Rh₁ and type Rh₂ bloods without preventing their reactions with anti-rh' and anti-rh'' sera respectively (Wiener *et al.*⁸). At the same time these observations show that the Rh-Hr agglutininogen must be a relatively large molecule. Moreover, the Rh₀ blocking antibody must be a relatively small molecule as shown also by its ability to pass through the intact placental barrier (Wiener and Berlin⁹). On the other hand, the properties of the Rh-Hr agglutininogen molecule represented by the blood factors hr' and hr'' (and their reciprocals rh' and rh'') must either be in close proximity or overlap, as shown by the reactions of the new anti-hr (or anti-f) serum.—I am, etc.,

New York.

A. S. WIENER.

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Anticoagulants in Myocardial Infarction

SIR,—I should like to support Dr. R. A. Murray Scott's plea for more energetic treatment of shock in this condition by the general practitioner (*Journal*, May 30, p. 1223). The severely shocked patient may not survive the journey to hospital, and a great opportunity to save the life of such a case lies in the hands of his own doctor.

I give nikethamide by intravenous or intracardiac injection, as an emergency measure, in moribund cases, and I believe it is often possible to keep these patients alive by combining this measure with the immediate institution of anticoagulant therapy by means of intravenous heparin. By continuing both therapies the critical first 48 hours can usually be tidied over. Pressor amines offer another hopeful line of treatment in combating shock, and the use of "mephentermine" (N-methylphenyl tertiary butylamine) has been reported¹ to reduce considerably the mortality in this type of case. On the other hand, noradrenaline has not proved so successful.² In this country injection of methylamphetamine hydrochloride ("methedrine") is freely available,

and as Bromage³ has shown this compound to be a powerful vasopressor drug its use might be considered in myocardial infarction. I have not yet had an opportunity to employ it, but am carrying a supply of ampoules in my bag for the next occasion which arises.

Dr. Murray Scott has suggested⁴ that a reduction of prothrombin level to 60–75% may be sufficient in the treatment of coronary thrombosis and convenient for domiciliary management in general practice. I would dispute this contention, as I have observed on more than one occasion a striking return of pain when the prothrombin level has been allowed to rise to 50%. The work of Payling Wright and Kubik⁵ has shown that recanalization of experimentally thrombosed arteries occurs rapidly under the influence of adequate anticoagulant treatment, although Payling Wright has pointed out⁶ that these experiments were conducted on normal arteries and the results may not be comparable when applied to atherosclerotic coronary vessels.

By using phenylindanedione ("dindevan") it is easy to obtain a consistent prothrombin reduction within the accepted therapeutic range without the necessity for unduly frequent prothrombin estimations, although I prefer to have the latter performed on alternate days when employing this anticoagulant.—I am, etc.,

Twickenham.

DAVID WHEATLEY.

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Importance of Post-mortem Examinations

SIR,—I wish to support Dr. F. E. Loewy (*Journal*, May 23, p. 1163) in his efforts to make post-mortem examination the rule on patients who die at home. I think it would be wrong, however, for this work to be loaded on to the hospital pathologist. Its value would be much greater if the general practitioner carried out the examination, and this would become a practical proposition if adequate mortuary accommodation and an assistant to open skull, etc., were available, plus a moderate fee.—I am, etc.,

Risca, Mon.

M. T. WADE.

Marooned Children

SIR,—I was surprised that neither Dr. Douglas Guthrie's article on King James IV of Scotland (*Journal*, May 30, p. 1191) nor your leading article (p. 1207) made mention of a much earlier attempt to discover what language children, isolated from the speaking world, would speak. Herodotus in his *History* describes a similar royal experiment, differing only in detail from King James's, performed by King Psammetichus of Egypt.

The children, who had been suckled by goats, spoke one word only, "becos," which was identified as the Phrygian word for bread. Thus the King concluded that the Phrygians were the most ancient people in the world. Is it possible that King James was acquainted with this story? —I am, etc.,

Windsor.

JAMES WHITBY.

Claims for Negligence

SIR,—I have read with interest the article by your medico-legal correspondent (*Journal*, April 25, p. 945), with which I am mainly in agreement. In particular I have noticed an increase of claims in this region as a result of the Legal Aid and Advice Act, 1949.

There is one point, however, which is causing hospital authorities and, I believe, their medical staffs much concern, where, if there has been no recent change in the law, there has certainly been a change in its application, and that is the tendency of the courts to extend the doctrine of *res ipsa loquitur* to claims where negligence is alleged during the treatment of patients in hospital. The effect of the doctrine, as your readers are no doubt aware, is to shift the onus of proof from the plaintiff to the defendants.

The case which has caused the trouble is *Cassidy v. Ministry of Health* (Fahrni—third party), a Court of Appeal decision in

1951. The plaintiff alleged negligence in connexion with his after-treatment in hospital following an operation on his left hand. The Court of Appeal held that the defendants were liable on the ground that the facts raised a prima facie case against them under the doctrine of *res ipsa loquitur* and that they had not explained how the plaintiff's condition could have arisen without negligence. That decision appears to conflict to some extent with the decision of the Court of Appeal in *Mahon v. Osborne* in 1939. In that case the alleged negligence related to the leaving of swabs in the abdomen of a patient following an operation. It was there held that the doctrine of *res ipsa loquitur* did not apply in the case of a complicated surgical operation, since an ordinary man, knowing the facts, could not without the help of expert evidence of the precautions necessary in such an operation say that the event which had happened must have been due to a failure on the part of the surgeon to exercise due care.

It is the view of a number of members of the legal profession with whom I have discussed the matter that the decision of the Court of Appeal in the Cassidy case—at any rate so far as it was based on the doctrine of *res ipsa loquitur*—might well have been reversed had there been an appeal to the House of Lords. In view of the repercussions since that case, it is hoped that a decision of the House of Lords will be obtained on the point as soon as a suitable opportunity arises.—I am, etc.,

Liverpool.

NIGEL RYLAND.

** Our Medico-Legal Correspondent discusses the doctrine of *res ipsa loquitur* at p. 1398.—Ed., B.M.J.

Treatment of Apoplexy

SIR,—I read with great interest the Refresher Course article on apoplexy by Professor F. J. Nattrass (*Journal*, May 23, p. 1158), but was surprised to find that he did not mention stellate ganglion injections in the treatment of vascular accidents, particularly embolism and thrombosis. It would be most helpful to learn his reasons for not discussing this vital mode of treatment, of which Professor René Leriche gave an excellent account (*Journal*, February 2, 1952, p. 231). Leriche and other workers demonstrated the effects of stellate ganglion block within an hour of the stroke, the improvement and recovery being most dramatic in many cases.—I am, etc.,

Glasgow.

RICHARD WOLFSON.

SIR,—In reply to Dr. Richard Wolfson, I refrained from reference to stellate ganglion block because I do not think this procedure is sufficiently established, or consistent in its results, to recommend as a routine, especially in general practice. It is being tried out by skilled operators in certain centres, and this is the right thing to do at present.—I am, etc.,

Newcastle-upon-Tyne.

F. J. NATTRASS.

The Catheter and Prostatic Obstructions

SIR,—In spite of the cogent arguments put forward by Mr. Wilson Hey and by Professor Charles Wells (*Journal*, January 10, pp. 99 and 100), the aseptic prostatectomy must be in reality very much of a *rara avis*, and the immediate operation irrespective of the patient's general condition certainly does not recommend itself in our surgical practice here, where the older male inhabitants are clinically undernourished, many with advanced arteriosclerosis, and all of them thoroughly terrified by their precipitous entry into hospital. Therefore if we start with the premise that preliminary diagnosis is necessary and desirable, the argument concerning the catheter and prostatic obstruction resolves itself into the route by which the catheter should be introduced. For those who favour retropubic prostatectomy any suprapubic puncture of the bladder offends against the principle of not interfering with the bladder at all. With any such method there is a danger of extravasation and consequent contamination of the retropubic space.

The penile catheter has the following disadvantages: infection may be introduced directly by the catheter; urethritis may be caused as a result of trauma; the inflam-

matory (and the normal) secretions are dammed back by the pressure of the catheter, especially a large one; subsequent troublesome stricture may form at the fossa navicularis; methods of retaining the catheter are clumsy and unhygienic, so that meatal ulceration may occur and the catheter is easily displaced; the drainage is not entirely dependent owing to the prepubic curve of the penile urethra.

The last point mentioned, that of dependent drainage, is probably the most important single factor in obviating infection, and with that object in view urethrostomy drainage fulfils all the criteria. I am surprised that no mention of this method has been made in your recent correspondence on this subject, for it eliminates so many of the disadvantages of an indwelling catheter while retaining the advantages. It does not seem to have been popular amongst British surgeons, being possibly associated in their minds with perineal urethrotomy, which is fraught with hazards, but Mr. John Sandrey¹ has published a clear and convincing account of the method in more than 300 cases. The technique is rapid and simple. He stresses the importance of making the opening in exactly the right place, 1 in. (2.5 cm.) in front of the perineo-scrotal angle. As he points out, two-thirds of the urethra is eliminated as a source of infection, the proximal third through which the catheter passes being much less liable to infection. The drainage is almost vertical and the catheter is retained satisfactorily with a stitch. A large-size catheter can be used without misgiving, and there is much less tendency for old gentlemen to pull them out. Stricture formation does not occur with a partial opening into the urethra at this site. One disadvantage is the difficulty in replacing the catheter if it comes out, but in fact this accident is very rare.

Perhaps the perineal region (it is not the true perineum through which the incision is made) is not the cleanest of skin areas, but contamination from the anus, if the incision is placed correctly, is easily avoidable. I have used, though this is not strictly necessary, a piece of aureomycin gauze-dressing round the base of the tube, and conditions conform quite reasonably to those labelled aseptic by Mr. Wilson Hey. Certainly at no time does the aseptic prostatectomist's finger or that of his assistant find itself in the rectum.—I am, etc.,

Jamaica, B.W.I.

R. P. M. MILES.

REFERENCE

¹ *Postgrad. med. J.*, 1949, 25, 71.

Mental Hospital Service

SIR,—I appreciate the gesture of Drs. R. A. Sandison and A. M. Spencer (*Journal*, May 16, p. 1111) in acknowledging that the comments in their earlier letter (*Journal*, March 7, p. 560) were open to misinterpretation, and in turn I regret that I judged too hastily their attitude to the needs of the chronic patient. But now they indicate that, whilst they are very conscious of the occupational needs of chronic patients, they are unwillingly driven to advocate a policy of concentrating medical attention on acute patients because "with the available medical staffs in most mental hospitals to-day it is impossible for both acute and chronic patients to receive adequate treatment." They go on to suggest that the working qualities of chronic patients have deteriorated in recent years. I question the truth of that statement, for one could equally well attribute the decline in the occupations of chronic patients to a decline in occupational facilities. But, even supposing that it is true, we must admit that this state of affairs has occurred even in some hospitals despite a considerable increase in the medical staff. So I think it is unwise to attribute the problem to inadequate medical staffing, and to prescribe a palliative on that assumption.

I believe that any analysis of the factors leading to the decline in the occupation of chronic patients would be so lengthy as to be out of place in this correspondence, but I will quote some statistical evidence to counter the suggestion that by concentrating medical attention on acute cases in general one thereby makes any substantial reduction in the hard core of chronicity. Having followed up the fate of each individual one of the 5,897 admis-

sions to my own hospital in the period from January 1, 1945, to December 31, 1951, I can state the following relevant facts.

An average of 24.7% of the admissions in each calendar year remained in hospital one year after the date of their admission, and this figure did not vary by more than 3% from the average and in any year. Of 2,048 admissions over the years 1945, 1946, and 1947, 13% were still in hospital five years after the date of their admission. So it appears that at least half of those patients who remain in hospital one year after admission represent the hard core of chronicity, and therefore the number of those requiring more than one year's residence serves to indicate the trend towards chronicity. In the period reviewed there was a progressive intensification in the treatment of new cases through increased medical staff, improved methods of special treatment, and particularly by a vast increase in occupational therapy. Yet all these therapeutic efforts, albeit most worthy and well justified on prima facie grounds, but not the slightest noticeable tendency to reduce the actual number or percentage of admissions who proved to be more than one year in hospital. Thus, however well established it is that modern methods of treatment will cure a certain limited number of patients who otherwise would become chronic, my figures suggest that their number is insignificant in relation to the fate of new cases in general.

But before we draw any conclusions from such evidence we must have regard for the fact that at least one-third of mental-hospital admissions are readmissions. A very high readmission rate in a hospital that is severely overcrowded might indicate, *inter alia*, that new cases were being inadequately treated, and it has been suggested by Drs. Sandison and Spencer that inadequate treatment will augment chronicity. Apropos of that I have noted that in 1951, when my colleagues were particularly hard pressed to discharge patients because of overcrowding, 45% of admissions were readmissions. Taking the year 1949 for comparison, I find that readmissions then constituted 33.9% of admissions. But the percentage of admissions of those two years needing more than one year in hospital were 21.7 (1951) and 20.4 (1949) respectively; or an increase of only 1.3% in potential chronics, despite an increase of 11.1% in readmissions, and the actual numbers of potential chronics for the two years were 206 and 201 respectively. If one is to draw any inference from this it is that the number of admissions destined to become chronic, despite all therapeutic effort, is so great as utterly to obscure any effect which our therapeutic attention to new cases may have in reducing chronicity.

In conclusion I suggest, however, that the chronic patient is not likely to suffer detriment by being deprived of specialized treatments at the hands of doctors, but he sorely needs occupational treatment, which is a form of treatment mainly administered by persons other than doctors. But unless the doctor proclaims himself to be at least as interested in the occupational direction of the chronic patient as he is in his more personal and specialized treatment of the acute case, it is certain that interest and effort will deteriorate amongst those ancillaries to whom he allocates the occupational treatment of his patients.—I am, etc.,

Shenley, near St. Albans.

OTH O FITZGERALD.

Half-way Homes for the Elderly

SIR,—Your correspondent Dr. J. M. Greenwood (*Journal*, June 6, p. 1280) appears to be in doubt as to the function of the so-called "half-way homes" provided by King Edward's Hospital Fund for London, though this has been stated in more than one of its annual reports. For the benefit of those who are interested, may I say that these homes conform closely to the pattern suggested in the last paragraph of Dr. Greenwood's letter, though they could scarcely be described as convalescent homes in the usual meaning of this term. Each home is linked to an active geriatric unit, and the medical officer in charge of this unit is in medical charge of the patients in the home. Only those who have been patients in the unit are admitted, and those who have been maintained, so that, if the patient unfortunately fails to benefit by a stay in the home, he or she is taken back to the geriatric unit. Clearly these homes do release hospital beds, and the cost of maintenance, which is provided by the regional hospital board concerned, is considerably less than in hospital.

The general council of the Fund allotted £250,000, subsequently increased to £350,000, for the purchase, adaptation,

and equipment of 12 homes, three in each of the four Metropolitan regions. Seven of them are now in full working order and others are in active preparation. The Fund has also contributed substantially to three other homes of a similar type.—I am, etc.,

ARCHIBALD GRAY,
Chairman of the Distribution Committee,
King Edward's Hospital Fund for London.

London, W.1.

The Royal Touch

SIR,—Those of your readers who were privileged to see Queen Salote Tupou of Tonga passing in the Coronation procession may perhaps be interested to know that, like French and English kings and queens, her predecessors were credited with power to cure the King's Evil by their touch. Frazer, in *The Golden Bough*,¹ records that "the savage chiefs of Tonga were believed to heal scrofula . . . by the touch of their feet; and the cure was strictly homoeopathic, for the disease as well as the cure was thought to be caused by contact with the royal person or with anything that belonged to it."—I am, etc.,

London, W.11.

HUGH FORSYTH.

REFERENCE

¹ *The Golden Bough*, 1911, 3rd ed., p. 371, Macmillan, London.

POINTS FROM LETTERS

General Peritonitis and Appendicectomy

Dr. R. E. LODER (Peterborough) writes: Children with appendicitis and generalized peritonitis, desperately ill though they may be, take a short, carefully given general anaesthetic very well. All experienced anaesthetists, however, must have seen how rapidly their condition deteriorates if there is any gross pulling on inflamed bowel and mesenteries. One notices that the more experienced a surgeon is the more often he is able to remove an appendix without great trauma and also the quicker he makes up his mind in doubtful cases to leave it in and just to drain.

Premenstrual Syndrome

Dr. W. S. INMAN (Portsmouth) writes: To the already mentioned irritability of mind and body in the premenstrual syndrome may be added a tendency to inflammation and even suppuration of the eyelids. During the last 28 years I have investigated in several thousands of sufferers the emotional factor in the causation of styes and tarsal cysts—the custom, extending throughout Europe, of cure by rubbing them with a wedding ring, a symbolic wedding, was a challenge not to be ignored—and I have formed the impression that in women these lesions were much more likely to occur just before the period than at any other time. After all, if menstruation means a missed pregnancy and the primary function of woman is to ensure continuance of the race, then anxiety, conscious or unconscious, about the fulfilment of her destiny is understandable, since man has been in emotional conflict about biological aims throughout history. . . . My experience with acute appendicitis is slight, but for many years I have noticed that virtually all the attacks in women have occurred during the premenstrual phase. My inability to interest my surgical colleagues in this curious association may arise from dissimilar experiences.

Cancer Research

Dr. J. B. HOBBS (London, W.C.1) writes: I was most interested in the article by Professor Ian Aird and Mr. H. H. Bentall (*Journal*, April 11, p. 799). It seems that a whole new vista in cancer research has been opened up. Having recently completed a junior appointment in a pathology department and spent many hours cross-matching blood, I have often pondered the following thoughts. It seems incredible that we can transfer many billions of living cells from person to person without transferring also either a carcinogenic agent or a predisposing factor, or perhaps sometimes even tumour emboli. Has any investigation ever been performed to determine the percentage with carcinoma in any site who have previously received transfusions of blood, and whether there is any correlation between the causes of death in a blood donor who died of cancer and patients who have previously received his blood? As an afterthought, and knowing that cancer susceptibility can be transferred via maternal milk in some animals, it would be interesting to know if malignant disease is common in dairy cattle, or would pasteurization in any case render the milk 100% safe?

Obituary

H. M. O. LESTER, O.B.E., Ph.D., M.R.C.S., D.T.M.&H.

Dr. H. M. O. Lester, whose sudden death at Penang on May 28 came as a great shock to his many friends, had a long and distinguished career in the Colonial Medical Service.

The son of the Reverend Henry Lester, Hugh Morley Oliff Lester was born at Walton, Cheshire, in 1902. He received his education at the City of London School and St. Thomas's Hospital, to which he went in 1920 with the City of London scholarship. He won numerous distinctions and scholarships, including the University of London Research Studentship for Physiology for 1923-4, and was demonstrator in physiology at his hospital. He graduated B.Sc. with first-class honours in physiology in 1922, and took the M.R.C.S., L.R.C.P. in 1925. In 1935 he obtained the Ph.D. degree.

After taking the London D.T.M.&H. Lester was appointed medical officer in Nigeria in 1926 and was immediately posted to the Tsetse Investigation Service, where his knowledge of physiology and biochemistry proved a valuable asset. He was early promoted to take charge of this service, and was made Deputy Director in 1930, a designation later changed to Deputy Director, Sleeping Sickness Service. Under Lester's guidance this service accomplished much. By 1942 420,000 cases of sleeping sickness had been treated, and the incidence of the disease had decreased from 20% in 1935 to 2% in 1942. During this time almost all epidemic and endemic areas in the country had been surveyed. Lester's work in Nigeria will be especially remembered for the creation of the Anchau Corridor. A large area in Northern Nigeria was rendered tsetse-free, and into this area a large population was moved and enabled to live in healthy conditions; and, with the co-operation of various Departments of Government, an entirely different standard of economic and social life was made possible. The Corridor has been visited by experts from various parts of the world and will remain as a monument to Lester's work. The O.B.E. was conferred on him in 1938. Realizing that the major attack on sleeping sickness had been successful, Lester felt that he should move into general medical administration, and he became A.D.M.S., Nigeria, in 1944. When the directorship in Palestine became vacant in 1946 Lester was the obvious choice for the post, and from then until 1948, during those difficult and bitter years, he built up and maintained the high morale of the medical service in Palestine at great nervous cost to himself. When the administration in Palestine passed out of the hands of the Colonial Office he was appointed Director of the East African Tsetse and Trypanosomiasis Research and Reclamation Organization. This was a post of some difficulty, requiring the services of a man of outstanding personality, as it entailed the welding together into one effective unit of the three organizations which this new organization replaced. That he accomplished this is everywhere acknowledged.

In 1951 it was essential to obtain as Director of Medical Services in Malaya a man of strong character and administrative experience to take over under the abnormal circumstances then prevailing. The choice fell on Lester, and he became Director in 1951. He himself would have preferred to remain in his post in East Africa, but characteristically accepted the challenge of

the more difficult position. In the short period left to him he accomplished much.

Hugh Lester had many of the attributes that go to make a great Director. He was a fine scientist, and in the field of trypanosomiasis contributed much to the literature, but his forte was as an organizer and administrator. He possessed a clear and analytical mind, and could very quickly see the essentials of any major problem, while at the same time he had a unique knowledge of the details necessary for the carrying out of a project. He was in many ways an exacting master, demanding of those serving with him the very highest standard, but he only asked for what he himself gave in full measure. Those who knew him best realized that underneath a somewhat stern exterior they were dealing with a man basically shy and retiring. He set himself the highest possible ideals, and wore himself out in an endeavour to attain and maintain these ideals. It was obvious that he was taking too much out of himself, but he could never agree to rest until his aim had been fully reached. He died in harness, working to the end to achieve a settlement of the urgent problems created by the emergency in Malaya.

Dr. Lester leaves a wife and two sons. No man ever had a better helpmate, and our sympathies go to his wife and family in their great grief.

J. L. M. writes: The news of the death, in Malaya, of Hugh Lester will be a shock to many who knew him in Nigeria, where he spent his first 17 years in the Colonial Medical Service. For all except the last few months of this time he was with the Tsetse Investigation and Sleeping Sickness Service. His great gifts were administrative, and by administration he meant getting something done. He usually knew exactly what he wanted to do and had, at least in Nigeria, an invaluable knowledge of the ways and thoughts of other officers, and of how they could most readily be persuaded to accept his plans. Lester did many things well: he became a notable hunter and a successful owner of racing ponies, and kept a lovely garden, a handsome house, and a delightful table. Among the many who knew him in Nigeria and whose sympathy will go to his widow and two young sons, there will be a handful of old headmen, hunters, messengers, and others who mourned Johnson's death so recently and now, again, will say a reverent "Allah ya jikansa" for Lester.

GEORGE SCOTT WILLIAMSON, M.C., M.D.

Dr. G. Scott Williamson, founder and medical director of the Pioneer Health Centre, Peckham, died suddenly at Tunbridge Wells on June 4 at the age of 69.

Born in Fife in 1883, George Scott Williamson was educated at Barnard Castle and Edinburgh University, where he qualified L.R.C.P., L.R.C.S. in 1907, graduating M.B., Ch.B. seven years later. After qualification he held appointments as pathologist at the Nordrachon-Dee Sanatorium and at Wakefield Mental Hospital. During this period he published papers on the cerebrospinal fluid in mental disorders. Then followed two years as assistant director of the Clinical Research Association, after which he was appointed lecturer in pathology at Bristol University and pathologist to the Bristol General Hospital. During the 1914-18 war he served for three years in France, where he commanded a field ambulance. He held the rank of lieutenant-colonel and gained the M.C.

After the war Scott Williamson came to London. He became director of pathological studies at the Royal Free Hospital, where his association with the late Sir James Berry gave him an unrivalled opportunity to study the thyroid gland. This led directly to his work on the

anatomy of the thyroid, which was embodied in his Arris and Gale lectures to the Royal College of Surgeons in 1926 and for which he received his M.D. with Gold Medal from Edinburgh University. After Sir James Berry retired Scott Williamson was elected McKenzie McKinnon Research Fellow and continued his thyroid studies in the laboratories of the Royal College of Surgeons under the direction of Sir Arthur Keith. He was also attached to the Medical and Surgical Unit at St. Bartholomew's Hospital, where the surgical work of Professor George Gask, Sir Thomas Dunhill, and Mr. Geoffrey Keynes gave him further facilities for his investigations.

It was at this time, in 1926, that Scott Williamson began to turn from pathology to the experiments in social medicine which were to lead 10 years later to the establishment of the Pioneer Health Centre. He began with a small club for working-class families in a house in Peckham. He quickly decided that for the understanding of health, in contrast to disease, the family was the proper unit for study. His aim therefore was to devise a method for attracting healthy families into a field of continuous observation. He regarded his family club as his laboratory. Soon Scott Williamson wished to extend his experiment, and such was his personality and enthusiasm that he was able to find the support and funds necessary for a much larger and more ambitious venture. In 1935 the Pioneer Health Centre was opened at Peckham, with himself and Dr. Innes Pearce, whom he later married, as its directors. At its peak the Centre catered for 875 families. The rules were simple: only local families could join; they were required to pay weekly subscriptions; and they had to submit to periodical medical examination. The building was so designed that the leisure activities of each member of a family, whatever his age, could be catered for: there were, for example, swimming-baths, a cafeteria, and a gymnasium, as well as rooms for social purposes and medical examination.

In *Biologists in Search of Material*, published in 1938, Scott Williamson records his views on the Centre and its method of working. After 4½ years the work was brought to an abrupt end by the outbreak of war. What had been achieved up to that date is recorded in *The Peckham Experiment* (1943), a book written by Scott Williamson's colleagues but inspired by him. After the war little remained intact but the human material of 550 of the 875 pre-war families. But a start was made, and the Centre reopened in 1947. Unfortunately the costs of running it far outran the income from the family subscriptions, and voluntary donations proved insufficient to bridge the gap. In 1950 it became necessary to close the Centre for lack of funds. Even then Scott Williamson did not give up. He tried to interest various official bodies, notably the London County Council, in the continuation of the work, but the conditions on which support might have been forthcoming were unacceptable to him. And it is fair to say that, though the social implications of the work at Peckham were widely acclaimed, there were doubts about some of the medical claims made for it. Finally, after protracted negotiations the L.C.C. bought the buildings and land with the intention of using them for a new medico-social research unit (*Journal*, February 9, 1952, p. 317).

To many observers the Peckham Health Centre was primarily a magnificent club where suburban families, normally living in uncomfortable isolation from each other, could come together in surroundings that pro-

vided ideal opportunities for physical and mental recreation. This social experiment was conducted in an enlightened and inspiring fashion, and its extension to other urban areas would give the citizen of our vast conurbations a "sense of belonging." But the evidence that the experiment advanced knowledge of the factors that make for health is tenuous; very little that is concrete seems to have emerged from the research that was being conducted. Scott Williamson certainly increased the sum of human happiness in Peckham, and this was no mean achievement.

We are indebted to one of Dr. Scott Williamson's colleagues for the following: Although Scott Williamson welcomed visitors, it must be remembered that the Centre had been devised by him for the purpose of making certain observations, not as a model for general application. This was in keeping with his genius; he was above all an observer, gifted with a rare understanding of what he saw, and content to leave the application to others. Some critics accepted the Centre as a valuable instrument, seeing clearly its possible use in their own fields of study—medical or social. They were often perplexed and disturbed that he refused to pursue such obvious studies, but adhered steadfastly to his own. The last four years led him to the conviction that health can be assessed neither by measurement of quantity nor by statistical method: it is a question of quality, of biological specificity. In fact, "living" cannot be covered by the methods of the physical sciences. Perhaps we might say that Scott Williamson opened a new door and looked into the future from its threshold.

Dr. H. Revilliod writes from Geneva: With a deep sorrow I have received the news of the sudden death of Dr. G. Scott Williamson. As I had the great privilege of seeing him and visiting the Peckham Centre several times in 1945 and the following years, I want to express my deep appreciation of the various results achieved by these colleagues of mine and their assistants in the field of human biology, together with their remarkable social and educational work. Like many scientists and practitioners interested in social hygiene, I consider the research work done in this Health Centre as a very precious contribution to the knowledge of human life in its various aspects and functions. This thorough study resulted in a new understanding of the problems of health and fitness, formerly neglected in medical teaching and practice. Its methods and conclusions are well presented in the numerous publications of Dr. Scott Williamson and his co-workers. Besides, I was impressed by the happiness and the physical and moral development of the people of all ages who, as members of the large Peckham family, voluntarily contributed to the investigations of the medical staff, and appreciated the resources offered to them in the Centre. May this scientific and humanitarian work, done with a rare competence and devotion by Scott Williamson, be pursued in the future for the good of the human beings he loved so much.

ALEXANDER MacLENNAN, M.B., C.M., L.M.

Mr. Alexander MacLennan died at Kilmun, Argyll, on May 31, aged 81 years. For more than 30 years, until he retired in 1938, he was a well-known surgeon and well-loved teacher of students in Glasgow. His elder brother, William, was at the same time equally distinguished as a physician and clinical teacher.

Alexander MacLennan was educated at Glasgow University, where, in 1894, he began his career by graduating M.B., C.M. with honours and being the most distinguished student of his year. At first he intended to specialize in obstetrics, and held junior appointments in London and at the Rotunda, Dublin, as well as studying abroad at Jena, Berlin, Berne, and Paris. Soon, however, he was appointed to the surgical staff of the Western Infirmary, where his reputation as a teacher

was made. In his early days there were few special branches of surgery, except otolaryngology, and a wide variety of conditions was seen in the out-patient department, including, of course, cases of venereal disease. MacLennan was certainly the first in Scotland to demonstrate the spirochaete of syphilis to students soon after the announcement of its discovery. His teaching was excellent, and his sessions in the out-patient department were always attended by crowds of students. He was very neat-fingered, and was early attracted to the surgical diseases and deformities of children. In 1914, when the new Royal Hospital for Sick Children, Glasgow, was opened, he was appointed surgeon and also the first Barclay Lecturer in Diseases of Childhood and of Orthopaedics in the University of Glasgow. In 1922 he was vice-president of the Section of Diseases of Children at the B.M.A. Annual Meeting which was held in Glasgow in that year.

No doubt when MacLennan retired, in 1938, to his charming house and garden in Argyll he regarded his surgical career as at an end; but this proved to be far from the truth. During the war years his area, reasonably accessible only by sea, was semi-isolated, and his surgical services at Dunoon Cottage Hospital were in great demand. His reward came when, in 1950, he was made the first Freeman of Dunoon in the presence of the whole community for miles around. This gave great pleasure to his friends, but especially to his wife, who was his devoted comrade and companion for so many years and who survives him.—J. W. M.

We are indebted to Mr. WM. A. CAMPBELL for the following appreciation: As one of the late Mr. Alexander MacLennan's oldest colleagues I would like to record my appreciation of him as a surgeon and a man. Alex died peacefully at Kilmun, alert and active till near the end. I fell under his spell over fifty years ago, and it was an inspiration to work under and for him. His clinical observations were keen and accurate, his operative skill unsurpassed. He was in the van of surgical progress. He had great strength of character combined with deep religious beliefs, not worn as a cloak, but woven into his being. His many surviving patients and friends will, I am sure, agree with me that his epitaph should be—"Well done, good and faithful servant."

WILLIAM FORBES, M.B., F.R.C.P.Ed.

J. P. A. H. has sent us the following appreciation of the late Dr. William Forbes: As a lifelong friend I feel that I can add a little to his obituary notice (*Journal*, June 6, p. 1283). Very early in his life Forbes manifested what was to be a great and lasting interest in science. While still at school he gained many prizes in botany, chemistry, and physics, and even in his early teens he was already acquiring books on anatomy, pathology, and medicine. His bent was always towards research, and, probably because of this, he early decided that pathology was his true *métier*. Unfortunately his research career was to be early interrupted by the advent of the war. Thereafter his time was more and more occupied by routine duties to which he gave of his all, leaving little time for original research. I feel certain that pathology has sustained a great loss by his early death.

As a man he was somewhat reserved until one knew him well. He always showed great kindness, and was willing to give much of his time to help those less fortunate than himself. To me he always appeared a very typical example of the Scots medical scientist. He had a keen dry sense of humour.

We record with regret the death of Dr. REGINALD STILWELL at the age of 80 on June 5 at his home at Hillingdon. For over 150 years members of the Stilwell family have cared for psychiatric patients at Moorcroft, Hillingdon. Reginald

John Stilwell was educated at Harrow and the Westminster Hospital, London, where he qualified in 1899. After qualifying he became a house-physician at the Westminster and Bethlem Royal Hospital, where he came under the influence of such men as Sir George Savage (then Dr. Savage), Dr. T. B. Hyslop, and Dr. W. H. B. Stoddart. He finally went to Moorcroft House in 1903, where he remained for the rest of his life. Interested in tennis and cricket, he was a member of the M.C.C. for many years. His other interests included painting and farming, and he was a Justice of the Peace for Middlesex, being a most conscientious attender at the Uxbridge Magistrates' Court. At Moorcroft he carried on the good work of his family and endeared himself to both patients and colleagues, who valued greatly his opinion and advice on difficult cases encountered in psychiatric practice. Stilwell married in 1907 his cousin Gertrude Stilwell, whose father, Dr. Henry Stilwell, was physician in charge of Moorcroft House from 1860 to 1906. The devoted service of Dr. and Mrs. Reginald Stilwell will be remembered by many who visited their charming house. Mrs. Stilwell died in 1947. Our sympathy is extended to Reginald Stilwell's colleagues and friends in the loss of a practitioner of great merit.

His many friends will have heard with deep regret of the death of Dr. ALBERT VICTOR WOOD at the age of 52. He died suddenly on May 25 after a long and painful illness borne with characteristic fortitude. His early life was spent in Skibbereen in Southern Ireland, where his family is well known and much respected. His father was forced to leave the country during the political troubles, but his heart was there, and he returned. Victor had the same love of his native country. He went to school at Cork Grammar School, and after being removed from the Royal Flying Corps, for which he had enlisted whilst under age, he entered Trinity College, Dublin, to study medicine. He qualified there in 1923, and then went directly to Blackpool, where he remained in general practice until the time of his death. He was a real family doctor, with a great capacity for making friends and many interests outside medicine. He was particularly gifted in the art of midwifery. He took a great interest in show-people and shows, especially the circus, and he counted a troupe of lions and a boxing kangaroo amongst his favourite patients. His lasting courage, his whimsical humour, and his zest for life will remain in the minds of those who knew him. Deep sympathy is extended to his wife and his three children.—D. K. L.

Dr. GEORGE W. RIPPON died suddenly at work, in his 51st year, on June 1, at the Royal Infirmary, Sheffield, where he had worked with devotion as a medical student, houseman, honorary anaesthetist, and as consultant in anaesthetics to the United Sheffield Hospitals. He graduated M.B., Ch.B. at Sheffield in 1925, and held appointments as house-surgeon to Sir Ernest Finch and house-physician to Dr. A. G. Yates at the Royal Infirmary; and later as house-surgeon to Mr. W. W. King at the Jessop Hospital, Sheffield. Rippon was in general practice for many years in Sheffield, where he was beloved by his patients for his courtesy and sincerity. His clinical skill and understanding earned for him a high reputation amongst his patients. His interest in anaesthetics began early, and when appointed in 1933 honorary anaesthetist to the Children's Hospital he applied himself increasingly to this specialty. For some years he carried on his general practice, but in 1949 he gave it up, having already been appointed anaesthetist to the Jessop Hospital and the Royal Infirmary, and devoted himself exclusively to anaesthetics. He was a ceaseless worker and an inspiration to all who served with him. To those privileged to be his friends, George Rippon was a charming and witty companion, with wide literary and artistic interests. He was exceptionally happy in his domestic life, and to be entertained in his home was something to be treasured in the memory. At this time of bereavement the heartfelt sympathy of all who knew him will go out to Mrs. Rippon, to her son in Korea, and to her two daughters.—J. W. and W. J. L.

Medical Notes in Parliament

AGENE IN BREAD

In the House of Lords on June 10 Lord TEVIOT drew attention to the high percentage of processed and chemically treated foods now consumed, and asked the Government to do everything possible to increase the availability of fresh food for the people. The report of the Ministry of Health covering the period from April, 1950, to December, 1951, stressed an increase in cases of dysentery and a lack of progress in reducing the stillbirth rate. The figures concerning cancer were deplorable and showed a marked increase. Outbreaks of food-poisoning in 1951 were greater in proportion where canned and processed food were consumed. He mentioned the case of a peeress who was never well and who was eventually discovered to be suffering from agene poisoning. In nearly every hotel one saw an automatic slot machine with stomach powders, aspirin tablets, and purgatives. Properly fed people did not need these drugs. Far too many people were making fortunes out of tampering with natural food and too many making vast sums out of the antidotes for bad food.

Lord HANKEY said the desire for white bread had caused adulteration of food for 200 years. Parliament between 1750 and 1800 had tried to foster the sale of a standard bread containing more bran, cheaper and more wholesome, but people clung to the adulterated white bread. When the use of steel rollers replaced the old grindstones, and robbed flour of essential vitamins and material, the dangers were only discovered some 50 years later. In spite of the improvement inaugurated during the war by Lord Woolton, the country to-day, Lord Hankey feared, was drifting back towards "poverty bread." In 1946 Sir Edward Mellanby published the fact that dogs fed on flour containing agene suffered nervous disorders, canine hysteria, and eventually death (*British Medical Journal*, December 14, 1946, p. 885).

The Governments of the United States and Canada then made the use of this flour a penal offence, but both permitted the use of another "improver"—chlorine dioxide. In 1950 the British Government at last decided to ban agene, but to permit chlorine dioxide. The Government gave warning that it would take a long time to provide the latter substance. To-day, seven years after Professor Mellanby's warning, the discredited agene was still in use and chlorine dioxide was suspect. On March 21, 1953, the *Lancet* had published a paper by Drs. G. C. Sheldon and Allan Yorke which described observations over many months in the case of a woman afflicted with skin disorders associated with loss of appetite and mental depression. Their evidence was that chemically treated flour was the cause. Nitrogen chloride—agene—was the original cause of the trouble, but chlorine dioxide was found to produce the same symptoms. Of eighteen nations in Europe and North America, nine permitted the use of agene and nine banned it. In France it was not used, and there had been nothing to compare with the great increase which had occurred in Britain in coronary thrombosis.

New Zealand Comparison

Lord HORDER said that Lord Hankey had asked about the increase in coronary thrombosis. Lord Horder wished that he knew what it was due to. He remarked that in New Zealand agene had never been used in preparation of bread, yet the incidence of coronary thrombosis was exactly comparable with its incidence in this country. He had not been convinced that agene produced any illness in human beings. If a man lived to be 160 he might by then begin to show some of the signs which dogs showed, because by then he would have had as much agene as Mellanby gave his dogs. He had yet to see a type of human illness analogous to canine hysteria in dogs. Therefore he believed the Government was wise in not being hustled over this question.

Lord BOYD-ORR said there was a remarkable improvement in the health of women and children in this country compared with the years before the war. He had great faith in the Ministry of Health and the Medical Research Council, and he believed they kept all the necessary factors in view. He was not alarmed by some of the things which had been said that day.

Lord DOUGLAS of Barloch said it had been proved that agene combined with some elements in the protein of the wheat and formed a definitely poisonous compound. He would like to see a prohibition against the substitution of artificial substances for natural foodstuffs.

Lord JESSEL said the milling industry wished to follow official recommendations on improvers, and awaited the results of research which was being carried out by the Ministry of Health and the Medical Research Council. The industry was confident that agene was in no way injurious to the health of the people.

Lord CARRINGTON said that the Government agreed with Lord Teviot about the importance of producing more fresh food. It had been decided to abandon the use of agene as soon as a suitable substance could be found, but the evidence did not justify the Government preventing the use of agene without knowing the effects of the substitutes which could be used. The only evidence the Minister of Food had of any ill effects from agene was the one case referred to in the *Lancet* last March. Joint investigations into the various alternatives were being carried out by the Ministries of Food and Health and the Medical Research Council in collaboration with research associations of the milling and baking industry. Difficult problems were involved, and the Government could not expect a quick answer to them. The makers of whiter flour would be required to restore the same amounts of the main nutrients as were present in 80% extraction flour. Iron, vitamin B, and nicotinic acid would be put back.

HEALTH SERVICES IN GAS INDUSTRY

Mr. STEPHEN SWINGLER on June 9 drew attention to the lack of an occupational health service in the gas industry. He said one of the responsibilities of the National Gas Council should be to establish such a service for gas workers. The Gas Council was almost alone among National Boards and National Councils in failing to establish an industrial medical service. The Medical Research Council recently decided to undertake long-term research into the incidence of lung cancer among gas workers. Therefore it was disappointing to find that only four of the twelve area boards which administered the gas industry had established full-time medical staffs.

Dr. BARNET STROSS supported the plea.

Government Reply

Mr. L. W. JOYNSON-HICKS, replying for the Ministry of Fuel and Power, said there was no hope of getting results from this inquiry within two or three years. It was likely to be considerably longer. There were, however, ample numbers of cases available within the four Boards to provide material for inquiry. Mr. Swingler was applying to the gas industry recommendations largely contained in the Dale Report. It was not the job of the Gas Council to set up a medical service for the industry. That was for each area board to do for itself. When the then Government appointed the Dale Committee on industrial health services in 1949 Mr. Attlee had announced that pending its report development in industrial medical services should be held up. In consequence little progress was made in the gas industry. The committee reported, and in 1951 the ban was removed by the then Prime Minister. The Minister of Labour then referred the recommendations of the Committee to a National Joint Advisory Council. Replies had been received from the British Employers' Federation and from each of the nationalized industries, but not from the T.U.C. Consequently, action on the recommenda-

tions could not be taken. The Scottish Gas Board had agreed to a permanent medical service, and the Gas Council had agreed. It was reasonable to expect that the remaining boards would take action.

The Health Service Inquiry

Mr. GEORGE THOMSON on June 9 asked the Secretary of State for Scotland to appoint a secretary from the Scottish Health Department as an additional secretary to the Committee of Inquiry into the National Health Service under the chairmanship of Mr. Guillebaud.

Mr. J. STUART replied that an experienced officer of the Department of Health for Scotland was being appointed to the secretariat of the committee to assist on matters specially affecting Scotland. Answering Mr. HECTOR HUGHES on the same day, Mr. Stuart declared that it was for the committee to decide, having regard to its terms of reference, the nature and scope of its review of the National Health Service in Scotland. The committee had invited memoranda from Scottish bodies and intended to hear oral evidence in Scotland, so that it would become fully aware of Scottish needs and circumstances. In reply to Mr. J. GRIMOND, Mr. Stuart said the committee's terms of reference gave it full scope to carry out all relevant inquiries. He had no doubt that it would have due regard to conditions in the Highlands and Islands of Scotland.

On June 11 Mr. SOMERVILLE HASTINGS asked whether the Minister of Health would take steps to ensure that full consideration was given by the Guillebaud Committee to the saving that would result from the replacement of part-time consultants by whole-time officers. Mr. IAIN MACLEOD replied that it was open to the committee to consider the point, but he did not think it would be appropriate for him specially to ask it to inquire into any particular topics.

Medico-Legal

RES IPSA LOQUITUR

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

When a plaintiff brings an action alleging that he has suffered damage as a result of the defendant's negligence, he has to prove if he can by calling evidence that the defendant has been negligent and that he has suffered damage as a result. If he fails to call such evidence, his action will be dismissed without the defendant being called upon to defend himself. But when the cause of the damage is shown to be under the management of the defendant or his servants, and the accident is such as in the ordinary course of things does not happen if those who have the management use proper care, the very happening of the accident affords reasonable evidence, in the absence of explanation by the defendant, that the accident arose from want of care.

It is this relaxation of the strict onus of proof that is labelled in English law by the maxim *res ipsa loquitur*, of which it was said by Lord Shaw of Dumfermline that no one would have called it a principle if it had not been in Latin.

Fact that Injury Happened

The difficulties in the way of the plaintiff which the maxim is calculated to relieve often occur in actions for negligence brought against hospital authorities and doctors. As a rule all the injured person is in a position to know or to prove is that he was in the care of the hospital and its staff for operation or treatment and that somehow or other, as a result of something which happened to him while he was unconscious, or while he was conscious but which he had not the technical knowledge to understand, he finished up with an injury. If the nature of the injury is such that

a reasonable layman knowing the facts would naturally infer that it could only have been caused by want of care by the hospital staff in the operation or treatment, all the plaintiff will have to prove in order to put the defendants on their defence is the fact that the injury happened, not how it happened. It is then for the defendants, the hospital authority or its staff, to show that the injury was caused by no negligence of theirs.

However, if the reasonable layman knowing the facts would naturally infer that the injury might have been caused by want of care by the hospital staff, but might also have been caused by something else, then the plaintiff must go further. He must call evidence to prove not only that the injury happened, but how it happened, and that it happened in fact as a result of the defendant's negligence. If he does not do so his action will be dismissed without the defendants being called upon to explain how the injury occurred or to prove that it occurred through no fault of theirs.

Two Cases

It is easy enough to formulate the two sides of the line, but in any individual set of circumstances it can be extremely difficult to decide on which side of the line the case falls. A classic example is to be found in the case of *Mahon v. Osborne*.¹ This was an action brought by the mother of a patient who on March 4, 1937, was operated on for a perforated duodenal ulcer. On June 12, 1937, he again became acutely ill, and at a second operation a swab was found that had been left in his abdomen at the first operation. On June 13, 1937, he died because of the swab.

The case was tried by Mr. Justice Atkinson and a jury at Manchester Assizes, and judgment was entered against the surgeon who had performed the operation. In the Court of Appeal Lord Justice Scott said that it was difficult to see how the principle of *res ipsa loquitur* could apply generally to actions of negligence against a surgeon for leaving a swab in a patient. The nature even of abdominal operations varied very widely, and many considerations bore upon this matter and presented a state of things of which the ordinary experience of mankind knew nothing. Accordingly there was no room for the reasonable layman knowing the facts to draw the inference necessary for the application of the rule.

Lord Justice MacKinnon in his judgment clearly indicated that in his view the proof simply of what happened was enough to put the surgeon to his defence and require him to explain how the swab was left in without negligence on his part. Lord Justice Goddard, as he then was, expressly said that in his view the doctrine of *res ipsa loquitur* did apply, and that it was for the surgeon to show that he had exercised reasonable care to prevent the swab from being left in the patient's abdomen.

Lord Goddard is, and Lords Justices Scott and MacKinnon were at that time, among the greatest masters of the Common Law.

A recent example of the application of the maxim was the case of *Cassidy v. Ministry of Health*.² The plaintiff was operated on for Dupuytren's contracture of the third and fourth fingers of the left hand. His hand was splinted for fourteen days under the care of the hospital staff, and on release it was found that not only were the fingers which had been operated on bent and stiff, but the two good fingers had also been affected. In the Court of Appeal Lords Justices Somervell, Singleton, and Denning all held that the mere proof of these facts would cause a reasonable layman to draw the inference that the injury could have been caused only by want of care on the part of the hospital staff, and was sufficient to call for an explanation from the defendants.

In truth, and putting aside Latinity and learning, the doctrine is fundamentally a matter of common sense. As with common sense, there will never be uniformity in its application.

¹ [1939] 2 K.B. 14.

² [1951] 2 K.B. 343.

Universities and Colleges

UNIVERSITY OF OXFORD

Dr. Janet M. Vaughan, Principal of Somerville College, and Dr. A. G. McD. Weddell, Reader in Human Anatomy and Fellow of Oriel College, were elected members of the Hebdomadal Council of the Royal College of Veterinary Surgeons for four years. In Congregation on June 6 the following medical degrees were conferred:

M.D.—*R. J. Dickson, R. D. Eastham, J. W. Fawcett, D. B. B. Whitehouse, G. Wetherley-Mein, R. E. Church, D. K. Ford, H. G. Dowler, J. Foley. *By proxy.

UNIVERSITY OF GLASGOW

On March 2 the degree of M.D. was conferred in absentia by diploma on 'R. S. Duff, and on April 25 the degree of M.D. was conferred on J. Joseph, I. A. Macdonald, and 'A. G. Melrose.

*With high commendation.

UNIVERSITY OF ABERDEEN

At a graduation ceremony on April 2 the following medical degrees were conferred:

M.D.—Joan M. Burrell, R. N. Johnston, S. J. H. Miller. M.B., Ch.B.—J. W. Davidson, 'Marion E. Mackay (with distinction in midwifery), 'C. G. Clark (with distinction in medicine), 'W. D. Wilson, J. B. O. Armstrong, R. A. Browne, C. I. T. Cruickshank, Christopher Donald, Annabelle M. Duguid, Mary E. Duncan, Eleanora J. Elmslie, G. Findlay, J. A. Fowler, C. V. Fraser, J. S. Fraser, R. D. Garson, G. M. Gill, A. J. Gray, Elizabeth N. Grieve, W. S. Hossack, Wilma E. M. Hoyte (née Cameron), A. G. Ironside, G. D. Laing, R. D. Laurensen, A. A. Lawrence, J. Lawrence, W. C. M. Lawrence, A. P. ham, D. Leslie, R. D. Little, I. M. Lowit, R. Lynch, A. P. McBain, A. M. McConachie, I. C. McLean, D. Macleod, J. Main, Helen M. Maitland, W. E. Mickleburgh, Jessie C. Millar, C. G. Mitchell, M. J. Mitchell, P. E. G. Mitchell, Dorothy N. Mortimer, D. A. E. Mowat, J. H. Palmer, J. A. Pattillo, G. T. Pollock (with distinction in surgery), I. F. Ralph, R. D. Robson, Gladys M. Riddell, G. M. McL. Robb, J. D. Robson, Lydia J. Rose, J. M. Ross, A. M. Semmence, A. W. Simpson, A. J. Smith, R. W. G. Stewart, R. W. Strachan, G. H. Swapp, P. G. Todd, A. H. Wade, G. W. Webster, J. H. Williamson, Jane M. Wiseman, J. R. Wood, M. B. Yorston. *With commendation.

UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examinations indicated:

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Part II: K. J. R. Ford, O. J. Slowik. Part I: H. L. English, W. E. Robinson, D. P. A. L. Scott, B. F. Whitehead.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examination indicated:

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—S. M. Akhtar, J. Bheennick, S. Bovornkitti, L. F. Cooper, Z. N. Dhabalia, J. F. Dick, D. W. Emuchay, T. Harinasuta, J. M. C. Henderson, A. S. Ismail, C. H. Lalgee, J. Mami, S. S. Moldi, G. S. Nelson (recommended for the award of the Milne Medal in Tropical Medicine), A. Palwala, J. E. Parry, F. A. Pearson, T. Rajcoomar, C. Runciman (recommended for the award of the Warrington Yorke Medal in Tropical Hygiene), T. Sukhanenya.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

The following candidates have been approved at the examination indicated:

D.P.M.—Part I: R. E. Brandon, N. C. Connell, F. H. Corbitt, W. Johnston, R. E. Lovelace, J. Mukerjee, Elizabeth Schoenberg, D. C. V. Stewart. Part II: Ruth Hoffman, N. B. Jetmalani.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 30 (No. 21) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	21	2	10	1	1	25	3	7	0	
Dysentery ..	505	65	115	11		269	38	69	10	2
Encephalitis, acute ..	3	0	0	0	1	2	0	1	0	
Enteric fever: Typhoid ..	2	0	1	0	1	1	0	0	0	
Paratyphoid ..	8	0	0	1		53	0	6(B)	1	(B)
Food-poisoning ..	147	17		2		127	20		0	
Infective enteritis or diarrhoea under 2 years ..				16	21				5	32
Measles* ..	9,012	269	455	283	301	6,242	330	413	247	478
Meningococcal infection ..	41	5	21	2	1	42	5	21	1	2
Ophthalmia neonatorum ..	41	5	8	0		44	7	8	0	
Pneumonia† ..	446	22	168	9	2	429	22	193	6	
Poliomyelitis, acute: Paralytic ..	30	5	2	2		18	1		2	
Non-paralytic ..	22	2				19	3		1	
Puerperal fever‡ ..	283	48	10	1		254	39	14	0	
Scarlet fever ..	1,084	72	175	33	56	970	70	174	14	50
Tuberculosis: Respiratory ..			157	16				174	34	
Non-respiratory ..			22	1				42	11	
Whooping-cough ..	2,476	228	451	54	124	2,781	165	280	76	106

DEATHS In Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0		0	0	0			0
Dysentery ..	0	0				0	0			
Encephalitis, acute ..		0					0			0
Enteric fever ..	0	0				0	0			
Infective enteritis or diarrhoea under 2 years ..	11		1	4	0	11		5		0
Influenza ..	8	0	2	0	1	6	1	4		0
Measles ..		0	1		0		0			1
Meningococcal infection ..		1	0				0			
Pneumonia ..	178	26	15	8	3	175	30			3
Poliomyelitis, acute ..	3	0			0	1	0			0
Scarlet fever ..		0	0		0		0			0
Tuberculosis: Respiratory ..	81	4	10	0	6	90	10	15		9
Non-respiratory ..		2	1	0	2		2	0		6
Whooping-cough ..	1	0	1	1	0	3	0			1
Deaths 0-1 year ..	211	18	26	11	11	212	25	31		18
Deaths (excluding stillbirths) ..	4,353	644	487	109	154	4,660	688	531		136
LIVE BIRTHS ..	7,380	1088	945	237	464	7,926	1191	881		505
STILLBIRTHS ..	194	35	14			189	26	28		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Infectious Diseases

Infectious diseases were less prevalent in England and Wales during the week ending May 30. Falls in the number of notifications included 1,265 for measles, from 10,277 to 9,012; 627 for whooping-cough, from 3,103 to 2,476; 249 for dysentery, from 754 to 505; and 222 for scarlet fever, from 1,306 to 1,084.

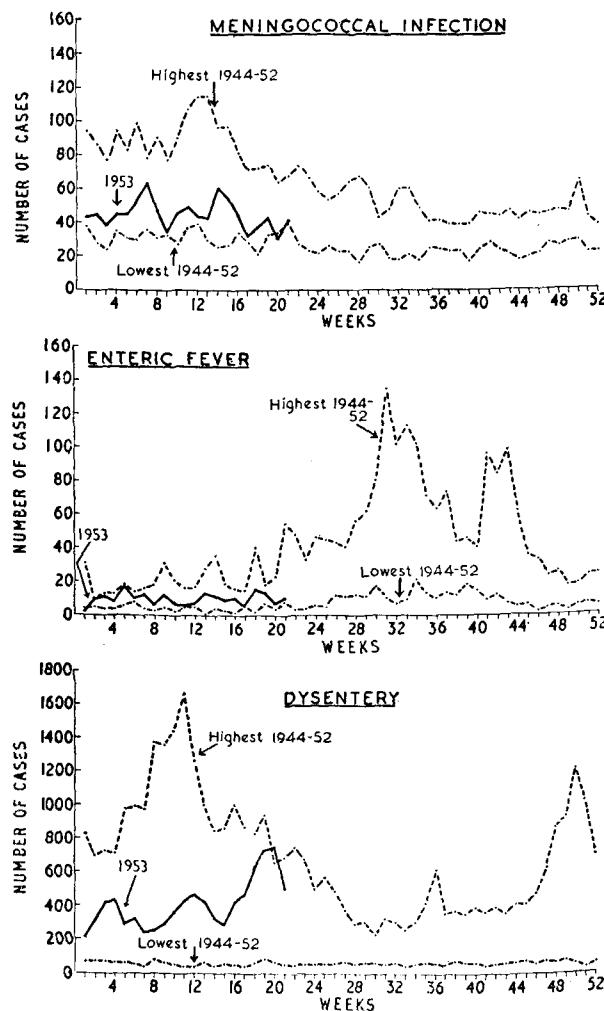
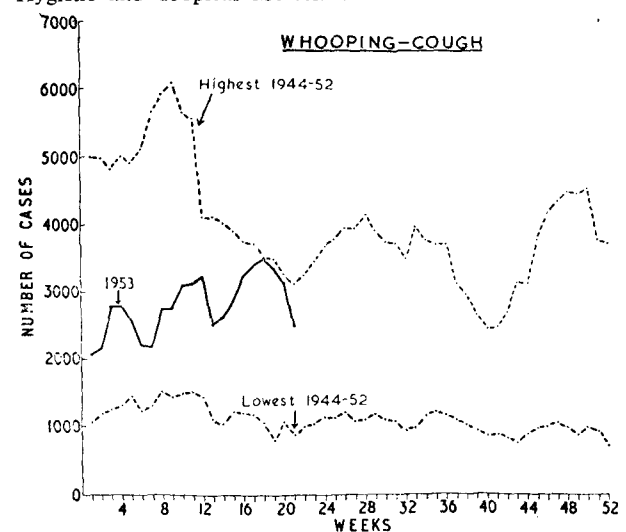
The largest declines in the incidence of measles were 135 in Lancashire, from 1,627 to 1,492, and 106 in Essex, from 311 to 205. The largest exception to the general fall in incidence was an increase of 70 in the number of notifications of measles in Cornwall, from 235 to 305. The largest falls in the number of notifications of whooping-cough were 131 in Yorkshire West Riding, from 283 to 152, 111 in Lancashire, from 388 to 277, and 61 in Warwickshire, from 189 to 128. Small falls in the incidence of scarlet fever were recorded in most areas; the largest fall was 42 in Yorkshire West Riding, from 136 to 94. 21 cases of diphtheria were notified, 2 more than in the preceding week. No changes of any size occurred in the local returns of diphtheria.

The seasonal rise in the incidence of acute poliomyelitis appears to have begun. 52 cases were notified during the week; these were 8 more for paralytic and 15 more for non-paralytic cases than in the preceding week. The increased incidence was confined to the southern section of the country. In the combined area of London, the south-east, south-west, and south midland counties 38 cases were recorded as compared with 14 in the previous week. The largest returns were London 7 (Hampstead 2, Lewisham 2), Kent 7 (Beckenham M.B. 2, Chislehurst and Sidcup U.D. 2), Wiltshire 7 (Pewsey R.D. 4, Warminster and Westbury R.D. 2), and Surrey 6 (Croydon C.B. 2, Richmond M.B. 2).

The largest centres of dysentery were Middlesex 84 (Edmonton M.B. 22, Tottenham M.B. 15, Southgate M.B. 11), London 65 (Chelsea 13, Westminster 10), Lancashire 57 (Liverpool C.B. 22), Bedfordshire 38 (Luton M.B. 20), Yorkshire West Riding 37 (Leeds C.B. 18), Durham 35 (Stanley U.D. 31), Essex 29, and Norfolk 26 (Great Yarmouth C.B. 14).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending June 6

The notifications of infectious diseases in England and Wales during the week included scarlet fever 758, whooping-cough 2,371, diphtheria 10, measles 8,726, acute poliomyelitis 51, dysentery 397, paratyphoid fever 6, and typhoid fever 0.

The Services

The following appointment and mentions in dispatches are included in the Coronation Honours List in recognition of gallant and distinguished services in Korea, during the period July 1, 1952, to February 28, 1953:

M.B.E. (Military Division).—Major (temporary) D. K. Tucker, R.A.M.C.

Mentioned in Dispatches.—Captain P. G. J. Duncan and Lieutenant (now Captain) M. J. Scott, R.A.M.C.

The Coronation Honours List includes the name of Acting Wing Commander K. Bazarnik, M.B., Ch.B., R.A.F., who has been awarded the Air Force Cross.

The following appointments and mentions in dispatches have been announced in recognition of gallant and distinguished services in Malaya during the period July 1 to December 31, 1952:

C.B.E. (Military Division).—Brigadier C. W. Greenway and Colonel W. D. Hughes, late R.A.M.C.

M.B.E. (Military Division).—Major (Temporary) T. M. Robinson, R.A.M.C.

Mentioned in Dispatches.—Lieutenant-Colonels (temporary) W. M. Stewart and R. M. Vanreenan, Major (temporary) B. J. Mahoney, and Captains F. J. Brunton, W. A. Duncan, and L. Yearham, R.A.M.C.

Medical News

Regius Chair of Forensic Medicine.—The Queen has appointed Dr. D. J. A. Kerr to the Regius Chair of Forensic Medicine at Edinburgh University in succession to Sir Sydney Smith, who is retiring. Dr. Kerr was educated at St. Paul's School, London, and Edinburgh University, where he is at present Lecturer in Forensic Medicine. He qualified in 1920. Since 1929 he has been Police Surgeon and Medical Referee to the City of Edinburgh.

Plan to Cut Laundry Costs.—Hospital laundry bills are apt to be heavy, especially if laundries are not working to capacity or if services are duplicated or outside contracts necessary. To remedy such a state of affairs, in 1951 the Scottish Western Regional Hospital Board invited the British Launderers' Research Association to survey the hospital laundry facilities in their Region and to make recommendations. Under the scheme finally approved by the Board 26 hospital laundries have been chosen as potential centres, while 19 others are retained for the use of the parent hospitals only; 53 laundries are to be closed, and work from 46 hospitals now put out to contract will be sent to the central laundries. It is estimated that the development costs for these changes will be in the region of £150,000, but the saving should be between £50,000 and £60,000 a year.

Medical Insurance Agency.—At the annual meeting of the Medical Insurance Agency, held on June 11, with Dr. James Fenton in the chair, another year of success and progress was reported. Both in rebates of premium to clients (over £16,000) and in surplus distributed to medical charities the great records of recent years were well maintained in 1952. It is pleasing to record that the medical charities will benefit to the extent of over £23,000 as a result of the year's operations. The branches are all in a flourishing condition, and have proved to be very successful in enabling medical policy-holders in parts remote from London to have the advantages of personal interview without travelling too far from their practices. Sir John McNee, Mr. R. L. Newell, Dr. Henry Robinson, Sir Arnold Stott, and Dr. E. R. C. Walker were re-elected to the committee for three years. Dame Barrie Lambert and Dr. Charles Hill, at their own request, were not re-elected. Dr. Janet Bottomley was elected for the first time. Dr. Fenton was re-elected chairman and Dr. Robinson as honorary secretary.

Society for Relief of Widows and Orphans of Medical Men.

—The annual general meeting was held on June 10, with the President, Sir Robert A. Young, in the chair. The membership of the Society is now 198, and at the end of 1952 there were 35 widows in receipt of grants. At the present time widows over 65 receive £75 and those under that age £60 a year. In addition a present of £30 was made at Easter and again at Michaelmas. The total amount distributed in 1952 was £4,525. The treasurer, Sir Ernest Rock Carling, reported that during the year income exceeded expenditure by £723 and that a legacy of £18 5s. was received. The address of the Society is 11, Chandos Street, Cavendish Square, London, W.1.

Beit Memorial Fellowships for Medical Research.—In their report for the year 1952-3 the Trustees record the following elections: *Fourth-year Fellowship (£735 per annum)*—Dr. Joan E. Keilin, for work on derivatives of haemoglobin, at the Department of Biochemistry, Cambridge. *Junior Fellowships (£630 per annum)*—Mr. J. R. Cannon, M.Sc., for work on the chemical structure of vitamin B₁₂, at the University Chemical Laboratories, Cambridge; Mr. G. P. Lewis, B.Pharm., for an investigation into the relationship between the structure and action of drugs, at the National Institute for Medical Research, Mill Hill, London; Mr. W. L. Nicholas, B.Sc., for work on the growth requirements of nematodes, with a view to its

possible application to the chemotherapy of nematode infections, at the Department of Zoology, Liverpool; and Dr. Evelyn E. B. Smith, Ph.D., for work on glucuronic acid and related compounds, at the Department of Biochemistry, Glasgow.

Lady Tata Memorial Trust.—The Trustees of the Lady Tata Memorial Fund, on the recommendation of the Scientific Advisory Committee in London, have made the following awards for research on leukaemia and allied diseases during the coming academic year:

Grants for Research and Other Expenses:

Dr. Astrid Fagraeus and Dr. Bo Thorell (Sweden): Karolinska Institute, Stockholm (*renewal*).

Dr. Clarence Merskey (South Africa): Department of Clinical Medicine, University of Capetown (*renewal*).

Professor Charles Oberling (France): Institut de Recherches sur le Cancer Gustave Roussy, Villejuif, Seine (*renewal*).

Dr. Charles Cady Ungley (Great Britain): Royal Victoria Infirmary, Newcastle-upon-Tyne (*renewal*).

Dr. Jo Nordmann (France): Hôpital de la Salpêtrière, Paris (*new award*).

Dr. Jean Baptiste Gabriel Dausset (France): Centre National de Transfusion Sanguine, Paris (*renewal with increase*).

Senior Research Fellowships

Dr. A. R. Gopal-Ayengar (India): Institute for Cancer Research: Royal Cancer Hospital, London (*extension for two months*).

Dr. Jørgen Kieler (Denmark): Fibiger Laboratories, University Institute for Pathological Anatomy, Copenhagen (*new award*).

Scholarships

Dr. Ragna Rask-Nielsen (Denmark): University Institute of Biochemistry, Copenhagen (*renewal*).

Dr. Roger Robineaux (France): Hôpital Saint-Antoine, Paris (*renewal*).

Dr. Flemming Kissmeyer-Nielsen (Denmark): University Institute for General Pathology, Aarhus (*new award*).

Dr. Niels Aksel Stenderup (Denmark): University Institute for General Pathology, Aarhus (*new award*).

In addition, the period of tenure of a special scholarship awarded earlier this year to Dr. Gavino Negroni (Italy), for work at the Imperial Cancer Research Fund Laboratories, Mill Hill, London, N.W.7, will continue until April 30, 1954.

New Areas for Designated Milk.—The Minister of Food has announced his intention of extending the areas in which only "specially designated" milk—that is, "pasteurized," "sterilized," "tuberculin tested," and (until September, 1954) "accredited"—may be sold. The new areas are Manchester, Dewsbury, Huddersfield, Chesterfield, Woking, Watford, and St. Albans. Places where designation is already compulsory are: London and Portsmouth (specified in 1951); Bath, Bristol, Birmingham, Wolverhampton, Bournemouth, Liverpool, Bootle, and Nottingham (specified in 1952); Brighton, Sheffield, Southampton, and Stoke-on-Trent (1953); and in addition the Minister announced his intention last April of soon specifying Newcastle-upon-Tyne, South Essex, Reading, and Plymouth and South Devon. If all the new areas are included with those already specified, the milk of nearly half the population of England and Wales will be designated. Similar steps to extend the areas for designated milk are being taken in Scotland, in consultation with the Secretary of State.

The National Formulary.—The First Amendment, 1953, to the National Formulary, 1952, will be published soon. The greater part of the Amendment is concerned with amending formulae and titles in the National Formulary so as to bring this publication into line with the British Pharmacopoeia, 1953. Other amendments include the replacement of benzoic acid in liquid medicines by "Solution of Benzoic Acid."

Society of Apothecaries.—The Lord Mayor of London has issued a precept summoning the Liverymen of the Worshipful Society of Apothecaries to meet at Guildhall on June 24 at 11.45 a.m. for the election of Sheriffs and other Officers.

Coronation Honours.—The name of Leonard Jan Bruce-Chwatt, M.D., M.P.H., D.T.M.&H., Senior Malariaologist,

Nigeria, was omitted from the medical Coronation Honours published in the *Journal* of June 13 (p. 1328). Dr. Bruce-Chwatt was appointed O.B.E. (Civil Division).

Dr. Max Behr, formerly in practice in Kiel and London as an E.N.T. surgeon, has had his degree of Doctor of Medicine renewed by Bonn University, Western Germany, on the 50th anniversary of his graduation. This is a rare honour. Dr. Behr is now 75 years old.

COMING EVENTS

Concert to Aid Poliomyelitis Research.—A concert in aid of the National Fund for Poliomyelitis Research is to be given by the London Baroque Orchestra at the Royal Festival Hall on June 28 at 3 p.m. The conductor will be Karl Haas, and the soloists are Irene Kohler (pianoforte) and Sylvia Fisher (soprano). Tickets (prices from 21s. to 3s. 6d.) may be obtained from the Royal Festival Hall Box Office. Tel. Waterloo 3191.

Oxford Graduates Medical Club.—The Summer Dinner will be held in Queen's College, Oxford, on July 10 at 7 p.m. Dr. C. G. Douglas, F.R.S., will be in the chair. Tickets (price 2 guineas) may be obtained before July 4 from Mr. Selwyn Taylor, 3, Roedean Crescent, Roehampton, S.W.15.

Postgraduate Symposium at Cambridge.—A symposium on diseases of the ear, nose, and throat and diseases of the eye, organized by the Cambridge University Medical School, will be held at Addenbrooke's Hospital, Cambridge, on June 27 at 10.30 a.m. Those wishing to attend the symposium are asked to notify the secretary of the Medical School, Tennis Court Road, Cambridge, as soon as possible.

Faculty of Radiologists.—The annual meeting will be held at the Royal College of Surgeons on July 3 and 4. During the meeting Dr. S. Cochrane Shanks will deliver the Skinner Lecture, taking as his subject "Radiology in Relation to Medicine." Further details may be obtained from the Hon. Secretary of the Faculty, 45, Lincoln's Inn Fields, London, W.C.2.

Princess Tsahai Memorial Hospital.—The general meeting of the subscribers to the Princess Tsahai Memorial Hospital Fund will be held at Tuke Hall, Bedford College, Regent's Park, on July 7 at 3 p.m. After the meeting a garden party will be held in the grounds of "The Holme," which adjoins Tuke Hall, by kind permission of the Governors of the College. A film of the opening of the hospital will also be shown.

Genetics.—The ninth International Congress of Genetics will be held at Bellagio, Italy, from August 24 to 31.

The 1954 Health Congress of the Royal Sanitary Institute will be held at Scarborough from April 27 to 30.

NEW ISSUES

Thorax.—The next issue (Vol. 8, No. 2) will be available in a week's time. The contents include:

THE OESOPHAGUS LINED WITH GASTRIC MUCOUS MEMBRANE. P. R. Allison and A. S. Johnstone.
ATRESIA OF THE OESOPHAGUS WITH AN ABNORMAL TRACHEAL FOLD. R. H. Franklin and A. J. P. Graham.
THE PROGNOSIS FOR THE CONTRALATERAL LUNG AFTER RESECTION FOR PULMONARY TUBERCULOSIS. M. R. Geake and F. H. Young.
THORACOPLASTY AND CONTRALATERAL PNEUMOTHORAX. R. Abbey Smith.
A LONG-TERM FOLLOW-UP OF THORACOPLASTY CASES. F. Ronald Edwards.
G. LEBRAI, and H. MORRISON DAVIES.
A NEW APPROACH TO PULMONARY EMPHYSEMA. Osler A. Abbott, William A. Hopkins, William E. Van Fleet, and Joe S. Robinson.
A CASE OF UNILATERAL PULMONARY EMPHYSEMA. Paul R. Swyer and G. C. W. James.
DEATHS FROM ASTHMA IN ENGLAND AND WALES. D. A. Williams.
CYSTIC ENLARGEMENT OF THE MUCOUS GLANDS OF THE BRONCHUS ASSOCIATED WITH CHRONIC BRONCHITIS. A. Duprez and R. Mampuy.
LOCALIZED BILHARZIAL GRANULOMA OF THE LUNG SIMULATING A TUMOUR. S. H. El Mallah and M. Hashem.
THE BLOOD SUPPLY OF MALIGNANT PULMONARY NEOPLASMS. L. Cudkovic and J. B. Armstrong.
CHORIOCARCINOMA ARISING IN THE MALE MEDIASTINUM. M. J. G. Lynch and G. L. Blewett.
A CASE OF RETROSTERNAL DIAPHRAGMATIC HERNIA. R. Warwick-Brown.
HAEMOPTYSIS AS AN INDICATION FOR BRONCHOSCOPY. S. J. Mac Hale.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, June 22

●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. W. Ritchie Russell: Poliomyelitis.
ROYAL EYE HOSPITAL.—5.30 p.m., Professor T. Nicol: Applied Anatomy of the Orbit.

Tuesday, June 23

ROYAL EYE HOSPITAL.—5 p.m., Miss Iris Kane: White Pupil and its Differential Diagnosis.
SOCIETY FOR ENDOCRINOLOGY.—At Royal Society of Medicine, 5.30 p.m., Dr. Charles Huggins (Chicago): Prostatic Glands as Targets for Steroids.

Wednesday, June 24

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., Dr. W. Mayer-Gross: Problem of the Symptomatic Psychoses.
BRITISH ASSOCIATION OF SPORT AND MEDICINE.—At Westminster Medical School, 5 p.m., discussion to be opened by Sir Adolphe Abraham and Dr. A. P. McDowd: Doplag of Athletes.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Parapsoriasis, Poikiloderma, and Mucosus Fungoides.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. E. F. Gale: Mode of Action of Antibacterial Agents.

Thursday, June 25

●HAMPSTEAD GENERAL HOSPITAL.—3 p.m., Mr. A. J. Gardham: Difficulty in Swallowing; 4.15 p.m., Dr. Phyllis Wade: Radiotherapy in the Management of Thyroid Diseases.
INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. W. C. Davison (North Carolina): Childhood Cancer.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Subcutaneous Mycotic Infections.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—5.30 p.m., Professor B. Gusic (University of Zagreb): Pathological Changes in the Blood Vessels and Nerves of the Oesophagus due to Corrosion.
●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Colonel W. R. M. Drew, R.A.M.C.: Recent Advances in Malarial Problems.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Ophthalmology Lecture by Professor Arnold Sorsby: The New Antibiotics.
UNIVERSITY COLLEGE, LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., Professor J. H. Quastel (Montreal): Action of Drugs on Enzyme Systems.
●WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Apothecaries Hall, Annual Banquet.

Friday, June 26

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., discussion for general practitioners by Mr. A. Radcliffe: Chronic Rhinitis.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. C. E. Dent: Diagnosis of Hyper-parathyroidism.
●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor L. J. Witts: Splenomegaly and Splenectomy.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Budden.—On April 6, 1953, at Woking Maternity Hospital, Surrey, to Dorothy (formerly Thompson), wife of Dr. Frank Budden, a brother for Margaret—Andrew Frank.
Falconer.—On May 15, 1953, at the Royal Infirmary, Perth, to Mary, wife of Dr. T. C. Falconer, of Skene, Lincs, late of Alloa, a son.
Hume.—At St. David's Hospital, Cardiff, to Rosamond (formerly Hyslop), wife of Dr. Michael Hume, a son—Charles Robert.
Johnson.—On June 8, 1953, at Romsey Hospital, to Katherine (formerly Broadfoot), wife of Dr. Peter Johnson, of Linden House Cottage, Romsey, Hants, a son.
Laing.—On June 4, 1953, at Queen Charlotte's Hospital, London, W., to Betty Patricia, wife of Dr. Basil S. Laing, a son—Simon Cluny.
Schofield.—On May 22, 1953, to Anne (formerly Davies), M.B., Ch.B., wife of Graham Schofield, M.B., F.R.C.S., 30, St. Alban's Road, Edinburgh, a daughter—Janet Gillespie.

MARRIAGES

Nicholas-Blackburn.—On June 13, 1953, at St. James's Church, Birch-in-Rusholme, Manchester, Arthur Stuart Nicholas, M.R.C.S., L.R.C.P., of Manchester, Lancs, to Barbara Blackburn, of Chorley, Lancs.

DEATHS

Baker.—On May 16, 1953, Frederick Charles Joseph Baker, M.R.C.S., L.R.C.P., of Neston, Raddan Stile Lane, Exmouth, Devon.
Carse.—On May 15, 1953, at "Foxbury," Dorking, Surrey, Garfield Carse, M.B., B.S., of 7, Devonshire Street, London, W.
Currie.—On May 12, 1953, James Scott Currie, M.B., Ch.B., of Saltford, Somerset.
Henderson.—On May 11, 1953, at "Brynmor," Southbourne Road, Bournemouth, Hants, Robert George Henderson, M.B., F.R.C.S.Ed., aged 81.
Rose.—On April 28, 1953, Leonard Mortimer Rose, B.M., M.R.C.P., of Woodside, Green Lane, Baldon, Yorks, aged 32.
Rowcroft.—On April 26, 1953, at Coonoor, South India, George Francis Rowcroft, D.S.O., M.R.C.S., L.R.C.P., Colonel, Indian Army, retired, aged 91.
Shaw.—On May 2, 1953, at 4, Palace Gardens Mansions, London, W., Evan Alan Sivell Shaw, L.R.C.P.&S.Ed., L.R.F.P.S.
Smith.—On May 1, 1953, Armstrong Smith, M.R.C.S., L.R.C.P.
Thompson.—On May 3, 1953, at Mill Lawn House, Burley, Ringwood, Hants, Charles Gurney Thompson, M.B., Ch.B., aged 86.
Wade.—On May 5, 1953, at The Driftway, Copthorne, Sussex, Albert Holland Wade, L.M.S.S.A., aged 91.
Wight.—On May 4, 1953, at Bank Place House, Leslie, Fife, Adam Ramsay Wight, M.B., Ch.B., J.P.
Williams.—On April 27, 1953, at Ferring, Sussex, Arthur Harold Williams, M.R.C.S., L.R.C.P., formerly of Worcester, aged 84.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

The Sacrifice of Healthy Canines

Q.—Are there disadvantages in retaining sound canines when an upper-jaw clearance for caries or pyorrhoea is being performed? I have sometimes seen them sacrificed when they have been apparently healthy.

A.—It is rarely desirable to retain two canines in the upper jaw when all the other teeth have been lost as a result of caries or pyorrhoea. The reason for this is that the retention achieved with a full upper denture is normally much greater than that to be obtained by making clasps or bands around the canines. An upper denture planned in this way would lack the stability of a full denture and tend to rock in an antero-posterior direction.

The situation is quite different in the lower jaw, where the difficulties of retention of full dentures are much greater and where as a rule two canines should be retained when possible.

Desensitization Against P.A.S. and Streptomycin

Q.—How may a patient best be desensitized against P.A.S. and streptomycin?

A.—When a sensitivity reaction develops during treatment with streptomycin and P.A.S. (para-aminosalicylic acid), the first procedure will naturally be to discontinue both drugs. The next step is to determine which of the drugs is responsible for the reaction. The method adopted will depend to some extent on the severity of the symptoms. If the symptoms have not been severe, a full dose of each of the drugs can be given in turn, when it can be expected that a reaction will develop to the drug to which the patient is sensitive. Occasionally, of course, the patient is found to be sensitive to both drugs. If the reaction has been severe, it may be thought wiser to proceed more cautiously, and to identify the offending drug by giving gradually increasing doses of each in turn. When this has been done, desensitization is carried out by the administration of gradually increasing doses. The size of the first dose will depend upon the degree of sensitivity. With streptomycin it may be possible to start with as much as 0.1 g., but if a reaction occurs to this the initial dose should be even smaller, down to 1 mg. or even in the most extreme cases less than this. The dose is then increased by 50% to 100% daily, avoiding reactions so far as possible. If evidence of a mild reaction occurs after a dose, the next dose should be reduced by 50%. In most cases desensitization can be carried out fairly rapidly, but in some much persistence and patience may be required. With P.A.S. similar principles apply, the oral dose being started at a level low enough to avoid symptoms, and then progressively increased day by day until a full dose is being given.

Children Who Refuse Milk

Q.—What is the best way of handling a small child who consistently refuses milk and other dairy foods? Is it better to provide the necessary nutrients in other ways, or are milk foods so essential that the issue should be forced and the child made to take them?

A.—There is no satisfactory alternative way of giving calcium to a young child other than by milk or milk products. Equally it can be asserted that a pint of milk (about 600 ml.) can be administered daily without a child being aware of it. Porridge, for example, can be made with milk instead of water. Milk puddings can be made attractive by the ample

addition of fruit, jams, or syrup. Milk jellies and milk shapes can use up a lot of the pint and can always be made attractive in colour and in shape (animals and so forth). Milk soups and milk "shakes" (with the specially prepared fruit juices which do not curdle the milk) can be very attractive also. If all these are scorned it is still possible to incorporate a lot of milk in other sorts of puddings, cakes, and scones. Junket will sometimes be accepted when milk is not. Good quality ice-cream is almost always popular, and contains most of the calcium and some of the protein that make milk so valuable. Another approach is through cheese and cheese dishes. Macaroni cheese, for example, can use up milk and cheese. Incidentally, even liquid milk may be taken willingly when sucked through a straw, and presumably the elementary methods of flavouring milk with chocolate, vanilla, coffee, etc., have been tried. The psychological implications of the question cannot be entirely ignored. Why does the child refuse milk? It would be wiser to try to find an answer to this before proceeding to "force an issue." It is not clear what methods are proposed to make the child take milk if it is resolutely refused, but it is unlikely that forcible feeding will be either very successful or free from harm.

Procaine in Fibrositis

Q.—Is procaine useful in the treatment of fibrositis?

A.—Procaine infiltration may give some permanent relief in the painful conditions of ligament and muscle which result from sprains, strains, and contusions. The major technical difficulty lies in placing the injection accurately in the structure from which the pain is arising. Infiltration where the pain is felt is ineffective in most instances because, owing to the false localization of pain from deep structures, the source of pain is usually elsewhere and its accurate definition is an essential preliminary. The best results are obtained with 1% procaine freshly made up in physiological saline; no adrenaline or preservative should be added. Since absorption from muscle may be rapid, not more than 10 ml. should be used, otherwise toxic and sensitivity reactions are likely to be frequent.

Filarial Elephantiasis

Q.—Recently I saw three cases of severe elephantiasis of the male genitalia. This district of China is not recognized as a filarial district, and no microfilaria were found in the blood on repeated examination. What else could account for the condition? What investigations would help in diagnosis? What treatment is advised?

A.—Elephantiasis of the genitalia may be congenital or hereditary, secondary to tuberculosis or other chronic inflammatory or neoplastic disease in the tissues or lymphatics of the pelvis, secondary to severe trauma to the pelvis or to long-continued application of local irritants. The latter are sometimes used in the Tropics as supposed remedies for infertility or lack of sexual vigour. The strong probability, however, in the cases in question is that they are of filarial origin, in spite of the absence of microfilariae from the blood; these are not infrequently absent in cases of elephantiasis.

As elephantiasis usually develops many years after the initial infection, it is important to find out whether the patients have ever lived outside the reputedly filaria-free district. Perhaps the district itself does not deserve its good reputation, but this could be established only by detailed clinical, haematological, and entomological surveys. Further, the distribution of insect-borne diseases is constantly changing, and an area now filaria-free may not have always been so. The presence of eosinophilia and a positive filarial complement-fixation test would strengthen the diagnosis.

The only treatment likely to be of benefit is surgical removal of the elephantoid tissue. Diethylcarbamazine ("hetrazan," "banocide") was at first thought to be of some value in these cases, but early claims have not been substantiated.

Post-traumatic Neurosis

Q.—I have a patient, a young man, who as a result of a trivial injury to his finger has sustained a severe and progressive post-traumatic neurosis, resulting in paralysis of the same arm and leg and rigidity of neck and spine. This condition has now been present for three years. I have been told that a satisfactory settlement of his claim for compensation will result in complete restoration of function. I disagree. What does your expert think?

A.—Where the disability is due to hysteria (purposive functional incapacity) alone, settlement may lead to restoration of function, but the process may take time, and rehabilitation measures will be necessary. More often the patient has to be given a period of light work while he recovers from the effects of his period of idleness and of the invalid attitude which has accompanied his symptoms. If the patient is of low intelligence, has a poor work record, or is not really capable by reason of age, fear, or other factors of doing his former job, the course of his illness is not much affected by settlement. Where injury is trivial, the neurosis is due more to the patient's inability to adapt himself to his work than to the injury and resulting claim. Only where his lawyer or compensation secretary have, in their enthusiasm, implied that the patient would be letting them down by recovering, and where very superficial self-deception or malingering are suspected, can full recovery be predicted with confidence.

It is important to remember that organic nervous disease not infrequently makes its appearance in the guise of a traumatic neurosis after trivial injury, and this must be carefully excluded if the disability progresses or if it has a hemiplegic distribution. Settlement will here improve neither the organic nor the functional component. Organic disease apart, the prognosis depends on the patient's personality, and it is unusual for a patient of sound personality to maintain symptoms for three years. Compensation may not be the most important aetiological factor.

Estimating the E.S.R.

Q.—What is the best way of taking and preserving blood for E.S.R. estimation in general practice? Please indicate any special precautions necessary for an accurate result.

A.—In general, sodium citrate is to be preferred to oxalate as an anticoagulant, because when oxalate is used the normal range is up to 20 mm. for healthy males and is higher in women, whereas with the Westergren citrate technique, with a 200-mm. tube, the upper limit of normal for healthy males may be considered as 4 mm. and in females up to 8 mm. In my experience a 200-mm Westergren tube and the use of sodium citrate as an anticoagulant is more satisfactory than the Wintrobe technique.

Almost any stand which will hold the tubes vertical may be used. The apparatus should be kept at an approximately constant temperature, because sedimentation depends on temperature. It is also desirable to set up the test as soon as possible after collecting the blood, because, if the blood is kept, aggregation of the cells may occur and the sedimentation rate may be falsely high.

Laboratory Investigations in Periarthritis Nodosa

Q.—What laboratory investigations are helpful in the diagnosis of periarthritis nodosa? Are there any changes in the plasma proteins?

A.—Most patients with periarthritis nodosa show anaemia and a leucocytosis of 10,000–25,000 with a left shift. Albuminuria, haematuria, and cylinduria occur in about two-thirds and eosinophilia in about one-third of all cases, the last almost exclusively among those with asthma. False positive Wassermann reactions and increased serum globulin are found in about half. Hyposthenuria and nitrogen retention occur in many cases, but usually in the terminal phases only. No detailed studies on the serum proteins have so far been published. The diagnosis of periarthritis

nodosa during life can be made only when it has been suspected on clinical grounds; and the most effective method of confirmation is by muscle biopsy.

NOTES AND COMMENTS

Food Value of Ice-cream.—Dr. D. LIVINGSTONE (Leamington Spa) writes: With reference to your question and answer on ice-cream ("Any Questions?" May 23, p. 1177) reference might well have been made to the legal minimum standards laid down by Statutory Instrument No. 828 of 1953, The Food Standards (Ice-Cream) Order, which came into force on June 1.

[N.B.—This Instrument lays it down that ice-cream (but not water ices or ice lollies) shall contain not less than 5% fat, 10% sugar, and 7½% milk solids other than fat. Alternative standards are provided for fruit-containing ice-cream and kosher ices.]

Treatment of Homosexual Tendencies.—Dr. CLIFFORD ALLEN (London, W.1) writes: I was surprised to read in "Any Questions?" (May 30, p. 1234) the assertion that it may be necessary to use narco-analysis to discover whether a homosexual patient is likely to respond to therapy. This is really an astonishing suggestion. I have never found narco-analysis necessary either to discover the prognosis or in the actual treatment of paraphiliacs. I am not averse to using narco-analysis in other suitable cases, but I cannot conceive how it can be of value in homosexuality. Rees long ago gave a number of factors upon which he thought prognosis should be based. These were age, duration of symptoms, intelligence, desire for cure, and social situation. I should like to add a number of others, which are: whether the patient has built up a homosexual environment and surrounded himself with abnormal friends; how much overt sexuality has developed or whether he merely has urges and fantasies; if the homosexuality is associated with alcoholism (when both are more difficult to treat). The ability to afford private treatment is also of importance, since it is very difficult to devote enough time to a patient of this type in an out-patient department. I have never heard of a case which was cured in prison in spite of the judge's invariable assurance when he sentences offenders that they will be treated adequately during their imprisonment. The essence of treatment is to unearth and dig away the emotional attachments and prohibitions which prevent normal development and then to encourage the patient to widen the environment into a normal sexual one. Many homosexuals are afraid of women and, once this fear is removed, will rapidly advance to normality. The will to recover is, perhaps, the most important factor, and without it nothing can be done. The oldest patient I have succeeded in curing was over 40, but it is much easier in youth.

OUR EXPERT writes: If Dr. Allen will consult my answer again, he will see that narco-analysis was not recommended as the ideal method of treatment in all cases of psychosexual inversion. The suggestion was that many psychiatrists may be able to obtain strong indications from one or two narco-exploratory sessions as to the likelihood of systematic analytical psychotherapy being able to bring about a reorientation of the sexual impulse. There is, by implication, the further suggestion that, however carefully the history may be taken, no other technique, if narco-analysis is skilfully employed, can provide so much valuable, relevant information with such economy of time.

Correction.—Dr. P. J. Fraser's communication on succinyl-monocholeline, mentioned in the letter of Dr. H. O. J. Collier and Miss Barbara Macauley (*Journal*, June 6, p. 1279), was made to the British Pharmacological Society, not to the British Pharmaceutical Society.

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DIABETIC MYELOPATHY

BY

HUGH GARLAND, T.D., M.D., F.R.C.P.

Physician-in-Charge, Department of Neurology, General Infirmary at Leeds

AND

DERYCK TAVERNER, M.B.E., M.D., M.R.C.P.

Lecturer in Medicine, University of Leeds

Neurological complications of diabetes mellitus have been recognized for nearly a hundred years (de Calvi, 1860) and during the present century the orthodox teaching has been that diabetes mellitus may result in a symmetrical polyneuritis expressing itself largely by tenderness of the legs, loss of knee- or ankle-jerks, ataxia, sensory loss in the feet, and perforating ulcers, constituting the picture of diabetic pseudo-tabes. Martin (1953) has said that neuropathy is "characterized by a diffuse and ill-localized pain, vasomotor disturbances, thermal paraesthesiae, changes in tendon-reflexes, and often an alteration in pain sensibility in the feet without much impairment of touch or pressure. If the disorder progresses shooting pains develop, vibration sense is lost and, lastly, sense of touch and position as well as motor power becomes involved." These statements accord well with textbook descriptions (Gowers, 1893; Collier, 1926; Brain, 1951) and are supported by the literature of the past fifty years.

Rudy and Epstein (1945), after an analysis of 100 examples of diabetic neuropathy, stated that pain and sensory disturbances were the commonest manifestations, and neither they nor Rundles (1945), in an exhaustive survey of this subject, make any mention of a purely motor form of diabetic neuropathy. Jordan (1936) and Woltman and Wilder (1929) also emphasized that the neurological changes in diabetes mellitus are mainly sensory and that motor disturbances are rare. Although there are many casual references to weakness and wasting of muscles in association with sensory disturbances, the important observations of Bruns (1890) have been overlooked or dismissed as irrelevant. He described three patients, aged 58, 59, and 70, suffering from diabetes mellitus of short duration; all three developed severe pain in the hip and thigh followed by weakness and wasting of leg muscles without objective sensory loss, and each recovered fairly quickly following dietary restriction.

The reality of diabetic neuropathy without objective sensory loss has become apparent to us from clinical observation of the following patients; the case histories are presented in the order in which the patients came to our attention.

Case 1

A man aged 56 was first seen by one of us (H. G.) on March 14, 1950. He gave a two-months history of pain in the lumbar region and down the back of the right leg to the heel and toes, with less severe pain down the back of the left leg, getting steadily worse, and numbness down the back

of the thighs and calves. There was no specific complaint of weakness, but there had been polyuria and polydipsia for one year, with loss of 28 lb. (12.7 kg.) in weight. He had diffuse and severe wasting and weakness of all the muscles of the right leg, including the gluteus maximus, with loss of the right knee-jerk and both ankle-jerks. There was no sensory loss. The blood pressure was 150/80 mm. Hg. He was found to have glycosuria, and was admitted to hospital. The diabetes was well controlled by a diet of 10 black, 8 red (10B, 8R) Lawrence lines, and 10 units of zinc-protamine insulin (Z.P.I.) daily.

Investigations.—The cerebrospinal fluid (C.S.F.) protein was 68 mg. per 100 ml.; Lange 0013331000; fasting blood sugar, 350 mg. per 100 ml. Radiography of the lumbar spine was normal.

When seen again on June 8 he was still taking tab. codein. co. to relieve pain. His disability was stationary or increasing, and the left knee-jerk was now seriously depressed. On readmission to hospital on August 15 there was considerable weakness of most muscles of the left leg and he was only just able to walk. C.S.F. protein, 105 mg. per 100 ml. Lange 1233310000.

In December, 1950, both knee- and ankle-jerks were absent and the plantar responses were extensor. He did not begin to improve until early 1951; by April he could walk with one stick, and in November he was walking quite well. In May, 1952, his urine was constantly sugar-free on 12 units of Z.P.I. daily. By July he was walking very well unaided, the knee- and ankle-jerks were still absent and the right plantar response was extensor, but the left was now flexor—he said himself that there was "almost incredible improvement."

Electromyogram (D. T.)—On September 25, 1952, strength-duration curves were normal except for slight partial denervation changes in the right tibialis anticus muscle. Needle electrodes in both tibialis anticus and quadriceps muscles showed a decreased sustained pattern of motor-unit activity on voluntary contraction, with prominent single units superimposed, which in places amounted to discrete motor-unit activity. There was no spontaneous activity.

In January, 1953, there was only a little aching in the legs. He was walking quite well without sticks and was just able to jump off the ground. There was no demonstrable weakness or wasting of leg muscles and tone was normal. The knee-jerks were just present, but the ankle-jerks were still absent. The plantar responses were both flexor. There was no sensory loss. The diabetes was fully controlled, and he had gained 50 lb. (22.7 kg.) in weight.

Case 2

A man aged 63 was first seen by one of us (H. G.) on June 1, 1950. There had been pain in the left buttock, radiating down both back and front of the left leg to the ankle only, for two months. The pain was improving and

Abnormal sensory signs are commonly present in association, and are the most frequent objective evidence of diabetic neuropathy. The most frequent abnormality is loss of vibration sense in the legs. Sensory change may occur in single or multiple areas, or it may be distal or limited to the area of distribution of one or more peripheral nerves. In one of our cases sensory loss was present in the zones of both ulnar nerves and one external popliteal nerve. There were parasthesiae, and the small muscles of the hands were wasted. In six months of excellent diabetic control one arm improved, one was unchanged, and the foot lesion deteriorated.

We have seen four examples of the "painful foot" syndrome (Fein *et al.*, 1940): severe burning pains in both feet were associated with diminished leg reflexes and sensory loss of distal distribution. One patient, a mule spinner (an occupation in which it is customary to work barefoot), had to wear slippers to alleviate the pains in his feet, but, nevertheless, preferred to tolerate the thirst of uncontrolled diabetes to the pain of walking to obtain a drink. A second case was also hyperglycaemic in type. Both responded to diabetic control, but two further cases were uninfluenced by treatment, including massive vitamin-B₁ therapy.

Three patients have been seen with clinical manifestations resembling active tabes dorsalis. A man of 45, who made a complete recovery within a year, had recent and uncontrolled diabetes. He had severe lightning pains, irregular pupils which responded poorly to light and briskly to accommodation, absent ankle-jerks, diminished knee-jerks, and absent tendon sensation at the heels. There was no other evidence of syphilis, and the C.S.F. and serological tests were normal.

2. Weakness and Wasting

The most striking component of diabetic neuropathy is weakness and wasting of the quadriceps femoris muscle. We have seen 12 examples.

Case 5.—A labourer aged 67 was admitted to hospital with a history of diabetic symptoms for one year, but his complaint was of pain in the right thigh, worse at night, of recent sudden onset. Diabetes was confirmed. Examination showed contracted pupils which responded sluggishly to light. The knee-jerks were diminished and the ankle-jerks absent. The right quadriceps femoris muscle was wasted. The C.S.F. showed a protein level of 72 mg. per 100 ml., but was otherwise normal. After three months, despite good diabetic control, symptoms and signs progressed. The C.S.F. protein was 78 mg. per 100 ml. and a myelogram was normal. Six months later he made a complete recovery and was sign-free, but had developed intermittent claudication and the pulses in his feet had been lost.

The condition may be associated with anterior crural pain and may occur in one or both legs. In one of our cases the legs were successively involved.

We have seen foot-drop in six patients. In one case the onset was bilateral; in another case sudden onset in one foot was succeeded some months later by an insidious onset in the other. Weakness and wasting of the small muscles of the hands has been seen four times. In one patient the condition recovered with diabetic control, but the other cases were unrelated to hyperglycaemia and abnormal signs were present elsewhere.

Auché noted that muscle involvement in diabetes might resemble the Aran-Duchenne or scapulo-humeral myopathies. We observed a patient of 74 with gross wasting and weakness of the pelvic and shoulder-girdle muscles far beyond the limits of senile change. The legs and forearms were spared. The condition was static and asymptomatic.

3. Autonomic Nervous System

We have observed four patients in whom diabetic gangrene appeared to have a neuropathic basis. In all, the gangrene was painless and recovered completely. In none were the peripheral pulses, colour, or temperature at the extremities abnormal, and all showed other evidence of neuropathy. In one case the condition relapsed three times, but amputation was averted by spontaneous healing with coincident improvement in the neurological state. One year later the foot remained in good condition.

The suggestion that certain cases of painless gangrene have a neuropathic rather than a vascular basis has practical importance. In the presence of clinically normal peripheral vessels and evident neuropathy, a prolonged trial of conservative management may avert amputation. Such a view is supported by the reports of Holt (1928), McKittrick and Root (1928), Bailey and Root (1942), de Takats (1945), and Joslin (1946).

We have seen one case of Charcot joint affecting the mid-tarsal region. Perforating ulcer and Charcot joints have been

described by Pryce (1887), Auché (1890), Bramwell (1907), Williamson (1911), de Takats (1945), Bailey and Root (1947), Morris (1947), Shore (1947), and Foster and Bassett (1947).

Painless distension of the bladder with retention and sometimes urinary infection were seen in four cases, and resembled the reports of Jordan and Crabtree (1935), Gill (1936), and Rudy and Muellner (1941).

A typical example of diabetic nocturnal diarrhoea has been studied. This resembled the cases of Sheridan and Bailey (1946). The apparently specific effect of liver injections is hard to interpret, but they make the recognition of the syndrome important. One of us referred to the use of vitamin B₁₂ in this condition (Hirson, 1951).

Case 6.—A housewife aged 63 had poorly controlled diabetes for eleven years and usually suffered paraesthesiae and pains in the legs. For seven years she had intermittent diarrhoea, worse at night, with faecal incontinence of "dirty brown water—like mud." Some attacks persisted for weeks. On examination there was marked retinopathy, and the ankle-jerks and vibration sense in the legs were absent. Gastro-intestinal investigations, including laparotomy, were negative, but the administration of crude liver extract by injection led to a complete remission, which, when she was last seen, had lasted for over a year. Previous remissions seldom exceeded two weeks. Diabetic control remained poor.

A fundamental study of the abnormalities of the autonomic nervous system in diabetes was made by Rundles (1945), who found postural hypotension, and visceral, vascular, and temperature-regulator abnormalities.

4. Cranial Nerves

We have seen a complete third-nerve lesion which we considered to be due to diabetes and which recovered completely and spontaneously (see Case 8 below). Similar lesions have been reported by Cerise and Bollack (1913), Ingelrans (1925), Root (1933), and Herson (1948). Most of the cranial nerves have been reported to be involved in diabetic neuropathies, usually as an active occurrence. We have twice seen Argyll Robertson pupils, also noted by Jordan (1936), Herman (1939), and Smith (1949).

5. Other Manifestations

While the conditions which we have so far described have clinically involved the peripheral nervous system, in a single case the central nervous system was also involved. The presentation resembled that of a subacute combined degeneration of the cord with peripheral nerve change, and later development suggested an encephalitis.

Case 7.—A housewife aged 65 had diabetes for two years, satisfactorily controlled by diet and insulin. She developed stiffness and weakness of the legs, with ataxia and paraesthesiae of the extremities. She was bedridden, and on admission to hospital showed a heavy glycosuria without ketosis. Both legs were spastic, the tendon reflexes were exaggerated, and clonus was present. Both plantar responses were extensor. There was widespread peripheral sensory loss. The blood and sternal marrow were normal. Despite stringent diabetic control and massive vitamin-B₁₂ therapy, the condition progressed. Trophic ulcers of the feet and sphincter incontinence developed, and there was mental confusion. She died unrelieved. Full neuro-pathological examination by Dr. E. Pollack revealed no specific lesions. There was considerable arteriosclerosis.

Griggs and Olsen (1937) and Rudy and Epstein (1945) reported similar cases.

Panatrophy (Kinnier Wilson) has been noted in four cases. This condition has not been fully described in diabetes before. Localized areas of profound wasting of muscle and subcutaneous tissues were found at sites far removed from possible insulin injections.

Although polyneuritis is commonly mentioned as a neurological complication of diabetes, we have not seen any example of the classical sensorimotor symmetrical polyneuritis running a typical course (Walshe, 1946). Further, we have found in the literature only a single case (Pitres and Marchand, 1917) which satisfied the usual diagnostic criteria.

The Cerebrospinal Fluid

The cerebrospinal fluid was examined 19 times in 18 of our patients. In six cases the protein level was above 50 mg. per 100 ml., the highest figure being 78 mg. per 100 ml. (in Case 5). Four months previously the same patient had shown a level of 72 mg. per 100 ml. Five of the six patients had severe active neuropathies, but one showed only mild change. Four patients (aged 40, 55, 63, and 70 years) had protein levels between 40 and 50 mg. per 100 ml. In all, the cell count and Wassermann reaction were normal.

These findings are in accord with those of Jordan (1936), Joslin and Root (1939), and Rundles (1945). We have not found the extreme levels up to 390 mg. per 100 ml. of protein previously recorded. There has been no direct correlation between the protein level and the degree of neurological change; although the highest levels have been found in severe neuropathies, some severe cases have shown normal levels. In the asymptomatic group the findings have been normal.

Aetiology

Two main causal factors have been proposed by previous workers—arteriosclerosis and vitamin-B deficiency. Arteriosclerosis shows a high incidence in diabetes, and Dolger (1947) regarded such change as "an associated concomitant" of the disease. The cyclic nature of some of our cases makes it seem unlikely that the lesions we describe are due to irreversible vascular change. We have seen neuropathies of all types in patients under the age of 30 and in older patients with clinically normal vasculature. By contrast, some severely arteriosclerotic diabetics have shown no nerve change.

To compare the neurological signs of diabetes with those of arteriosclerosis 100 elderly in-patients were examined. All were in the chronic wards of a former municipal hospital, and the only cases excluded from a consecutive series were those under the age of 50, those whose mental state prevented adequate examination, and those with fixed joints. We examined, in particular, the tendon reflexes, pupils, vibration sense, and tendon-pressure sensation. There was no significant difference in the findings in those patients with and those without normal palpable pulses at the ankles. Inevitably, in view of the multiple conditions present, no evidence of a consistent neurological picture emerged, but there was no overall similarity to that of our diabetic cases (Table I). Woltman (1929) and Critchley (1931) also commented on the varied findings in arteriosclerosis.

TABLE I.—Comparison of Abnormal Findings

	100 Consecutive Diabetic Out-patients (Av. Age 54.3 Years)	100 Consecutive Chronic In-patients (Av. Age 73 Years)
Knee-jerks absent	19	22
" diminished	31	9
" exaggerated	6	74
Ankle-jerks absent	63	42
" diminished	16	19
" exaggerated	0	37
Vibration sense absent at knee	27	71
" " " ankle	50	89
Achilles tenderness increased	4	39
" " decreased	32	8

Notes: (1) The findings in both legs are reported. (2) All patients in these two series were jointly examined by the same observers. (3) Of the chronic in-patients 13 showed significant pupillary change. Allowing for detectable disease (cerebral lesions, tabes, etc.), 12 patients showed unexplained reduction or absence of knee-jerks and 15 unexplained reduction or absence of ankle-jerks. The corresponding figures for increase of the reflexes was 20 and 14. In the only two diabetic patients in this group the diagnosis was suggested on the basis of the neurological findings only.

The pathological studies of Woltman and Wilder (1929), which have provided the main experimental evidence for a vascular aetiology, were conducted on limbs amputated for gangrene. This selection seems to invalidate their conclusions, but, even within this selected group, the authors notice that "there is not an accurate correlation between the degree of degeneration and the neurological symptoms."

We have been impressed by the disparity between the consistent picture of the chronic diabetic neuropathies and the diverse findings in arteriosclerosis. Taken in conjunction with the considerations outlined above, we think it unlikely that diabetic arteriosclerosis causes neuropathy.

The therapeutic value of vitamin-B₁ administration (Vorhaus, 1939; Aring *et al.*, 1939; Fein *et al.*, 1940) has been the basis of the deficiency theory of the diabetic neuropathies. We have been unable to reproduce such results in active or chronic cases, and have had no need to conduct a therapeutic trial in hyperglycaemic cases. We have found, in our patients, no other evidence of vitamin deficiency, which would be anticipated if the hypothesis were correct. Rowlands and Wilkinson (1938), Sinclair (1938), Needles (1939), and Pollack *et al.* (1941), found no biochemical evidence of vitamin-B₁ lack in their cases. Lowry and Hegsted (1945) found that rats rendered diabetic with alloxan had reduced vitamin-B₁ requirements.

The claim that a chronic vitamin deficiency can respond rapidly to specific treatment is in itself surprising, as late beriberi, for example, does not respond in this way. In acute lesions a response might be expected, but such has not been our experience, and, by contrast, spontaneous remissions often occur.

We have found that neither the sex of the patient nor the type or severity of diabetes is related to neuropathy. Table II analyses the findings in our out-patient group. In general, the asymptomatic cases occur in the older age groups and the more severe active cases are commonest in middle life.

TABLE II.—Neurological Findings in 100 Unselected Diabetic Out-patients

	No. of Subjects	No. with Neurological Abnormalities
Total cases	100 (av. age 54.3 years)	57 (57%)
Males	23 (" " 46.4 ")	13 (56.5%)
Females	77 (" " 58.1 ")	44 (57.1%)
Under 30 years	8 } 30	3 } 12 (40%)
30-50	22	
50-70	61 } 70	38 } 45 (64.3%)
Over 70	9	
Diabetes less than 1 year	15	7
" 1-3 years	23 } 63	14 } 37 (58.7%)
" 3-5 "	25	16
" 5-10 "	18 } 37	9 } 20 (54.0%)
" over 10 years	19	11
Controlled on insulin	68 } 82	39 } 49 (59.7%)
" without insulin	14	10
Uncontrolled on insulin	6 } 18	4 } 8 (44.4%)
" without insulin	12	

The role of hyperglycaemia in the causation can be interpreted only in relation to the classification groups. Most of the patients presenting with uncontrolled diabetes and neurological abnormalities respond rapidly to routine treatment. These form our first group. The rest, together with patients who are in good control and yet show nerve change, fall into our second and third groups. The significance of previous episodes of hyperglycaemia or ketosis cannot be assessed, since such states are almost universal, at least at the onset of diabetes. We will refer to cases in which neuropathy preceded clinical diabetes (Cases 8 and 9). Bonkalo (1950) finds that his experience "tallies well with the generally acknowledged fact that there is no direct connexion between blood sugar and neuritis."

In hyperglycaemic neuropathies the sole factor has been the failure of diabetic control. Neurological features occur only in a proportion of diabetics who are out of control, and no predisposing factors have been found in such cases. However, the frequency of pain in diabetic ketosis is well known.

Treatment

Symptomatic treatment, including heavy sedation, and physiotherapy are needed in most active cases. Optimum diabetic control will be indicated on general grounds, but this produced striking results only in our first group. It is justifiable, however, to observe the effects of insulin on any acute case even when control is apparently adequate on diet alone.

De Takats (1945) claimed that lumbar sympathectomy gave relief from leg pains. Sandstead and Beams (1938) advocated large dosage of sodium chloride, but we have had no success with a small group of cases treated by this method. Vitamin B₁₂ was not available at the time of these investigations.

Wagener (1945) noted, in respect to diabetic retinopathy, that present methods of diabetic control are unsatisfactory. We hold this to be equally true of diabetic neuropathy.

Discussion

There is no good evidence that the incidence of neurological change in diabetes is materially less than in the "pre-insulin" era. The onset of neuropathy may have been delayed in the diabetic life.

We have described and emphasized the more common presentations, but the obscurity of some manifestations is noteworthy. Root (1933), Jordan (1936), and Wilder (1940) have listed alternative diagnoses which have needed consideration. Our experience also has been of the need to exclude a wide range of neurological conditions and even of intrathoracic and abdominal diseases.

In two cases neuropathy presented in subjects in whom neither clinical evidence of diabetes was found at the time nor any alternative cause for their condition. In Case 8, one year after the first neurological illness, clinical diabetes developed with a second episode of neuropathy, and in Case 9 the type of pain, in association with the glucose-tolerance curve, indicated the true diagnosis.

Case 8.—A housewife aged 65 presented with a complaint of pain around the left eye and developed left-sided ptosis and external ophthalmoplegia. The C.S.F. showed a protein level of 45 mg. per 100 ml. and was otherwise normal. An x-ray film of the skull and the Wassermann reaction were negative. There were no constitutional symptoms and no glycosuria. Angiography was not undertaken, as rapid spontaneous remission occurred. One year later she complained of pain, worse at night, in the right breast and the thigh. The Achilles tendon sensation was exaggerated and vibration sense was lost in the legs. She had glycosuria and mild diabetic symptoms. The blood sugar rose to 278 mg. per 100 ml. The diabetes was controlled by diet alone. After three months she was sign- and symptom-free.

Case 9.—A housewife aged 55 attended hospital complaining of the symptoms of right ulnar neuritis. Sensation was impaired in the area of distribution of that nerve and examination was otherwise normal. Spurling's sign was negative. Gross radiological osteoarthritis of the cervical spine, suggesting a neurogenic arthropathy, was present. The description of the pain was typical of diabetic neuropathy. Pain was unrelieved despite prolonged immobilization of the neck in a plaster collar. Only one of a series of urine tests showed sugar to be present, but the glucose-tolerance curve, after 50 g. of glucose, gave half-hourly blood-sugar levels of 98, 172, 212, 188, and 141 mg. per 100 ml. Spontaneous remission of the pain occurred after four months.

Claude (1911) thought that neurological change might precede diabetes, and Jordan (1943) reported seven cases of neuropathy in patients without clinical diabetes who had abnormal glucose-tolerance curves.

Thus, even in the absence of glycosuria or constitutional symptoms we believe that the blood-sugar curve may be of value in the diagnosis of obscure neurological problems.

Our findings have a bearing on the fundamental considerations of diabetic pathology. They offer support to the view that diabetes is a disease-complex in which the metabolic disorder is only one manifestation, with neuropathy occurring not as a "complication" but as an integral part of a variable process. Dry and Hines (1941) presented

similar views with regard to arteriosclerosis in diabetes, writing that "an inherent weakness or abiotrophy exists which affects both the insulin-producing tissues and the vascular system which require, in each instance, only an additional stimulus to bring about pathologic change." Wagener (1945), studying retinopathy, added similar evidence, and Gilbert and Dunlop (1949) showed a variation from normal in the obstetrical history of females who later developed diabetes.

Jordan and Randall (1936) and Jordan, Randall, and Bloor (1935) described changes in the lipid content of nervous tissue from patients with diabetic neuropathy which was not present in control material from arteriosclerotic subjects. Sirek *et al.* (1950) record abnormal levels of blood phospholipids in their cases. These findings require further study.

Conclusions

About half of all cases of diabetes mellitus show evidence of neurological disease.

Diabetic neuropathy may be divided into three groups: (a) hyperglycaemic—related to failure of control and rapidly relieved by routine treatment; (b) active—the most serious form, present in about 3% of all cases, unrelated to diabetic status and with a tendency to remission and relapse; and (c) asymptomatic—chronic, permanent, and not disabling.

There is no good evidence that arteriosclerosis or vitamin-B₁ deficiency is a causal agent. The neuropathic process seems to be inherent in some cases of diabetes.

The glucose-tolerance curve is of value in the investigation of obscure neurological disease.

The production of gangrene, neurogenic bladder, and joint change by diabetic neuropathy is of practical importance.

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well-balanced diabetic. To overcome this it is advisable to raise the carbohydrate content of the diet to 200 g. and give the mother a morning injection of soluble insulin and a second injection before tea of soluble insulin mixed with enough P.Z.I. to render the morning urine free of acetone bodies. If ketosis persists the addition of about 20 g. of glucose to each of the four meals usually clears it up. It is now well known that the maternal mortality rate can in this way be kept to a very low figure, but less is known about maternal morbidity of diabetics following pregnancy. The following points were therefore investigated: (1) insulin requirement following pregnancy; and (2) incidence and aggravation of diabetic complications: (a) retinitis, (b) hypertension, and (c) albuminuria. In none of the last 80 pregnancies of the K.C.H. series was there any significant increase in insulin requirement following pregnancy and attributable to it.

As regards retinitis, four cases were of interest—two were patients of Dr. Lawrence's and two of mine. Both of Dr. Lawrence's cases developed severe retinal haemorrhages, mostly of the flame or linear variety, and in one case these were associated with oedema of the optic disks; in both, the retinal lesions disappeared after the pregnancy. In my cases—both long-standing diabetics of 21 and 13 years' duration—there were previous ocular complications; in the former severe bilateral diabetic cataracts which made it difficult to exclude the presence of early retinitis, and in the latter typical early retinitis. During pregnancy the former developed definite aneurysms, blob haemorrhages, and patches of early exudate, and these have since progressed to retinitis proliferans with severe loss of vision. In the other case the retinitis has progressed since pregnancy. In both cases there has been an increase in albuminuria and a rise in blood pressure. These two cases are mentioned in detail because, from the maternal point of view, they are of great importance in connexion with the decision whether or not, in long-standing diabetics, pregnancy should be advised or be allowed to proceed. In the remaining 10 cases with retinitis at the onset of pregnancy there has been no appreciable change or evidence of deterioration, although two of them have been through two pregnancies. It is possible, therefore, that the progression of the retinal complication in the two cases would have occurred quite apart from the pregnancy, as, in fact, it very often does in such long-standing cases.

The question of hypertension and albuminuria is considered in connexion with toxæmia of pregnancy.

Toxæmia of Pregnancy

It is generally recognized that toxæmia is a relatively frequent complication of diabetic pregnancy. It is referred to again in connexion with foetal mortality, but I thought it would be worth while trying to follow up the toxæmic cases with a view to finding out whether they showed an unexpectedly high incidence or rapid development of hypertension and albuminuria following pregnancy. Interpretation of results is made difficult by the small number of cases and the fact that diabetics are apt to develop hypertension and albuminuria quite apart from pregnancy; some help, however, is to be gained from the relatively young age of the patients studied and the recognized association between these complications and the duration of the diabetes.

Of the last 222 diabetic pregnancies at King's College Hospital, 24 have been complicated by toxæmia, which on two occasions has occurred with successive pregnancies in the same patient. Three of the 24 cases are untraced, one died with eclamptic fits and cholaemia a few hours after delivery of a normal child which survived, and one had uraemia due to chronic nephritis. The remaining 19 cases have been followed with special reference to hypertension, albuminuria, and retinitis. In 13 there is no evidence of change in any of these respects following the toxæmic pregnancy, the only instance of hypertension being in a woman who had a benign essential hypertension before the pregnancy,

PROGNOSIS IN DIABETIC PREGNANCY

BY

WILFRID OAKLEY, M.D., F.R.C.P.

Physician, King's College Hospital

The observations in this communication are based on two series of diabetic pregnancies: (1) 275 pregnancies supervised and delivered at King's College Hospital, referred to as the K.C.H. series; and (2) 458 pregnancies, details of which were collected from different centres in Great Britain, and referred to as the Q series. A detailed analysis of some of this clinical material has already been published (Peel and Oakley, 1949).

I will first deal briefly with the maternal aspect and then pass on to the more controversial and less satisfactory problem of the fate of the foetus.

The Maternal Aspect

In the Q series of 458 pregnancies 13 mothers died—in eight the cause of death was diabetic coma, and three of these died undelivered. Of the remaining five deaths two were due to peritonitis and one each to pneumonia, pulmonary embolism, and eclampsia, giving a maternal mortality rate of 2.8%. In the K.C.H. series of 275 pregnancies there were four deaths due to pulmonary embolism, septicaemia, cholaemia, and massive collapse of the lung; there were no deaths in diabetic coma and none of the patients died undelivered—giving a mortality rate of 1.4%. These figures show that death attributable to diabetes still does occur, but it can always be prevented by proper supervision of the mother.

In this connexion the insulin requirement in at least 75% of cases rises during the second and third trimesters, and what is perhaps more important—the renal threshold in about the same percentage falls at about the fourth or fifth month of pregnancy. This constitutes one of the chief difficulties from the point of view of control of the maternal diabetes, and is usually first recognized by the development of heavy glycosuria and often severe ketosis in a previously

TABLE I.—Late Effects of Toxaemia of Pregnancy

Case No.	Before Toxaemia				After Toxaemia			
	B.P.	Alb.	Retinitis	Interval	B.P.	Alb.	Retinitis	Duration of M.D.
1	Normal	0	0	4 yrs.	132/98	0	0	12 yrs.
2	130/90	Sl. trace	?	7 "	120/90	0	Severe	11 "
3	148/80	0	0	4 "	170/90	0	0	11 "
4	130/80	Trace	0	1 1/2 "	160/90	Sl. trace	0	23 "
5	130/90	"	0	1/2 yr.	130/80	++	Early mild	16 "
6	130/80	0	0	4 yrs.	160/100	0	0	10 "
				8 "	195/110	0	0	14 "

* Two toxæmic pregnancies.

which was no worse after it. The remaining six cases are summarized in Table I. It will be noted that both patients who had two toxæmic pregnancies are included in this small series. It is also interesting that in all six cases the diabetes had been present for 10 or more years; but this makes the interpretation of results more difficult, as diabetes of this duration may, quite apart from pregnancy, be associated with some hypertension, albuminuria, and retinitis. In these circumstances, it would be quite wrong to conclude that toxæmia of pregnancy constitutes a graver danger to the diabetic than to the non-diabetic mother, and I think the same can probably be said regarding the child.

Fate of the Foetus

Let me now turn to the prognosis in diabetic pregnancy from the point of view of the child. That an abnormally high percentage of these pregnancies result in stillbirth or neonatal death cannot be denied, that many different theories have been put forward to account for this high foetal loss also cannot be denied, but the fact that we still know little or nothing of the cause of this loss, if not actually denied, is being obscured, in my opinion, by the unwarranted acceptance of unproved theories and uncontrolled experiments. The results of the two series of pregnancies—733 cases in all—are applied to some of the theories put forward to account for this high foetal mortality rate in order to show that none of these theories will stand up to a critical analysis of a sufficiently large series of diabetic pregnancies.

(1) Control of the Maternal Diabetes

In 1942 Lawrence and Oakley recorded 54 diabetic pregnancies and showed that, if these were divided into three groups according to the degree of control of the maternal diabetes, the foetal mortality rate in the worst group was

TABLE II.—Relation of Foetal Mortality to Age of Onset of Maternal Diabetes

Age of Onset of Diabetes	No. of Babies	Foetal Mortality
1-15	70	21 (30%)
16-24	105	24 (23%)
25 and over	92	29 (31%)

70% and in the best 23%, the intermediate group being 50%. These results suggest that poor control will raise the foetal loss rate, but also that good control will not lower it below the high figure of 23%.

(2) Severity of Maternal Diabetes

Gilbert and Dunlop (1949) have shown that there is no significant difference between the foetal mortality rate in non-insulin-treated and insulin-treated diabetic mothers; this finding has been confirmed by other workers and by me.

(3) Age of Onset of Maternal Diabetes

The relationship between the age of onset of the maternal diabetes and the foetal mortality from maceration, stillbirth, and neonatal death has been studied by Forgen

Pederson (1949). In a series of 147 babies he found that when the onset of maternal diabetes was during the ages of 1 and 15 the foetal mortality rate was 42%, during 16 and 24 years 29%, and over 25 years 6%. He therefore concluded that when diabetes begins in childhood the foetal mortality rate is high; when the patient is grown-up before the onset of her diabetes the foetal mortality is far less. In order to test the validity of this statement the mortality rate in a series of 267 babies delivered of diabetic mothers at King's College Hospital was related to the age on onset of the maternal diabetes (Table II); the results obtained fail to confirm the existence of any direct relationship.

(4) Duration of Maternal Diabetes

It has also been suggested that the duration of the maternal diabetes may be a factor in the production of the high foetal mortality rate. A series of 665 pregnancies was therefore analysed from this point of view (Table III). These

TABLE III.—Relation of Foetal Mortality to Duration of Maternal Diabetes

Duration	Q Series				K.C.H. Series			
	Cases	S.	N.	Total	Cases	S.	N.	Total
0-4 yrs.	209	66	18	84 (40.2%)	97	19	10	29 (30%)
5-9 "	109	35	10	45 (41%)	72	9	11	20 (28%)
10-14 "	60	15	9	24 (40%)	55	4	10	14 (25%)
15-19 "	19	9	1	10 (52.6%)	28	4	2	6 (21%)
20+ "	5	2	0	2 (40%)	11	0	3	3 (27%)
Total	402	127	38	165 (41%)	263	36	36	72 (27%)

S.—Stillbirths. N.—Neonatal deaths.

figures show: the high foetal loss rate for all durations, the absence of any relationship between duration and foetal mortality, and the significantly lower mortality in the K.C.H. series, to which reference is made later.

(5) Diabetic Complications

As foetal loss could not be accounted for in terms of control, severity, or duration, it was decided to see whether the presence of retinitis or albuminuria in the mother before the onset of pregnancy could be a causal factor. Hypertension was not seriously considered, as it is almost always an indication for advising against pregnancy or, alternatively, for termination.

In spite of the relatively large number of pregnancies, these complications were found in comparatively few; 12 mothers had retinitis at the time of conception. In these 12 cases 14 pregnancies resulted in 12 live children and 2 neonatal deaths, a loss comparable to the uncomplicated pregnancies. Albuminuria, especially when associated with hypertension, is so well recognized as being associated with high foetal loss rate, even in non-diabetics, that it is not surprising that only six patients had persistent appreciable albuminuria at the time of conception and were allowed to continue; all six cases gave birth to live babies, and all survived and did well.

(6) Complications of Toxaemia of Pregnancy

Much stress has been laid on the frequency of toxæmia in these cases and upon the danger of this condition to the child. Table IV shows the results of toxæmic pregnancies in the K.C.H. and Q series. It will be seen that the toxæmic cases had a slightly higher foetal mortality rate

TABLE IV.—Relation of Foetal Loss to Toxaemia of Pregnancy

	Cases	Toxaemia					Total Foetal Loss
		No.	%	Live	Dead	Foetal Loss	
Q series	455	86	19.0	48	38	44.2%	40.3%
K.C.H.	274	31	11.3	21	10	32.2%	26.7%

than the others; but toxæmia is clearly not the answer, nor can one expect that any form of therapy directed against it will appreciably lower the foetal death rate.

Smith and Smith (1938) put forward the view that toxæmia of pregnancy is related to a disturbance of hormone balance and, pursuing the same line of thought, Priscilla White (1947) claims to have greatly lowered the foetal mortality rate by giving stilboestrol in increasing doses together with a daily injection of progesterone. In order to test the validity of this claim the Medical Research Council in England has organized an investigation in which a series of pregnant diabetics—selected at random—have received hormone therapy from an early stage of pregnancy, the controls being given inert tablets of identical appearance. The only ways in which treatment differed from that advocated by Priscilla White were that progesterone has been given by mouth in the form of ethisterone—daily injections being impracticable in the conditions existing in England—and the patients have not been admitted to hospital as a routine measure at least two weeks before delivery. Neither the physicians nor the obstetricians in charge know which cases have received active and which inert therapy, and it is hoped that, in this way, results of statistical significance will be obtained. Unfortunately, the results of this investigation are not yet available, but in a series of 50 pregnancies in which hormone therapy was given at King's College Hospital, 21 resulted in stillbirth or neonatal death, giving a foetal mortality of 42%.

(7) Mode and Time of Delivery

It has been shown in Table III that the foetal loss rate in the K.C.H. series was very significantly lower than that in the Q series; there are several possible causes for this. Where large numbers of cases are treated greater experience is apt to produce better results; close co-operation between diabetic and obstetric departments is also of great importance, as is regular diabetic and antenatal supervision. The main cause of the difference, however, is to be found in the time and mode of delivery.

TABLE V.—Relation of Foetal Loss to Mode of Delivery

Mode of Delivery	Q Series					K.C.H. Series				
	Cases	Live	S.	N.	% Loss	Cases	Live	S.	N.	% Loss
Spontaneous labour	129	83	23	23	35.6	17	14	2	1	18.0
Induced labour	126	91	23	12	27.8	36	23	9	4	36.0
Caesarean section	115	97	3	15	15.7	156	127	1	28	18.5
Total	370	271	49	50	27	209	164	12	33	21.5

S.—Stillbirths. N.—Neonatal deaths.

Table V shows the high loss rate associated with spontaneous labour in the Q series, the much lower figure in the K.C.H. series being due to the fact that all the cases so delivered went into labour spontaneously at or before the thirty-sixth week, at which time they would otherwise have been induced or had caesarean section. The figures for induction are high but comparable—primiparae giving a higher foetal death rate than multiparae, as might be expected. The figures for caesarean section are much lower, and again are comparable. It would appear, therefore, that in the Q series the large number of pregnancies allowed to continue to spontaneous labour accounted for the higher foetal mortality, and incidentally also for the fact that three mothers died undelivered. It will be seen from Table V that the practice in the K.C.H. series of terminating the pregnancy at about the thirty-sixth week by caesarean section or, in the case of those who have had a previous normal delivery, by induction has resulted in a great reduction in stillbirths but a considerable neonatal mortality. Until some reliable method of preventing death *in utero* in the last few weeks of pregnancy has been discovered—and I am not convinced that such a method yet exists—I feel that we are most likely to reduce the loss rate

by obtaining a live baby and directing our efforts to prevent it from dying. This brings me to my last consideration—namely, the newborn baby.

The Newborn Baby.—The majority of neonatal deaths occur within 48 hours of delivery and are due to what appears to be respiratory failure; the baby has recurrent attacks of apnoea with cyanosis, in one of which it dies. Other possible causes of death are foetal hypoglycaemia and congenital deformities. The latter are relatively common, and 19 instances were observed in 221 consecutive diabetic pregnancies at King's College Hospital, giving an incidence of 8.6%. Such deformities could not be related to duration or control of maternal diabetes, and, although all the mothers were receiving insulin, there was no evidence that hypoglycaemia was more frequent or more severe than in those pregnancies which resulted in normal children.

(8) Foetal Hypoglycaemia

Although once regarded as a likely cause of neonatal death, there has recently been a tendency to discount this possibility. In order to arrive at a more definite conclusion it was decided to estimate blood sugars at two-hourly intervals on a series of babies, half of whom received no glucose and the other half 50% glucose hourly by mouth. In all, 17 babies received glucose and 18 no glucose, the respective neonatal deaths being two in the former and four in the latter series. The number of cases is too small to allow of any definite conclusions, but certain findings are of interest. In one of those that received glucose and died there was no demonstrable sugar in the blood one hour before death, while in the other the blood sugar at the time of death was 175 mg. per 100 ml. In the same series eight of those that lived had blood sugars of 30 mg. or less in the first six hours, and in four of these the level fell to 20 mg. or less; one survivor had no demonstrable blood sugar at two hours after delivery. Of the 18 babies that received no glucose, three of the four that died showed levels of 35 mg. or less per 100 ml. within six hours of death, and the remaining one had a blood sugar of 78 mg. four hours before it died. The blood sugars of six of those that lived fell below 35 mg. per 100 ml., and in four of these it was less than 20 mg. It is difficult, therefore, to say more than that death may occur with a normal blood sugar and survival with a very low one or even without any demonstrable sugar in the blood. This problem clearly needs further study.

Conclusion

Great emphasis must be laid on the importance of the nursing and management of the newborn infant. The use of an isolette in which both oxygen content of the air and temperature can be controlled, and regular suction if there are any signs of respiratory embarrassment, may help to reduce neonatal mortality. The use of continuous low-pressure suction and some form of mechanical respirator are under consideration in our department, and electrolyte and hormone studies are being carried out on these babies in the hope that they may shed some light on the present obscure problem of the high foetal mortality in diabetic pregnancy.

I acknowledge my indebtedness to Mr. John Peel, who was not only responsible for the obstetric management of these cases but also played a large part in the collection and analysis of the questionnaire series. I am grateful to Dr. R. D. Lawrence for access to the records of his private patients.

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FATAL HYPOGLYCAEMIA IN A DIABETIC PATIENT WITH PITUITARY NECROSIS

BY

RICHARD I. ALEXANDER, M.B., Ch.B.

Lately, Resident House-Physician, Victoria Infirmary,
Glasgow

Case Report

The patient, a man aged 36 at his final illness in 1952, had no illnesses of importance in childhood, and his development was quite normal. In 1933, at age 17, he was admitted to hospital in diabetic coma. After treatment he was maintained on a diet and insulin, and remained well until 1940, when he was admitted to hospital in hypoglycaemic coma. He responded to treatment with glucose, and thereafter the diabetes was controlled by three daily injections of soluble insulin. In November, 1951, he was admitted to hospital after having been knocked down by a vehicle while in a hypoglycaemic state. He was dismissed, apparently in good health, on a diet of 212 g. of carbohydrate (2,352 calories) and two injections of soluble insulin a day—40 units in the morning, and from 25 to 30 units in the evening.

He seems to have been free of symptoms and regularly at work until April 29, 1952, when he complained of headache and nausea. He took his food and insulin as usual, and went to bed at 11.30 p.m. Two hours later he was found in coma and having convulsions. He was given sugar orally, and he recovered. Throughout that day he remained well, but at 10.15 p.m. he was seen to be acting as though drunk, and an hour later was again comatose and sweating profusely. Oral sugar revived him. Next day he felt well and took his food and usual insulin. At 10 p.m. he was seen staggering along the road, and at 11 p.m. was found completely comatose. He was given sugar by mouth, and at 12 midnight he was sitting up in bed talking and smoking. He had some tea to drink containing 12 teaspoonfuls of sugar. He did not take any more insulin. Two hours later, at 2 a.m. on May 2, he was once again comatose and having convulsions. It was found to be impossible to give him anything by mouth. At 9 a.m. his doctor gave him 50 ml. of 50% glucose intravenously, and 50 ml. of 10% glucose subcutaneously. This had no effect. He was admitted to the Victoria Infirmary at 1 p.m., having then been in coma for 11 hours.

On admission he was seen to be slimly built, but well nourished. He was completely comatose and was sweating profusely. His limbs were spastic, and irregular twitching movements were present. Plantar responses were extensor. Pupils were equal and reacted to light. There was nothing abnormal in the chest or abdomen. Axillary and pubic hair showed normal distribution.

Treatment and Progress

Blood was withdrawn for sugar estimation, and 100 ml. of 50% glucose was given intravenously. No change occurred in his condition. Intravenous glucose was repeatedly administered throughout the afternoon until a total of 300 g. had been given. The blood sugar on admission was 8 mg.

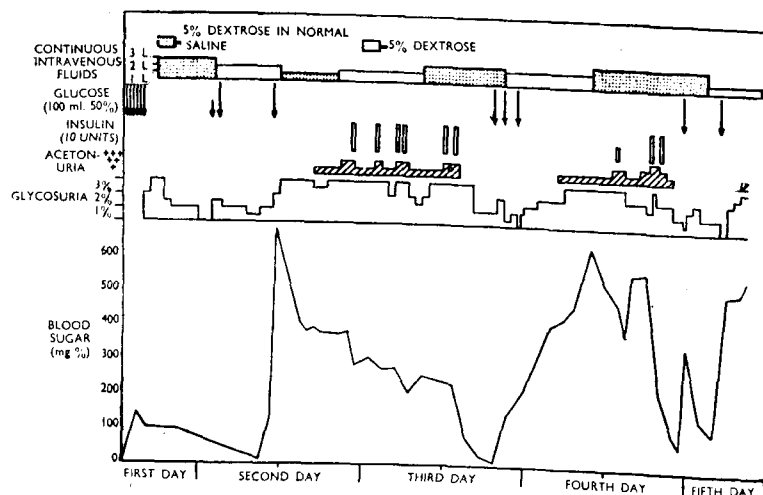


FIG. 1.—Showing intravenous therapy and insulin treatment, degrees of acetonuria and glycosuria, and blood-sugar levels.

Pituitary necrosis, not associated with shock or haemorrhage, is occasionally encountered in post-mortem examinations. Plaut (1952), in a routine series of necropsies, found pituitary necrosis in 13 out of 149 cases, but does not correlate these findings with clinical findings. Kraus (1920, 1926a, 1926b) noted the relative frequency with which pituitary necrosis is found in diabetics, and particularly in young diabetics, and described certain "diabetic changes in the hypophysis." Kiyono (1926) could find no characteristic changes in the pituitary glands of diabetics, but described two cases in which there was necrosis. Another two cases of pituitary necrosis in young diabetics were reported by Baló (1923).

When pituitary insufficiency complicates diabetes mellitus, conditions exist analogous to those in the Houssay animal. Houssay (1936) showed that diabetes produced in an animal by pancreatectomy was alleviated by subsequent hypophysectomy. Such an animal was readily rendered hypoglycaemic by fasting, and showed pronounced hypersensitivity to insulin.

This phenomenon has been observed in the human subject on a few occasions. Apart from a brief reference by Calder (1932) to a case of Simmonds's disease which showed amelioration of pre-existing mild diabetes, nine cases have been reported (Lyll and Innes, 1935; Kotte and Vonderahe, 1940; Feldman *et al.*, 1947; Vandenbroeck and Félin, 1947; Bastenie, 1949 (quoted by Poulsen, 1953); Marzullo and Handelsman, 1951; Williams, 1952; Israel and Conston, 1952; Poulsen, 1953). The ages of these nine cases (three male, six female) ranged from 29 to 53, with an average of 39. Three cases showed a great improvement in the diabetes (including, in Poulsen's case, disappearance of diabetic vascular lesions in the eye) and remained alive. In each case there was clinical evidence of pituitary damage. Of the six fatal cases necropsy was performed in every case. In the sixth case there was clinical evidence of pituitary insufficiency. In all the fatal cases there was a disappearance of signs of diabetes of either gradual or sudden onset, and in five of the cases death was associated with marked hypoglycaemia. In the remaining case the blood sugar was not estimated.

Irradiation of the hypophysis, leading to amelioration of diabetes, has been reported by Merle (1935) and by Balfour and Sprague (1949). Similar results following surgical removal of the hypophysis have been reported by Chabanier *et al.* (1936) and by Luft *et al.* (1952).

Another case of pituitary insufficiency in a diabetic is here reported.

Necropsy Report

Necropsy was carried out, four hours after death, by Dr. J. E. Craik, of the Department of Pathology, Victoria Infirmary. There was no evidence of bruising of the scalp or of an old fracture of the skull. The C.S.F. was increased in amount but was clear. There was oedema of the brain with flattening of the convolutions and a slight pressure cone on the inferior surface of the cerebellum, but not on the medulla or pons. The cerebral blood vessels were unusually healthy for a diabetic: they were thin and did not contain any

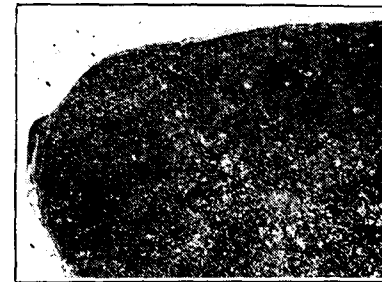


FIG. 2.—Low-power view of pituitary, showing two areas of necrosis. (H. and E. $\times 7$.)

plaques of atheroma. The brain weighed 1,510 g. The cut surface was moist, but there were no petechiae or larger haemorrhages. No softening or macroscopic abnormalities could be found.

The respiratory, circulatory, digestive, and genito-urinary systems showed no macroscopic abnormalities. The pancreas weighed 55 g.

The suprarenal glands were much enlarged, the right weighing 12 g. and the left 10.5 g. On section it was seen

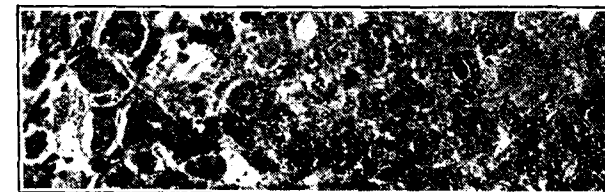


FIG. 3.—High-power view of anterior pituitary, showing recent necrosis to the right and normal pituitary cells to the left. Outlines of necrotic cells are still preserved, but nuclei are small and pyknotic, and the cytoplasm is losing its specific staining reactions. (H. and E. $\times 100$.)

that they had undergone simple hyperplasia, the proportions of cortex and medulla being normal. The pituitary and thyroid appeared normal.

Histology.—In the pancreas, islets of Langerhans were extremely scarce; in a search through two blocks of tissue only one islet was found. It was probably a little on the large size, but otherwise appeared normal. The thyroid showed histological evidence of hyperfunction. The acini varied greatly in size, some being so small as to be almost solid. They were lined by thick cubical epithelium, which was often folded. Colloid was well coloured but did not fill the acini completely, and often there was peripheral vacuolation. Both suprarenals were large, but the hyperplasia was proportional in the medulla and all the layers of the cortex. There was no histological abnormality. The pituitary showed peculiar patchy necrosis in the most anterior part of the anterior lobe. The necrosis was early;

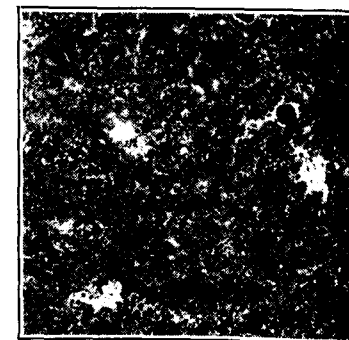


FIG. 4.—High-power view of anterior pituitary, showing older necrosis with gross granulocytic and lymphocytic infiltration. The architecture of the pituitary is almost completely destroyed. (H. and E. $\times 100$.)

per 100 ml. After one and a half hours this had risen to 148 mg., but the patient showed no improvement. Periodic convulsive attacks lasting 10 to 15 minutes occurred, separated by periods of relative calm lasting 24 to 40 minutes. At 4 p.m. a catheter was inserted and, from this time, frequent analyses of urine were made. Blood-sugar estimations were carried out regularly. At 6 p.m. continuous intravenous fluid was started, beginning with 5% dextrose in normal saline. Penicillin, 1,000,000 units, was given, followed by 500,000 units twice daily. Later in the day the convulsions became less severe, but generalized twitching movements persisted. At no time did he respond to cutaneous or aural stimuli.

May 3.—Throughout the day the patient's condition remained unchanged. The skin was moist and twitching movements were still present. Overnight the blood sugar had fallen to severe hypoglycaemic levels (11 mg. per 100 ml.), but subsequently rose and was maintained at between 300 and 400 mg. per 100 ml. Lumbar puncture was performed at 11 a.m.

May 4.—There was no improvement in his clinical state. A heavy glycosuria persisted, and on account of the appearance of ketonuria, increasing in amount, 10-unit doses of soluble insulin were given, up to a total of 60 units. The blood sugar, which throughout the earlier part of the day was maintained at between 200 and 300 mg. per 100 ml. suddenly fell to extremely low levels (14 mg.) with disappearance of ketonuria and glycosuria. Glucose, 150 g. was administered intravenously. The blood sugar then rose to between 100 and 200 mg. Lumbar puncture was repeated at 3.30 p.m.

May 5.—The patient's condition was still unchanged. During the afternoon twitching movements became less marked, and by 6 p.m. were no longer present. Hyperventilation developed and acetone appeared in the breath. Glycosuria and ketonuria increased, and the blood sugar rose to 651 mg. In spite of this hyperglycaemia, sweating remained profuse. Small doses of insulin up to a total of 25 units were again given, resulting in a fall of blood sugar to 78 mg.

May 6.—The limbs were now flaccid. Sweating was still occurring. The blood-sugar levels fluctuated between 118 and 561 mg. per 100 ml. The patient died at 11.10 a.m.

During this period in hospital there was an irregular pyrexia, with a terminal rise to 104.4° F. (40.2° C.). The blood pressure was maintained at about 115/75 until two hours before death, when it fell to 90/50.

The biochemical findings in blood and C.S.F. are summarized in Tables I and II. The fluctuations in blood-sugar readings, with details of therapy, are shown in Fig. 1. The Wassermann reaction of the blood and C.S.F. was negative.

TABLE I.—Biochemical Findings in the Blood

Date and Time	Urea (mg./100 ml.)	Chlorides (mg./100 ml.)	Alkali Reserve (Vol. CO ₂ %)	Potassium (mg./100 ml.)	Calcium (mg./100 ml.)	Phosphorus (mg./100 ml.)	Alkaline Phosphatase (K-A Units)
2/5/52 4 p.m.	46	416	48.1	18.9	—	—	—
3/5/52 11 a.m.	27	591	52.8	—	—	—	—
4/5/52 1.30 p.m.	39	627	45.3	18	9.7	1.15	8.2

TABLE II.—Biochemical Findings in the C.S.F.

Date and Time	Glucose (mg./100 ml.)	Chlorides (mg./100 ml.)	Protein (mg./100 ml.)	Cells (per c.mm.)	Granulocytes (%)	Lymphocytes (%)
3/5/52 11 a.m.	80	749	44	35	80	20
4/5/52 3.30 a.m.	208	767	54	23	76	24

in some patches the cells were still well preserved but had pyknotic nuclei; in some the cells were only just discernible; and in others the cells were lost, but the general architecture of the pituitary was still preserved (see Figs. 2, 3, and 4). It was thus obvious that the various patches of necrosis were not of the same age, though none was of more than a few days' duration. In the brain, sections from the pons showed various degrees of degeneration of ganglion cells. A few appeared normal. Most showed moderate or severe chromatolysis up to complete loss of nuclei. Shrinkage of ganglion cells was a feature, most being surrounded by a clear zone. There was no evidence that glial proliferation had begun. In the liver, glycogen was increased, as was to be expected. Otherwise the histological appearances were normal.

Comment

The notable feature of this case is the sudden development of a series of severe hypoglycaemic episodes in a diabetic patient who seems to have been under at least moderately satisfactory control for 19 years. The last of these episodes, which terminated in coma lasting four and a half days and death of the patient, began two hours after he had been treated successfully for an insulin reaction, and in spite of the fact that additional glucose, but no insulin, was given. In hospital, extremely large doses of glucose were required to raise the blood-sugar level, which, however, fell spontaneously to a severe hypoglycaemic level. Later, when small doses of insulin were given to combat ketosis, the blood sugar fell to unexpectedly low levels even while glucose was being administered by intravenous drip. This state of affairs suggests suddenly acquired extreme insulin sensitivity, and the explanation for this may lie in the pathological changes found in the pituitary.

Death in this case resulted from extended hypoglycaemia. Since the brain can utilize only glucose for its metabolism, if this is virtually absent from the blood for a considerable period irreversible changes may be expected in the brain cells. These changes have been studied by Baker and Lufkin (1937), Baker (1938), Sahs and Alexander (1939), and Lawrence, Meyer, and Nevin (1942). The duration of hypoglycaemia required for these changes is not known exactly, although Lawrence *et al.* state that hypoglycaemic coma of one to three hours is compatible with recovery. In the above case the patient had been in coma for 11 hours before admission, and remained in coma despite the rise of blood sugar. Cellular changes in the brain similar to those reported by these observers were, in fact, present.

Summary

Pituitary necrosis is occasionally encountered in routine necropsies. Its occurrence in diabetic subjects is noted.

The Houssay phenomenon is described, and cases are cited of this phenomenon occurring in man.

Irradiation of the hypophysis and hypophysectomy as a treatment of diabetes is mentioned.

Another case of pituitary insufficiency in a diabetic is reported.

Extended hypoglycaemia as the ultimate cause of death is discussed.

I wish to thank Dr. Ian Murray, of the Department of Metabolic Diseases, Victoria Infirmary, for his help and encouragement in the preparation of this article, and for his permission to publish this case; also the staff of the Department of Biochemistry, and Mr. Grey, of the Photographic Department, for their assistance.

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FRIEDREICH'S ATAXIA COMBINED WITH DIABETES MELLITUS IN SISTERS

BY

D. W. ASHBY, M.D., M.R.C.P.

Physician to the Gateshead Hospitals

AND

P. S. TWEEDY, M.D., M.R.C.P.

Late Senior Registrar, Bensham General Hospital

The combination of Friedreich's ataxia with diabetes mellitus in families has been mentioned mainly in Continental literature. Schlezinger and Goldstein (1940), in the only comprehensive survey in the English language, list 18 patients from the literature with two of their own. The comparative rarity of the association prompts us to record its occurrence in two sisters.

Case 1

A woman aged 28 was admitted to hospital on September 15, 1950. She had been a full-term normally delivered infant. During her childhood her family noticed that she tended to stumble, to walk on her toes, and to be unable to play or skip normally. The stumbling increased, until at the age of 14 she could just walk along a narrow passage by supporting herself with her hands on the walls, and at this time she could not sit upright in a chair. From the age of 22 she had been partly confined to bed, being able to get around only by holding on to objects in her room, and from 27 she had been wholly bedridden. In 1948 she had been investigated for joint pains and was found to have diabetes mellitus. She was put on a diet without insulin, to which she had since adhered. Menstruation had been scanty, only two to three days every three months, following menarche at 16.

Physical Examination.—The patient sat slumped in a chair and was unable to walk even with assistance. No abnormal signs were found in the heart, lungs, or abdomen. The blood pressure was 108/80. **Skeletal system:** Scoliosis and bilateral pes cavus were present. **Central nervous system:** The patient was fully co-operative. Well-marked head-nodding, particularly during questioning, slurred and slow speech, and coarse lateral and rotary nystagmus were noted. The pupils were equal and reacted briskly to light and on accommodation. The fundi were normal. Right eye 6/12, left 6/6. Colour vision was normal. Other cranial nerves were normal. The upper limbs showed gross hypotonia, ataxia, dysmetria, dysidiadochokinesia, intention tremor, and diminished power, particularly of grip. The biceps, triceps, and supinator jerks were present and equal though diminished, and there was no wasting or sensory change apart from absent postural sensibility of the finger. The legs showed hypotonia, incoordination, dysmetria, an

ataxia. Knee- and ankle-jerks were absent, plantar responses extensor. Postural and vibration sense were absent in lower limbs. **Endocrine system:** The pubic and axillary hair normal, no facial hirsuties. There was no abnormal pigmentation. Breast development was normal. The thyroid was of normal size. The reproductive organs were hypoplastic.

Investigations.—The urine contained sugar but no acetone or albumin. On a 140-g. carbohydrate diet and 38 units of soluble insulin morning and evening, blood sugars after a 40-g. breakfast were: 8 a.m., 163 mg.; 10 a.m., 135 mg.; 12 noon, 120 mg. per 100 ml. The fasting blood sugar (receiving insulin) was 140 mg. per 100 ml. A chest radiograph showed normal lung fields and heart shadow. A radiograph of the skull showed a normal sella. Electrocardiograph: Sinus rhythm, 100 a minute; standard leads showed left axis deviation; P-R interval 0.1 second, QRS 0.08 second, T2 flat, T3 inverted, ST3 0.5 mm. depression; leads V4 and V6 showed low-voltage and notched T waves. The serum Wassermann reaction was negative; serum sodium, 300 mg. per 100 ml.; blood cholesterol, 85 mg. per 100 ml. The basal metabolic rate was within normal limits. Cerebrospinal fluid: Normal pressure, normal chemistry and cytology; Wassermann reaction, negative. The 17-ketosteroids were normal, 13 mg. per 24 hours.

Case 2

A woman aged 26, a sister of Case 1, was admitted to the same hospital on February 6, 1951. Schooling had been normal until the age of 13. She had had scarlet fever at 7. After this she had begun to stumble like her sister, to be unable to skip, and to walk on her toes, so that her shoes became worn beneath them. At 19, after an influenzal illness, she was no longer able to walk without help. Her symptoms progressed without remission until the year before admission, from which time she had been confined to her bed, although able to walk with assistance. Two years previously she had been losing weight and her doctor had discovered sugar in her urine. She had been stabilized on insulin with diet. Her menstruation was normal, with menarche at 15.

Physical Examination.—Although confined to bed during the previous year, she was able to walk with aid or with a walking-machine. No abnormal signs were found in the heart, lungs, or abdomen. The blood pressure was 110/85. Lower limbs showed acrocyanosis. **Skeletal system:** Pes cavus on right was present. **Central nervous system:** She was less affected by ataxia than her sister and was brighter mentally. There were oscillating movements of the head and restless movements of the arms, and nystagmus with coarse component to the right. Pupils were equal and reacted briskly to light and on accommodation. Other cranial nerves were normal. The fundi were normal; right eye 6/18, left 6/6. Colour vision was normal. The upper limbs showed hypotonia, dysmetria, and dysidiadochokinesia. The right biceps-jerk was diminished. There were no wasting and no sensory changes. The lower limbs showed weakness without wasting, hypotonia, absent knee- and ankle-jerks, and bilateral extensor plantar responses. Weakness was more marked in the proximal segments; the grip and ankle movements were fair, shoulder and hip movements weak. Vibration sense was absent at the ankles, but other forms of sensation were normal. **Endocrine system:** The pubic and axillary hair were normal; no facial hirsuties. There was no abnormal pigmentation. Breast development was normal. The thyroid was of normal size. The reproductive organs, though hypoplastic, were more developed than her sister's.

Investigations.—The urine contained sugar but no acetone or albumin. On a 100-g. carbohydrate diet with 35 units of soluble insulin morning and evening, blood sugars after a 30-g. carbohydrate breakfast were: 8 a.m., 215 mg.; 10 a.m., 150 mg.; 12 noon, 140 mg. per 100 ml. Fasting blood sugar (receiving insulin) was 180 mg. per 100 ml. A radiograph of the chest showed normal lung fields and heart shadow. A radiograph of the spine showed no spina bifida.

The serum Wassermann reaction was negative. Electrocardiograph: Sinus rhythm 100 a minute; low voltage QRS complexes, P-R interval 0.12 second; T waves—changes in all leads, particularly diphasic in T1 and T2, inverted aVL flat in V6. A radiograph of the skull showed the sella, though small, to be within normal limits. The serum sodium was 315 mg. per 100 ml.; blood cholesterol, 206 mg. per 100 ml. The basal metabolic rate was within normal limits. Cerebrospinal fluid: normal pressure, normal chemistry, and cytology; Wassermann reaction negative. The 17-ketosteroids were normal, 10 mg. per 24 hours.

Family History

Among the patients' parents and their siblings there was no history of clumsiness of gait, foot deformity, twisted spine, or diabetes. III(4), III(6), and II(3) (see Fig. 1) were found to be free from neurological disorder, glycosuria, and

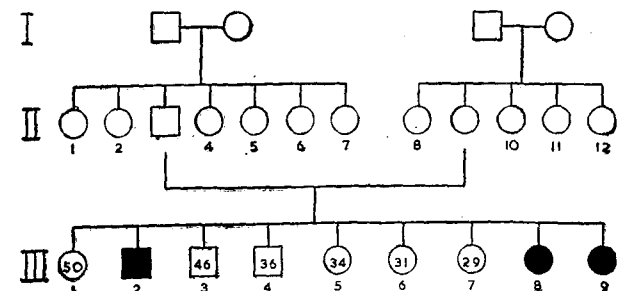


FIG. 1.—Family tree.

congenital deformities. The urines of III(1), III(5), and III(7) did not reduce Benedict's reagent. The eldest brother, III(2), is stated by the sisters to have had a nervous disease similar to their own and to have died from the effects of diabetes at the age of 31. Records of his death have not been available. There was no consanguinity between their parents. Information about the grandparents was scanty.

Recorded Cases of the Combination

Since Schlezinger and Goldstein's paper Segall (1948) has described diabetes in taste-blind identical twins, one of whom had a peculiar dragging walk; both had pes cavus and gradually developing muscular incoordination. Although



FIG. 2.—Photograph of the two sisters. Case 1 is on the right.

the diagnosis of Friedreich's ataxia was not made in these twins, it seems reasonable to suppose that this was in fact the diagnosis. Dassen, Soto Romay, and Fustinoni (1939), have described two cases, not included in Schlezinger and Goldstein's review. Further mention of the combination comes from Bell (1939), who records one patient and a sibling with Friedreich's ataxia, not previously recorded, and from Richards (1946), who described three patients with Friedreich's ataxia in one family, of whom two were diabetic, both males. The present pair brings the total to 29 patients, 20 being females, one pair of these being twins. They are members of the seventh family to be recorded.

Onset of Ataxia and Diabetes

The onset was usually in the first two decades of life, and the Friedreich's ataxia has always preceded the diabetes, which began acutely, requiring insulin for its control or leading to death. However, one of the patients described by Schloss (1932) had merely glycosuria after a high carbohydrate diet, while Mollaret's (1929) patient had only a single episode of severe diabetes mellitus, leading to coma, then subsiding, ultimately requiring no treatment.

Pathogenesis

Schlezinger and Goldstein discuss, apart from coincidence, theories of hereditary predisposition, chromosome linkage, diabetic myelopathy, and neurogenic diabetes.

Coincidence

That the association of Friedreich's ataxia with diabetes mellitus is more than a chance coincidence has been claimed by Curtius, Störing, and Schönberg (1935), and re-emphasized, though with little further evidence, by Schlezinger and Goldstein. A demonstration that the incidence of diabetes mellitus is greater in people with Friedreich's ataxia than in the general population would rule out coincidence. The former authors give the estimated incidence of Friedreich's ataxia in Switzerland as 1 in 90,000. If the incidence were the same in this country there would be about 400 to 500 cases. Taking the total number of diabetics as 150 to 200,000 (Lawrence, 1944)—an incidence of about 1 in 250—one might perhaps expect two of the cases of Friedreich's ataxia to have diabetes mellitus. There is no way of confirming these estimates, but Bell (1939) lists 846 cases of Friedreich's ataxia and hereditary spastic paraplegia (which may be due to a similar genetic fault), including five cases of the combination with diabetes. This is a somewhat higher incidence of diabetes than in the general population, although the numbers involved are small and are a highly selected group.

The most striking thing about the Friedreich's ataxia and diabetes mellitus combination is that the diabetes occurs only in those members of the affected families who have ataxia. There are five members of the sibships concerned who have ataxia alone. The recorded incidence of diabetes then is evidently more in the ataxics than in the other members of the family. It is not known how far the various authors looked for diabetes in the families of patients having Friedreich's ataxia by itself. Curtius *et al.* investigated 41 out of 51 relatives of their two patients with the combination, and found evidence of neither diabetes nor neurological disorder among them. The incidence of status dysraphicus, comprising such conditions as enuresis, funnel-shaped sternum, kyphoscoliosis, asymmetry of breasts, contracture of little finger, pes cavus, spina bifida, acrocyanosis, lumbarization of first sacral vertebra, and cleft palate, was, however, higher than in random samples of the population.

Chromosome Linkage and Genetic Factors

Juvenile diabetes is thought to be inherited as a recessive, though the frequency of manifestation is low in those with appropriate constitution (Gates, 1946). Bell and Carmichael (1939) state that approximately two-thirds of their cases of ataxia were inherited as recessives. If linkage occurs two types of sibships should result: (1) three normal siblings to

one with both diseases, and (2) two normal siblings to one with ataxia and one with diabetes. The second type should be three times as common as the first. Most of the reported sibships containing diabetes and ataxia are of the first type, though some also contain one or more cases of ataxia alone, which could be explained on the basis of failure of manifestation of the diabetes. Sibships of the second type seem very uncommon. There are none in Bell and Carmichael's series, and it seems unlikely that diabetes has been missed in the family histories, as it is such a striking disease to the relatives. Moreover, in the pedigree of Curtius *et al.* the histories of 96 members were elicited, 41 out of 51 living members being examined and no diabetes being found.

The lack of sibships with individuals showing one condition or other, and not both, also tells against a hypothesis of looser linkage with cross-overs.

There are three other possibilities to be considered: (1) the ataxia gene may occasionally give rise to diabetes; (2) there may be two separate genes, one giving rise to ataxia only, the other giving ataxia and diabetes; and (3) the ataxia gene may express itself in different ways according to the genetic pattern of its environment.

The first possibility does not explain multiple cases of diabetes and ataxia in the same sibship. It would be supported if a high percentage of subclinical diabetes could be found in ataxic families without manifest diabetes. With regard to the second hypothesis, it is known that there are at least three different genetic types of ataxia—dominant, recessive, and sex-linked recessive (Bell and Carmichael). There is no definite proof that these three types are each due to a single gene. Ataxia combined with diabetes may well be a hereditary syndrome due to a gene different from that of recessive ataxia; the combination of these two diseases may represent the fully developed syndrome, ataxia alone being a milder form with failure of manifestation of the diabetes. This would explain the occurrence of both diseases in one or more members of a sibship and ataxia alone in another. The third possibility is attractive because it would link diabetes with some of the other dysbiotrophies mentioned later and would also effectively explain the multiplicity of cases of diabetes and ataxia within the one sibship. Both diabetes and other dysbiotrophies could result from the effect of certain genetic environments on the ataxia gene. For instance, retinitis pigmentosa has been reported as occurring in the siblings affected by ataxia in two different families (Claus, Frenkel, and Dide, quoted by Alpers and Waggoner, 1929).

Neurogenic Diabetes

No neurogenic lesion causing permanent diabetes has been described. Claude Bernard (1855) produced transient hyperglycaemia by puncture of the fourth ventricle, stimulation of the posterior part of the hypothalamus having a similar transient effect. Stimulation of the ventro-medial nucleus also causes hyperglycaemia, while destruction of these nuclei protects the animals from diabetes normally produced by pancreatectomy (Le Gros Clark *et al.*, 1938). Clinically, such conditions as basal meningitis, cerebral haemorrhage, trauma, and neighbourhood tumours may all produce transient hyperglycaemia, but not permanent diabetes. Friedreich's ataxia does not produce irritative neurological phenomena, and it is difficult to see how a degenerative lesion of the above-mentioned hypothalamic nuclei could cause a diabetes presenting clinically as what Lawrence (1951) calls the "insulin-deficient type." Further evidence against the concept of neurogenic diabetes is afforded by the lack of correlation between the course of the diabetes, which develops acutely over a few weeks or months, and the slow course of the Friedreich's ataxia. In those patients who died in coma there is no report of any dramatic increase in signs of damage to the central nervous system. Moreover, other symptoms of hypothalamic disturbance, such as changes in sleep rhythm, polyphagia, hyperthermia, hyperhidrosis, diabetes insipidus, excessive emaciation, or obesity, have not been described in those cases which have diabetes. Of the 26 patients described in detail, two were physically

underdeveloped and had menstrual irregularity, and three (including our Case 1) showed an infantile uterus with amenorrhoea or oligomenorrhoea. These are the only symptoms which might conceivably be put down to hypothalamic damage. Records of histological examination of brain stem and hypothalamus are scanty. Rossi (1893), quoted by Schlezinger and Goldstein, described areas of degeneration subcortically, including the basal ganglia; and Wichtel (1943), cited by the same authors, reported degenerative change in the dorsal vagus and dentate nuclei, but normal basal ganglia and tuber cinereum. Köhne (1941) demonstrated normal supraoptic and paraventricular nuclei. The pituitary gland showed only an excess of eosinophil cells. There is thus little or no positive evidence in favour of the hypothesis of neurogenic diabetes.

Diabetic Myelopathy

As Friedreich's ataxia precedes the onset of diabetes mellitus, and is unlike any recognized neurological complication of it, theories of diabetic myelopathy need not receive serious consideration.

Dysbiotrophy

Endocrine disturbances in Friedreich's disease are almost always due to hypofunction of one or more glands of internal secretion—for example, myxoedema, genital infantilism (Curtius *et al.*; Schlezinger and Goldstein). As diabetes can be a manifestation of islet-cell hypofunction, it can be regarded as analogous to these and other non-neurological dysbiotrophies that occur, such as spina bifida, supernumerary digits, etc. The occurrence of some of these conditions, particularly the endocrine disturbances, may be determined by the genetic milieu of the ataxia-bearing gene, thus providing cases analogous to those with diabetes mellitus and Friedreich's ataxia.

Summary

Cases of Friedreich's ataxia and diabetes occurring in siblings are described; the previous literature is reviewed and theories of causation are discussed. Of these, the hypothesis that the combination is either a hereditary syndrome or an effect determined by the genetic milieu of the ataxia-bearing gene seems most satisfactory.

We are indebted to Dr. C. N. Armstrong for his helpful criticism and suggestions; to Mr. David F. Smith for his report on the pelvic organs; to Dr. A. C. Crooke for his estimation of the urinary 17-ketosteroids; to Miss U. Phillip for help with the genetic aspects of this paper; and to Dr. Julia Bell for reading the manuscript.

ADDENDUM.—Since this paper was submitted for publication Dr. H. A. Dewar has kindly drawn our attention to two further sisters. One, aged 16, has recently been under his care at the Royal Victoria Infirmary, Newcastle-upon-Tyne. She has mild ataxia, optic atrophy, and diabetes mellitus requiring insulin for its control. Her sister died in diabetic coma at the age of 19, and is said to have had ataxia and optic atrophy as well.

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TIME OF ERUPTION OF PERMANENT TEETH IN BRITISH CHILDREN IN 1947-8

BY

E. M. B. CLEMENTS, M.B., B.S.

E. DAVIES-THOMAS, M.R.C.S., L.R.C.P.
L.D.S. R.C.S.

AND

KATHLEEN G. PICKETT, B.Sc.

(From the Department of Anatomy, University of Birmingham)

The most recent study of the times of eruption of the permanent teeth in British children is the survey made by Ainsworth in 1925. The object of the present paper is to bring the subject up to date, both by the assembly of new data and by the use of modern methods of analysis. Graphical techniques have usually been employed for estimating the mean eruption times of human teeth—for summaries of the data see Schultz (1934), Dahlberg and Maunsbach (1948), and Gödény (1951). Dahlberg and Maunsbach, and Gödény, have based their own analyses upon the observation of Klein, Palmer, and Kramer (1937) that the frequencies of erupting teeth at successive ages follow the normal probability function. The precision of the statistical methods for analysing integral responses of this function has been greatly improved over the past twenty years by the development of probit analysis (see Finney, 1947), and it is now possible to specify the statistical error of the estimates.

This paper is based on the analysis of dental observations made during the course of the Birmingham Anthropometric Survey on 1,427 boys and 1,365 girls attending elementary schools. The children, who ranged in age from 5 to 13 years, were unselected and were drawn from 87 infant, junior, and secondary modern schools representing all types of area in the City of Birmingham.

Survey

Dental Examination.—The children were examined by one observer throughout (E.D.-T.). Examination was made in a good light with a dental mirror and probe. The observations were dictated to a clerical assistant, who recorded the findings on a standard form. unerupted and extracted teeth were recorded as not present. The number of teeth extracted during the period of eruption will be very small, and will not have affected the analysis materially. A tooth was classified as erupted as soon as the gum was pierced. Clinical observations on the teeth were also recorded, but these have not been analysed in this paper.

Social and Anthropometric Data.—The Birmingham Anthropometric Survey recorded the occupation of either the father or the family's chief wage-earner. This information was coded into the appropriate socio-economic classification of the Registrar-General by reference to the Classification of Occupations. Class I comprises the professional, Class II the intermediate, Class III the skilled, Class IV the semi-skilled, and Class V the unskilled occupations. The development of puberty was assessed and scored on a four-point scale, using a scheme based on the classification proposed by Greulich *et al.* (1942). The age in months was recorded from the school records to the month below—that is, the age reached. The mean eruption times which are presented have not been adjusted for this grouping. At the examination an index number was allocated to each child to identify both the child and its school.

Combination of the Dental and Anthropometric Surveys

The index number allocated to a child in the anthropometric survey was used in the dental survey. This common index number has linked the two surveys and has been the means of associating the information collected in each.

The records of the dental survey were coded into a numerical form suitable for punching into standard 80-column Hollerith cards. The basis of this coding was that each column represented a tooth, and permitted up to 12 subdivisions. One of these was used to represent each of the possible classes of "absent" and "present" teeth, combined with observations on the incidence of caries.

A set of punch cards was prepared by a mechanical "reproducer" from the master cards of the Birmingham Anthropometric Survey to include only the index number, the age, and other coded information, the punches being made only in the first 19 columns. These cards were passed through a "mechanical interpreter" which printed the index number on the card so that it was easily legible. These "reproduced" punch cards were then matched with the coded dental records, and the dental information read from the records was punched into the remaining columns.

The last preparatory procedure was carried out only to facilitate the computing, and consisted in converting the ages, so far recorded in months, into periods of a quarter of a year by grouping them in threes. The different groups were numbered in numerical order—for example, the ages, 060, 061, 062 (in months) were all numbered 01 (first quarter year) and so on. Each group had the number punched mechanically into the cards. The various manual steps in the coding and punching have been verified at each stage.

Statistical

A preliminary tabulation was made of the number of boys and girls in each age group. The number of erupted teeth in each group was then tabulated for each tooth. The probability of observing erupted teeth in each age group was computed from these data. These probabilities were graphed for all the teeth in the right lower jaw. They were transformed into probit values, and these were also

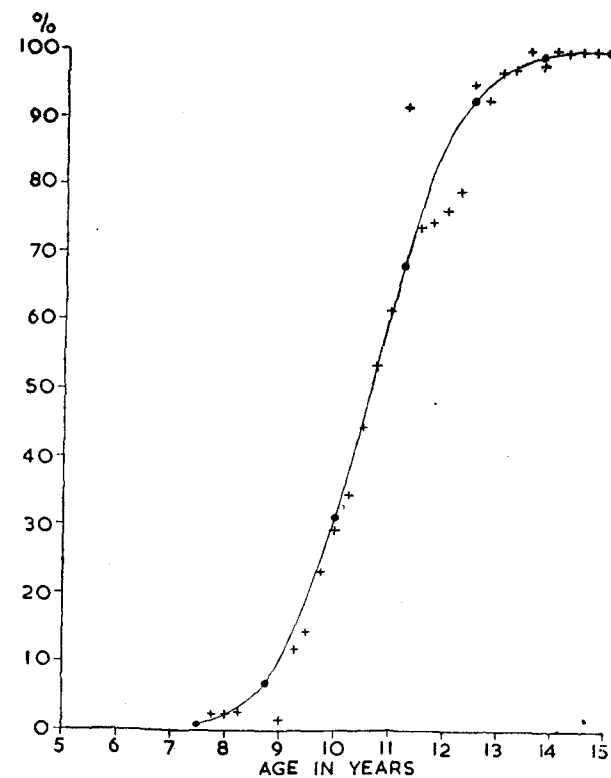


Chart showing the observed probability of eruption of boys' lower right canine teeth at different ages.

graphed. The best-fitting straight line was fitted to these points, and from this line the corrected probit values were read off and transformed into probabilities. These corrected values were plotted on to the original graphs, and were found to smooth the observed data well. These findings indicate that the normal probability function will form the basis of a satisfactory analysis. As an example the probability of finding erupted lower canine teeth at different ages is shown in the Chart, and the smooth probability curve has been fitted in the manner described.

The analysis has been made by the probit method. The computations were based on the observed probabilities of finding the teeth erupted at various ages. The technique used was that devised by Black (1950), and the coefficients were corrected for the effects of grouping by the technique of Tocher (1949). Errors of estimate for the various statistics have been computed, and the various tests of significance have been made using a "t" test. There is no evidence of heterogeneity of departure from the fitted probit lines. In the main samples, too, in which the development groups and social classes are pooled, the values of "g" are all less than 0.1, and all except two of them are less than 0.05.

Results

For convenience the following abbreviations have been used in reporting the findings: I_1 for the central incisor tooth; I_2 for the lateral incisor tooth; C for the canine tooth; Pm_1 for the first premolar tooth; Pm_2 for the second premolar tooth; M_1 for the first molar tooth; M_2 for the second molar tooth. No erupted third molar tooth was seen.

Mean Eruption Times of the Teeth.—The data for the teeth of the right upper and lower jaws have been examined in detail, and these form the basis of the various comparisons which have been made. The mean eruption times of the teeth in the upper and lower jaws are given in Table I for both sexes, with the standard error and the 5% and 95% fiducial limits of the mean. The statistics presented in Table I are based on a relatively heterogeneous

TABLE I.—Mean Eruption Times, Standard Errors, and the 5% and 95% Limits of the Mean, of the Teeth in the Right Upper and Lower Jaws

Tooth	Boys				Girls			
	Mean in Months	S.E.	5-95% Limit of Mean		Mean in Months	S.E.	5-95% Limit of Mean	
			Upper	Lower			Upper	Lower
Upper Jaw								
I ₁	84.13	0.71	85.52	82.74	79.46	0.57	80.58	78.34
I ₂	98.17	0.74	99.62	96.72	93.80	0.87	95.51	92.09
C	137.56	0.92	139.37	135.75	128.07	0.85	129.73	126.40
Pm ₁	124.96	1.12	127.16	122.76	117.45	0.84	119.09	115.80
Pm ₂	138.22	1.13	140.43	136.01	132.76	1.17	135.04	130.47
M ₁	73.29	0.78	74.83	71.76	71.25	0.77	72.76	69.74
M ₂	143.67	0.94	145.51	141.84	137.94	0.88	139.66	136.22
Lower Jaw								
I ₁	72.96	0.72	74.38	71.54	69.22	0.57	70.35	68.08
I ₂	87.63	0.71	89.01	86.25	84.17	0.70	85.55	82.79
C	126.16	0.80	127.72	124.61	112.90	0.74	114.34	111.45
Pm ₁	136.20	0.99	138.14	134.26	126.33	0.94	128.18	124.48
Pm ₂	147.87	1.17	150.16	145.57	139.62	1.17	141.91	137.33
M ₁	73.69	0.79	75.24	72.15	70.08	0.67	71.40	68.77
M ₂	136.87	0.84	138.53	135.22	134.15	0.89	135.89	132.40

sample. Thus, children from all classes of the Registrar-General's (1931) socio-economic classifications are included, and in the older age groups adolescents are grouped with children who do not yet show external signs of puberty. The data have been examined to see if these factors influence the mean eruption times of the teeth.

Mean Eruption Times of Teeth in Different Social Classes.—The data were sub-classified into the social classes previously specified. Class I was combined with Class II, and Class IV with Class V. Probit computations were carried out on the data for the right lower teeth in boys. None of the differences are statistically significant, although a trend towards an earlier eruption in Classes I and II

TABLE II.—Mean Eruption Times and Standard Errors of the Teeth in the Right Lower Jaw for Social Classes I and II Combined and for Class III in Boys*

Tooth	Mean Eruption Time in Months with S.E.	
	Social Classes I and II Combined	Social Class III
I_1	68.0±4.9	73.7±0.9
I_2	84.2±1.9	88.3±0.8
C	127.7±3.3	126.4±1.1
Pm_1	133.7±5.0	136.8±1.3
Pm_2	141.0±5.3	148.2±1.5
M_1	73.5±3.1	73.7±1.0
M_2	132.7±4.7	137.2±0.9

* For explanation of classes see text.

combined is apparent. The statistics for Classes I and II combined and for Class III are given in Table II. Classes IV and V combined follow Class III very closely. The mean difference between the classes, over all the teeth, is 3.36 ± 1.13 months, a finding which indicates that the differences between the mean eruption times are important. Further analysis was unprofitable because of the small number of children in Classes I and II.

Variation in Mean Eruption Time Associated with Puberty.—The data were sub-classified into two groups: (1) those showing no onset of pubertal development; and (2) those showing obvious signs of such development. The mean eruption times were computed for the right lower C, Pm_1 , Pm_2 , and M_2 teeth of boys and girls, and are given in Table III. A trend towards the earlier eruption of teeth

TABLE III.—Mean Eruption Times and Standard Errors of the Lower Right C, Pm_1 , Pm_2 , and M_2 Teeth in Boys and Girls With and Without the Physical Signs of Puberty

Tooth	Boys		Girls	
	Mean Eruption Times in Months with S.E.		Mean Eruption Times in Months with S.E.	
	No Development	With Development	No Development	With Development
C	127.7±1.3	123.2±3.7	113.3±0.7	108.9±6.6
Pm_1	137.4±1.6	137.6±2.2	126.8±1.6	124.1±4.4
Pm_2	148.8±1.8	147.8±1.9	136.3±1.7	129.3±8.3
M_2	137.8±1.2	135.3±2.3	133.6±1.1	130.2±2.8

in the pubescent group is apparent in both sexes, although the differences between the mean eruption times are not statistically significant. The mean difference between the two groups, over all the teeth, is 1.95 ± 1.0 months for boys and 4.13 ± 0.72 months for girls; values which indicate that the differences between the mean eruption times of the groups are important. No sub-classification was made into the various stages of puberty, although it was apparent that the few boys and girls who were well advanced all had their M_2 teeth, whatever their age. This observation indicates that if children are examined on several occasions during their growth the early eruption of the M_2 tooth may be found to be associated with early puberty.

The effect of a possible interaction between the social and developmental classifications of the data has been ignored in making these examinations, but the findings indicate that, whilst the mean eruption times of teeth recorded in Table I

TABLE IV.—Difference in Months Between the Mean Eruption Times with the Standard Error of the Corresponding Right and Left Teeth of the Upper and Lower Jaws

Tooth	Right and Left Upper Jaw		Right and Left Lower Jaw	
	Boys	Girls	Boys	Girls
I_1	+2.09±1.41	-0.07±0.89	-0.71±1.08	-0.26±0.79
I_2	-0.37±0.95	+0.59±1.27	+0.18±1.03	-0.16±1.01
C	+0.70±1.48	-0.97±1.27	+0.12±1.14	+0.07±1.03
Pm_1	-0.34±1.52	+0.99±1.18	+0.88±1.44	-0.02±1.40
Pm_2	-0.56±1.58	-1.92±1.80	+0.31±1.64	-0.67±1.72
M_1	+0.66±1.15	+0.49±1.01	+0.49±1.02	+1.17±0.94
M_2	-0.02±1.26	-0.23±1.24	-1.45±1.30	+1.08±1.28

The mean eruption time of the left tooth has been subtracted from that of the right in all cases.

may apply to elementary schoolchildren generally, because slight variations in the constitution of this population from place to place may be ignored, they should not serve as standards for other groups of children.

Mean Eruption Times of the Dentitions on the Right and Left Sides.—The mean eruption times have been computed for the right and left upper and lower teeth. The differences between these times are set out in Table IV. No significant difference was found between the mean eruption times of the teeth of the right and left sides of the upper and lower jaws in boys and girls.

Sexual Differences in the Mean Eruption Times.—A comparison of the mean eruption times of the teeth in the right upper and lower jaws of boys and girls is given in Table V.

TABLE V.—Differences Between the Mean Eruption Times, with Standard Errors, of the Teeth of Boys and Girls in the Right Upper and Lower Jaws, and Between the Upper and Lower Jaws in the Same Sex

Tooth	Right Upper Jaw	Right Lower Jaw	Boys	Girls
	Difference Between the Mean Eruption Times in Months, with S.E.	Difference Between the Mean Eruption Times in Months, with S.E.	Difference Between the Mean Eruption Times in Months, with S.E.	Difference Between the Mean Eruption Times in Months, with S.E.
	Boys—Girls	Boys—Girls	Upper—Lower	Upper—Lower
I_1	+4.67±0.91†	+3.74±0.92†	+11.17±1.01†	+10.24±0.81†
I_2	+4.37±1.14†	+3.46±1.00†	+10.54±1.03†	+9.63±1.12†
C	+9.49±1.25†	+13.26±1.09†	+11.40±1.22†	+15.17±1.13†
Pm_1	+7.51±1.40†	+9.87±1.37†	+11.24±1.49†	+8.88±1.26†
Pm_2	+5.46±1.63†	+8.25±1.66†	+9.65±1.63†	+6.86±1.65†
M_1	+2.04±1.10	+3.61±1.04†	-0.40±1.11	+1.17±1.01
M_2	+5.73±1.29†	+2.72±1.22*	+6.80±1.26†	+3.79±1.28†

* Probability of less than 5%.
† Probability of less than 1%.

In the upper jaw the mean eruption time of every tooth with the exception of the M_1 was significantly later for the boys than for the girls. In the lower jaw the mean eruption times of the teeth in boys were significantly later than those for the girls. (The level of significance of the difference in the case of the M_2 tooth is only at the 5% level of probability.) This finding confirms the previous observations made by Ainsworth (1925) and Leslie (1951).

Comparison of the Mean Eruption Times of the Corresponding Upper and Lower Teeth.—The differences between the mean eruption times for boys and girls are given in Table V. It is apparent that the mean eruption times of the teeth in the upper jaw are later for both sexes, with the following exceptions:—Boys: The lower Pm_1 and Pm_2 teeth erupt about 11 and 10 months respectively after the corresponding upper teeth (a difference statistically significant at the 1% level of probability). The difference between the upper and lower M_1 teeth was not significant. Girls: The lower Pm_1 and Pm_2 teeth erupt a matter of nine and seven months respectively after the upper teeth (both differences are statistically significant at the 1% level of probability). The difference between the mean eruption times of the upper and lower M_1 teeth was not significant. The observation that the mean eruption time of the lower Pm_1 tooth is significantly later than that of the upper for boys and girls, whereas generally the teeth in the upper jaw are later than those in the lower jaw, has also been made in previous surveys.

Sequence of the Mean Eruption Times.—The order of eruption of the teeth determined from the mean eruption times is set out in Table VI. It is found that the order is the same in boys and girls, but that the order is different in the upper and lower jaws. The eruption times of the I_1 and M_1 teeth and the Pm_1 , Pm_2 , and M_2 teeth are so similar that sampling variation can give rise to a different order of eruption in a proportion of determinations. The order of eruption of the teeth has been determined from the mean eruption times found in some recent surveys, and the results are included in Table VI. It is apparent that the

TABLE VI.—Order of Eruption of the Permanent Teeth in Several Countries, as Determined from the Mean Eruption Times

Country of Origin:	England				New Zealand		America		Hungary		Sweden	
	Birmingham Survey		Ainsworth (1925)		Leslie (1951)		Klein et al. (1937)		Gödény (1951)		Dahlberg and Maunsbach (1948)	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
<i>Upper Jaw</i>												
I ₁	2	2	2	2	2	2	2	2	2	2	2	2
I ₂	3	3	3	3	3	3	3	3	3	3	3	3
C	5	5	6	6	5	5	6	6	6	6	6	6
Pm ₁	4	4	4	4	4	4	4	4	4	4	4	4
Pm ₂	6	6	5	5	6	6	5	5	5	5	5	5
M ₁	1	1	1	1	1	1	1	1	No data—assumed to be erupted first	No data—assumed to be erupted first	No data—assumed to be erupted first	No data—assumed to be erupted first
M ₂	7	7	7	7	7	7	7	7	7	7	7	7
<i>Lower Jaw</i>												
I ₁	1	1	2	2	1	1	2	2	No data—assumed to be erupted first or second	No data—assumed to be erupted first or second	No data—assumed to be erupted first or second	No data—assumed to be erupted first or second
I ₂	3	3	3	3	3	3	3	3	3	3	3	3
C	4	4	4	4	4	4	4	4	4	4	4	4
Pm ₁	5	5	5	5	5	5	5	5	5	5	5	5
Pm ₂	7	7	6	6	7	7	6	6	6	6	6	6
M ₁	2	2	1	1	2	2	1	1	No data—assumed to be erupted first or second	No data—assumed to be erupted first or second	No data—assumed to be erupted first or second	No data—assumed to be erupted first or second
M ₂	6	6	7	7	6	6	7	7	7	7	7	7

anticipated variations in the order resulting from sampling variations have been found, but, apart from this, the order of eruption is the same in each survey.

Discussion

Although the statistical significance of the differences cannot be assessed satisfactorily, comparison of the mean times of eruption of teeth found in this survey with those reported by Ainsworth (1925) suggests that to-day the mean eruption times of teeth are, with the following exceptions, a few months earlier in each sex: the upper and lower Pm₂ teeth in both sexes, the upper and lower Pm₁ teeth in boys, the lower Pm₁ teeth in girls, which are all a few months later than they were 25 years ago. Except in the case of the premolar teeth, the mean eruption times found in 1947-8 also tend to be a few months sooner than those which are indicated by the data for English children published by James and Pitts (1912).

These comparisons suggest that there has been a tendency for the mean eruption times of all teeth, except the premolars, to become earlier in this country during the past 40 years. The later eruption of the premolar teeth may be attributable to a fall in the rate of extraction of the preceding temporary molar teeth, and may be a change towards a more normal time of eruption (see Leslie, 1951). The indications that mean eruption times of teeth, other than the premolars, may be earlier in children from a better socio-economic environment, which are provided by the present survey and which are supported by the observations of Hellman (1923) on the incisor teeth, suggest that this trend may reflect a progressive improvement in the socio-economic condition of the nation. The conclusions Hellman drew from his data were based mainly on the findings for the premolar teeth, and differ from ours on this account.

The likelihood that socio-economic and general physical status have an influence on the time of eruption is given further substance by the observations that children who show physical signs of puberty tend to have earlier mean eruption times than children who are still prepubertal.

The mean eruption times of teeth as determined in the Birmingham Survey appear to be a few months in advance of those found by Leslie (1951) for New Zealand children. The method by which his statistics are computed introduces errors due to rounding, and thus makes the statistical significance of any detailed comparison with our data uncertain, but the differences would probably be statistically significant for about half of the teeth. The mean eruption times of the teeth of Birmingham children tend to be earlier than those of other European children, except for the lower premolar teeth, and the differences are slightly greater than they are in the New Zealand data (Dahlberg and Mauns-

bach, 1948; Gödény, 1951). These findings suggest that the physical development of British children to-day, in so far as it is reflected in changes in the mean eruption times of teeth, is slightly in advance of that of other children of European stock, and those from New Zealand, about which we have information.

Summary

The mean times of eruption of human teeth have been computed from observations on 1,427 boys and 1,365 girls aged 5 to 13 years.

The mean times of eruption of teeth of children who are either of a superior socio-economic group or are pubescent tend to be earlier than those in other children.

The mean times of eruption of the corresponding right and left teeth do not differ significantly in either the upper or the lower jaws.

The mean times of eruption of the teeth of boys are, with the exception of the upper M₁ teeth, later than those of girls.

The mean times of eruption of teeth in the upper jaw are later than those in the lower jaw, except for the Pm₁ and Pm₂ teeth, which are earlier, and the M₁ teeth, which do not differ significantly.

The order of eruption of the teeth determined from mean eruption times is the same, within the limits of sampling variation, as that found in other stocks of European origin.

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ORDER OF ERUPTION OF THE PERMANENT HUMAN DENTITION

BY

E. M. B. CLEMENTS, M.B., B.S.

E. DAVIES-THOMAS, M.R.C.S., L.R.C.P.

L.D.S. R.C.S.

AND

KATHLEEN G. PICKETT, B.Sc.

(From the Department of Anatomy, University of Birmingham)

Whilst the order of eruption of teeth as determined from mean eruption times is relatively constant (Clements, Davies-Thomas, and Pickett, 1953), the times of eruption of individual teeth are very variable, and consequently individual children may be expected to vary greatly in the order in which their teeth erupt. This is shown by Table I, which provides estimates of the 5% and the 95% limits of the ages of eruption in children examined in the course of the Birmingham Anthropometric Survey. It is also evident from Table I and the Chart that eruption times overlap considerably. The explanation is clearly that the eruption times of each tooth are distributed at random, so that late eruption of a tooth with a relatively early mean eruption time may occur after the early eruption of a tooth with a later mean eruption time.

TABLE I.—Mean Eruption Times, and the 5 and 95% Limits of Distribution for the Teeth of Boys and Girls in the Right Upper and Lower Jaws

Tooth	Boys				Girls			
	Mean in Months	S.D.	5-95% Limit of Distribution		Mean in Months	S.D.	5-95% Limit of Distribution	
			Upper	Lower			Upper	Lower
Upper Jaw								
I ₁ ..	84.13	9.97	100.48	67.69	79.46	7.65	92.01	66.83
I ₂ ..	98.17	10.10	114.74	81.51	93.80	12.40	114.13	73.35
C ..	137.56	16.39	164.44	110.51	128.07	14.85	152.43	103.56
Pm ₁ ..	124.96	21.90	160.88	88.83	117.45	14.63	141.45	93.30
Pm ₂ ..	138.22	21.74	173.87	102.35	132.76	22.06	168.93	96.36
M ₁ ..	73.29	10.91	91.19	55.29	71.25	10.79	88.95	53.45
M ₂ ..	143.67	14.93	168.15	119.04	137.94	14.15	161.15	114.59
Lower Jaw								
I ₁ ..	72.96	9.38	88.32	57.48	69.22	6.76	80.29	58.14
I ₂ ..	87.63	9.71	103.55	71.61	84.17	10.12	100.78	67.47
C ..	126.16	14.71	150.28	101.90	112.90	11.99	132.57	93.11
Pm ₁ ..	136.20	19.74	168.76	103.63	126.33	18.87	157.00	95.49
Pm ₂ ..	147.87	20.83	182.24	113.70	139.62	21.88	175.51	103.52
M ₁ ..	73.69	10.99	91.74	55.67	70.08	8.80	84.51	55.57
M ₂ ..	136.87	14.49	160.61	112.93	134.15	13.23	155.85	112.31

I₁ = the central incisor tooth; I₂ = the lateral incisor tooth; C = the canine tooth; Pm₁ = the first premolar tooth; Pm₂ = the second premolar tooth; M₁ = the first molar tooth; M₂ = the second molar tooth.

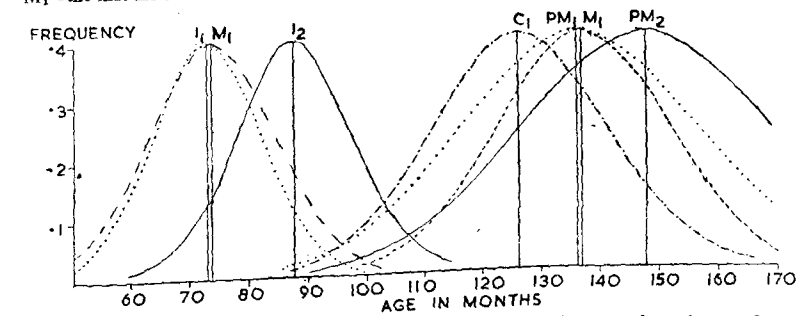


Chart showing standardized frequency distribution of the eruption times of the permanent teeth in the lower jaw for boys.

Little or no variation would be found in the order of eruption if the early eruption of one tooth was associated with the early eruption of the others. Alternatively, if the times of eruption of the various teeth were independent, all possible variations in the order of eruption would occur. The data on tooth eruption collected in the Birmingham Anthropometric Survey were therefore examined to determine whether or not the order of eruption of teeth which have their mean eruption times close together is constant, and, if variations occur, to estimate the probability of different patterns of eruption.

Method

The records of a tooth have been classified as erupted (the tooth having pierced the gum) or unerupted. Each of these classes has been sub-classified into two further classes by sorting the records of another tooth into classes of erupted and unerupted teeth. The records of two teeth comprise the simplest case, and for these a fourfold table may be constructed to indicate the number of occasions on which (1) both teeth were present, (2) neither tooth was present, and (3) either one or the other tooth was present. Additional teeth may be similarly sub-classified to give 16 possible combinations for four teeth. Only the records of children who were of such an age that erupting teeth might be expected to occur have been examined.

TABLE II.—Occurrence of Erupted and Unerupted I₁ and M₁ Teeth in the Jaws of Children Aged 5-9 Years

Teeth Erupted	Boys	Girls	Total
<i>Upper Jaw</i>			
I ₁	7 (4.7%)	8 (6.6%)	15 (5.6%)
M ₁	142 (95.3%)	113 (93.4%)	255 (94.4%)
Number of occasions when 1 tooth was erupted	149	121	270
<i>Lower Jaw</i>			
I ₁	55 (53.9%)	45 (54.2%)	100 (54.0%)
M ₁	47 (46.1%)	38 (45.8%)	85 (46.0%)
Number of occasions when 1 tooth was erupted	102	83	185

Factors which may tend to accelerate or retard the eruptions of certain teeth, such as the early eruption of the premolar teeth following on the early loss of the deciduous teeth, may also affect the frequencies of the orders of eruption (see Leslie, 1951).

Results

The order of eruption of the I₁ and M₁ teeth has been examined in 644 boys and 633 girls aged 5 to 9 years. In each sex the records were divided into a group in which the upper right I₁ tooth had erupted and one in which it had not. The same was done with the lower teeth. Each of these classes was then divided into a subgroup in which the M₁ tooth had erupted and another in which it was still unerupted. The findings are given in Table II. Either one

or the other of the two upper teeth was seen alone on 149 occasions in boys and 121 occasions in girls; the corresponding figures for the lower jaw were 102 occasions in boys and 83 occasions in girls; upper I₁ occurred alone seven times in boys and eight times in girls; lower I₁ was seen alone 55 times in boys and 45 times in girls; upper M₁ was seen alone 142 times in boys and 113 times in girls; lower M₁ was seen alone 47 times in boys and 38 times in girls. These proportions are similar for both sexes ($\chi^2=0.46$ and 0.02 (1 d.f.) respectively).

TABLE III.—Occurrence of Erupted and Unerupted C, Pm₁, Pm₂, and M₂ Teeth in the Jaws of Children 7–14 Years Old.

No. of Teeth in Group		Classes of Erupted and Unerupted Teeth				Upper Jaw				Lower Jaw			
						Right		Left		Right		Left	
						Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
		C	Pm ₁	Pm ₂	M ₂	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %
3 teeth	1	+	+	+	0	75 (57.7)	82 (58.6)	64 (54.2)	86 (53.4)	30 (25.9)	49 (36.0)	30 (27.8)	52 (38.0)
	2	+	+	0	+	33 (25.4)	44 (31.4)	33 (28.0)	54 (33.6)	77 (66.3)	78 (57.4)	77 (56.2)	
	3	+	0	+	+	8 (6.1)	1 (0.7)	7 (5.9)	1 (0.6)	8 (6.9)	7 (5.1)	6 (4.3)	
	4	0	+	+	+	14 (10.8)	13 (9.3)	14 (11.9)	20 (12.4)	1 (0.9)	2 (1.5)	2 (1.5)	
Total ..						130	140	118	161	116	136	108	137
2 teeth	5	+	+	0	0	25 (28.4)	42 (49.4)	38 (37.3)	50 (51.6)	52 (45.2)	72 (67.3)	50 (42.7)	71 (59.7)
	6	+	0	+	0	3 (3.4)	0 (0.0)	3 (2.9)	1 (1.0)	4 (3.5)	5 (4.7)	5 (4.3)	5 (4.2)
	7	+	0	0	+	1 (1.1)	3 (3.5)	5 (4.9)	2 (2.1)	51 (44.3)	28 (26.1)	50 (42.7)	40 (33.6)
	8	0	0	+	+	2 (2.3)	1 (1.2)	1 (1.0)	0 (0.0)	1 (0.9)	0 (0.0)	1 (0.9)	0 (0.0)
	9	0	+	0	+	11 (12.5)	5 (5.9)	6 (5.9)	7 (7.2)	1 (0.9)	0 (0.0)	3 (2.6)	2 (1.7)
	10	0	+	+	0	46 (52.3)	34 (40.0)	49 (48.0)	37 (38.1)	6 (5.2)	2 (1.9)	8 (6.8)	1 (0.8)
Total ..						88	85	102	97	115	107	117	119
1 tooth	11	+	0	0	0	10 (7.5)	8 (7.5)	5 (3.8)	4 (4.2)	74 (71.9)	123 (86.0)	74 (67.9)	118 (89.4)
	12	0	+	0	0	106 (79.7)	82 (77.4)	101 (77.7)	79 (83.2)	13 (12.6)	11 (7.7)	21 (19.2)	6 (4.6)
	13	0	0	+	0	11 (8.3)	10 (9.4)	14 (10.8)	6 (6.3)	7 (6.8)	3 (2.1)	4 (3.7)	4 (3.0)
	14	0	0	0	+	6 (4.5)	6 (5.7)	10 (7.7)	6 (6.3)	9 (8.7)	6 (4.2)	10 (9.2)	4 (3.0)
Total ..						133	106	130	95	103	143	109	132

+ = erupted; the tooth has pierced the gum. 0 = unerupted. There were approximately equal numbers of children in each age group.

The records of the C, Pm₁, Pm₂, and M₂ teeth have been sorted in a similar way for 1,135 boys and 1,077 girls from 7 to 14 years old, and the results for the right and left upper and lower jaws are given in Table III. This table should be read as in the following example, reading from line 9 of Table III for the right upper jaw: "Two teeth were erupted and two unerupted on 88 occasions in boys. The Pm₁ and M₂ teeth were the erupted teeth on 11 occasions (12.5%). Two teeth were erupted on 85 occasions in girls and the eruption of the Pm₁ and M₂ teeth together was seen five times (5.9%); and so on for the left side.

All the combinations of these four teeth have been seen, the combinations varying greatly in their frequency. The differences between the distributions have been tested for significance. The frequencies found in the right and left sides in the same sex do not differ statistically. The difference in the frequencies found between the sexes are all significantly different at the 1% level of probability except for three classes: (1) where three teeth have erupted in the lower jaw; (2) where two teeth have erupted in the lower jaw; and (3) where one tooth only has erupted in the upper jaw. The values of χ^2 for the teeth in the upper and lower jaws respectively, are: for three teeth 6.46 and 14.26 (3 d.f.); for two teeth 22.35 and 13.76 (5 d.f.); for one tooth 23.86 and 0.36 (3 d.f.). The distributions are very different in the upper and lower jaws of the same sex.

The frequencies of the various orders of eruption for different combinations of only two or three teeth out of the four teeth tabulated in Table III may be obtained by combining the appropriate lines of the table so as to omit the tooth not required.

Discussion

The present observations substantiate, what is already well known, that there is considerable variation in the order in which human teeth erupt, and extend this knowledge by providing estimates of the frequencies with which different patterns of eruption may occur in British children.

The most frequent order of eruption of the upper and lower I₁ and M₁ teeth, and the upper and lower C, Pm₁, Pm₂, and M₂ teeth, in both sexes is the same as that given by the mean eruption times. These are: the M₁, I₁, and the Pm₁, C, Pm₂, M₂ teeth in the upper jaw; the I₁, M₁, and the C, Pm₁, M₂, Pm₂ teeth in the lower jaw.

The mean time of eruption of the upper I₁ tooth is later than that of the upper M₁ tooth by 11 months in boys and eight months in girls, and this implies that the distributions of these teeth will overlap only slightly. On the other hand, the mean eruption times of the lower I₁ and M₁ teeth hardly

differ in either sex, and so the distributions of these teeth will almost coincide (see Chart). The upper right I₁ tooth was seen to erupt before the corresponding M₁ tooth on 5.6% of occasions, and the lower I₁ tooth on 54.0% of occasions. These observations agree well with the expected values computed from the data of Table I assuming independence. On this assumption I₁ erupts first in 4.0% and 54.8% of all cases in the upper and lower jaws respectively.

Erupted Pm₁, Pm₂, and M₂ teeth were observed without an erupted C tooth 27 times, or on about 10% of occasions, in the right side of the upper jaw, and three times, or on about 1% of occasions, in the right side of the lower jaw. On the assumption that the order of eruption of teeth on the right side is independent of that on the left, both sides will show these three teeth to be erupted on about 1% and 0.1% of occasions in the upper and lower jaws respectively. This condition was observed, however, 13 times in the upper jaw and once in the lower jaw. These observations do not accord with the estimated frequencies, and indicate that the eruption times of corresponding right and left teeth are correlated.

All possible combinations of the orders of eruption of the C, Pm₁, Pm₂, and M₂ teeth actually occur in the Birmingham records. The frequency with which departures occur from the assumed normal order of appearance of the teeth, as given by the mean times of their eruption, implies that the times of eruption of these four teeth are independent of each other.

A similar type of analysis to that undertaken in this study was made by Livy (1885). He compared the eruption times of the corresponding upper and lower teeth in children; he also found that the order of eruption was reversed in a variable proportion of cases in each age group.

It is apparent that many instances of abnormal orders of eruption of teeth which are encountered in the field of orthodontics simply represent extremes of the normal variation; the only sense in which they are abnormal is that they are infrequent.

Summary

The order in which the I₁ and M₁ teeth and the C, Pm₁, Pm₂, and M₂ teeth erupt in British children was investigated and considerable variations were found in both the upper and the lower jaws.

The frequencies of occurrence of the different patterns of eruption were estimated. The most frequent order of eruption was found to be the M₁ tooth followed by the I₁ tooth, and the Pm₁ tooth, followed in succession by

the C, Pm₂, and M₂ teeth in the upper jaw; and the I₁ tooth followed by the M₁ tooth, and the C, Pm₁, M₂, and Pm₂ teeth in that order in the lower jaw.

The analysis indicates that the times of eruption of teeth with similar mean eruption times on the same side are independent of each other, but that the eruption times of corresponding teeth on the right and left sides are correlated.

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MAMMARY ABSCESS

DISADVANTAGES OF ANTIBIOTICS IN ITS MANAGEMENT

BY

C. P. MILLS, F.R.C.S.

(From the Department of Surgery, Postgraduate Medical School of London)

In days gone by the cardinal signs of inflammation, heat, pain, redness, and swelling were all too familiar. Just as the classical picture of lobar pneumonia with its typical crisis is seen no more, so the clinical features of acute pyogenic infections have been greatly altered since the general introduction of antibiotics. No one will deny their immense value in combating what were earlier most severe infections, but in less severe cases they can be a mixed blessing if not used with judgment and restraint. The need for surgery is as great as ever, although its extent may be much restricted. Since antibiotics can mask so effectively many of the arresting features of acute infections, the timing of an operation is becoming more and more important.

A good deal of suffering can, in my opinion, be avoided by a general appreciation of the limitations of antibiotics in the treatment of acute infections, and this point I want to underline by citing the records of four cases of acute mammary abscess. Cases of this sort are no doubt the everyday experience of most active general surgeons, but it is their very frequency which has prompted me to record the following cases.

Case 1

The patient was aged 26. Immediately after a normal delivery her left nipple became sore and cracked, and led to weaning. Two weeks later, 24 days after her confinement, she developed a painful swelling in her left breast. On the twenty-ninth day she was seen by her own doctor, who noticed a painful, red, indurated area in the lower half of the left breast. "Distaquaine penicillin," 400,000 units, was given daily, together with local applications of heat for four days. She was admitted to hospital on the thirty-sixth post-partum day, and 12 days after the onset of symptoms.

The left breast was fuller and more pendulous than the right, which seemed quite normal. There was an obvious swelling in the lower and outer quadrant. Peau d'orange was not seen. The nipple was not retracted, but the lower half of the areola was tethered to a hard, slightly tender non-fluctuant mass, measuring 8 by 8 cm., and easily felt

by the flat of the hand. The skin over the mass was not discoloured and was no hotter than the surrounding breast tissue. There was some fixity of the mass to the underlying pectoral fascia. Glands were not palpable in the axilla.

When she was first seen in hospital the absence of the signs of inflammation and the size, hardness, and fixation of the mass in the breast strongly suggested the diagnosis of a lactation cancer.

On the following day a radial incision was made over the most prominent part of the mass. A very thick-walled multiloculated abscess cavity was entered, which was involving most of the lower half of the breast. Free drainage was established. The pus yielded a profuse growth of a coagulase-positive *Staphylococcus pyogenes*, resistant to penicillin but sensitive to aureomycin, streptomycin, and chloramphenicol. Streptomycin, 0.5 g., was given twice daily for four days. Two weeks later the wound was completely healed, and there was no more than a diminishing thickening. Her total period of disability was 26 days.

Case 2

The patient, aged 32, noticed pain, tenderness, and swelling in her right breast three days after a normal confinement. For the next ten days she was given daily injections of distaquaine penicillin, 300,000 units, and local applications of kaolin poultices. The swelling became less painful but no smaller. On the twenty-fourth post-partum day the baby had to be weaned, when the patient developed a generalized rash. On the thirtieth day her own doctor again prescribed injections of penicillin of the same dosage as previously because the breast and upper arm had become stiff and swollen.

On admission to hospital on the thirty-fifth day—that is, 32 days after the onset of symptoms—her temperature was 98.4° F. (36.9° C.), pulse 80, respirations 20, and white blood cell count 11,000. She was looking in the very best of health. The left breast was normal. The right breast was enlarged and deformed by a large, easily visible swelling in the right lower quadrant. There was no peau d'orange, but a little reddish discoloration and oedema over the centre of the swelling. The upper part of the areola was tethered to the tumour. The mass was hard, smooth, and slightly tender, non-fluctuant, and a little hotter than the surrounding breast tissue. It was fixed to the underlying pectoral fascia. There were three firm, tender glands in the right axilla. There were even fewer signs and symptoms of an acute inflammatory condition in the breast than in Case 1. The patient was a very healthy-looking woman with no evidence of fever or toxæmia, complaining only of a large, slightly tender mass in her right breast.

The fixity of the mass to the skin, areola, and underlying fascia; the oedema of the breast and the upper arm; and the presence of enlarged glands in the axilla were once again very suggestive of a lactation carcinoma. The next day a radial incision was made over the most prominent part of the mass. A great depth of dense inflammatory tissue had to be penetrated to find one small loculus of pus in its centre. Bleeding was profuse and difficult to control. Culture of the pus yielded a profuse growth of *Staph. pyogenes* resistant to penicillin but sensitive to streptomycin, aureomycin, and chloramphenicol.

A section from the abscess wall showed an inflammatory reaction with infiltration by foamy macrophages, plasma cells, and polymorphonuclear cells. There was an area of fat necrosis.

Streptomycin, 1 g. twice daily, was given for six days. She was discharged on the sixteenth post-operative day with a clean granulating wound but still some residual thickening in the breast.

Case 3

This patient, aged 28, was confined five weeks before coming to hospital, and complained of pain in the left breast for two days immediately prior to admission.

The left breast was diffusely swollen and tender. There was no discoloration or oedema. After eight days of distaquaine penicillin, 300,000 units daily, the breast was indurated in the left upper and outer quadrant, but less tender and still non-fluctuant.

Chloramphenicol, 0.5 g. four times daily, was given for seven days, by which time fluctuation had developed. Exploration revealed a multiloculated breast abscess with a thick and densely hard wall. Brisk bleeding was encountered, and this could be controlled only by packing. Six daily doses of 300,000 units of distaquaine penicillin were then given, the wound being dressed every third day. The patient was discharged on the thirty-fifth day after the onset of symptoms. She returned, however, one month later with a recurrence of symptoms. Distiquaine penicillin, 600,000 units daily, was given for seven days, and then streptomycin, 1 g. a day for a further seven days. The old incision was then reopened, and pus encountered which grew a penicillin-resistant coagulase-positive *Staph. pyogenes*. The patient was discharged with the wound well healed 54 days after the recurrence of symptoms. In all, she had been attending hospital 116 days, with a brief respite in the middle, after first being seen with a simple acute breast abscess.

Case 4

This patient, aged 32, complained of pain and swelling in the right breast on the thirty-first day after her confinement, and came to hospital four days later.

The left breast appeared normal. The right breast was red and swollen, with a very tender, smooth lump measuring 5 by 5 cm. just below the areola.

Stilboestrol, 10 mg. thrice daily, was given for five days, and 5 mg. for a further ten days. At the same time a dose of 600,000 units of distaquaine penicillin was given daily until the tenth day after the onset of symptoms. The lump was then still the same size but distinctly less tender.

On the thirteenth day a large breast abscess was drained. Daily injections of 600,000 units of distaquaine penicillin were continued until the nineteenth day, when the wound was still discharging and a new area of induration and tenderness had appeared above the areola. Two days later a second thick-walled abscess was drained of approximately 5 ml. of pus, which again yielded a penicillin-resistant *Staph. pyogenes*. After a further 17 days the wound was well healed. The patient took 34 days to recover from an acute breast abscess.

Discussion

Cases 1 and 2 serve to illustrate how the symptoms and signs of an acute breast abscess, by prolonged penicillin therapy, can be masked to such an extent that the condition may be difficult to differentiate from a lactation carcinoma.

Cases 3 and 4 illustrate well how an abscess can be so attenuated by antibiotics that the need for early incision is not appreciated and an undue amount of disability results. Perhaps it might be said that all that these last two case histories make evident is a lamentable lack of judgment in timing a surgical excision. This I freely admit, but claim in extenuation that the giving of antibiotics so relieved symptoms, and so modified the local tissue reaction, that the necessity for incision was less evident. Further, I claim to be not alone in making these mistakes.

Lake (1952) makes it quite clear that there is a growing awareness of the dangers and drawbacks of the indiscriminate use of the antibiotics. My experience in the casualty department of a large general hospital has certainly made me acutely aware of their obvious limitations. Used early and vigorously, they undoubtedly abort completely what were previously the most severe and disabling infections; one can confidently expect prompt resolution with complete

restoration of function. When, however, their administration is not begun until the infection is firmly established, complete resolution unaided is most unlikely. Gratifying as may be the alleviation of symptoms and the abatement of the toxæmia, timely surgical incision to drain what may be only a small collection of sterile pus is no less necessary than it was in earlier days. Antibiotics in many instances render surgical intervention no less necessary, though they may greatly modify its extent. The relief of pain which their use affords makes it only too easy to defer a necessary incision until long after the proper time. Meantime there develops a dense local inflammatory reaction which, when operation is ultimately undertaken, bleeds alarmingly, and which interferes considerably with the establishment of free drainage.

Perseverance with the administration of antibiotics long after they have ceased to have any value is a malpractice which is in no way confined to the management of acute mammary infections. The same mistakes are made in infections at other sites, but more evidently in situations like the finger pulp or the parotid, where the clinical sign of fluctuation is in any event long delayed.

My experience suggests that their abuse presents, in the case of breast infections, a problem peculiar to this situation—namely, the development of a hard, painless, fixed mass which in its clinical features mimics very closely a lactation carcinoma. This problem in diagnosis is especially seen when the patient first presents for treatment at hospital, having been previously under the care of her own practitioner. This point has recently been briefly alluded to by Stammers (1953).

It may well be that the unsatisfactory treatment of some of these infections can be attributed to the presence of resistant organisms. This is undoubtedly all too often the case in mammary abscess, especially if the patient is confined in hospital, where by a process of selection a permanent reservoir of resistant strains seems to be maintained. This was true of one of the above cases.

Heavy dosage with, say, penicillin will in the case of a light infection lead to clinical improvement so long as the local production of penicillinase does not build up to an effective level.

Stammers has suggested that in the presence of antibiotics the character of the local inflammatory reaction is greatly modified. There may, however, be a simple explanation. On the one hand, we have an infection with prompt antibiotic treatment which clears up quickly and completely. At the other end of the scale we have the old-fashioned abscess of the pre-antibiotic days, a large collection, representing a considerable loss of tissue. Somewhere in between, when the forces of invasion and those of repair are closely matched, it seems reasonable to assume that there may develop a hard inflammatory mass surrounding a small collection of pus such as was encountered in the breast cases described above.

Summary

The management of four cases of acute mammary abscess is reported. Treatment was primarily with penicillin, one case receiving in addition a seven-day course of chloramphenicol.

It was observed that the classical signs and symptoms of acute inflammation were considerably altered by the use of antibiotics.

A dense hard mass of fibrous and granulation tissue surrounding a loculus of pus was a feature of all the cases. The vascularity of the mass presented a real danger when it was explored surgically, in the form of torrential haemorrhage (as illustrated by Case 2). The undue delay of operative drainage because of the masking of symptoms and signs led in turn to a long and tedious recovery.

The lessons that might be learnt from these observations are: (1) Antibiotics, though of immense value in the treatment of acute infection, especially the localization of the disease in the breast, have their limitations. (2) The treatment of a localized collection of pus is still by surgical drainage, the timing of which is now as important as ever.

My thanks are due to Mr. Maurice R. Ewing for encouragement and help in the preparation of this paper.

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PROSTHETIC MUCOSAL HYPERTROPHY IN THE MOUTH, SIMULATING MALIGNANCY

BY

J. WALTER, B.M., M.R.C.P., F.F.R., D.M.R.E.

Consultant Radiotherapist, Sheffield National Centre for Radiotherapy; Clinical Teacher in Radiotherapy, University of Sheffield

Now that a realization of the importance of early diagnosis and treatment of cancer is spreading, not only in the medical profession but among the lay public, it is more than ever necessary to separate those benign lesions that mimic malignancy. This paper seeks to focus attention on one type that is common enough to merit detailed discussion—the mucosal hypertrophy due to chronic irritation by dental prostheses. Experience both at a large centre dealing primarily with cancer and at a general hospital dental department shows that this lesion is a regular cause of suspicion and alarm among patients, their general practitioners, general surgeons, and dental surgeons. Descriptions of the lesion are hard to find outside the dental literature. The only account that I can trace in recent general medical literature is by Simmons (1941). More recently, recognition seems to be increasing among dental surgeons. With the relative increase of the older age groups, and the increased number of dentures supplied under the National Health Service, many more of these lesions are to be expected in the future.

Clinical Picture

There are two principal sites: (1) the alveolo-buccal sulcus, immediately adjacent to the alveolus, more commonly lower than upper; and (2) the hard palate, more or less centrally grouped round the midline.

First Type (Alveolo-buccal).—The typical lesion is a projecting elongated fleshy mass or tag on the mucosal surface adjoining the outer side of the edentulous alveolar margin (Figs. 1 and 2). Its length, parallel with the alveolus, ranges from a few millimetres to several centimetres, and its width up to about 1.5 cm. Its surface is ridged, with one or more deep furrows, and if the patient inserts his denture the edge can be seen to lie accurately in, or slip easily into, a furrow. The alveolus is atrophic and the denture fits very loosely; usually it will be found to be an old one, commonly dating back ten years or more. The mass is fairly soft in the early stages, becoming harder with age and fibrotic changes, but there is not the spreading induration at the base that characterizes

malignancy. There may be ulcerations of the furrow with a little bleeding; inflammation may cause tenderness and increased induration at the base, which can arouse suspicion of malignancy. The patient may complain of a little lump which has inconvenienced or alarmed him, or of intermittent pain due to sepsis. In some cases the lesions are not noticed by the patient at all, but are discovered by the dental surgeon when the patient attends for new dentures. Histologically there is considerable acanthosis and thickening of the surface epithelium but no evidence of invasion; there may be increased fibrous tissue secondary to inflammatory changes.

Second Type (Palatal).—Here the presenting lesion is on the hard palate, in the form of one or more flat or pedunculated papillomatous patches, typically a few millimetres across. There may be a complete ring of separate or fused patches, corresponding with the relief chamber or suction ring on the upper denture. The surface of the denture may be roughened and irregular. Ulceration and bleeding are uncommon. The patches may also appear at the posterior end of the hard palate, on a transverse line due to the "food line" at the back of the denture.

Case Material

The clinical material over the last eight years at the Sheffield National Centre for Radiotherapy has been reviewed. Twenty cases were found; 10 of these were of the first type, 8 of the second, and 2 were in atypical sites, and not definitely of similar nature. (These numbers are small in comparison with the material in a dental department; for example, at the Sheffield Royal Hospital 24 cases were seen in the dental department in a single year (1951) and approximately the same number were seen in the facio-maxillary surgical unit.)

Alveolo-buccal Cases.—Of the 10 cases in this group nine were in females. The lower jaw was the site in all but two. This preponderance in females and the lower jaw was also found by Simmons (1941). Ages ranged from 37 to 78, the mean being 51 years. The length of history varied between three weeks and three years, usually two to four months. Most lesions were 1–3 cm. long; one unusual case showed hypertrophy extending symmetrically along nearly the whole length of the lower alveolus on both sides. The age of the denture was not routinely recorded in all cases, but was typically at least several years, the oldest set being 16 years.

Palatal Cases.—In the eight cases the sex distribution was equal. Ages ranged from 39 to 75, the mean being 63 years. The length of history ranged from a few weeks to a few months. None of the individual lesions was larger than 1 cm.

Atypical Cases.—The first case was a proliferative papilloma, 2 cm. across, on the floor of the mouth just behind the alveolus. The other was a hypertrophic patch at the posterior end of the lateral border of the tongue, apparently an enlarged papilla.

Treatment

The only danger these lesions are likely to cause arises from a mistaken diagnosis of cancer leading to radical



FIG. 1

FIG. 2

FIG. 1.—A typical hypertrophic mucosal lesion on the upper alveolus. FIG. 2.—The lesion in Fig. 1 in relation to the denture.

treatment by surgery or irradiation. Simmons (1941) mentions such a case treated by implanted radium to full carcinoma-lethal dosage; the tumour itself proved completely resistant to the radiation, but there was some troublesome necrosis in surrounding normal tissue. If the possibility is borne in mind, these cases are not likely to cause real difficulty, but experience suggests that this clinical entity is not widely recognized.

The important part of the treatment clearly rests with the dental practitioner, to whom the patient should be referred. If the denture is left off, and the source of the irritation thus removed, there will usually be some improvement, with disappearance of inflammation and reduction in size of the mass, especially in recent cases. Occasionally the mass may almost completely disappear; this applies particularly to small papillomatous patches on the palate. However, it will almost always be advisable to replace the denture by a completely new model. Simple trimming or adjustment may prevent contact with the mass and remove the symptoms, but the fundamental defect—that is, the unbalanced occlusion—will remain.

How should the offending nodule itself be treated? Simmons (1941) advised excision of the ridges with the diathermy loop and coagulation of the base with the diathermy button, after which healing took place in about a month. Excision, of course, provides the speediest means of removal, and is usually to be advised, especially in the alveolar cases. The later history of the present series was as follows.

Alveolo-buccal Cases.—In all cases the patient was advised to discontinue the wearing of the denture and to visit the dentist as soon as possible. In five cases the nodules were excised by the dental surgeon, either at once or after two to three months; one was removed after eight months—this was the case mentioned above with the extensive hypertrophy all the way along the lower alveolar edge. In the other five cases no removal was carried out after the denture had been adjusted or replaced (or simply left off). The nodule regressed spontaneously, till in the course of two to six months it had either disappeared or been reduced to a tiny tag giving no trouble.

Palatal Cases.—Conservative treatment was the rule here. One nodule was removed for biopsy and the base carbolyzed. The other seven were left alone and the denture attended to; all seven more or less disappeared in one to five months.

Atypical Cases.—The papillomatous mass behind the lower alveolus was excised, as it was comparatively large (2 cm.). The hypertrophic patch on the back of the tongue was left alone, after reassurance of the patient; it did not change, but no active treatment was necessary and the patient was discharged after six weeks.

Discussion

This hypertrophic reaction to continued trauma is now mentioned and even illustrated in standard textbooks for dental practitioners (Thoma, 1941; Stones, 1951). The former calls it "areolar hyperplasia." However, it continues to arouse special interest, as evidenced by descriptions of individual cases in dental literature (Vandory, 1937; Clark, 1947; Holland, 1949). Histological examination shows no evidence of malignancy, but there is proliferation of epithelium and reactive overgrowth of granulation and connective tissue that can resemble a fibroma. Campbell (1944) describes a case that showed masses of epithelioid cells, giant cells, and dense fibrous tissue with many lymphocytes, the whole picture suggesting a sarcoma.

Guardo (1945) calls the lesions "paraprosthetic," and distinguishes two types—acute and chronic. The acute form heals as soon as the irritant is removed; the chronic type stops growing if the cause is removed, though excision is needed before function is restored. He mentions the possibility of malignant change, but quotes no specific instances of this; no other author among those I have

been able to trace mentions this important change as actually occurring, and one would like to have further details before accepting it. As an agent of cancerphobia, the potency of the lesion is attested by Hecht (1939) and Holland (1949); our own experience and that of any radiotherapeutic or dental centre amply underline this danger. One general practitioner was distressed (perhaps justifiably) by my not considering it necessary to take a biopsy but contenting myself with reassurance of the patient and his doctor.

Runnerstrom (1940) emphasizes the importance of servicing dentures after fitting; after dental extractions there is physiological resorption and atrophy of the alveolar process, and most sets of old dentures will be found to have incorrect relation to the jaw, with unbalanced occlusion; the lesions therefore are due primarily to lack of service, with a combination of mechanical trauma and bacterial infection.

In treatment most authors naturally favour simple surgical removal. This is certainly the best treatment for the great majority of cases, in which irreversible change with fibrous overgrowth has taken place. The present series, with appreciable spontaneous improvement in half of the alveolar cases and practically all of the palatal cases, shows that conservative treatment may sometimes be useful, if only as a preliminary measure. Even if disappearance is not complete, it may occasionally be enough for practical purposes; in any case, whatever shrinkage does occur will minimize the extent of surgery required. Active measures seem to be unnecessary in the case of small flat patches on the hard palate, as shown by the spontaneous satisfactory resolution in seven of the present eight cases. Anything larger would need active removal; advanced palatal papillomatosis and hyperplasia have recently been described by Thoma (1952) and Fisher and Rashid (1952).

Hecht (1939) is emphatic about the necessity for surgery; if the tissue returns to normal after leaving off the denture there may be a scar, which may interfere with the proper fit of a denture. He advises, for the palatal papillomatous hyperplasia, radical excision through the periosteum: this would undoubtedly be effective, but in the light of the present series seems unnecessarily drastic as a routine. In some alveolar cases, especially those in which the margin is extensively involved on both sides of the midline, it may be necessary to carry out the operation of "buccal inlay" after excision of the hypertrophic tissue, in order to leave a sulcus deep enough to give a denture adequate seating; a skin graft is inserted in the hollow outside the mandible, bridging the gap between the alveolar and buccal mucosae and folding to form a deep enough groove.

In general, therefore, surgical removal may be said to be the treatment of choice, with occasional exceptions, notably in small patches on the hard palate. In all cases the denture must be overhauled, and nearly always will need replacement; simple easing or trimming may relieve irritation for a time, but leaves the root cause—that is, malocclusion—untreated.

Summary

Attention is drawn to the hypertrophic tumours in the mouth due to irritation by badly fitting dentures. The commonest sites are the alveolo-buccal sulcus of upper and lower jaw and the hard palate. They are apt to be mistaken for malignant tumours. Treatment is usually by simple excision; spontaneous resolution may be adequate in the occasional case, especially for small lesions on the hard palate. A completely new denture is nearly always necessary.

I am much indebted to Mr. R. Rastall, senior hospital dental officer, Royal Hospital, Sheffield, for invaluable discussion and advice as well as for the illustrations; also to Mr. J. J. Hodson, lecturer in dental pathology, University of Sheffield, for some recent references.

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SIMPLE DEPRESSED FRACTURE OF THE SKULL

BY

LAMBERT ROGERS, V.R.D., M.D., M.Sc., F.R.C.S.

Professor of Surgery, University of Wales

(From the Surgical Unit, the Royal Infirmary, Cardiff)

Whether or not to advise elevation of a simple depressed fracture of the skull which is symptomless is a recurring, albeit an infrequent, problem. Most depressed fractures are compound, and the indication for operation in these cases is absolute.

When a child is seen with a slight depression, an unbroken scalp, and a complete absence of symptoms, there may be a natural inclination on the part of the medical adviser and the patient's relatives to leave well, or what is apparently well, alone. X-ray films may merely confirm the depression and the electroencephalogram may be normal, but nevertheless a piece of the inner or vitreous table of the skull may have been driven through the dura mater into the brain. This is illustrated in the following case.

Case 1.—A boy aged 9 fell from a swing and dented his left parietal region. He was unconscious for about 20 minutes and then recovered completely and walked home. When seen at the Cardiff Royal Infirmary some five months later he had no symptoms and presented no abnormal features except a shallow depression in the left parietal region which was confirmed by x-ray examination. The nervous system was normal, as was also the electroencephalogram. At operation an in-driven fragment of the inner table of the skull was found to have penetrated both dura and brain, and to have anchored the brain at the site. A flap of bone, including the depression, was removed, reversed, and replaced after cutting away the projecting bony fragment which had entered the brain, and after smoothing the rather uneven surface of the inner table, which was now lying outwards. The boy made a good recovery, and it was concluded that freeing the anchored and developing brain was desirable in order to avoid possible complications in the future.

Depression in the Newborn Child

At birth and in infancy the skull bones are so soft that in these cases there is indentation without fracture, but it is convenient to regard them in the same category, as they are examples of traumatic depressions nevertheless.

Case 2.—A male baby delivered by forceps had a deep indentation in the left fronto-parietal region. He appeared in all other respects normal, and was seen at intervals until 2

months old; but as during this time there was no indication of the restoration of the normal contour of the skull by the disappearance of the indentation, this was effected by operation, with a satisfactory result. After turning down the scalp, a flap of bone was cut with scissors and with the thumbs the depression was pushed out and the osteoplastic flap replaced. The baby thrived and now has a skull of normal appearance, and what was a considerable reduction in intracranial capacity due to the deep indentation has been restored to normal.

Diagnosis of a Simple Depressed Fracture

A depressed fracture is usually obvious, but is not always so, especially if lying beneath the temporal muscle and its overlying fascia. In these circumstances x-ray examination in strictly antero-posterior as well as lateral planes may also fail to detect the depression. Films taken after slight rotation of the skull will make it obvious, however, as in the following case.

Case 3.—A naval stoker aged 26 fell from a plank on to the quayside at Cardiff docks and lost consciousness, which he regained in an ambulance on the way to hospital. He developed a swelling over the right side of the forehead, on which there were some abrasions, and the left eye showed subconjunctival haemorrhage. No depression could be felt, but slightly rotated antero-posterior views of the skull showed a depressed fracture underneath the left temporal muscle. Six days after his admission to hospital the depressed part of the left squamous temporal bone was elevated after first reflecting the temporal muscle. Recovery was uninterrupted.

Any error in diagnosis is usually in the opposite direction, of suspecting a depressed fracture when none exists, and what is felt and thought to be a depressed fracture is in reality a haematoma with a soft centre and firmer periphery.

Operative Treatment

If a depressed fracture is compound the question of whether to operate or not does not arise. Operation is indicated, as it is in the case of compound fractures occurring elsewhere in the body, and for a similar reason. It is suggested that simple depressed fractures should likewise be operated upon. Two points in technique may be referred to. (1) It is advisable to operate early, before union has taken place. In this early phase the bony fragments can be elevated, but after union has occurred this is no longer possible. To try to lift up the depression, which is really a reversed bridge, is like applying pressure to the arch of a cantilever bridge, and is quite futile. In this phase a block of skull comprising the fracture should be removed, reversed, and replaced. (2) The best way to deal with the indented skull of the infant is to cut out a flap of bone with a pair of scissors, reflect it on its base as a hinge, press up the depressed area with the thumbs, and replace the flap.



Drawing of baby boy aged 2 months with persistent depression in left frontal region (Case 2).

Conclusions

Further cases might be quoted, but these serve to illustrate that simple depressed fractures should be elevated to restore the contour and capacity of the skull and to free what may be an anchored brain in the hope of avoiding future complications such as epileptic attacks. Early operation is advisable; not urgently as in compound fractures, but at a time convenient to patient and surgeon. Secondly, in the case of fractures in the temporal region, depression should be suspected and special x-ray examination made to ascertain whether it is present and masked by the temporal muscle and a tense overlying temporal fascia. Lastly, deep depressions in the skulls of the newly born should be pressed out within a few months of birth, if during this time no tendency is observed for natural restoration to take place.

I am indebted to Miss J. M. Williams, of the Welsh National School of Medicine, for the drawings.

TEEPOL IN THE PREPARATION OF SPUTUM FOR TUBERCLE CULTURE

BY

P. BROWNING, M.B., Ch.B.

K. M. CALVER, Ph.D., B.Sc.

AND

E. E. PATERSON, B.Sc.

(From the Bacteriological Service, Hawkhead Laboratory, Paisley)

Demonstration of tubercle bacilli in sputum is necessary for diagnosis and for controlling risks to contacts, and is also, owing to recent developments in chemotherapy, of increasing importance in assessing treatment. Thus identification of this organism constitutes a growing duty of public health laboratories.

Pottenger (1930-1) showed that microscopical examination of a Ziehl-Neelsen film for 10 minutes will reveal less than 88% of positive specimens. The value of selecting a purulent portion of sputum for preparing films has been re-emphasized by Spendlove *et al.* (1949), who clearly demonstrated the superiority of this procedure as compared with concentration by alkali treatment and centrifugation, which seems to reduce the acid-fast properties of the organism. Corper (1928) stated that over 100,000 tubercle bacilli must be present per millilitre of sputum before they can be detected microscopically in a fairly thick film, while according to Cruickshank (1952) the number is from 10,000 to 50,000. Thus adequate direct examination of sputum films is time-consuming, and even when thoroughly carried out some 10% of positive specimens probably escape detection. Culture methods also have their defects, and some microscopically positive sputa fail to yield growths. Cruickshank noted as high as 27% failures with weakly positive sputa in general, and 68% when chemotherapeutic agents had been administered. However, it is clear from the work of Dubos (1946) that the tubercle bacillus is fickle in its reaction to artificial nutrient environments.

Direct examination and culture are complementary, and should be carried out in parallel in order to minimize false-negative results. This is all the more important since the valuable method of guinea-pig inoculation can be performed only on a limited scale and also has its failures. Recently the Public Health Laboratory Service Working

Party on the Diagnosis of Tuberculosis (Report, 1952) described very thorough experiments to determine which of four techniques for homogenization and culture of sputum yielded the greatest proportion of positives, and concluded that "sodium hydroxide proved significantly better than any other methods." We have obtained promising results by a different method which is exceedingly simple and rapid as compared with the alkali technique.

Method

The detergent "teepol," stated by the manufacturers to be a solution of sodium higher alkyl sulphates, was used to homogenize the specimen and kill contaminants. Trial sputa, mainly from sanatorium patients and received after one to three days in transit, consisted of 3-10-ml. specimens in 1-oz. screw-cap universal containers with "blackol" liners. First a direct smear was stained Ziehl-Neelsen and examined for five minutes by each of two people. The number of tubercle bacilli found in positive films during the 10-minute search varied from abundant to only one or two. To each specimen was then added an equal volume of teepol, the mixture being shaken once or twice for a few seconds and kept at room temperature for six hours in the case of a third of the specimens, the others being left for 24 hours. The result was a homogeneous and syrupy mixture. The whole surface of a slope of Löwenstein-Jensen medium in a universal container was inoculated with three small (2-mm.) loopfuls of each mixture and kept at 37° C. for six weeks.

Results

Of 142 specimens, 41 were positive microscopically, and growths of tubercle bacilli were obtained from all but one of the latter. Of the 101 microscopical negatives, eight proved positive on culture, two of which were examined for virulence and found to be virulent to the guinea-pig. Three further specimens, microscopically a positive and two negatives, were discarded because of contamination. Growth was usually observed in the third or fourth week.

It is not yet known whether the shorter exposure will yield a larger proportion of positive results, or whether the carry-over of a small amount of detergent benefits the culture, but apparently it is not harmful. The effect of larger inocula has yet to be tried. A 50% watery dilution of teepol often fails to homogenize and so to sterilize even in 48 hours, coliform organisms and yeasts mainly surviving. The method is apparently applicable to other types of specimen, urines having been successfully cultured.

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The seventh annual report of the Institute of Child Health (University of London) includes an account of research undertaken or projected at the Institute during 1952. In January a full-time physiologist was appointed and is at present engaged on investigations of renal function. The Institute has undertaken supervision of the Population Investigation Committee's survey of growth and development being carried out by Dr. J. W. B. Douglas. At the Child Study centre the investigation into normal growth and development is proceeding, and the report of the results of the pilot survey was produced during the summer. Improved techniques of measurement have been introduced; x rays have been used to determine tissue depth, and an accurate method for assessing this has been determined. Dr. A. P. Norman has continued his clinical investigations of fibrocystic disease of the pancreas and (with Dr. L. I. Wolff) of hepatic and renal function in full-term and premature neonates. Dr. J. Dean and Mr. D. I. Williams have continued their work on nocturnal enuresis.

Medical Memorandum

Congenital Tracheo-oesophageal Fistula Without Oesophageal Atresia—With Resultant Asphyxial Death

Congenital tracheo-oesophageal fistula in the presence of a normal oesophagus is an extremely rare occurrence. The literature contains only isolated reports of this condition: two cases are described in which correction had been attempted (Imperatori, 1939; Haight, 1948). Haight reports having observed this anomaly in two out of a series of 65 cases of oesophageal anomalies.

CASE REPORT

An African woman aged 38 was brought to the Government mortuary. She had been found in a kitchen apparently dying, and soon afterwards, at hospital on October 27, 1950, was certified as dead.

At necropsy she was found to be well developed; weight 145 lb. (65.8 kg.); height 64 in. (163 cm.). There were bright red bilateral subconjunctival haemorrhages and subaponeurotic petechial haemorrhages over the frontal region of the scalp. The brain was congested and oedematous, and there was coning of the medulla. The heart muscle was flabby and friable; otherwise the heart was normal. The blood was very dark and fluid. Ruptured air vesicles were found along the surfaces of the lungs, which were slightly ballooned, congested, and oedematous, with mucus in some bronchioles. Midway down the oesophagus, and in the posterior wall, there was an old fistulous communication with the trachea, measuring 1½ by ¼ in. (4.4 by 1.9 cm.). The edges of this fistula were well rounded and firm. Lodged in the trachea, between this fistulous opening and the hypopharynx, was a single bolus of meat (see illustration). Curling of the epiglottis was noted. The liver, spleen, kidneys, and gastric mucosa were congested. The stomach contained a partly digested meal. The rest of the bowel was normal.



Photograph of specimen. Note the fistula in the otherwise normal oesophagus; also note the lower end of the bolus of meat showing in the upper part of the fistula while still impacted in the trachea.

A histological report on the lung read as follows: "Section of this lung shows that it is congested, with patchy extravasation of red blood cells and oedema fluid into the alveoli. In one of the small bronchioles there is an acute inflammatory exudate. The lymphoid foci in the lung substance are hyperplastic, with plasma-cell infiltration. The histological features suggest an early bronchiolitis." Histological examination of the edge of the fistula showed no evidence of any pathological condition in the tissues. The cause of death was asphyxia due to impaction in the trachea of a regurgitated bolus of meat through a congenital tracheo-oesophageal fistula.

The C.I.D. subsequently obtained the following history of the deceased up to the time of death: "Deceased had been employed for the past four years in domestic service by a Chinese woman in the City of Johannesburg. During this time she was periodically indisposed, and was treated at hospital; the nature of her complaint was not known, but it appeared that she was receiving injections in her breast, since she once reported to her employer that she intended discontinuing her hospital visits because the breast injections were too painful. On the night she died she was found by her employer lying on the kitchen floor 'shivering and with her tongue darting in and out of her mouth'; she was unable to speak. That evening she had been given soup-meat for supper. She was a small eater. She had always complained of pain in her chest."

Despite all efforts by the police no evidence of previous hospital treatment could be found. Such evidence at the best of times is extremely difficult to trace, let alone in the case of a deceased person.

DISCUSSION

The rarity of congenital tracheo-oesophageal fistula without other abnormalities of the oesophagus is substantiated by a review of the literature (Haight, 1948). The symptoms consist of choking and coughing coincident with the ingestion of food and particularly liquids. Leven and Lannin (1945) remark that because of difficulties in establishing the diagnosis the condition may continue to remain unrecognized and untreated, giving the impression of being an acute recurring pneumonitis. Also in patients who have survived more than a few days a recurring pneumonitis has been the reason for frequent admissions to hospital.

In the above case the initial appearances—namely, subconjunctival haemorrhages, subaponeurotic haemorrhages, cerebral congestion and oedema, colour and fluidity of the blood, ruptured air vesicles, and ballooning of lungs—all suggested an asphyxial death, and a very rapid one. Loubser (1945) states that when the process of asphyxiation is very sudden and complete, especially in those cases due to obstruction by foreign bodies, death takes place rapidly, with marked signs of asphyxia, and especially small subconjunctival or subaponeurotic haemorrhages.

The sequence of events suggested is that this woman was attempting to swallow a large bolus of gristly soup-meat (which aptly describes the impacted bolus), or that, owing to some sudden disturbance, she involuntarily swallowed the bolus, which passed partly down the oesophagus; and then, because of some vagal inhibition, spasm with regurgitation occurred, the bolus shooting upwards and backwards through the fistula and into the trachea and lodging there, with resultant complete obstruction and rapid asphyxia.

The question that immediately arises is, How did this woman live for so long with so large an asphyxial potential? The histopathology suggests that minute fragments of foreign material were inspired via the oesophagus through the fistula and via the trachea into the lungs, with resultant inflammatory foci. This would also explain her story of ill-defined chest pains for which she received hospital treatment over a number of years. Professor R. H. Mackintosh, medico-legal pathologist to the Union Government, suggested that a major catastrophe was prevented all these years because of purely mechanical reasons—namely, involuntary contraction of the oesophagus and trachea with swallowing, resulting in almost complete closure of the fistula as food or liquid passed down the oesophagus. This must be the accepted view.

I am indebted to Professor R. H. Mackintosh for permission to publish this case and also for helpful discussion. My thanks are also due to Sergeant D. J. van Schalkwyk, Assistant Curator, Government Mortuary, for photographing the specimen.

BENNIE KRAUSEY, M.B., Ch.B.,
Additional District Surgeon, Johannesburg.

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Arrangements for priority and special rations for invalids are set out in a new edition of a Ministry of Food Memorandum, Med. 2 (1953). The Food Rationing (Special Diets) Advisory Committee of the Medical Research Council has recommended two changes in this edition. Patients suffering from an organic disorder affecting swallowing are to be granted an extra ration of fats in addition to the extra sugar which they are allowed at present, and the extra ration of fats and meat given to children with coeliac disease on a gluten-free diet has been extended to cover all adult cases of tropical sprue and steatorrhoea. The Memorandum is being distributed to all registered medical practitioners in the United Kingdom.

Reviews

FOUNDATIONS OF MODERN
PHARMACOLOGY

Adventures in Physiology, with Excursions into Auto-pharmacology. A selection from the scientific publications of Sir Henry Hallett Dale, O.M., G.B.E., F.R.S., M.D., F.R.C.P. With an introduction and recent comments by the author. (Pp. 652, with many figures. £6 6s.) London: Pergamon Press. 1953.

There are thirty papers and lectures in this book, chosen for continuity of interest; they are mainly on humoral transmission and histamine. One might wonder at first, as the author says he did, whether it was worth reprinting papers which were readily accessible—and, what the author did not say, papers which are already part of contemporary knowledge and regularly consulted by physiologists and pharmacologists the world over. The answer is that we have here, in collected and convenient form, a series of papers that have played a large part in the foundation of modern pharmacology, and indeed have made history. Moreover, the author has now added some valuable comments, or second thoughts, bringing the papers under the light of more recent knowledge. It is these comments which provide the really fascinating part of the book. They show that the author has not only continued to read widely, but has adjusted his earlier views to modern conceptions. Often, in preface and in comments, he refers to instances "in which accident seems to have favoured, or even to have prompted, some scientific enterprise of mine." And indeed, if we are to believe the author, not even the Three Princes of Serendip were more fortunate in their serendipity than he. One can only agree with him up to a point: in the extract above quoted the operative word is "enterprise." The crucial accident was that the author happened to be endowed with the genius and the enterprise to follow up the unexpected events which happen from time to time no doubt, though so often with no further consequences, to all of us.

Yet in spite of this good fortune, as he calls it, that eternal spirit of discontent which is part of the equipment of the scientific mind shows through at times. What he seems to regret is not having been endowed with precognition: "Doubtless I ought to have seen that *nor*-adrenaline might be the main transmitter" (in 1910); and, "Even more curious, however, is the fact that, by this time (1914), both Elliott and I seem to have become shy of any open allusion to the 'chemical transmission' theory, which he had originated ten years earlier." The title of the book is an apt one, for few research workers can look back on their earlier work with the same satisfaction, and with such searching self-analysis, and see that in retrospect it was more adventurous than appeared at the time. No better book could be studied by the young research worker needing stimulus and encouragement. There is a bibliography of 253 papers and lectures by the author.

The work has been well printed, and the illustrations have come out well; the opportunity has been taken for the correction of some misprints in the originals, not, however, without introducing some others—for example, in title No. 11, p. 26, where "retraction" should read "retractor."

C. LOVATT EVANS.

INFECTIOUS MONONUCLEOSIS

Infectious Mononucleosis. By Sidney Leibowitz, M.D. Modern Medical Monographs 5. (Pp. 164. \$4.75.) New York: Grune and Stratton. 1953.

This monograph is based on 25 cases studied in detail by the author and a review of the literature whose thoroughness is attested by a list of 377 references. It is possible to speak of various phases in the history of infectious mononucleosis: the clinical phase, in which glandular fever was recognized; the haematological phase, in which the changes in the blood picture were studied and the identity of acute mononucleosis and glandular fever was established; the serological phase

associated with the Paul-Bunnell reaction; and, most recent of all, the pathological phase. Knowledge of the pathology has come partly from biopsies of the glands and the liver, but chiefly from the 38 fatalities which have accumulated over the years, some from accidents and some from the disease itself. Infectious mononucleosis is not a killing disease, and the rare deaths are usually the result of rupture of the spleen or respiratory paralysis from involvement of the central nervous system. The picture at post mortem is one of widespread perivascular lymphocytic infiltration.

Readers of this monograph will probably be impressed by the frequency of involvement of the liver, the common occurrence of abnormalities in the electrocardiogram, and the seriousness of involvement of the central nervous system. When this last occurs, there may be few of the usual clinical features of infectious mononucleosis, and the mortality is high—about 11%. Dr. Leibowitz believes that the frequency of positive serum reactions would be increased from the present 83% to 100% if the tests were adequately performed, and he is sceptical of the existence of cases with a persistently negative Paul-Bunnell reaction. There is certainly evidence of the existence of an undefined virus disease or diseases which have a clinical resemblance to glandular fever but do not show the typical haematological and serological reactions. This is a clearly written, useful, and well-produced monograph, which gives a good account of this interesting disease.

L. J. WITTS.

OBSTETRICS IN PHILADELPHIA

Clinical Obstetrics. By Members of the Staff of the Pennsylvania Hospital. Edited by Clifford B. Lull, M.D., and Robert A. Kimbrough, M.D. (Pp. 732; 392 illustrations and 8 coloured plates. £4.) Philadelphia and London: J. B. Lippincott Company. 1953.

This book is written by 20 members of the staff of the Pennsylvania Hospital with Dr. Clifford B. Lull the editor initially. Unfortunately he died in 1951, and thereafter Dr. Robert A. Kimbrough assumed the leadership of the team and dedicated the work to the memory of the first editor. By and large it is an account of the practice of the division of obstetrics and gynaecology of a hospital whose history goes back more than 200 years. It is intended primarily for the use of the hospital's own students and as an adjunct to the practical instruction which they are given. Nevertheless, it is not far short of being a complete undergraduate textbook, and omits little which any student should know. Its style, presentation, and illustration are unusually attractive, and are worthy of study by anyone with ideas of writing a book.

This sumptuous production has clearly been a labour of love by a staff devoted not only to their work but to their hospital, whose tradition and eminence they wish to see maintained. So the foreword consists of a history of the Pennsylvania Hospital, and the closing chapters are concerned with maternal and foetal results obtained in their hospital, city, and state; with an analysis of avoidable factors in the deaths; and an indication of the training, standards, and obligations of obstetricians of the present and future.

Probably few in Britain will find themselves able to buy this expensive book, whose strongest appeal is to those connected with Philadelphia. Nevertheless the idea behind it and the excellence of its execution might well be copied by some of the older and larger teaching institutions here, those whose tradition for service, scholarship, and research deserves handing on to the new generation.

T. N. A. JEFFCOATE.

PATIENTS' ART

Experimental Studies in Psychiatric Art. By E. Cunningham Dax, M.B., D.P.M. Foreword by Sir Stewart Wilson. (Pp. 100; 51 illustrations. 18s.) London: Faber and Faber. 1953.

The earliest form of human communication known to us was in drawing and painting. The cave artists painted because they liked painting and not because they were sick. It gave expression to their creative imagination.

Dr. Dax, aware that the arts had been used extensively in mental hospitals, set himself the almost impossible task of organizing the output of the creative activity of the mind under standard conditions. Thus might we use the arts scientifically in psychological medicine. Scientific assessment of this work would, he believed, enhance its diagnostic and therapeutic value. This applied also to the playing of selected music to patients. He attempted experimentally to correlate the effects of music with the production of paintings. A record was played to the patients, and then followed nine and a half minutes of painting. These results were thought to be "statistically significant." Individual experiments were a failure because spontaneity was lost in the process, while group products were awkward material for evaluation and the results inconclusive.

Far and away the most important part of this interesting and original book is Dax's description of the facilities for art work at Netherne Hospital. He had an enthusiastic and invaluable collaborator in Mr. E. J. Adamson, who was in charge of the groups engaged in painting and drawing. He showed genius in establishing the right atmosphere in which the creative imagination of the patients could easily find expression. Mr. Dax is unnecessarily apologetic about the lack of scientific validation in the artistic productions of his patients. The invisible and unrecordable accompaniments which to the artist and others are the picture cannot be measured. The "art therapy" enthusiasts (and the doubters) will find this book well worth reading. They need not worry when they cannot prove the value of the painting.

E. A. BENNET.

BIBLIOGRAPHER'S DELIGHT

Jacob de Castro Sarmiento. By Dr. Augusto d'Esaguy. (Pp. 119. No price.) Lisbon: Edicoes Atica.

Jacob de Castro Sarmiento (1691–1760), an able and versatile physician of scientific tastes, practised very successfully in London during most of his active life. His career provides enough puzzles for the most ardent bibliographer, for his name appears in several forms and with several initials. He wrote in six languages, and all his works are rare and some very rare indeed. It has even been suggested that there were two or more men of the same or similar names.

Sarmiento was born at Braganza of Jewish parents who practised secretly the rites of their religion. Jews had been expelled from Spain in 1492. The Inquisition took longer to enter Portugal, where it never obtained the same hold. In that small country a certain number of Jews did succeed in maintaining an underground existence until able to declare themselves in quite modern times. Sarmiento at any rate gained some slight knowledge of Hebrew. He studied at the Universities of Evora and Coimbra and practised at Lisbon. In 1720 he came to London. There he attached himself to the synagogue of the Spanish and Portuguese Jews, acting as the physician to its members.

In London Sarmiento was one of the very earliest to advocate the practice of "variolation." This had been very recently introduced from the East by Lady Mary Wortley Montagu. It consisted in inoculation from the pus of a mild case of smallpox and preceded Jenner's vaccination by some 60 years. Sarmiento's first publication (London, 1721) was on variolation and was in Latin. In 1723 he printed a work of conventional Jewish piety which leaves no doubt that he had openly reverted to his ancestral faith. His rise in practice was rapid and was maintained. He was licensed by the College of Physicians in 1725, was elected to the Fellowship of the Royal Society in 1729 and to that of the College in 1739. He maintained a correspondence with scientific men in Portugal and Brazil, and in both countries his opinions continued to be highly esteemed. He introduced the Newtonian philosophy into his native land by his accounts of parts of Newton's works in Portuguese. He also translated into Portuguese certain works of his own edition of the works of Francis Bacon. Sarmiento's writings on *materia medica* long held the field. Late in life he left the synagogue. He had two sons, one of whom became a British general.

The writings of Sarmiento were chiefly in Portuguese and are very numerous, while he himself is credited by Dr. Augusto d'Esaguy with no fewer than 28 works. His reputation was maintained by editions of his works or of works ascribed to him for nearly three-quarters of a century after his death. The late Dr. Maximiano Lemos wrote a learned book on Sarmiento, but Dr. d'Esaguy has been able to add considerably to his list of Sarmiento's writings, though he does not include his contributions to the *Philosophical Transactions* of the Royal Society. Dr. d'Esaguy's reproductions of the title-pages of some of the rare and less accessible works of Sarmiento will be specially welcomed by bibliographers.

CHARLES SINGER.

SYPHILITIC OPTIC ATROPHY

Syphilitic Optic Atrophy. By Professor Walter L. Bruetsch. (Pp. 138; 30 illustrations. £2.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

This monograph appears at an opportune time. The development of blindness in the late stages of syphilis, coming on slowly and inexorably some 20 years after the infection had been incurred either in the congenital or acquired disease, had been recognized in a vague way for over a century and was fully established as a clinical entity in the 1880's by such writers as Fournier, Erb, and Westphal. To-day, although the incidence of the disease is much less in this country than it was a quarter of a century ago, it is still an important cause of blindness, while in the United States it has been variously estimated that there are between 25,000 and 50,000 persons blind from this cause. From time to time many theories have been advanced to explain the implication of the optic nerve, and until the revolutionary work of Lere in 1904 it was generally accepted that the main lesion lay in the ganglion cells of the retina; the atrophy was thus considered, and is usually called, "primary" optic atrophy. Pathological examinations have been relatively few, but the histological material gathered by Bruetsch fully bears out the view of the early French author that all cases of the disease have the characteristics of a secondary atrophy due to an inflammatory meningitis at the base of the brain affecting usually the intracranial portion of the optic nerve and the chiasma. It would therefore seem logical to substitute the term "syphilitic" for "primary" optic atrophy.

While the pathological material presented in this monograph is of very great value, the therapeutic corollary is of still greater importance, for the author contends, and backs up his contention with impressive material, that if diagnosed in its early stages the progress of the disease can be arrested. This is a novel view to take of a condition hitherto considered hopeless, and it depends upon the results of newer methods of therapy by malaria and penicillin. In the author's view these should replace therapy by the arsenamines. Early diagnosis in suspected cases—a matter which depends chiefly on a close study of the peripheral visual fields—is thus of paramount importance and holds the key to the eventual elimination of a disease which hitherto has been almost uniformly associated with tragedy.

The monograph is short, easily read, beautifully illustrated, and persuasive in its argument. It will be of unusual value to the syphilologist, neurologist, and ophthalmologist as well as the general physician.

STEWART DUKE-ELDER.

The new edition of the *Medical Directory*, in its handsome red-and-gold covers, contains the usual information about members of the medical profession and medical institutions. We learn from a table that nearly a quarter of the 46,000 doctors in England live in London, and that the 8,917 doctors in Scotland are 2,000 fewer than the London doctors. Published by J. and A. Churchill, the price is 72s. (two volumes). The *British Journal Photographic Almanack* 1953, as well as containing much of interest to any doctor whose hobby is photography, includes a section specifying the suitability of many photographic materials to special subjects in medical photography. It is published by H. Greenwood, London, for 5s. (cloth bound 7s. 6d.).

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SIR HENRY DALE'S OPUS

Not often has the work of one man and his associates been so richly fruitful as that inspired and carried out by Sir Henry Dale, O.M. Publication of some of his writings in a book (reviewed at p. 1434) is a reminder of the pervasive influence his work has had on the progress of medicine in the first half of this century. It was from 1904 to 1914, when Dale was working with Laidlaw at the Wellcome Laboratories, together with Barger, Carr, and Ewins, that the outstanding work was done which determined the lines of much that followed later. If the lectures are excluded, the papers from that period occupy nearly half the book.

Few papers have been written which have maintained their importance for so long as that published in 1910 by Barger and Dale on the chemical structure and sympathomimetic action of amines. It remains even to-day the principal contribution to this subject, the importance of which for all doctors is evident when we reflect on the extensive and still-growing use of substances like ephedrine, amphetamine, and isoprenaline. Closely connected with this work was that on the specific alkaloid which Barger and Carr obtained from ergot and called ergotoxine. Dale's exhaustive study of its action revealed that it prevented many of the motor effects of adrenaline, leaving the inhibitory actions unaffected. During the last twenty-five years there have been continuous efforts to find other substances with similar properties though more suitable for clinical use. A compound which can prevent the vasoconstrictor action of adrenaline may also lessen the vascular tone maintained by the sympathetic system and so be used to lower blood pressure in hypertension; but such a substance must not, like ergotoxine and ergotamine, itself cause vascular spasm and so be liable to cause gangrene. Almost every year recently a new substance has been introduced for this purpose, with varying success.

The development of the study of histamine, which was made together with Laidlaw and later with Richards, had important results for physiology and physiological methods, for pathology, and finally for therapeutics. The problem left unsolved by the papers written with Laidlaw in 1910 and 1911 was how to explain the fall of blood pressure which histamine

caused when injected into an animal, in view of the fact that it caused vasoconstriction on perfusion through the vessels of an organ. The results published in 1918 with Richards put forward what was then a revolutionary conception. This was that the capillary bed can vary greatly in size, can constrict or expand independently of the arteries, and plays an important part in determining the level of the blood pressure. It was found to be on this capillary bed, which did not function in conditions of perfusion as carried out until that time, that histamine exerts its action in the body. But for the publication of Krogh's work almost immediately afterwards, which came to similar conclusions on capillary activity by more direct methods, Dale and Richards would have received greater recognition for their discoveries than they did. Their results were obtained by devising conditions in which the vessels of the perfused organ behaved as they behaved in the body. The perfusion methods were developed further later on, and culminated in the Dale-Schuster pump, described in 1928, which has been an invaluable tool.

For pathologists the study of histamine was important on two grounds. First, the phenomenon of histamine shock described by Dale and Laidlaw in 1919 led them to conclude that "a large group of poisonous substances of animal or bacterial origin" could increase capillary permeability and thereby cause oedema and circulatory collapse. Secondly, the study of the action of histamine was related by Dale to his work on anaphylaxis, which he showed in a most convincing manner was due to the reaction between antigen and a precipitating antibody inside the cell. He explained the similarity of the effect of histamine in certain species to anaphylaxis in that species as due to the release of histamine by the antigen-antibody reaction, and expressed his belief that allergic responses arose in the same way. Therapeutics has gained finally because it is on the basis of this work that the antihistamine compounds have been found useful in so many allergic and other conditions.

But perhaps it is for his investigations on acetylcholine that Sir Henry Dale is best known. In 1914, before Loewi had given his demonstration of the humoral transmission of vagal stimulation, Dale wrote, "One can conclude that there is some degree of biochemical similarity between the terminations of voluntary nerve fibres in striated muscle and the mechanism connected with the peripheral termination of craniosacral involuntary nerves." In his book Dale now refers us to arguments set out by T. R. Elliott (to whom the *Adventures* are dedicated) in 1905 and 1907 for regarding the motor end-plates of striated muscle fibres as homologous with autonomic ganglion cells. No matter how the credit for this remarkable

prescience should be distributed, this 1914 paper of Dale's and the papers with Gasser in 1926 and with Gaddum in 1930, form a series of imposing preludes to the final demonstration in 1936 of acetylcholine as the transmitter of impulses passing along the voluntary motor nerves, in which Brown and Feldberg and Vogt all assisted. From this work has come the use of neostigmine in myasthenia gravis and as an antagonist of D-tubocurarine in anaesthesia. The work was followed by the demonstration of humoral transmission in ganglia, and from there the path has led to the methonium compounds and the use of hexamethonium to ensure a bloodless field in surgery.

This record, truly impressive in itself, is a justification too of the need for single departments of pharmacology and biochemistry where organic chemist, biochemist, and biologist should be able to study a problem together. We may fittingly conclude by quoting from a leading article in this *Journal* on the occasion of Sir Henry Dale's election as President of the Royal Society in 1940: "His life has been spent in the service of experimental medicine, and it is a remarkable fact that his major researches in the laboratory have subsequently found important application in clinical medicine."

TEAMWORK IN GENERAL PRACTICE

As last week's *Journal* went to press during the Annual Conference of Local Medical Committees it was not possible to include a complete account of the Minister of Health's address to it. Space and time only allowed us to report and comment on Mr. Macleod's observations on the rising cost of the pharmaceutical service and measures proposed to stabilize this. Confronted by a picked audience eager to hear him speak, Mr. Macleod responded by going beyond his prepared brief and quickly established a relationship with the Conference which should have wide repercussions. Maybe he will find it possible to repeat this experiment by addressing, one day, the Representative Body. What he said was in effect a straight answer to Left-wing assertions that the present Government is out to destroy the Health Service. Mr. Macleod sees in the N.H.S. a possibility to realize more fully than before "the full conception of the family doctor." The general practitioner must be, he declared, the leader of the domiciliary health services. More patients should be treated in their homes, in their own familiar surroundings, and fewer in hospitals. This would greatly enhance the value and interest of the work of the

general practitioner. He stressed the importance of direct consultation between family doctor and consultant. The general practitioner should be promptly informed when his patient leaves hospital, and when he referred a patient for consultation he should always receive a considered opinion from a senior member of the staff. The general practitioner should have direct access to x-ray and pathological facilities. He should be considered part of the hospital service of his area. There should be complete liaison between the general practitioner and the local health authority, particularly in preventive work. In this matter conditions varied in different parts of the country. Some feared that where many people were concerned with the welfare of the patient there was a danger of the general practitioner's being crowded out. Here Mr. Macleod emphasized once more that the general practitioner should be the clinical leader of the team. "We are engaged," he remarked, "in a great experiment in social medicine, but it must not be strangled by too much administration or too much central direction." He ended with a plea for co-operative effort between himself and his department and the professions engaged in the Service: "It is only in partnership that we are going to solve this problem and achieve the true potentiality of the National Health Service."

The Conference responded with enthusiasm to a Minister who did not hector or lecture to them, who spoke, indeed, not as a politician wishing to score debating points but as someone engaged in a different capacity in the same kind of work as others and wishing to make the best of it with them. The problems of general practice and of the general practitioner are not peculiar to this country. With local variations they are fundamentally the same in all countries able to make the fullest use of the resources of modern medicine. These resources cannot be brought to the sick person by any one practitioner working in isolation from his colleagues. Nor can they be parcelled out piecemeal by this or that expert on a conveyor-belt system. The service of the health visitor, of the physiotherapist, of the consultant and the specialist, of the clinical pathologist, must be co-ordinated and controlled by someone if the patient is finally to be treated as a whole person and not as an assembly of bits and pieces of disordered physiology. Mr. Macleod puts the general practitioner firmly in the centre of the picture as the clinical leader of the team whose various special skills are brought to bear on the diagnosis and treatment of the person whose mind or body is afflicted. And it is only the general practitioner who is in a position to relate all this to the individual circumstances of the patient as

a member of a family and to his work. Integration and co-ordination are in danger of becoming vogue words, but what they stand for is what is urgently needed in the practice of medicine to-day. The Minister of Health sees this work of integration and co-ordination in clinical work as the responsibility of the general practitioner. This is no novel conception; general practitioners have for years consistently pressed the Ministry for just those facilities and responsibilities which the Minister of Health now says should be theirs as of right. Mr. Macleod has driven it home in direct terms at a time when this was needed. General practitioners will be eager to respond to his challenge, and in doing this they will feel encouraged to look at their work, and the way they do it, in a fresh perspective—a perspective in which the N.H.S. becomes one instead of three separate services developing independently of each other.

COMPLICATIONS OF DIABETES

The complications of diabetes may affect any system of the body, and relatively few diabetics escape them completely. Elsewhere in this issue, for example, Drs. C. Hirson, E. L. Feinmann, and H. J. Wade report finding neurological abnormalities in 57 of 100 unselected diabetic out-patients; and Semple¹ found evidence of arterial disease in 42 of a similar series of 100 patients. The designation of the various non-metabolic lesions of diabetes as complications has been criticized on the grounds that there is often no relation between the duration and severity of the diabetes and their onset, and in fact that they often appear before the symptoms of the so-called primary disease. Beaser² found that only 65 of 190 diabetics (34%) had classical diabetic symptoms at the time of diagnosis, and in 36 (19%) diabetic complications were the presenting complaint. There are two possible explanations for this apparent paradox. The clinical onset of diabetes may be preceded by a long silent phase during which pathological changes develop in different parts of the body. Colwell³ went so far as to deduce from a study of insulin requirements at different ages and at different stages of the disease that diabetes begins at birth and has run half its course before it is recognized clinically. The alternative theory, supported by Dr. Wade and his colleagues, is that the metabolic upset is but one manifestation of a more general process and that the

manifold effects of diabetes arise from a common unknown aetiology. The answer should be found in studies of the relative incidence of so-called complications in patients with well and poorly controlled diabetes, but here the evidence is conflicting. Wilson, Root, and Marble⁴ found that, whereas 62 of 247 young patients with long-standing diabetes (25%) had diabetic nephropathy, all the 37 patients who had achieved good control of their diabetes had escaped it. On the other hand, Croom and Scott⁵ found no correlation between retinal and vascular changes and the severity or control of the diabetic state.

Wade and his colleagues classify the diabetic neuropathies into three clinical groups: first, hyperglycaemic neuropathies, characterized usually by pain and paraesthesiae without objective signs and quickly relieved by control of the hyperglycaemia; secondly, active neuropathies, more severe and complex neurological syndromes with a striking tendency to relapse and remission unrelated to alteration in diabetic control; and, lastly, asymptomatic neuropathies, found in 54% of their out-patients and characterized mainly by areflexia in the legs, absence of vibration sense and deep pressure sensation, and, sometimes, abnormal pupillary reactions. On page 1405 Drs. Hugh Garland and D. Taverner report under the title "Diabetic Myelopathy" five cases of a syndrome originally described in 1890 by Bruns. The patients were between the ages of 56 and 73, and all had relatively mild diabetes of short duration, the longest history being three years. All complained of severe pain in the legs, always symmetrical and tending to be greatest in the hip and thigh. The leg muscles were wasted and there was impairment or loss of the tendon reflexes in all five patients; three had unequivocal extensor plantar responses; none had any objective sensory disturbance; four had raised protein in the cerebrospinal fluid. The authors suggest that the cord changes responsible for this syndrome may well be secondary to atheromatous degeneration of the spinal arteries. The complete recovery of four of the patients when their diabetes was controlled is perhaps against this theory: and Wade and his colleagues concluded that there was no evidence to incriminate either arteriosclerosis or vitamin B₁ deficiency as causal factors in their cases. Whatever the cause of these neuropathies, the very rare association of diabetes with Friedreich's ataxia, reviewed in this issue by Drs. D. W. Ashby and P. S. Tweedy, appears to be genetically determined.

Some practical points emerge from consideration of the complications of diabetes. The importance of routine urine testing, whatever a patient's presenting complaint, should hardly need stressing; but even in

the absence of glycosuria a blood sugar curve may occasionally be helpful in diagnosis. Secondly, full clinical examination of all diabetics at regular intervals is clearly essential. Not only will this often lead to the finding of lesions in the nervous system, the vascular system, the eyes, and the kidneys, but now and then it will bring to light an associated disease such as haemochromatosis. This condition is probably not so rare as was formerly thought, its recognition has been simplified by the discovery of characteristic serum iron changes,^{6,7} and its early diagnosis assumes more importance in view of the possibility of treatment by phlebotomy, to which Houston⁸ recently drew attention.

ANTIBIOTICS IN NATURE

The publicity given to the intensive search for new antibiotic-producing organisms during the past decade has tended to obscure the biological role of antibiotics. Microbiologists have been interested in the general phenomena of the action of micro-organisms on one another since the first serious attempts to cultivate them were made,¹ and both beneficial and harmful relations were recognized and studied before any specific stimulatory or inhibitory metabolic products were isolated. The battles often so strikingly displayed on laboratory culture media probably also took place under natural conditions in the soil, and plant pathologists were quick to appreciate that their study might lead to new methods of controlling plant diseases, especially those caused by soil-borne root-parasites. For example, Weindling² found that the soil fungus *Trichoderma lignorum* produces a lethal substance which enables it to parasitize a number of pathogenic fungi. Attack on *Citrus* seedlings by *Rhizoctonia solani* in sterile soil was largely prevented by adding spores of trichoderma to that soil. Other examples of this kind have been recorded in the vast literature that has accumulated.^{1,3} As a result of all this work it is now known that several different kinds of antagonistic association take place in culture or in soil.

Direct parasitism of one organism by another is a form of antagonism, and many examples of it have been found among the fungi.² For example, species of *Piptocephalis*, moulds belonging to the Mucorales, are obligate parasites on other moulds of the same order. However, the majority of soil fungi are saprophytes and exert antagonistic effects in other ways.⁴ Many fungi are able to suppress the development of other organisms by bringing about growth conditions generally unsatisfactory to them. They produce simple chemical compounds—e.g., citric acid, ammonia, carbon dioxide—which are in a sense antibiotics but act non-specifically and mainly by causing large changes in soil acidity. Other fungi—e.g., *Penicillium* spp.—and particularly filamentous

actinomycetes of the genus *Streptomyces*, produce specific inhibitors, toxins, and lytic enzymes (true antibiotics). Finally, competition between micro-organisms for some limiting nutrient is also a factor which may retard their growth and may affect some organisms more than others in the mixed population.

The effects of antibiotics are frequently so striking in culture that they might well be thought to be very important in nature in controlling the microbial populations in soils. However, soil is complex and heterogeneous, both chemically and in physical structure, and in it exist vast numbers of organisms of many types in very close association with each other. All types of antagonistic and beneficial association are taking place at once, and it is impossible with present techniques to disentangle the different effects and assess their relative importance. Antibiotics undoubtedly will be produced in certain soil conditions, but it is less certain that the organisms producing them will benefit by it. Many antibiotics are inherently unstable and unlikely to persist; they may be adsorbed on to soil particles, and they are often broken down enzymatically by other micro-organisms not susceptible to their inhibitory action. For instance, Daines⁵ found that a substance produced by *Trichoderma lignorum* was toxic to *Streptomyces scabies* (the organism causing scab of potatoes) in artificial liquid medium but was rapidly destroyed when added to soil.

The artificial addition of antibiotics in quantity to the soil might prove of value in farming or horticulture, but in view of the complexity of soil the prospects are not very bright. Very little work has so far been done in this direction, and it is not known what changes in soil fertility or partial sterilization might be induced. The converse process, artificial addition of living bacteria, has, however, been studied in the hope that organisms capable of producing antibiotics against the added bacteria would be stimulated to develop. Enrichment of soil in this way does usually lead to the enhanced development of various groups of organisms in it, and in some cases new antibiotics have thus been found. Dubos⁶ added various pathogenic cocci to soil at intervals over a period of two years and succeeded in isolating *Bacillus brevis*, which produced antibiotics (gramicidin and tyrocidin) active against them.

However, in general there is very little proof that organisms so stimulated have necessarily produced or are able to produce antibiotics against the introduced organism. Indeed, it is difficult to see why the ability of one organism to produce an antibiotic against another should encourage it to develop in the presence of its victim, unless it is also able to utilize the cell substance of the inhibited organism. This has been shown to occur at least in culture with some of the myxobacteria, which not only produce a bactericidal secretion but a lytic substance which enables them to draw their nutrients from lysed bacteria. Have antibiotics a significance in evolution? So far it has not been possible to prove that those formed naturally in soil can influence the balance of microbial populations there, and therefore ability to produce an antibiotic is unlikely to favour the survival or development of the organism which makes it. Antibiotics may be only excretion products which accidentally at the most confer advan-

¹ Lancet, 1953, 1, 1064.
² New Engl. J. Med., 1948, 239, 765.

³ Arch. Intern. Med., 1942, 70, 523.
⁴ New Engl. J. Med., 1951, 245, 513.

⁵ Lancet, 1949, 1, 555.
⁶ Rath, C. E., and Finch, C. A., J. clin. Invest., 1949, 28, 79.

⁷ Houston, J. C., and Thompson, R. H. S., Quart. J. Med., 1952, 21, 215.
⁸ Lancet, 1953, 1, 766.

¹ Waksman, S. A., Microbial Antagonisms and Antibiotic Substances, 1945, New York.

² Phytopathology, 24, 1153; Botanical Review, 1938, 4, 475.

³ Garrard, E. H., and Lochhead, A. G., Scientific Agriculture, 1938, 18, 719.

⁴ D'Aeth, H. R. X., Biol. Rev., 1939, 14, 105.

⁵ Amer. Potato J., 1937, 14, 85.

⁶ Proc. Soc. exp. Biol. (N.Y.), 1939, 40, 311.

tage by cutting down the competition for available foodstuffs. As yet it is not possible to pronounce definitely, and the biological role of antibiotics remains somewhat of a mystery.

PROGNOSIS IN DIABETIC PREGNANCY

The successful solution of a problem in medicine often brings in its train other, if less serious, problems. So with diabetes mellitus: the adequate treatment of it by insulin has provided an increasing number of pregnant diabetics to perplex physician, obstetrician, and paediatrician. In a paper at p. 1413 of this issue of the *Journal* Dr. Wilfrid Oakley has concerned himself with the outlook for the pregnant diabetic and her baby. He confirms that the insulin requirement usually rises after the fourth month of pregnancy at a time when the renal threshold for sugar usually begins to fall. This may lead to heavy glycosuria and severe ketosis in a previously well-controlled diabetic, but with proper supervision there should be no maternal deaths from diabetic coma. Oakley found it difficult to assess the remote effects of pregnancy on the march of the disease, because increased insulin requirement, retinitis, and hypertension and albuminuria can all occur independently of an intervening pregnancy, but he does not consider that pregnancy increases the chances of such complications developing. In particular he concludes that toxæmia of pregnancy does not involve a greater risk in the diabetic than in the non-diabetic of precipitating permanent hypertension.

But if the outlook for the pregnant diabetic in terms of mortality and morbidity continues to improve, the prognosis for the baby remains clouded by a foetal loss of over 25%, a high rate which Oakley finds largely unexplained. He is unable to support views that the foetal loss is related to the duration or severity of the diabetes or to the age of its onset. In particular his figures deny that toxæmia is the cause of the high foetal death rate, and he therefore concludes that any form of therapy directed against toxæmia cannot appreciably increase the foetal salvage rate. This conclusion is diametrically opposed to the views of Dr. Priscilla White in Boston, as expressed most recently in a full account of 525 viable pregnancies in diabetic women treated between 1936 and 1951.¹ She considers that the four factors affecting the foetal mortality are the disturbed metabolism of diabetes, sex hormonal imbalance, the degree of maternal vascular disease, and congenital malformations. She emphasizes that the second of these is at least as important as the first, for it favours toxæmia, premature labour, and intrauterine death, and that it is just as amenable to treatment. The hormonal imbalance is said to be characterized by a high level of serum chorionic gonadotrophin, a low level of serum oestrogen with abnormal ratios of its degradation products, and a low level of urinary pregnanediol excretion—findings which have not been fully confirmed by others.² This imbalance is said to be correctible by the administration of increasing doses of stilboestrol and progesterone, which for the best results

must be given parenterally; the response to them can be assessed by laboratory tests. The theoretical basis for this hormone therapy is not generally accepted, and it is interesting to note there has been some change in emphasis from the claimed stimulative effect of such treatment on the placenta to its substitutional value. Yet the results in White's treated group, in which hormone therapy was a very important but not the only feature of management, are remarkable, 345 out of 380 babies being born alive. Consequently the results of the current controlled investigation by the Medical Research Council in this country into the value of such hormone treatment are eagerly awaited.

If Oakley and White differ on the question of treatment with oestrogen and progesterone, they apparently agree on several other points of management. Thus, although others may disagree,^{3,4} they both regard caesarean section at about the 37th week of pregnancy as the method of choice for delivery. One result of this interference is to shift the emphasis from stillbirths to neonatal deaths. Discounting the importance of hypoglycaemia, and disregarding those deaths due to congenital malformations, both agree that neonatal death most often occurs within 72 hours of birth and is usually due to respiratory failure, which White attributes to hyaline membrane disease. This is a field of neonatal paediatrics which requires further illumination, and it is encouraging to note that research is being pressed forward both in London and in Boston.

CHRONIC OTITIS EXTERNA

The term chronic otitis externa covers a multitude of different clinical appearances, though with few exceptions the essential lesion is an eczematous inflammation of the skin lining the meatus and concha. At one time chronic middle-ear discharges were commonly seen, and it is perhaps surprising that the skin of the external meatus was not more often the seat of pyoderma. Indeed, otitis externa is limited in most cases to the outer third or cartilaginous part of the meatus, the inner part and the drum remaining healthy.

The affection is most often seen in middle adult life and is probably more common in men. Scalp dandruff and other signs of the seborrhoeic state are often present, and when the eruption extends from the meatus to the concha and the neighbouring skin of the neck and face it usually takes on the characteristic appearance of that disease. But this is saying little more than that such a patient appears to be particularly susceptible to eczematous eruptions with local, low-grade, superficial infection of the skin; he is at the same time particularly liable to develop epidermal sensitivity and to give adverse reactions to antiseptics and antibiotics applied locally. Of the underlying nature of the seborrhoeic diathesis, of its relation to endocrine function, diet, and infections of the upper respiratory tract, there is no precise knowledge.

Otitis externa often starts insidiously with a slight scaling and irritation of the outer part of the meatus, accompanied by scalp dandruff and possibly low-grade seborrhoeic dermatitis of the head or trunk. The skin

of the meatus is tightly bound down to the cartilage, leaving little room for oedema swelling. It is well known that severe pain may result from comparatively slight oedema of the meatus, and it seems likely that irritation is also accentuated. Scratching is violent and paroxysmal, and paves the way for secondary infection. Emotional tension will usually increase itching and scratching, so that the patient's mental attitude may assume great importance and account for the intractability of the otitis.

For some years past it has been said that fungus infections are common in this situation, though current experience in the United Kingdom does not seem to support this view. More often the common streptococcus and staphylococcus are responsible, and since antibiotics began to be used *Pseudomonas aeruginosa*, which is resistant to them, has often been found. Scratching, the mild trauma of dressings, and ear-syringing may all predispose to the development of secondary infection, and exacerbations often seem to result from exposure to water in swimming. Periodically infection of the epidermis spreads to the dermis and subjacent tissues with the production of cellulitis, which may be exceedingly painful; localization of this to actual furunculosis is unusual. The occurrence of secondary infection, seeming to prolong and exacerbate the original disorder, naturally suggests treatment with antiseptics and antibiotics. But if this treatment is continued for more than a few days epidermal sensitization to the application is apt to develop, resulting in a rapid spread of weeping dermatitis to the pinna and surrounding skin. When this stage is reached the aetiological factors are confused and may be most difficult to unravel. It is then far easier to do harm with treatment than good.

Treatment is almost entirely a matter of local applications, but great caution should be exercised in the use of local antiseptics. The common hospital practice now is to identify infecting organisms in culture, to determine their antibiotic sensitivities, and to give treatment accordingly. Although this is, no doubt, the theoretically correct procedure, it is doubtful whether in practice it yields particularly good results. Organisms seem to change their sensitivity, and superinfection with resistant organisms so readily occurs, that better results are often obtained with antiseptics having a wider bactericidal effect. Proprietary preparations containing chlorhydroxyquinoline or iodochlorhydroxyquinum ("quinoxin" cream and "vioform" cream) seem at present to offer a good compromise between antiseptic activity and the possibility of irritation or sensitization. Even so, it is probably best to limit their use to a few days while the worst of the infection is overcome, and to cease the application before the skin has had time to become sensitized. Four or five days' antiseptic treatment is nearly always safe and is nearly always sufficient. After this the treatment is that of eczematous dermatitis and varies according to the degree of activity of the inflammatory process. At all stages emulsified bases such as unguentum aquosum B.P. are likely to be preferable to purely greasy applications, though in the more chronic stage Lassar's paste can hardly be bettered. As an antipruritic 2% or 3% liquor picis carbonis may be added to the application. The antihistamines have proved, as

was expected, to be inclined to cause epidermal sensitization and contact dermatitis when applied locally; their use in otitis externa involves considerable risk of this complication and is seldom advisable. X-ray treatment can be extremely successful. It is probably best withheld until the condition has reached a quiescent stage, whether with treatment or spontaneously, when repeated small doses of superficial x rays will often prevent recurrence.

POISONOUS FISH

Such scientifically highly civilized parts of the world as the British seaside are virtually free of fish lurking to sting or lacerate the unlucky bather. Nor do the sea fisheries of Western Europe trawl up fish poisonous to eat, and anyone who has been served with a Mediterranean fritto misto of starfish, sea cucumber, squid, and other members of the molluscan, arthropod, or echinoderm phyla will testify to the fact that most sea creatures are amazingly innocuous to the digestion. But it is otherwise in the Tropics. The director of fisheries in Malaya recently lectured¹ to the Malayan Branch of the B.M.A. on the various kinds of catfish, sting rays, and scorpion fish provided with sharp spines and puncture poisons of unknown composition, and on the puffer fish, which blows itself up like a football when disturbed and is dangerous to eat. Sea snakes also are common around Malayan shores, the commonest species being four or five feet long and its venom eight times as poisonous as that of the cobra, of which it is a relation. It is good to know that "sea snakes are gentle and inoffensive creatures, and do not bite unless they are provoked."

The treatment of injuries caused by fish appears to be best carried out by sucking out the poison and spitting it away, opening up of the wound as quickly as possible, and washing with permanganate. Cortisone may be a useful adjuvant in severe cases, for it has been found helpful in cases of snake-bite poisoning.² The Malay peoples have various "cures" for catfish poisoning, some of which are herbal, and it would be interesting to know whether they have a useful pharmacological effect or are purely magical. As for the puffer, whose body contains alkaloids which produce respiratory and cardiac failure, it is apparently a Japanese delicacy. If all its viscera are removed immediately it is caught it is said that the poisons have no time to diffuse into the adjacent flesh, which is then quite wholesome. But accidents have been recorded.

At the annual general meeting of the Royal Statistical Society on June 24 the Guy Medal in Gold was awarded to Professor A. Bradford Hill, who, in the words of the report of the council of the Society, "has occupied for many years a pre-eminent position in the field of medical statistics, in which he commands the highest regard not only in this country but also overseas. It was a tribute to his international reputation that he was recently elected an honorary fellow of the American Public Health Association 'in recognition of his outstanding services in the field of public health.'"

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REFRESHER COURSE FOR GENERAL PRACTITIONERS BREAST-FEEDING DIFFICULTIES

BY

F. CHARLOTTE NAISH, M.D.

Feeding difficulties fall naturally into two divisions: overfeeding and underfeeding, but the former is far less common and less important than the latter. When the supply of milk is abundant and it flows freely an active, greedy baby may take too much. Perhaps six out of ten of these babies promptly vomit the excess and make normal gains in weight; these present a laundering difficulty but not a feeding difficulty. Perhaps two more retain the excess and make exceptional gains in weight: as the food is well balanced, the growth is well balanced, and so, again, there is no feeding problem. The remaining two babies may suffer from frequent loose stools, through overloading their stomachs. Since frequent loose stools are also (and much more commonly) a sign of underfeeding, the first essential is to verify by test-weighing that the baby is really taking an exceptional quantity. If this is found to be so, then no immediate treatment is necessary, for the condition is not serious and usually rights itself. In no case should treatment aim at reducing the milk supply, for such treatment nearly always overreaches itself and creates an underfeeding problem. If it is considered essential to reduce the bowel action, this should be done by giving an emulsion containing 2 minims (0.12 ml.) of castor oil and 20 gr. (1.3 g.) of mucilage of acacia to the drachm (3.5 ml.) of water. One drachm before feeds is a suitable initial dose, and the dosage can be freely varied according to the result obtained.

In all other cases of difficulty the baby gets too little milk.

Recognition of Underfeeding

The number of babies classed as underfed will depend largely on the doctor's standard of satisfactory weight gain. There is wide variation in this. From the fourteenth day to the end of the third month the weekly gain is independent of the birth weight and should not be less than 6 oz. (170 g.). Eight ounces (230 g.) is a reasonable target for boys and 7½ oz. (210 g.) for girls. This does not mean that these gains can be looked for every week: such progress often occurs, but probably cannot be ensured in any way. But it does mean that every baby gaining less than 6 oz. (170 g.) is to be classed as momentarily underfed, and corrective measures applied so that it shall gain from 18 to 24 oz. (500 to 700 g.) in any and every spell of three weeks. It is not enough merely to get back to gains of 6 oz., but the arrears should also be made up.

Though it is true that loose greenish stools are generally a sign of underfeeding, the bowel signs are ambiguous. It is better to base treatment on weight and use the return to normal stools as a check on the adequacy of the measures taken.

When dealing with mothers who are not satisfied with the progress of their babies, one must remember that the babies are under constant observation by people who are concerned for them; in consequence the number rightly referred to a doctor greatly exceeds the number referred unnecessarily. Moreover, if the mother worries without cause it is bad for the baby; so much so that there will ultimately be a feeding difficulty if the case is dismissed without study and explanation. Often, however, the history will be overlaid with interpretation, so that in its first form it is useless: the essential facts may need to be elicited by cross-examination.

The main causes of underfeeding are mechanical difficulties, which may be in connexion with the mother, the baby, or both; infections; and insufficient flow or secretion of milk.

Mechanical Difficulties

In the baby, difficulty may be caused by nasal obstruction. There may be a congenital malformation of the nasal passages which, if severe, results in great respiratory distress, as the infant's reflexes are not adapted to purely oral breathing. Such cases are not primarily feeding problems, and are unsuitable for domiciliary treatment. Partial nasal obstruction may result from an upper respiratory infection, and may be treated with nasal drops before the feed. Chlorbutol and menthol nasal drops (N.F., 1952) are useful for this.

Hare-lip and *cleft-palate* constitute a bar to feeding at the breast, but not necessarily to feeding with human milk, provided the mother is good at manual expression of her milk. Breast pumps are in general unsatisfactory because they work by suction alone, without expression. This does not produce enough milk from the breast to maintain the supply.

Tongue-tie has been so often diagnosed in error that some teachers have reacted so far as to deny its existence. Although it is rare, I believe that it does occur and is well worth treating. Part of the process of getting milk from the breast consists in compressing the nipple against the palate by drawing the tongue along it. Occasionally the tongue is not mobile enough to carry out this movement. In some babies labelled "bad suckers" it can be observed that the tongue never comes forward beyond the lower lip or, in extreme cases, beyond the lower gums, and, as a confirmatory sign, the tongue does not point normally in the forward position, but shows a double curve and central recess. If the fraenum of such a tongue is snipped the tongue will point normally—sometimes at once but more usually after about three days. The "bad sucking" is completely cured.

In the mother, *malformed nipples* are a fairly frequent cause of difficulty. If observed early they can be cured by the wearing of "Woolwich-type" nipple shields for the remainder of the pregnancy. Even if the condition is not observed until near the confinement it is still worth ordering the shields; though, as their action is gradual, they will not be nearly so effective.

If the practitioner does not see the mother until the nipples are actually causing difficulty in feeding, then the matter is serious. A breast pump may sometimes be applied just long enough to draw out the nipple to its fullest extent, and the baby immediately substituted; but this will not be enough in severe cases. The most generally applicable method of feeding an infant on human milk when the mother's nipples are not usable is for her to express the milk by hand. Her ability to do this well usually depends on her having practised daily expression of colostrum for six weeks or so before the confinement. A breast pump should not be used to obtain milk, for the reasons given above. Faulty nipples, if not treated in time, may spell defeat, even though everything else is propitious.

Cracked nipples are even commoner than malformed nipples, and, like them, can be almost entirely avoided; if they occur, they constitute a very serious difficulty. The two main causes of cracked nipples are: (1) failure to keep the skin soft by oil-massage during pregnancy and, in the worst cases, deliberate hardening by scrubbing and spirit lotions; and (2) excessive suckling during the first three to four days after the birth, before the milk has "come in." It is most regrettable that much traditional teaching advocates both these faulty procedures.

A cracked nipple cannot heal while it is in use, so that suckling must be temporarily given up. Also, every cracked nipple is liable to infection and needs to be softened—ends which can be met by the exhibition of penicillin cream during the resting period. If there is a yield of milk to be preserved manual expression should be performed. The breast pump is even more definitely contraindicated than in the treatment of malformed nipples, for the suction, in elongating the nipple, opens the crack, and is just as painful as suckling. Nipple shields of the type through which the baby sucks are to be classed as pumps in these respects. If cracked nipples due to both hardening of the skin and excessive suckling coincide with engorgement the position is more serious still, as the epithelium of the nipple becomes oedematous and liable to further damage.

Some degree of engorgement is usual between the third and tenth day after birth. If it is severe and not properly handled the breasts may become swollen, hard, hot, and superficially oedematous. The areola, under which lie the main collecting sinuses, will be too taut for the baby to grip and squeeze between its jaws, and in consequence feeding is impossible until the tension subsides. This will happen after two or three days; but those are days of starvation for the infant, of acute discomfort with a high liability to mastitis for the mother, and of internal damage probably leading to partial involution for the breasts themselves. Treatment is therefore advisable, and the most effective method of shortening the engorgement is the exhibition of stilboestrol: three doses of 5 mg. at four-hourly intervals. In the most severe cases a larger first dose, up to 20 mg., has been recommended. Stilboestrol treatment is suspected of having some permanent effect on the lactation in a fair proportion of cases, but it reduces the danger of mastitis and the period of starvation.

If the doctor is at hand at the beginning of engorgement, then the best way of forestalling the acute phase is to institute a regime of frequent but short feeds, perhaps two-hourly feeds of five minutes each side. The baby is usually hungry enough at this stage of its life to accept such a regime and feed vigorously, provided that its rest is not cut down too much; this is one reason for keeping the feeds short. Such feeds may be followed by careful expression by hand (by the mother, because she is less liable to damage the underlying tissues), but care should be taken to see that she does not get too anxious and exhausted. This regime is most successful when it has been explained in the course of ante-natal education: it is quite impossible if, at the same time, the nipples have been allowed to become cracked.

Infections

Many babies with infections do not present only a feeding difficulty, and the doctor will quickly sort out those with a frank pyrexia, with obvious respiratory difficulty, or with acute diarrhoea. However, the class of infected babies includes many more than these. There are many mild infections which are very difficult to recognize. On the whole subject of infection in infancy, no one should omit to study Cruickshank (1945) and Moncrieff (1953). A history of loss of appetite, or of vomiting of sudden onset, or of offensive stools is suggestive of an infection; abnormal redness of the mucous membranes or of the finger-tips (as though a number of whitlows were forming) is a sign pointing in the same direction. There may not be actual loss of weight, but the gain is sure to be low. Many such infections pass unrecognized.

The treatment of an infection should be the immediate exhibition of penicillin by injection, in doses of 300,000 units (suspended) every 24 hours. Without prejudice to the question of how antibiotics should be used in adults, there must be no delay in giving them to infants, in whom an infection may not provoke any physiological reaction.

Inhibition and Failure of Lactation

It may be difficult to distinguish clinically between inhibition of the flow of milk and failure of secretion as causes of underfeeding.

If, when the baby is taken away from the breast after about two minutes, milk is seen to be squirting from the nipple it can be assumed that there is no inhibition of the flow of the milk. This simple test is either positive or indecisive, never negative. On the other hand, if a baby takes the breast eagerly, but soon refuses to suck, cries vigorously, and will not make another attempt, it can usually be assumed that the contraction of alveoli and ducts in response to the stimulus of sucking has been inhibited. Once more the absence of this behaviour means nothing. The time at which underfeeding occurs is some guide to the probable cause. Since the growing baby demands more and more milk, the later underfeeding occurs the more likely it is to be due to a lack of active tissue in the breast. The same line of reasoning indicates that a gradual drop in the baby's gains is probably due to inadequate secretion; a sudden drop to inhibition of flow.

The causes of inhibition of flow are psychological, but fortunately they are usually superficial. It is extremely common at the moment when the mother takes sole charge of the infant and at the same time resumes her household duties. Worries quite unconnected with the nursing couple may inhibit the flow at any time. So may uncongenial people in the entourage; a midwife or mother-in-law may easily prejudice the success of breast-feeding.

Either cause of underfeeding may produce the other. If the mother is worried because the baby's growth is slowing down, this may add failure of flow to failure of secretion. And if the inhibition of flow, when secretion is plentiful, leads to stretching of the breasts the secretion will be reduced. In addition, underfeeding through failure of the flow is a self-aggravating condition—that is, the fretfulness of the underfed child worries the mother and so prolongs her inability to give the milk which is present in the breast. This underlines the need for prompt and firm treatment when a baby is gaining insufficiently; it is important to deal with the situation before secondary causes come into operation.

Treatment of Underfeeding

The first line of treatment is complementary feeding. Provided a good technique is used (see below) this method will ensure immediately an adequate intake, with the highest possible proportion of human milk, it will ease the mother's anxiety, and permit a return to full breast-feeding if the flow or secretion of milk is restored. It is also largely self-regulating.

Other treatment may also be required. If the mother is nervous or the baby cross, sedation may be advisable; for the baby syrup of chloral, 15 minims (0.9 ml.), should be given half an hour before the feed. If inhibition of the flow of milk from the gland is the cause of underfeeding, some psychological exploration of the situation will be necessary. Simple measures, such as feeding in physical comfort, in solitude and quiet, and without haste at the start, are often all that is needed. If the secretion is inadequate the mother's output will be increased by shortening the interval between the feeds, for this keeps the gland in full activity for more of the day. The length of the feeds should not be increased; it may have to be cut down if the frequency of feeding is reducing the baby's sleep. In a few cases of only slight underfeeding, treated early, this method may take precedence over complementary feeding. In cases in which failure of flow is the primary cause of underfeeding there is no indication for feeding more often, and to do so might increase the tension already present in the situation.

The technique of complementary feeding deserves careful attention. Any normal artificial-feeding formula will serve for the complement, for, though the baby is unaccustomed to any but human milk, the amount of complementary feed that it will have to take is usually small. The complement should be offered immediately after the breast-feed; it must therefore be prepared beforehand and kept warm during the feed. It should be given by spoon from a cup; the quantity to be given is what the infant will readily take. If the complement is given from a bottle, only the second of the four

purposes of complementary feeding (allaying anxiety) will be fully achieved. There have been disputes on this question, and many cases have been cited in which an adequate intake was immediately secured and the mother's anxiety was allayed. But no cases have yet come to my notice in which the proportion of human milk in the diet was the highest possible or in which a return to full breast-feeding was practicable without a sacrifice of weight gain.

Conclusion

Finally, brief mention must be made of three conditions which may worry either the doctor or the mother—namely, failure to establish lactation, vomiting, and constipation.

Non-lactation is often diagnosed too soon. It is important at all times to give sips of sterile water (with or without sugar) to allay the baby's thirst, as this interferes with its rest more than hunger does. But artificial feeds should not be given until the eighth day or until the baby has lost 15% of its birth weight, whichever is the earlier; and they should not exceed 1 oz. per lb. (60 ml. per kg.) of body weight a day until the fourteenth day. If by that time the milk is still not coming in in effective quantities it may be doubted whether lactation can be established.

Vomiting is a constant cause of complaint. Few mothers (strange though it seems) expect milk to be curdled in the stomach, so that the curds in the vomit alarm them. Vomiting should be judged in relation to test feeds and weight gains. If it seems that the baby's progress is affected by the vomiting, and there is no infection, then belladonna, 5 minims (0.3 ml.) of the tincture in water, or atropine methonitrate, 2 to 5 drops, should be given before the feeds. Even when the infant's progress is not affected, this treatment may be necessary to quieten the mother. If the vomiting continues in significant quantity, a stomach wash-out should be given to determine whether there is mucous gastritis; if large quantities of mucus are found the treatment should be repeated daily until the condition remits. The only cases of vomiting needing weaning are those which follow on puerperal sepsis.

Constipation is usually a false report. What is nearly always meant is that the motions are infrequent, but the stools are normal in themselves and passed without strain. The condition demands no treatment whatever. In the rare cases in which the stool is hard and difficult to pass (and pyloric stenosis has been excluded) a mild laxative should be given, such as mist. magnes. hydrox., B.P., $\frac{1}{4}$ to 1 drachm (1.7 to 3.5 ml.), or syrup of senna, 15 to 30 minims (0.9 to 1.8 ml.).

The number of points at which prevention is not only better than cure but also much simpler is worth stressing. Regular supervision will always lead to greater success than can be secured by interventions to deal with difficulties.

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Next Refresher Course Article.—"Pyelitis in Children," by Professor A. V. Neale.

The Treatment of Accidental Poisoning.—In the paragraph on the treatment of aspirin poisoning in this Refresher Course article (May 30, p. 1214), the use of "intravenous sodium lactate (70%)" is advised. In order to obviate any possibility of misunderstanding, it should be stated that the sodium lactate is to be given in isotonic solution. The 70% refers to the strength in which the lactate is usually purchased.

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LINGUA MEDICA

A STUDY IN MEDICAL SEMANTICS*

BY

FFRANGCON ROBERTS, M.D.

Socrates: He who first gave names gave them according to his conception of the things which they signified, and if his conception was erroneous . . . shall we not be deceived by him?—PLATO, *Cratylus*.

The meaning of anything is usually another name for the same thing.—CHARLES CHAPLIN, *Limelight*.

The language of medicine has more than utility value. It enshrines the ideas about disease which were held by primitive societies, the gradual evolution of medical knowledge in 2,500 years, and the geographical course which this knowledge has taken. It illustrates the mental processes by which men in all ages have found names for natural phenomena, incidentally giving us glimpses of their domestic, agricultural, and military background, and it explains why medical concepts, however modern, are still most accurately expressed in the language of Hippocrates.

Sources

The principal sources of medical words are five: Saxon, Graeco-Roman, Romance, Arabic, and Modern German.

Saxon

This source comprises our native Anglo-Saxon, together with Scandinavian, Teutonic, and other languages of North-west Europe. The words which it furnishes are all short, and express simple ideas—*head*, *hand*, *ache*. Their derivation is of no interest except to students of these languages.

Graeco-Roman

This is, of course, the most prolific source. The Greek component derives from early Greek, Minoan, Egyptian, and Asiatic sources, and first appears in organized form in the writings of Hippocrates (b. circa 460 B.C.). On the decline of Greece proper the words were taken over by the Greeks in Alexandria and later by the Romans. The Romans were in the habit of employing Greeks as their physicians, among them Galen (A.D. 131–200), but they also practised medicine themselves either as professionals or as amateurs. The head of a household, at any rate in the provinces, would dispense medicines to the members of his villa. But whether Greek or Roman, professional or amateur, they were bilingual, and used Greek and Latin words according to convenience. This explains the double nomenclature of the present day: *nephros*, *ren*; *orchis*, *testis*; *encephalon*, *cerebrum*. Andrews (1947) maintains that Latin words were completely suppressed except for a few such as *anus*, *penis*, which might be used in vulgar jokes. This is manifestly incorrect, as the writings of Celsus and others abundantly show.

Romance

Romance words are those which, though of classical derivation, arose in Italy, France, or Spain. From Italy we have *belladonna* (beautiful woman, from the effect of the drug on the eyes), *malaria* (bad air), and

* In this article the following abbreviations are used: Ar., Arabic; E., Modern English; M.E., Middle English; F., Modern French; O.F., Old French; G., Greek; L., Latin; Lit., Literally; Pop., Popular.

influenza. From France come *goitre*, *tic douloureux*, *grand mal*, *petit mal*, *chancre*, *trocar*, and many others. From Spain, *mosquito* and *quarantine*.

Arabian

During the long eclipse of Western culture in the Middle Ages (A.D. 476–1453) science was pursued to a high level by the Moslems, whose empire extended from Arabia, through Egypt and the north coast of Africa, to Spain. To them we owe algebra and our arithmetical notation. They translated the Greek and Latin medical texts, the use of which was proscribed by the Christian Church. At the Renaissance the Humanists, experiencing great difficulty with the Arabian translations, and finding a new pride in their long-neglected heritage, sought the original sources. Consequently few Arabian words survive. Most of these are names of chemical substances: *sugar*, *syrup*, *alcohol*, *alkali*, *elixir*, *naphtha*, *senna*. Of medical words there seem to be only four:

Nucha, neck.

Mater (dura and pia), from the Arabic word for *mother*. The Arabians were, and still are, in the habit of using flowery language, with a special preference for family relationships. *Mater* therefore means either mother of membranes or, more probably, mother or protector of the brain.

Cephalic (vein), from Ar. *alkifal*, outer.

Basilic (vein), from Ar. *basilik*, inner.

The *Oxford English Dictionary*, however, derives *cephalic* from the belief that this vein influenced the head, and *basilic* from the fact that this was the chief, therefore royal, vein used for bleeding (G. *basileus*, king). With all due respect I think the Arabian origin the more probable.

Modern German

For reasons given below these are very few—*magenstrasse*, *magenblase*, the hybrid *kernicterus*, and some psychiatric terms.

Corruption

In their migration across Europe many words have become corrupted. In some—for example, *shingles*, from *cingulum*, belt—the phonetic resemblance is obvious. In others, the process is more gradual. L. *botellus*, pudding or sausage, late pop. L. small intestine, O.F. *boel*, M.E. *buel* or *bouel*, E. *bowel*. G. *plege*, a blow, L. *plaga*, O.F. *plage*, M.E. *plage*, E. *plague*. *Hydropsie*, *dropsy*. Cf. pop. *polio*, *flu*.

The Construction of Modern Words

In constructing modern words classical words are invariably used, never the Saxon. For this there are several reasons. First, Saxon words go no further than primitive folk-medicine. In the classics, on the other hand, we have an elaborate verbal system invented for much more advanced concepts. Moreover, until the eighteenth century Latin was the universal language of scholarship. Secondly, Latin was the universal language of medicine allies itself with other by using classical words medicine allies itself with other sciences. *Proto-*, first, is used in physics and medicine; *cortex* and *medulla* are used in botany and medicine.

Thirdly, in English, minor parts of speech—pronouns, prepositions, and auxiliary verbs—play an essential part. By their use main words can be kept small, a fact which contributes to the richness of our language in poetry and literature.

" . . . he fell from off the seat backward by the side of the gate, and his neck brake, and he died; for he was an old man and heavy." (I Samuel, iv. 18.)

By reason of its simplicity and directness this passage might serve as a model for a medical witness at an inquest.

In describing more complicated matters, however, it is essential to eliminate minor parts of speech and to use portmanteau words. Take *agranulocytosis*—a, neg. or alpha privative; *granulum*, granule; *kutos*, cell or vessel; *sis*, a state of; a state of deficiency of the kind of cells which have granules. One word of 15 letters does for 12 words having a total of 51 letters.

Fourthly, we can express recognized diseases. *Acromegaly*, lit. large ends. To say "a man with large hands and feet" might mean anything, since many normal men are so built.

It is fortunate for us that this country stood in the stream of classical culture. The Germans, who, living too far north, were outside this stream, had to build up their medical language on their native Teutonic foundations. Hence the clumsiness of their vocabulary, which is full of such words as *zwölffingerdarmgeschwür*, *zweifingerintestineulcer* for duodenal ulcer, and *wormfortsatzentzündung*, *wormlikeprojectionburning*, for appendicitis. International communication now compels the Germans to abandon such words for the classical.

When there is the choice of a Greek or a Latin word the rule is to use the Latin only in adjectival forms and with prefixes (apart from hyphenated words such as *cerebrospinal*), and to use the Greek when two nouns or a noun and a verb are joined. *Renal*, *suprarenal*, but *nephropexy*; *testicular*, but *orchidectomy*. (I exclude names of pharmaceutical preparations. With the erudition of commerce I cannot keep pace.) This practice is in the best classical tradition, since the Romans did not adopt the Greek habit of joining major parts of speech together.

Hybrid Forms

Medicine is riddled with hybrid Greek-Roman words. For instance, the G. *-itis* is suffixed to words of both languages. Despite the pundits there is no objection to hybrids (though this *Journal* might get rid of its *addressograph*). Ordinary speech would, in fact, be very difficult without them. In *On the Art of Writing*, by the late Sir Arthur Quiller-Couch, Professor of English Literature, Cambridge University, there occurs this unfortunate passage:

"I was waiting, the other day, in a doctor's anteroom, and picked up one of those books—it was a work on pathology—so thoughtfully left lying in such places; to persuade us, no doubt, to bear the ills we have rather than fly to others capable of being illustrated. I found myself engaged in following the antics of certain bacilli generically described as 'Antibodies.' I do not accuse the author (who seemed to be a learned man) of having invented this abominable term: apparently it passed current among physiologists, and he had accepted it for honest coin. I found it, later on, in Webster's invaluable dictionary: Etymology, 'body' (yours or mine, 'anti,' up against it: compound, 'antibody,' a noxious microbe.

"Now I do not doubt the creature thus named to be a poisonous little wretch. Those who know him may even agree that no word is too bad for him. But I am not thinking of *him*. I am thinking of *us*: and I say that for our own self-respect, whilst we retain any sense of intellectual pedigree, 'antibody' is no word to throw even at a bacillus. The man who eats peas with his knife can at least claim a historical throwback to the days when forks had but two prongs and the spoons had been removed with the soup. But 'antibody' has no such derivation. It is, in fact, a barbarism, and a mongrel at that. The man who uses it debases the currency of learning."

This is severe enough. But read the first sentence again. The censorious professor himself uses the word "anteroom"—a mongrel if ever there was one, half Latin, half Teutonic.

The Persistence of Obsolete Ideas

As everyone knows, the humoral theory, which dominated medicine from Greek times to the middle of the nineteenth century, is indelibly imprinted in our speech—in *sanguine*, *phlegmatic*, *choleric*, *melancholic*, and in *humour* itself. From the Greek age we also have *hysteria*, *hypochondria*, *phrenic* (frenzy), *spleen* (or ill-temper); the boiling out of the humours in *eczema* (G. *zelein*, boil), and the

secretion of *pituita* (mucus) from the brain through the base of the skull into the nose. The arteries, being empty at death, were believed to carry air, hence their name (G. *aer*, air, *tereo*, carry).

Derivation by Association or Transfer

Innumerable names are derived from resemblances to animals, plants, parts of buildings, musical instruments, articles of adornment, tools, and weapons. Of greater interest are words derived by association or transfer. Several types can be recognized:

1. *Transfer from the Thing or Animal Used.*—*Histos*, loom. In *histology* the meaning is transferred to the material made from the loom. *Vaccination*, from *vacca*, cow. *Graft*, from G. *graphein*, write, through O.F. *graffe*, F. *greffe*, and M.E. *grift*. The Gauls were taught horticultural grafting by the Romans, who used slips shaped like pencils. In *inoculate* we have a similar idea, the bud to be grafted being the "eye" (oculus)—cf. the eye of a potato.

2. *Transfer to an Attribute.*—*Anopheles*, harmful (insect). *Jejunum*, empty. *Trachea*, rough; originally *arteria trachea*, rough air-vessel—cf. pop. *whites* for leucorrhoea.

3. *Association Through a Common Characteristic.*—*Anthrax*, coal, and *carbunculus*, little coal, the common idea being burning. John of Trevisa (1535), translating the great thirteenth-century encyclopaedia, *De Proprietatibus Rerum*, by Bartholomew Anglicus, a work probably used by Shakespeare, has: "Anthrax is a postume whyche cometh of ful wood matere and venomous. It is callyd also 'carbunculus,' for it brennyth like a coal." *Alopecia*, from *alopex*, fox, the common idea being manginess. Trevisa, from the same source, has: "By that euyl callyd *Allopicina* nourysshynge of heer is corrupte and fayllyth, and the fore-party of the heed is bare, such men fare as foxes."

4. *Indirect Association.*—*Quinsy*, from G. *kuon*, dog, *achein*, throttle, through O.F. *quinancie* and F. *esquinancie*. The idea was no doubt derived from the self-strangulation of a dog straining at the leash. At first it was applied to any obstruction of the throat. *Carotid*, from G. *karos*, sleep, from the Greek practice of producing unconsciousness by compressing these arteries—cf. F. *garrotter*. *Pupil* (of the eye) from *pupilla*, little girl or doll; so-called from the small image of oneself seen in another's eye. *Oestrus*, gadfly, a modern example. In some animals sexual excitement resembles excitement caused by a sting. *Idio-*, in *idiopathic*, *idiosyncrasy*, of course means peculiar to itself. In Greek times *idiotes* meant a private person, private in the sense that he kept himself to himself and took no part in civic affairs. Hence by easy gradations through *non-expert*, *layman*, *ignoramus*, *foolish*, to *idiot*.

Change in Meaning

Change in meaning takes various forms:

1. *Simple Change.*—*Asphyxia*, lit. no pulse. It retained this meaning until the eighteenth century. *Atheroma*, from G. *athere*, porridge, originally meant sebaceous cyst, from the consistency of the contents. The somewhat similar appearance of the aorta led in the middle of the nineteenth century to its present meaning.

2. *From the General to the Special.*—It has always been customary, when the true nature of a disease is unknown, to name it from its main characteristic. *Pyrexia* of unknown origin is a modern example. *Typhus*, from G. *typhos*, mist, figuratively expresses the stuporous mental state in fevers. *Eclampsia*—ek, from *lampas*, light—was first applied to any illness arising suddenly like a flash of light. *Herpes*, creeping, was applied to all spreading skin infections.

3. *From the Special to the General.*—*Nausea*—G. *naus*, ship—at first meant sea-sickness, but had acquired its modern meaning by the time of Hippocrates. *Thele*, nipple, has acquired a wide application in *epithelium*, *endothelium*.

4. *Complete Reversal.*—*Nyctalopia* was used by the ancients for day-blindness as well as night-blindness.

Phlegmatic, cold, indifferent, comes from G. *phlegma*, burning, inflammation. The contradiction is more apparent than real. Catarrh, which was regarded as the typical form of inflammation, results in the secretion of *pituita*, mucus, which Hippocrates, in *The Nature of Man*, describes as the coldest of the humours. It is a remarkable fact that, although we use several Greek words meaning heat, we do not use *psuchos*, or any other Greek word meaning cold. Those interested in the medical aspects of Polar and Himalayan exploration have not yet learnt to call themselves psychologists. *Symposium*, in Greek times, meant a drinking-party (for men only). High thinking was, however, far from being neglected. In fact, the purest gems of philosophy, including Plato's *Symposium*, arose in those enjoyable gatherings. The Greeks got more inspiration from their wine-cups than we get from our tea-cups.

Words of Obscure Origin

The search for origins is sometimes rendered difficult because the ancients, like ourselves, used a word in widely different meanings. In M.E., *reins* meant feelings as well as kidneys. In the former sense it appears several times in the Bible. "God trieth the hearts and reins" (Psalms vii. 9), "My reins shall rejoice" (Prov. xxiii. 16).

Amnion meant lamb and also bowl for receiving the blood of sacrificial animals. Its first application to a foetal membrane appears in the writings of that flamboyant philosopher Empedocles (504–443 B.C.), but there is no reason to suppose that he derived this use from either of its other meanings, capable though he was of supersonic flights of imagination.

Astragalos had no less than eight meanings. Both in the *Iliad* and the *Odyssey* it is used for the first or second cervical vertebra. Hippocrates gives it its modern meaning. It was also used for knuckle-bones and for any other bones used as dice in gambling.

Thymus—G. *thumos*, thyme—originally meant any warty excrescence, from the supposed resemblance to a bunch of thyme. Galen was the first to apply it to the gland. English butchers sometimes call it sweetbread of the neck to distinguish it from the pancreas, but although thyme suggests sweetness the idea that this is the connexion is too far-fetched.

Cataract, in addition to its present meaning, also meant something which impedes a cataract—namely, a sluice-gate. Ambrose Paré (1550) has *cataracte ou coulisse* (portcullis).

Misnomers

Medicine teems with verbal inaccuracies. We must remember, however, that much of medical jargon is incorporated in popular speech, and therefore partakes of the general sloppiness. Take, for instance, the word *catch*. Who does the catching and who gets caught? We say, "It catches me in the neck" and, "I caught pneumonia" (cf. F. *la grippe*, influenza). The truth is of course, that only the bacteriologists can catch the pneumococcus; the rest of us can no more catch one than we can catch a train. Then there is our incorrigible habit of blaming the environment for raining *attacks* and *strokes* upon our offending persons. We have an attack of indigestion when it is almost certainly our own fault. So we have *impetigo*, from L. *impetere*, attack; *epilepsy*, from G. *lepis*, attack; *plague* and *hemiplegia* from G. *plege*, blow.

Prefixes are very often used as arbitrary means of making distinctions, regardless of their true meaning; *ortho-*, *meta-*, and *para-* in organic chemistry; *epilepsy*, attack upon, and *catalepsy*, attack down; *analysis*, loosening up, and *catalysis*, loosening down. (We say *break up* when we might as well say *break down*). Verbs, too, are used with no strict regard to their meaning; *syndrome*, running together, and *symptom*, falling together.

But, this said, there remain some words which should be suppressed. The worst offender is *haemophilia*, love of blood. Almost as bad is *parenchyma*, beside-in-jive.

Ecchymosis should be *echaemosis*, since it is blood that is poured out. *Lithotomy* should be *lihtectomy*, since the stone is cut out. Unwarranted liberties are taken in the use of *-sis* (*-osis*, *-asis*). The meaning of this ending should be restricted to a state of, to distinguish it from *-itis*, inflammation. It can indicate an attribute, as in *cyanosis* (G. *kuanos*, blue), the presence of an abnormal constituent as in *anthracosis*, a non-inflammatory disease as in *sarcoidosis*, or a condition associated with disease as in *acidosis*. *Diverticulosis* should mean merely that diverticula are present; *diverticulitis*, that they are inflamed. In *leucocytosis* the prefix *hyper-* is understood by ellipsis. *Nephrosis*, a state of kidneys, is nonsense. *Neurosis* is no better, but can perhaps be sanctioned by the popular expression "state of nerves." *Aponeurosis*, a ridiculous word, perpetuates the inability of the Greeks to distinguish between nerves and tendons.

The Plural

In forming the plural we should be guided by general sanction rather than by strict adherence to etymology or consistency (cf. *gladioli*, *antirrhinums*). Since we are writing English, we may regard the classical words which we use as naturalized into English. Moreover, we cannot expect people who know little of the classics to appreciate the difference between feminine Latin nouns ending in *a* and Greek neuter nouns ending in *a*. *Stigmata* is usual, but *enemata* is pedantic. *Empyemas* is, I think, preferable to *empyemata*. In Latin nouns of the fourth declension—for example, *sinus*—which are the same in the singular and plural, the English plural avoids confusion. Incidentally, *sino-auricular* should be *sinu-auricular*.

American Usage

American usage differs from ours in the following ways: (1) Reversal of *r* and *e*; *fiber* for *fibre*. Our usage is better. (2) Suppression of *u* after *o* in such words as *color* for *colour*, *humor* for *humour*. This is more correct, but our forms are too firmly established to be changed. (3) Suppression of the final *al* after *ic*; *physiologic* for *physiological*. This again is more correct, since *al* is redundant, but the position is complicated by the conversion of many adjectives ending in *ic* into nouns: *logic*, *economics*. Note that *economic* and *economical* have different meanings. (4) The use of *e* instead of the ligatures *æ* and *œ* (wrongly called diphthongs). The ligature is a clumsy device and causes great difficulty to typists. Moreover, *æ* fails to represent the original sound *oi*. The G. *oisophagos* was represented better by the Early English *ysophagus*. *Fetus* is better Latin than *foetus*. I think the ligatures should be abolished. We get on quite well without them in *economy* (*oikos*, house, *nomos*, law) and similar words. In holding this opinion I find myself in the good company of Fowler.

Conclusion

"The Man of Science," said Sir James Barrie, "appears to be the only person who has something to say just now—and the only man who does not know how to say it." This stricture, if justified, should be directed not against the language, but against its misuse. The function of a language is to express men's thoughts elegantly, accurately, and unambiguously. To achieve this end a language must be supple, adaptable, free from pedantry, and prepared to welcome immigrants. For science it must, in addition, be able to cope with the housing problem created by a rapidly expanding verbal population. Despite occasional lapses and the inevitable inclusion of technical jargon, we have forged in *Lingua Medica* an instrument of remarkable efficiency. It is up to us to keep it untarnished.

For the elucidation of several obscure and disputed points I have had the great advantage of consulting Dr. W. H. S. Jones, whose knowledge of Greek medical literature is encyclopaedic. I thank him most warmly.

REFERENCE

Andrews, E. (1947). *A History of Scientific English*, p. 64. New York.

AMERICAN MEDICAL ASSOCIATION ANNUAL MEETING IN NEW YORK

The 102nd Annual Meeting of the American Medical Association was held in New York City from June 1 to 5. There were over 16,000 members present, and another 16,000 guests. At the opening session the retiring president, Dr. LOUIS H. BAUER, discussed the medico-political situation in the U.S.A. and described some of the work done for the medical profession by the A.M.A. Touching on the subject of professional ethics, Dr. Bauer said that unethical procedures must be completely stamped out. The president-elect, Dr. E. J. MCCORMICK (Toledo), in his address to the House of Delegates made suggestions towards solving some of the outstanding professional problems. "We must," he said, "be conscious of our twin roles as physicians and statesmen." Another speaker was Mrs. O. C. HOBBS, Secretary of Health, Education, and Welfare in President Eisenhower's cabinet. She stated that any Government programme of compulsory medical care would be undemocratic and uneconomic. The Government's role would be to protect public health, foster research, care for those unable to pay, and rehabilitate the disabled.

Dr. ALFRED BLALOCK, of Baltimore, well known for his contributions to the surgery of the heart, was awarded the American Medical Association's Distinguished Service Award for achievement in medicine. The award carries a gold medal and citation.

The Scientific Sections

More than 400 papers were read at the scientific sections and 21 medical films were shown. Colour television programmes, presented on screens 5 ft. by 6 ft., featured, on a closed circuit, clinical and surgical demonstrations of sinusitis, peptic ulcer, mitral stenosis, cancer of the cervix, essential hypertension, and breast tumour. A few of the papers which were read are reported below.

Cancer of the Digestive Tract

Improved methods for the early detection of cancer of the digestive tract, which is responsible for 41% of the cancer deaths in the United States each year, were demonstrated as one of the 260 scientific exhibits by a University of Chicago research team. The new method, it was asserted, has led to the diagnosis of cancer of the digestive tract with an accuracy of 90%. The technique is based on the Papanicolaou method for the early diagnosis of cancer through the recovery and identification of exfoliated cancer cells. The method, developed by Professor George N. Papanicolaou, of the Cornell University Medical College, has so far been applied most successfully in the detection of incipient cancers of the uterus and the cervix. Its application to the detection of early cancers of the digestive tract and other internal organs has proved difficult because of the difficulty of recovering exfoliated cells. The Chicago investigators believe they have succeeded in developing improved methods for the recovery of incipient cancer cells, if present, from the oesophagus, stomach, and colon, thus promising to extend the Papanicolaou technique to the early detection of the disease in those organs. A special device consisting of a balloon covered with an abrasive net, like a coarse hair-net, is inflated inside the stomach. The stomach is then washed with chymotrypsin, a natural digestive substance that dissolves the mucus in the organ's lining and frees any cells, cancerous or otherwise, that are embedded in it. This makes it possible for the abrasive surface of the balloon to gather the loosened cells for examination by the Papanicolaou method. Studies are now under way, it was learned, to determine whether a chymotrypsin "bath" may not be used by itself, without the balloon, as a satisfactory method for screening patients for possible stomach cancer. Preliminary findings were described as "encouraging." Similar methods for irrigating

and washing, it was reported, have been successful in the recovery of cells from the upper part of the colon and from the upper part of the small intestine.

Ulcerative Colitis

Drs. H. E. BACON and H. D. TRIMPI, of Philadelphia, reported a series of 302 cases of chronic ulcerative colitis treated since 1940; of these, 67 (22.4%) were operated on. Total colectomy with excision of the rectum was performed in 34 patients, and 29 of these have been completely rehabilitated. Operative mortality was nil. Five carcinomas were discovered in 5 of the 34 excised specimens: of these, four were unsuspected pre-operatively. The authors recommended a two-stage operation, the first consisting of ileostomy and colectomy, and the second of excision of the rectum. Ileostomy was not indicated unless it preceded or accompanied colectomy. In the opinion of the authors, surgery offered the removal of a precancerous bowel, a cure of the disease, and the arresting of secondary arthritic, kidney, liver, and thrombo-embolic disease.

Arterial Transfusion

Dr. SAM F. SEELEY, of Washington, D.C., spoke on arterial transfusion, saying that it had attracted wide interest in the resuscitation of patients in profound shock due to severe blood loss. He did not recommend arterial transfusion in mild or moderate shock, or even in sudden deep shock, provided adequate amounts of blood were given intravenously. In his opinion the most important contribution resulting from studies of pressure transfusions had been the recognition that even greater quantities of blood were necessary for resuscitation than was surmised even during the second world war.

Endometrial Hyperplasia and Carcinoma of the Fundus

Dr. E. R. NOVAK, of Baltimore, spoke about the relationships of endometrial hyperplasia and adenocarcinoma of the fundus. Endometrial hyperplasia was normally produced by unopposed oestrogen stimulation and could similarly be produced by exogenous oestrogens. This histological entity might be found in either pre-menopausal or post-menopausal patients, and atypical hyperactive variants occurred at any age. Hyperactive forms which were indistinguishable from true fundal adenocarcinoma might follow prolonged oestrogen therapy. Oestrogen was considered as a possible carcinogenic factor, and, since this steroid could definitely lead to extremely proliferative forms of hyperplasia, the relationship between oestrogen, hyperplasia, and adenocarcinoma had to be considered. Dr. Novak then discussed the difference between pre-menopausal and post-menopausal hyperplasia, with particular reference to its premalignant role and its treatment.

Bilateral Adrenalectomy for Severe Hypertension

Dr. R. F. BOWERS, of Memphis, reported the results of adrenalectomy in 28 patients with severe hypertension. He left a small piece of viable adrenal tissue on the left side. Pre-operative therapy with cortisone and deoxycortone acetate was given for 44 hours prior to the second-stage operation. Eight deaths occurred, all in very severe cases. The blood pressure fell to normal in all but two of the survivors, and all 20 of the survivors showed signs of mild hypoadrenalism. Maintenance dosage of cortisone ranged from nil in three cases to 60 mg. daily in one case.

The Mechanical Heart in Human Surgery

Dr. F. D. DODRILL, of Detroit, described a mechanical heart, which had been used to by-pass either the right side or left side of the human heart. The right-sided substitution was done for congenital pulmonary stenosis. A left-sided by-pass of the human heart had also been successfully carried out during the operative treatment of mitral valve disease.

Correspondence

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

Intrinsic Factor Activity in Solid Material

SIR,—Further to our article (*Journal*, February 28, p. 467) we wish to announce the isolation of a solid material with high intrinsic factor activity. In this case the source was a concentrate derived from pig gastric mucosa kindly supplied by Dr. T. Jukes of the Lederle Laboratories Division. We understand that this material produced good clinical and reticulocyte responses when given orally in a daily dosage of 40 mg., together with 10 µg. of vitamin B₁₂ for ten days. Lower dosages have also been effective. The electrophoresis technique was applied to a solution of the material in buffer, and the latter was subsequently removed from the appropriate fraction. Absorption of radioactive vitamin B₁₂ after oral administration was used as a test of biological activity.¹ This was carried out in collaboration with Dr. F. T. Farmer and Mr. C. Clayton.

In one patient 2 mg. of the new material produced better absorption of vitamin B₁₂ than was produced by either 25 mg. or 100 mg. of the original concentrate. A second aliquot of the same concentrate fractionated in the same way yielded material which was definitely active in a dose of 4 mg. and possibly active in a dose of 2 mg. The material is homogeneous when subject to electrophoresis at pH 6.4, but is decomposed at pH 8.6 in barbitone buffer. Further evidence has been obtained that intrinsic factor is mucoprotein in nature, and most of its amino-acid and carbohydrate constituents have been identified. It is interesting to note that lysine, histidine, and tyrosine are apparently absent.

Tests are proceeding upon solid material isolated in a similar manner from human gastric juice.—We are, etc.,

A. L. LATNER.

C. C. UNGLEY.

Newcastle-upon-Tyne.

REFERENCE

Welch, A. D., et al. (1952). *Fed. Proc.*, 11, 308.

Tropical Diseases in Britain

SIR,—I too have read with great interest and not a little nostalgia the annotation on this subject (*Journal*, May 16, p. 1096). I should be the first to agree with the writer upon his insistence that a microscopic examination and the discovery of malaria parasites in the blood is an essential preliminary to treatment of an attack of this fever. Early and accurate diagnosis and early and effective treatment should be the watchword for all forms of malaria; but this, alas, proves sometimes to be the counsel of perfection. As one who has seen and practised both sides from the laboratory and clinical angle for some 40 years I feel that I should qualify this statement. As Dr. W. Melville Arnott has written (*Journal*, May 30, p. 1219), the academical standpoint assumes a much more serious aspect in the case of subtertian malaria (*P. falciparum*), and it is always within the bounds of possibility that this parasite may crop up from time to time in travellers arriving by air or sea from one of the endemic areas of the disease. I can call to mind many instances where there has been no time to undertake microscopic diagnosis, and it has been necessary to act as in an emergency and inject quinine in order to save life.

I remember particularly a young man who was lying in a coma in a London hotel, having just arrived by air from South Africa. His main complaint had been acute tonsillitis, which was thought to account for the high fever, and for which appropriate treatment had been applied, when he suddenly became comatose. Intravenous quinine given without delay undoubtedly saved his life, but the diagnosis was later confirmed in the laboratory from blood films taken before quinine therapy was undertaken. One is comforted by the idea that even if the diagnosis had not been correct no real harm would have been done.

There have been others, too, in which no parasites were found in thick and thin blood films at the time of examination, but where the balance of evidence was in favour of subtertian malaria. It is undoubtedly true that occasionally, especially in the most acute and dramatic cases, the ring forms of the parasite may be particularly difficult to find in blood preparations. I have seen relapses of benign tertian malaria as well in which the same obtained but where the character of the rigor, the subsequent hot and sweating stages, and the enlarged painful spleen could leave no doubt in the clinician's mind of the correctness of the clinical diagnosis. Sometimes the discovery of malarial pigment in the mononuclear cells is confirmatory evidence.

In quartan malaria I have in mind two cases in which, although the fever and quartan periodicity were suggestive, thin blood films were searched for hours with a negative result. Finally, in one instance, however, after 2½ hours' scrutiny a single quartan parasite hove into view in a thick blood film. Intramuscular injections of quinine in these instances clinched the diagnosis by abolishing the fever when other antimalarial drugs, including mepacrine ("atebrin") and proguanil, had failed.

The same principle similarly obtains in amoebic dysentery. It is curious that here, too, in the most acute cases with profuse diarrhoea *E. histolytica* in its active stages may be most difficult to demonstrate. I can recollect a fulminating case of this disease of an acuteness and toxicity rarely encountered, but when the proctoscope was brought into use, and scrapings made from the bleeding mucosa, these parasites were present in large numbers and the diagnosis became obvious. Another instance I can call to mind was that of an officer who when playing tennis at Wimbledon was attacked with acute diarrhoea with blood and mucus. Such was the character of the stools and the severity of the illness that he was regarded as suffering from ulcerative colitis till some three weeks later emetine was injected as an experiment and at this point the attack began to subside. Sigmoidoscopy was then performed, and active amoebae were present in the exudate in large numbers, in spite of the fact that the stools had been examined microscopically many times with a negative result. It then transpired that as a boy of 11, some 15 years previously, he had contracted amoebiasis in Mauritius.

Another difficulty crops up in intestinal amoebiasis where the lesions in the large intestine are typical of amoebic ulceration but no actual evidence of the parasite can be secured. I have had experience of many of these—some of which had been subjected to treatment for ulcerative colitis on previous occasions. Here surely is a basis for experimental therapy and for the verification of the "proof of the pudding is in the eating." If the patient recovers, and the ulcerations heal on emetine and emetine bismuthous iodide therapy, then the original clinical diagnosis must have been correct.

In these somewhat exceptional instances I am always reminded of the analogy of the rabbit. How many of us have seen their very characteristic burrows and other evidences of occupation, without obtaining so much as a glimpse of the owner, but it would be a foolish man who could swear that the occupant of the burrow is not somewhere or other ensconced inside, and this little parable is peculiarly applicable to *E. histolytica*.—I am, etc.,

PHILIP MANSON-BAHR.

London, W.1.

Primary Red-cell Aplasia

SIR,—We were interested in the medical memorandum from Dr. Michael Donnelly (*Journal*, February 21, p. 439) and the letter from Drs. A. G. V. Aldridge and P. Kidd (*Journal*, March 28, p. 729) regarding cases of red-cell aplasia in infants.

We have described a case of this condition fully in a male adult African (*J. Path. Bact.*, 1953, in press). He was referred to us for anaemia, and when we saw him was gravely ill. He said he had been getting progressively weaker for about nine weeks, and had been getting general body pains, weakness, and dyspnoea. His heart and lungs were normal, there was no oedema, the spleen was and liver were not enlarged, there were no petechiae, there was no icterus and no sign of riboflavin deficiency. There was histamine-fast achlorhydria. He gave no history of having been exposed to toxic substances. He had been taking mepacrine, but only in the usual doses, for suspected malaria. Blood examination on admission showed: red cells 1,320,000 per c.mm.; haemoglobin 2.3 g.%; mean corpuscular volume 54 µ³; reticulocytes nil; white blood cells 5,650 per c.mm.; platelets 700,000. A sternal puncture done on admission showed complete red-cell aplasia, with normal white and megakaryocytic elements.

He was kept under observation in hospital for eight days, during which period there was no reticulocytosis. He was then

given 4 mg. daily of riboflavin for 14 days and 2 mg. daily for nine days. Seven days after the first dose of riboflavin reticulocytes began to appear in the peripheral blood (0.5%) and reached 27% on the twelfth day after the commencement of treatment. The reticulocyte response was therefore specific and reached the expected level. The red cells and haemoglobin doubled themselves in 21 days. The patient was discharged after six weeks in hospital with a blood count of 4,290,000 and 11 g.% of haemoglobin. Eight months after commencement of treatment the patient is perfectly well and has a red cell count of 5.5 million per c.mm. and a haemoglobin of 14.5 g.%. A sternal puncture done five days after the commencement of treatment showed 5% early erythroblasts, no late erythroblasts, and no normoblasts. A third marrow biopsy 12 days after the start of treatment showed 15% early erythroblasts, 27% late erythroblasts, and 34% normoblasts. Two more marrow punctures were done 23 and 30 days respectively after the commencement of treatment, and revealed that the early and late erythroblasts had decreased in number and the marrow had become predominantly normoblastic.

In view of the fact that so far all cases of true red cell aplasia have proved fatal, with the exception of one of Heilmeyer's cases and the two mentioned above, we think that our findings, if confirmed, may have a useful place in the treatment of this grave condition.—We are, etc.,

HENRY FOY.

ATHENA KONDI.

Nairobi, Kenya.

Who Was Geminus?

SIR,—To the many with a dilettantish interest in medical history the articles in your May 30 issue must have given special pleasure, although some statements may have caused surprise—for example, that the 1511 Act governing medical practice "did not apply to medical graduates of Oxford and Cambridge" (p. 1179). Were there any home-produced university medical graduates in 1511? By that date Aberdeen alone had given academic recognition to medicine, but it was merely studied as one subject in the general course, and no separate medical degrees were awarded at that time.

Some of the information about Geminus (p. 1187) seems to go further than the ascertained facts warrant. What is the evidence that he was "almost certainly a surgeon"? An individual (or individuals) with the name of Thomas Geminus (Gemynous, Gemynus, Geminie, Gemyne, etc.) is mentioned in various contemporary records—as a surgeon in the list of Edward VI's disbursements (1547-52), in the *Annals of the Royal College of Physicians* (1555), in the *Register of the Stationers' Company* (1555) as a stranger (foreigner) who was fined for calling a brother of the company a false knave and later as a benefactor to the "Brydewell," but he is not mentioned in the *Annals of the Barber Surgeons*. In addition the cognomen is associated with an excellent engraver, a printer, a cartographer, an instrument maker, and a putative author of books on anatomy. If one man possessed such widespread skill and erudition he must have been versatile indeed, and, although it is possible there was only one Geminus, an unusual name does not necessarily imply the same individual.

It is doubtful if the Geminus associated with the *Compendiosa totius Anatomie delineatio* was a medical man. Nicholas Udall in his "Address to the Reader" refers to him as a "workman," an unusual designation even in those days for a surgeon, anatomist, and author. When Vesalius complained of the plagiarism of his work by "that Englishman," he was not referring to Geminus, as your contributor infers, but almost certainly to Dr. John Caius, who had once lived and studied with Vesalius at Padua and who had returned to England in 1544, the year after the *Fabrica* and *Eptome* were first published. The Latin text used in the first two editions (1545, 1552) of the *Compendiosa* is a résumé of the *Fabrica*—it is the Vesalian *Eptome*—but in the third edition (1553), which purported to be a translation by Udall from the original Latin into English, the text actually used was a modified version of Vicary's (1548) *The Anatomie of the Bodie of Man* (itself largely pirated from de Mondeville's work), rearranged to follow the order of Mundinus's *Anathomia* (1316), which may be regarded as the first manual of practical anatomy, whereas Vesalius's *Fabrica* is a systematic treatise.

As Vicary raised no objections, while Vesalius did, we must assume that the former knew and approved of this use of his recently published work; but it is difficult to understand why the help of Nicholas Udall, *quondam* headmaster of Eton, prebendary at Windsor, and author of *Ralph Roister Doister*, was reputedly required to translate a book already in the vernacular (perhaps he translated only the plate legends which are copied

from the original Latin), or how the deception was not apparently commented upon by those familiar with Vicary's book. Caius has been blamed for instigating the plagiarism of Vesalius's great work, and it has also been suggested that Geminus is a punning pseudonym hiding the identity of Dr. Thomas Twyne, who translated other Latin works, but the association of the Vesalian plates with the Vicary script seems rather to implicate Vicary as the possible moving spirit behind this piece of artistic piracy.

There are other mysteries concerning Geminus, and not the least intriguing are how exactly his copperplates were acquired for French editions of the *Compendiosa* by Jacques Grevin, the French humanist, or how the same or similar copperplates were available for the *Anatomia Deusch*, first published in Nuremberg in 1551, and for other German and Dutch anatomical works. Apparently Geminus had widespread connexions. Other points arise from Dr. Underwood's remarks on Geminus, and one of topical interest will be mentioned. Is the engraving on the title-page of the 1559 edition of his book a portrait of Elizabeth I? It was intended to be Queen Mary, but Queen Elizabeth had ascended the throne before the edition could be published, so the engraving (possibly with a few alterations) remained, with a fulsome dedication to the new Queen added.—I am, etc.,

Manchester.

G. A. G. MITCHELL.

The Judet Operation

SIR,—Mr. T. M. Hennebry (*Journal*, May 23, p. 1166) has stated a case in favour of the Judet operation for osteoarthritis of the hip. I would like to question some of the points he raises.

It is not reasonable to compare the results of the Judet operation for osteoarthritis with those following a fractured femoral neck. In osteoarthritis the acetabular cartilage is grossly abnormal at the time of operation. In my experience it has been unusual to find a fractured neck of femur with marked osteoarthritis. It is likely that many of the cases of fracture following the Judet operation will subsequently become osteoarthritic and painful owing to the incongruity of the surfaces. This certainly occurs after other causes of incongruity. It may, however, require a number of years for these changes to occur, and I think it is fair to say that no one yet is in a position to assess the frequency of this complication. As the majority are in the elderly, with a high mortality in the ten years after operation, it is probable that a satisfactory statistical survey on this point will take many years. This last fact justifies its use in these cases.

I would agree that many cases of osteoarthritis have a thickening of the capsule and periarticular structures which restrict movement and are certainly, in part, responsible for the pain. Your correspondent suggests that it is in this type of case with a marked contracture that the Judet operation may fail. Osteotomy in this case is almost uniformly successful in relieving the pain. This, after all, is the predominant, and often the only, complaint of the patient.

As Mr. Hennebry says in his letter, this prosthesis is "far from being the final solution." This is becoming increasingly obvious with the passage of time. His suggestion that displacement osteotomy is a retrograde step is surely a failure to recognize its indications.—I am, etc.,

Harlow Wood, Notts.

J. P. JACKSON.

Treatment of Pulmonary Emphysema by Pneumoperitoneum

SIR,—We have read with particular interest the report of Drs. R. D. C. Brackenridge and A. Thelwall Jones on the treatment of pulmonary emphysema by pneumoperitoneum (*Journal*, May 23, p. 1135). For the past twelve months we have been engaged on, and have now terminated, a similar investigation on this very problem. Without wishing to anticipate the results of our report, which are now ready for publication, we wish to pass the following comments on their paper.

Vital capacity is an obsolete yardstick in the assessment of respiratory function. Three-second spirometric tests presuppose a high degree of experimental accuracy, and assume the absence of inspiratory dyspnoea.¹ Maximum breathing capacity is a much more accurate index of lung function, and there is much to commend its employment.² However, even here the skill, degree of experience, co-operation, and education of the patient are factors which have to be taken into consideration in the assessment of readings.

Broadly our findings are not as encouraging as those obtained by Drs. Brackenridge and Jones. Yet in a number of instances our emphysematous patients, after pneumoperitoneum, have expressed themselves as being subjectively improved in health and have stated that their dyspnoea has lessened. However, a critical evaluation of some of the variable factors involved in the assessment of dyspnoea—season, climate, intercurrent infection, bronchial spasm, and wishful thinking on the part of the patient—ought to make for the greatest caution by investigators in their interpretation of slightly beneficial or equivocal results. We feel that this view is probably true of the role of pneumoperitoneum in the assessment of pulmonary emphysema.—We are, etc.,

Halifax.

BERTRAM MANN.
E. A. MURPHY.

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The Degradation of Flour and Bread

SIR,—I was interested to see Dr. E. H. M. Milligan's letter on the above subject (*Journal*, May 2, p. 994), for L. J. Harris¹ states that "most expert opinion now agrees that the average working-class diet in this country is so frequently low in vitamin B₁ that it would be an advantage to encourage an increased consumption of wholemeal bread." But of late there has been an increasing tendency for cases of vitamin B₂ deficiency to arise, as instanced by the frequency of beefy sore tongues and undoubted pellagrous dermatitis masquerading under the pseudonyms of neurodermatitis or even industrial dermatitis. According to Harris,² it is not uncommon for pellagra to occur in mental patients in this country, although it appears that the medical and nursing staffs escape this condition. It is open to question whether the hospital diet is at fault, or whether they are long-standing unrecognized cases of B₂ deficiency which had reached the last stage of all—dementia. When Sydenstricker visited this country during the late war he found a similar state of affairs. The fact that, despite the so-called restoration of flour, cases of nicotinamide deficiency do arise makes one ponder that all is not well; and it appears that matters will worsen when the extraction rate of flour is again raised. Furthermore, cases of acute encephalopathy and confusional insanity are known to arise, especially in the elderly, after severe operations such as hysterectomy or prostatectomy, which are similar in most respects to delirium tremens and curable with adequate doses of nicotinamide.—I am, etc.,

Heanor, Derbyshire.

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PHILIP TURTON.

Antabuse Addiction

SIR,—All those who deal with alcoholics have observed the variability of the antabuse-alcohol reaction in different subjects. This variability is to be expected, for the aversion effect of antabuse therapy does not depend on the physical symptoms when alcohol is taken—the vasodilatation, headache, tachycardia, and nausea—but on the concurrent subjective state of the patient. This is a feeling of impending personal catastrophe which, like tolerance of pain, varies from subject to subject. A great many psychopathic drinkers show a magnificent tolerance for acetaldehyde, and considerable bravado. They often claim that a small gin

makes them feel like several doubles when on antabuse. It is noticeable, however, that they prefer to omit their antabuse. The more labile psychoneurotic is often profoundly disturbed by the antabuse-alcohol reaction and avoids alcohol.

A small group of patients has emerged, however, who, in spite of recurrent terrifying experiences with the reaction, repeatedly ask to be put back on antabuse. Their assertion that they are now certain that this will stop their drinking appears to be a rationalization, for in a short time they proceed to drink again, even carrying antabuse tablets with them in some cases and swallowing more of them whilst drinking. These patients obviously tend to become rapidly confused, restless, and uncoordinated whilst indulging in this procedure. They also seem to show an increased tendency to self-reproach when sober. Can it be that these patients incorporate antabuse into their drinking pattern not only to achieve more rapid escape from insupportable tension but also to inflict simultaneously the punishment demanded by a harsh super-ego which is, of course, part of that tension?

However this may be, these patients show the surprising tendency to seek antabuse as an adjunct to their drinking, and they thus appear to be unsuitable cases for treatment with the drug.—I am, etc.,

Twyford.

L. C. F. CHEVENS.

Smoking and Cancer of the Lung

SIR,—Mr. P. G. Moore's letter (*Journal*, June 6, p. 1281) obscures very nicely the point which we wish to make (*Journal*, May 16, p. 1105), and is far from giving the precision he suggests. Diphtheria has been virtually wiped out as a cause of death in this country. This has had very little effect on the expectation of life, because the large number of children who never had the disease are included in this figure. But the chance of dying between the ages of 1 and 15 has been materially decreased, because diphtheria used to cause a considerable proportion of deaths between these ages. In exactly the same way, even if lung cancer were abolished, the expectation of life would not be changed very much, but the chance of dying in middle age would, because lung cancer is an important cause of death at this age.

The expectation of life, or mean future life time, at any age, if considered by itself, has the same limitation as any other mean value in that it gives no information concerning the shape of the distribution from which it is calculated. It is for this reason that it is rarely used by actuaries in the comparison of mortality. Mr. Moore's figures, if taken in conjunction with those in our letter, will serve a most useful purpose in providing a practical demonstration that an apparently small difference in the expectation of life may conceal a substantial difference in mortality.—We are, etc.,

London, N.W.10.

London, W.1.

J. A. HEADY.

R. G. BARLEY.

Limb Injuries in Coal-miners

SIR,—Dr. C. T. H. Whiteside in his letter (*Journal*, May 30, p. 1222) remarks that it would be interesting to know if the high percentage of limb injuries which he found in the country's coal-mines colliery in Kent is representative of the country's coal-mines as a whole. A very detailed accident analysis is made by the South Western Division of the National Coal Board and the figures showing the part of the body injured can be extracted. In the year 1951, among a population of 106,000 miners, injuries to the limbs accounted for 61% of all injuries causing absence of more than three days' duration (upper limb 36%, lower limb 25%). These figures support Mr. Whiteside's contention that limb injuries constitute the greater proportion of all injuries sustained in the coal-mines. The analogy which he draws between war, in which about 50% of the total injuries are limb injuries, and coal-mining is in my opinion particularly appropriate. If a little thought be given to the nature of coal-mining operations it will not seem so surprising that limb injuries are predom-

inant. A more appropriate analogy might be the proportion of limb injuries in heavy industry other than coal-mining.

Dr. Whiteside's estimate that there are about 250,000 accidents per year, each causing absence of more than three days, among the total mining population is fairly accurate, and it is undeniable that this is a startling and appalling figure. It should be borne in mind, however, that this figure may be swollen by changes in the law relating to compensation and that the fatal accident rate, which cannot be thus affected, has been falling steadily for many years. The number of fatal accidents between 1922 and 1940 remained around or above 0.40 per 100,000 man shifts worked. After a rise in 1941 and 1942 the rate declined more or less steadily to 0.25 in 1948 and 1949, the 1952 figure being 0.23.

The mining industry is well aware of the seriousness of the accident problem, and is systematically attacking it in a number of different ways. The industry is also fully seized of the necessity for active research, and the N.C.B. are at present supporting two research projects which have the aim of, *inter alia*, defining the causes of accidents in all their technical detail. In these investigations the importance of limb injuries, which Dr. Whiteside has emphasized, will not be overlooked.—I am, etc.,

Medical Service, National Coal Board,
London, S.W.1.

J. S. McLINTOCK.

Transverse Arrest of Head

SIR,—May I refer to some of the points raised in the discussion on transverse arrest of the head? When I wrote my article (*Journal*, April 18, p. 865) I was not aware of the teaching of Mr. Wilfred Shaw on this subject, and I regret, therefore, that I did not refer to the very clear account of this complication which he gave in 1933.¹ Also the monograph by Mr. Parry Jones on the Kielland forceps² had not yet appeared. This important work is a credit to British obstetrics, and should be studied by all who use or intend to use this instrument.

Much of the discussion has centred around the use of the Kielland forceps, and there is now general recognition of its value. Its introduction has constituted, I believe, a big obstetrical advance, not because it possesses any inherent magical properties, but because its use demands a careful study of each case and a proper cephalic application. Mr. Parry Jones in his letter (*Journal*, June 6, p. 1278) has drawn attention to the important point that the "wandering method" of application is almost as classical as the one involving rotation of the anterior blade.

I did not intend to give the impression, as Mr. A. P. Bentall suggests (*Journal*, May 16, p. 1107), that cases of transverse arrest can only be dealt with by those who have mastered the use of this instrument, nor did I intend, as Mr. Rutherford Morison fears (*Journal*, May 16, p. 1107), to exclude the general-practitioner obstetrician from using this instrument. I believe, however, that all who may be up against this complication will be the better able to deal with it if they have studied the technique of using the Kielland forceps. Mr. Bentall disagrees with my statement that deep general anaesthesia is necessary for manual rotation. He admits, however, the necessity for rotation of the shoulders with this manoeuvre, and Munro Kerr and Chassar Moir³ refer to the need for "deep surgical anaesthesia."

Dr. J. D. Martin (*Journal*, May 16, p. 1107) himself admits the difficulty of comparing the various figures for the foetal risk for the various methods of instrumental delivery in the true occipito-posterior positions. I feel, however, that my figures showing only one foetal death in 55 primigravidae delivered in the face-to-pubes position with forceps justify the claim that this method of delivery has a low foetal risk. Admittedly with this technique the strain on the soft tissues is great, and the risk of severe lacerations in unskilled hands is high. Manual or forceps rotation, however, is also not free from serious risk in this respect.—I am, etc.,

Middlesbrough.

BRYAN WILLIAMS.

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Obituary

S. A. WINSTANLEY, M.B., Ch.B.

We record with regret the death on June 1 of Dr. S. A. Winstanley. The announcement of his death to the Annual Conference of Local Medical Committees last week evoked an expression of very real regret at the passing of a long-familiar figure and an old friend and counsellor. For more than a quarter of a century Winstanley had always been in the Lancastrian group at such Conferences, and though he was not a frequent speaker, either there or in the Representative Body, and certainly claimed no gift of oratory, his advice, modestly proffered, was highly valued, if not always followed. The place in which he excelled was the committee, and not many men have a longer record of committee work on behalf of the Association. His membership of the Insurance Acts Committee and its successor, the General Medical Services Committee, lasted unbroken for nearly a quarter of a century, and was relinquished only a couple of years ago.

Sydney Adams Winstanley was a Lancashire man by birth and education. His whole career was spent within a few miles of Manchester City Hall. He was born at Pendleton by Salford on November 25, 1878, and was educated at Manchester Grammar School, from which he went on to Victoria University, graduating M.B., Ch.B. in 1914. After acting as house-surgeon at St. Mary's Hospital, Manchester, he settled in general practice at Urmston, a town a few miles to the south-west of Manchester. He was from an early stage in his career what would now be called a general-practitioner specialist, his interest being in obstetrics. As long ago as 1922 he published in the *British Medical Journal* notes on 259 cases of labour conducted by "twilight sleep," a subject which at that time was arousing particular interest. A few years later Winstanley served on a sub-committee of the British Medical Association set up to report on the general question of anaesthetics in midwifery. But he was a typical general practitioner, if such a being exists, much liked by his patients and colleagues. Among other appointments he held was that of medical officer to the Urmston Cottage Hospital.

Joining the British Medical Association in 1919, Winstanley soon began to take a part in local and eventually in central affairs. His first official appearance at Headquarters appears to have been as a newly elected member of the Insurance Acts Committee in 1928. For some years he was a member of the executive of that body, also of the negotiating committee which was formed in 1944 and continued until after the National Health Service was well established. He was a member of the Medical Planning Commission set up in 1940, for ten years a member of the Services Committee, for four years a member of the Association committee concerned with the problems of demobilization, and from 1938 to 1951 a member of the Central Medical War Committee. His help seems to have been sought in all the various problems of the National Health Insurance service—remuneration, regulations, prescribing, additional benefits, organization of public medical services, and so on. There were subcommittees set up at various times to deal with these matters and Winstanley was a member of them all. He served also on the Spens Committee set up in 1945, which had its repercussion in the Danckwerts

award. Like so many Lancastrians, Winstanley had a highly developed business sense. National Health Insurance practice, he once said, was never at any time a sound business proposition, except in so far as it was subsidized by private practice, and he foresaw, several years before the advent of the National Health Service, that this "subsidy" would diminish in value. In 1942 he moved to instruct the Insurance Acts Committee to apply for a wartime capitation fee of fourteen shillings, and, failing satisfaction, to call upon practitioners to give the requisite notice of withdrawal of service, adding, however, that this action did not imply a strike, because the insured population would obtain their attendance by the application of the "own arrangements" clause. He failed to carry the Conference with him.

In his own Manchester area Winstanley was prominent in medico-political affairs—a member for many years, and eventually chairman, of the Local Medical and Panel Committee for Lancashire, chairman of the Manchester Division in 1935–6 and again from 1946 to 1950, and year by year he was sent up to the Representative Meetings. He was also a member of the Manchester Medical Society and of the North of England Obstetrical and Gynaecological Society. He was a man eager to serve his profession, as was shown by the mass of varied committee work he undertook, but there was about him a certain shyness which accounted for the fewness and brevity of his interventions in debate. His alert and likeable personality will be greatly missed.

Dr. ARTHUR B. MCMASTER, formerly medical officer of health for Dover, died at his home at Dover on May 25, in his 79th year, after a long illness. Arthur Berry McMaster was a native of Athlone, the posthumous son of a clergyman. By means of scholarships and exhibitions he was able to pay for most of his education. At Queen's University, Belfast, he was a distinguished student, taking many prizes, including the Gold Medal for Midwifery. He qualified M.B., B.Ch., B.A.O. in 1898, and proceeded M.D. in 1902. For some years McMaster was in general practice, first at Rochdale and later at Stockport. But his health was never robust, and in 1909 on medical advice he gave up general practice. After taking the D.P.H. at Manchester he specialized in public health, holding his first appointment at Crewe. In 1920 he was appointed M.O.H. and port medical officer, Dover. Here he reorganized to a high pitch of efficiency the public health department and port medical service. He retired in 1939, but continued for the duration of the war as M.O.H. for the Borough of Sandwich and East Kent No. 2 District. For over 50 years he was an active member of the British Medical Association, being chairman of the Dover Division from 1927 to 1929, and president of the Kent Branch in 1929. He was also deeply interested in the work of the St. John Ambulance Brigade, and was an assistant district commissioner. As a man McMaster was quiet and reserved. Apart from his profession, his chief interests were in reading and his garden; he played an active part in parish affairs, and was churchwarden for many years. Dr. McMaster was twice married, and leaves a widow and two sons.

We record with regret the death of Dr. DAVID GAMBLE MADILL on May 27 at his home at Sutton, Co. Dublin. The son of a Presbyterian minister at Garvagh, Co. Armagh, Madill was educated at Coleraine Academical Institute and Trinity College, Dublin, where he graduated M.B., Ch.B., B.A.O. in 1908. Whilst he was a student at Dublin he obtained the Haughton Medal and the Surgical Travelling Prize. After qualifying he became a house-surgeon at Sir Patrick Dun's Hospital, and later became assistant to Dr. Henry Jellett there. Madill subsequently became assistant

master of the Rotunda Hospital. In 1929 he became a founder Fellow of the Royal College of Obstetricians and Gynaecologists.

We are indebted to B.S. for the following appreciation: David Madill was one of my greatest friends in Trinity College, Dublin, where he was a medical student in the year junior to mine. He had entered the University before me, but had decided to take a special degree in experimental science, and succeeded in obtaining a first-class moderatorship. After he entered the medical school he was a very successful coach for students competing for the examinations in botany and zoology. He joined Sir Patrick Dun's Hospital, where later he became house-surgeon, and this post was followed by his appointment there as assistant to Dr. Henry Jellett. When Dr. Jellett became Master of the Rotunda Hospital he nominated Madill as his assistant. This proved to be a first-class choice. He was an excellent teacher and operator, and was very popular with post-graduates, students, and nurses. A couple of years after he had completed his time as assistant master he was appointed gynaecologist to the Adelaide Hospital, where he continued his successful career. He was also gynaecologist to Monkstown Hospital. He acquired a large practice and was beloved by his patients. Madill did not publish a great deal, but he acted as co-author in Dr. Jellett's widely read large textbook on midwifery. Unfortunately, Madill was bedridden in his last two or three years. He married Miss Georgina Lauder, of Sutton, who was one of the most popular figures in Ireland and who was in the championship class in golf. Madill himself took up the game, but never achieved distinction. They had one daughter, and to his wife, daughter, and grandchild we extend our heartfelt sympathy.

Dr. JOSEPH R. MUTCH died at his home in Aberdeen on June 2 at the age of 58. His illness and death came as a profound shock to his many friends, colleagues, and patients. As until a few weeks before his death he was apparently in good health. Joseph Raeburn Mutch was a native of Cornhill, Banffshire. He was one of a large family, and like so many successful doctors his upbringing was humble. Opportunities were not presented to him, but he was endowed with a high intelligence and a tremendous capacity for hard work. He was dux of the village school, but was unable to continue his education. He became apprenticed to a watchmaker. During this time he developed a disease of his hip-joint which incapacitated him for two years and left him with a limp. However, during the 1914–18 war he served in the Gordon Highlanders as a clerk, and in the Royal Flying Corps as an instrument-maker. After the war Mutch opened a business in Aberdeen as a watchmaker. He then proceeded to qualify as an optician; but this did not satisfy him, and only stimulated him to higher endeavour. He began to study medicine at the University of Aberdeen when he was 34. He graduated M.B., Ch.B. in 1934. The following year he passed D.O.M.S.Eng., and in 1936 he proceeded M.D. Mutch's one consuming interest was the eye, and it is small wonder that he devoted his professional life to it. He was soon appointed to the staff of the Aberdeen Royal Infirmary. He carried on a large private practice, but on the introduction of the National Health Service he became a full-time consulting ophthalmologist to the North-Eastern Regional Hospital Board. His professional life was short, but he accomplished what many would consider a lifetime's work: he published many papers and did much original research. He was particularly interested in the effect of diet on the eyes. He had many outside interests: he made a collection of barometers, clocks, and spectacles; he loved gardening and photography; he was an active member of the B.M.A.; and he was an elder of the kirk and a keen Rotarian. Success left Joseph Mutch unspoiled. His struggle did not harden his heart, but gave him a sense of real values. He could not tolerate sham or humbug. In spite of his somewhat gruff approach he was the gentlest of men. The world is the richer for his living, and he will be missed.—C. B. G.

We are indebted to Dr. FRANK COLEMAN for this appreciation of Dr. ALFRED NOLAN FELL, whose death was recorded in the *Journal* of May 23 (p. 1169): As a school-friend of Nolan Fell I should like to express my appreciation of his sterling qualities and integrity of character. I knew him in the 'eighties while we were together at Nelson College, New Zealand. He played cricket and Rugby football for the college for three years. Whilst at Otago University he was considered the best attacking three-quarter in the colony of New Zealand. At Edinburgh in 1901 he captained the university fifteen during their phenomenal year when they played sixteen matches without a loss, and he subsequently played for Scotland against England, Wales, and Ireland. He won the Muir Cup at Edinburgh University in 1900, and in the same year obtained a double blue. Fell's academic record was almost as brilliant. Whilst in practice at Colchester yachting was one of his favourite pastimes, no doubt acquired from his father's love of this sport in the harbour of Nelson.

Medical Notes in Parliament

DEATH OF A SOLDIER

Wing Commander N. J. HULBERT on June 16 asked the Secretary of State for War if inquiries were completed in regard to the death of Private Donald Harrison, of Stockport, who died in Moston Hall Military Hospital in April.

Mr. ANTHONY HEAD in reply said that Private Harrison, aged 18, was called up for military service in January, 1953, when he was passed as medically fit. On March 13 at Wrexham he reported sick with a pain in his back, which the medical officer in charge of his unit diagnosed as fibrositis. He again reported sick on March 26, when the medical officer diagnosed "Query hysteria" and ordered his admission on March 26 to the Military Hospital at Chester. On admission he was given by the admitting medical officer a preliminary medical examination, which included a detailed examination of the central nervous system, for the purpose of allotting him to the appropriate medical division of the hospital. The admitting officer made a firm but not final diagnosis of hysteria. This preliminary examination was correct in so far as Harrison was undoubtedly suffering from hysteria. The fact that it was not discovered that he was also suffering from a rare and malignant disease was not necessarily at this stage due to negligence, since a more detailed subsequent examination should have taken place after admission to the ward.

After admission Private Harrison was required by the medical staff of the hospital to fend for himself, and other patients were forbidden to help him. The treatment of hysterical patients did require that they should be encouraged to help themselves, but in no circumstances should it entail harshness. Although he complained that he could not use his legs, he was left to get about as best he could by himself. This treatment continued for five days, during which time Harrison's condition deteriorated, and he (Mr. Head) was satisfied that the continuance of this type of treatment was due to negligence and undoubtedly resulted in harshness. A full physical examination was always required before a diagnosis of hysteria could be justified, and should have been made on the first day in the ward. The medical specialist looking after Harrison should have satisfied himself that this had been done. This he neglected to do. Furthermore, although during these five days Harrison frequently complained of pain in his legs, thighs, and back, and although this was recorded by the subordinate nursing staff, the day sister in charge of the ward never drew the attention of the medical specialist to Harrison's repeated complaints. This wrong and harsh treatment was continued despite the comments and protests of at least one other patient in the ward.

It was not until Tuesday, March 31, that Harrison was seen by a psychiatrist and thereafter received sympathetic

handling, but even at this stage a full examination had not been made.

On the night of April 1 the medical orderly became worried about Harrison's condition and called the orderly medical officer, and then for the first time Harrison was given a full medical examination. The orderly medical officer realized at once that Harrison was dangerously ill, and from this time he was treated for the malignant disease from which he was suffering. Harrison died early on the morning of April 5.

Irregularities and Mistakes

At the time of his admission to hospital Harrison's illness had undoubtedly reached a stage when death was inevitable, since malignant disease of this type in youth, though rare, grew very rapidly. He (Mr. Head) did not suggest that this in any way excused the mistakes made in the handling of the case.

After Harrison's death it should have been abundantly clear to the commanding officer of the hospital that serious irregularities and mistakes had occurred. Yet, so far as he could ascertain, no thorough inquiry was instituted by the commanding officer, although on May 18 he stated that a full inquiry had already been made by himself and that he was satisfied that there was no truth in the allegations that there had been ill-treatment of patients.

This serious occurrence was caused not by any fault in the method of procedure laid down for Army hospitals but by the failure of certain individuals to carry out their duties. The commanding officer would be called to account for his conduct and be tried by court-martial. The medical specialist concerned, who left the R.A.M.C. in May, would be reported to the General Medical Council. The day sister concerned, who was a civilian, had had her contract terminated and would be reported to the General Nursing Council.

Nurses Sensitive to Penicillin

Asked on June 18 what number of district nurses had developed a sensitivity to penicillin and could not undertake further nursing duties, Mr. IAIN MACLEOD said the total number of district nurses affected was not known, but a special inquiry had shown that in 70 local health authority areas 73 nurses had become sensitive to penicillin and had to give up nursing for varying periods. There was evidence that the incidence could be reduced by strict observance of technical precautions. He had at once obtained advice on this from his Standing Medical Advisory Committee and was circulating this advice urgently to local health authorities and others concerned. Mr. Macleod further said that nurses who had to give up work by reason of sensitivity to antibiotics were entitled to the normal sick-leave allowances and could, in appropriate cases, qualify for incapacity benefit under the National Health Service (Superannuation) Regulations. They might also, when the circumstances warranted it, qualify for industrial injuries benefit. The numbers, if any, who might have to give up nursing permanently were not yet known.

Casualties in Korea.—United Kingdom casualties in Korea between July 1, 1951, and June 1, 1953, were 2,237 officers and men, of whom 447 were killed or died of wounds. For the same period, total United Nations casualties, including South Korean and United Kingdom casualties, were about 180,000, of whom about 35,000 were killed.

Coronary Thrombosis.—On the advice of the Advisory Committee for Medical Research in Scotland, five grants from National Health Service funds have been made for research on coronary thrombosis. At March 31, 1953, £5,100 had been paid, and £11,600 remained to be paid during this year.

Chalk in Flour.—In the 12 months ending May 23, 1953, 11,369 tons of calcium carbonate were added to national flour. The whole of the supplies conformed to the specifications of the *British Pharmacopoeia* and were obtained from home sources.

Physiotherapists.—There were 4,178 physiotherapists employed in hospitals in the National Health Service in England and Wales on December 31, 1952; 3,250 were full-time and 928 part-time.

Universities and Colleges

UNIVERSITY OF EDINBURGH

The Queen has appointed Dr. D. J. A. Kerr, Lecturer in Forensic Medicine at Edinburgh University, to be Regius Professor of Forensic Medicine, in succession to Sir Sydney Smith, who is resigning on September 30, 1953.

UNIVERSITY OF LONDON

Miles Weatherall, D.M., Senior Lecturer in Pharmacology at London Hospital Medical College, has been appointed to the University Readership in Pharmacology tenable at that College. L. F. Lamerton, M.Sc., Ph.D., Senior Assistant Physicist at the Royal Cancer Hospital, has been appointed to the Readership in Physics applied to Medicine tenable at the Institute of Cancer Research, Royal Cancer Hospital.

Dr. A. d'A. Bellairs, Lecturer in Anatomy in the University of Cambridge, has been appointed to the Readership in Anatomy, tenable at St. Mary's Hospital Medical School.

Dr. K. W. Cross, Senior Lecturer in Human Physiology at St. Mary's Hospital Medical School, has been appointed to the Readership in Human Physiology tenable at the school.

The title of Reader in Anatomy in the University has been conferred on Dr. J. T. Aitken in respect of the post held by him at University College.

Donald Arthur McDonald, D.M., Senior Lecturer in Physiology at St. Bartholomew's Hospital Medical College, has been appointed to the University Readership in Physiology tenable at the College.

W. C. J. Ross, Ph.D., D.Sc., has been appointed to the Readership in Chemistry tenable at the Institute of Cancer Research (Royal Cancer Hospital), from January 1.

Dr. D. Robertson Smith has been appointed Lecturer in Clinical Pathology in King's College Hospital Medical School and Honorary Assistant Clinical Pathologist to the hospital, and Dr. D. G. Rushton Junior Lecturer in Morbid Anatomy in the Medical School.

Mr. L. H. Savin, senior ophthalmic surgeon at King's College Hospital and the Royal Eye Hospital, has been appointed a Fellow of King's College, and Professor R. Milnes Walker, professor of surgery in the University of Bristol, a Fellow of University College.

The following scholarships at the Royal Free Hospital School of Medicine have been awarded for 1953-4: *A. M. Bird Entrance Scholarship*, Miss G. Freeman (City of London School for Girls); *Mrs. George M. Smith Scholarship for Women*, Miss M. L. Shaw (Pontefract and District Girls High School); *MacIntyre Evans Scholarship for Women*, Miss G. R. Perry (Royal Free Hospital School of Medicine); *Elizabeth Garrett Anderson Scholarship for Women*, Miss D. I. Hawkins (Royal Free Hospital School of Medicine); *Dr. Margaret Todd Scholarship for Women*, Miss R. D. Low (Royal Free Hospital School of Medicine); *A. M. Bird Scholarship for Clinical Studies*, Miss A. M. Horn (Royal Free Hospital School of Medicine).

The following candidates at the London School of Hygiene and Tropical Medicine have been approved at the examination indicated:

ACADEMIC POSTGRADUATE CERTIFICATE IN PUBLIC HEALTH.—J. Carlton, G. J. Glynn, Winifred M. Hiscock, K. A. Rahman, S. Sandmo, D. Ungar, D. Yarom.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

Ph.D.—*In the Faculty of Medicine*: E. S. Jones.
FINAL M.B., CH.B.—*Part II*: J. D. Agnew, J. A. Barlow, A. G. Bowers, M. J. A. Britten, N. T. Burnett, B. J. Charlack, R. W. Coffee, J. S. Comaish, J. R. Cope, G. W. Danger, K. S. Davies, R. J. G. Downie, Florence M. Dukensfield, D. P. Duffield, T. R. Evans, R. Finn, J. G. Foley, D. Gardner, Anne M. Godfrey, D. H. Goldsmith, Mary Gregson, Patricia O. Grundy, W. B. Hanley, P. A. Harrison, J. W. Hill, H. B. Hilton, E. J. M. Hopkins, C. L. Imison, R. A. Johnson, P. L. Jones, P. King, J. B. Laine, V. Leach, C. L. Levene, G. Lloyd, B. A. Lowe, Joan K. McCann, Anne D. Micah, J. B. Middleton, J. M. Nichols, F. T. O'Brien, B. J. O'Dowd, L. Ratoff, M. R. Rayman, A. Roberts, S. S. Rubenstein, M. J. Samuels, H. Savage, Eleanor K. Scott, T. F. Shelley, Mary E. Shepherd, A. Speakman, D. Taylor-Robinson, D. A. Thomas, R. S. Todd, V. Tonge, A.

Turner, M. R. B. Wallace, W. P. Walsh, P. K. Wilson, Elizabeth A. Witham, N. C. Woodier, G. H. Worsley, I. Wort.

DIPLOMA IN PUBLIC HEALTH.—*Part I*: C. Sudhipongse.
DIPLOMA IN RADIOLOGY.—*Radiodiagnosis, Part I*: B. K. Bajaj, W. C. Heron, P. McCann, P. N. Newsam. *Radiotherapy, Part I*: H. J. J. Beyleveld.

D.T.M.&H.—K. M. Aboud, A. N. Basu, S. N. Bhattacharya, K. R. I. Hariharan, R. Hecker (recommended for the award of the Milne Medal in Tropical Medicine and the Warrington Yorke Medal in Tropical Hygiene), E. S. Jones, G. Moles, Y. Na Songkhla, H. C. C. Nwankwo, T. Viriyakul.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College held on May 5, with the President, Dr. W. A. Alexander, in the chair, the following were elected Members of the College: D. S. Nand, G. R. B. Kumarakulasinghe, W. MacLeod, S. N. Wanchoo, L. K. Ganguli, W. D. L. Fernando, N. Y. McCallum, E. W. Moore, M. Hasan, R. A. Gulmohamed, I. F. Sutherland, D. A. I. Grewar, B. Senior, N. Feldman, Y. Ho, Q. G. Quah, S. K. Biswas, W. S. A. Allan, T. H. Maniar, K. Z. Hasan, M. M. Baig, W. L. F. Hatchuel, A. Sandler, I. N. Marks, A. T. Lambie, J. K. McKechnie, C. Nwokolo.

The College approved of regulations permitting suitably qualified persons to read in and borrow from the library. The College library, the use of which has hitherto been restricted to Fellows, was founded in 1681 and is the oldest medical library in Scotland. It is almost entirely restricted to medicine and contains nearly 200,000 volumes.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the College held on May 20, with Professor Walter Mercer, President, in the chair, the following candidates, having passed the requisite examinations, were admitted Fellows: A. J. C. Allison, A. E. Amoils, E. S. Chellappa, A. F. G. C. Christie, D. C. Cooke, E. C. Edwards, J. C. Foster, J. D. Fraser, D. R. Gunn, I. A. Harris, H. H. Martin, J. S. Mehta, M. N. Menzies, L. L. Ptak, K. Rubinstein, U. N. Shahi, M. R. Shirazi, J. D. C. Sim, I. M. Stewart, G. G. Vashi, R. D. Venn, W. F. Walker, I. Wilson.

SOCIETY OF APOTHECARIES OF LONDON

The diploma of L.M.S.S.A. has been granted by examination to the following successful candidates: G. Hamlet, J. V. Parson, A. McL. Keil, J. S. Bennett, P. M. Teng, N. Kaan, W. J. G. Hughes, F. L. D. Steel, C. E. Lay.

The following candidates have been awarded the Diploma in Industrial Health: M. S. Bopari, P. K. Bose, J. Fairlee, A. Munn, P. N. B. Peacock, S. Mukherjee, W. E. Scott, D. K. Ramadwar.

Mr. E. J. Dearman, Bedel of the Society, retired on February 28, after 52 years' service with the Society.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examination, were admitted L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P.&S.G., on March 7: I. D. Archibald, B. R. Bayne, I. C. Beard, S. C. Bose, S. Burton, Lydia F. G. Cowan, J. A. W. Dressler, Catherine B. Gregor, L. A. Harris, M. L. M. Izzadeen, C. R. Lee, W. T. M. MacNeish, D. N. Randeria, R. H. Rosen, M. R. Soliman, Sheila C. Spark, D. C. Stevenson, Margaret J. Taylor, J. R. Ward, G. J. Whiston.

CONJOINT BOARD IN IRELAND

The following candidates were successful in the Spring post-graduate examinations:

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.—G. E. C. Hewson.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—S. Lennon, D. E. Munro, E. O. Lundholm, B. G. Fleming, C. McP. Smith, M. A. Rahill, J. W. Sandler, R. A. Robinson, B. A. O'Connell, D. H. A. Irwin.

DIPLOMA IN CHILD HEALTH.—G. Bheek, F. P. S. le Roux, Margaret Magill, A. J. MacDonald, A. J. Edwards, E. O'Connor, T. D. Shanahan.

The following candidates were duly admitted licentiates in medicine and midwifery on March 27, having passed the final examination in medicine, surgery, and midwifery of the Conjoint Board of Ireland: J. M. Anklesaria, C. P. Carey, T. H. Chillingworth, J. A. Davies, I. H. C. Lynch, E. A. Moore, I. Parbhoo, W. V. Reynolds, D. Ryan, J. F. L. Watson.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending June 6 (No. 22) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	10	2	3	0		24	1	11	1	1
Dysentery ..	397	68	70	3	1	276	25	84	4	1
Encephalitis, acute ..	5	1	0	0		3	1	0	0	
Enteric fever: Typhoid ..	0	0	0	0		3	0	0	0	
Paratyphoid ..	6	0	1	1		45	0	12	0	
			(B)					(B)		
Food-poisoning ..	204	33		1		137	11		3	
Infective enteritis or diarrhoea under 2 years ..				18	24				13	24
Measles*	8,726	297	308	234	252	6,616	519	376	219	386
Meningococcal infection ..	25	1	16	1	3	31	2	12	3	1
Ophthalmia neonatorum ..	25	0	9	0		39	5	13	0	1
Pneumonia†	317	14	140	5		380	20	165	7	
Polio myelitis, acute: Paralytic ..	36	1	0	3	0	26	2	0	0	2
Non-paralytic ..	15	0				18	0			
Puerperal fever‡	174	25	16	0		225	25	11	1	2
Scarlet fever ..	758	37	141	36	40	915	69	165	16	43
Tuberculosis: Respiratory ..			147	19				175	26	
Non-respiratory ..			23	5				23	6	
Whooping-cough ..	2,371	178	341	36	80	2,595	125	175	81	118

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0		0	0	0		0	0
Dysentery ..	0	0				0	0		0	
Encephalitis, acute ..		1			0		0			0
Enteric fever ..	0	0	0			0	0		0	
Infective enteritis or diarrhoea under 2 years ..	10		3	3	0	11		4	1	0
Influenza ..	3	0	0	0	0	5	1	3	1	0
Measles ..		0	1		0		0		0	0
Meningococcal infection ..		1	0				0			
Pneumonia ..	125	11	9	8	5	139	14		9	3
Polio myelitis, acute ..	1	0			0	1	0			0
Scarlet fever ..		0	0		0		0		0	0
Tuberculosis: Respiratory ..	74	10	10	0	5	87	10	13	2	8
Non-respiratory ..		0	2	0	1		0	2	1	0
Whooping-cough ..	1	0	1	0	0	1	0		0	0
Deaths 0-1 year ..	212	26	14	10	13	203	21	30	9	13
Deaths (excluding stillbirths) ..	4,317	608	452	92	115	4,479	625	539	98	148
LIVE BIRTHS ..	7,759	1052	927	232	417	7,758	1149	919	216	427
STILLBIRTHS ..	178	25	30			201	35	21		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Food-poisoning in Lancashire

Over 1,000 persons are believed to have suffered from food-poisoning last week in an epidemic which affected a number of towns (including Preston and Blackpool) and sanitary districts in north-west Lancashire. For the following information we are indebted to Dr. A. Dodd, divisional medical officer of health, Division No. 3 of the Lancashire county administrative area.

During the period June 13 to 20, 135 cases of food-poisoning were notified from 6 of the sanitary districts in the division. In addition 129 cases were known but not notified, giving a total of 264 cases. Three county boroughs and other districts of the administrative county were affected, some earlier and more severely than No. 3 Division. The vehicle of infection is believed to have been a large batch of meat pies manufactured on June 10 and 11. It may be that some pies baked on June 9 and 12 were also infected. A report on the morning of June 13 of the occurrence of two cases of food-poisoning and the information that meat pies, among other foods which had been eaten, resulted in a decision the same morning to stop production of meat pies. Staff at the place of manufacture were interviewed, excluded from work when justified by circumstances, and faecal specimens submitted for investigation. Distribution lists of meat pies were passed to appropriate local authorities in order that unsold meat pies could be destroyed or subjected to laboratory test and consumers traced if possible.

Salmonella morficans bovis was isolated from faeces of persons affected and from meat pies. No pathogenic organisms were isolated from powdered gelatin, flour, fat, or a first sample of the main carcass meat used in the manufacture of pies. It was not possible to obtain meat from each source for test. *Salmonella* organisms were isolated from several persons employed at the bakery who were probably infected by eating meat pies, but the finding in one case may prove to be significant. Investigations continue, particularly concerning meat supplies.

Clinical reports show that the incubation period varied from 6 to 30 hours, usually about 18 to 24 hours. Shivering or abdominal colic or vomiting (sometimes very severe) was followed by diarrhoea, accompanied by headache, pains in the limbs, and general prostration. The duration of illness was from eight hours to five days. The severity of symptoms was very variable. At the time of writing these notes only two persons are known to have been admitted to hospital from No. 3 Division of the Lancashire county administrative area, but it is understood that more were admitted to hospital from other districts, and that two deaths may have been due to the infection. Primary cases are still being reported, and also a few secondary cases.

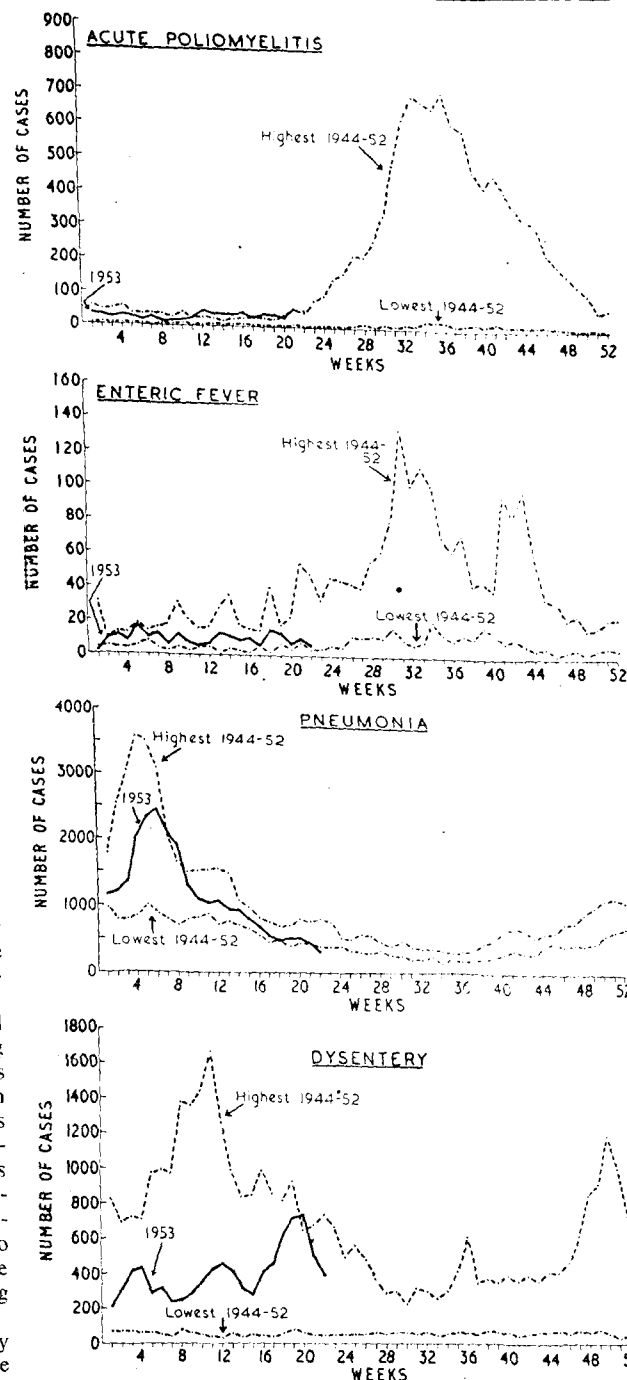
Thanks are due to Dr. S. C. Gawne, Lancashire county medical officer of health, for permission to supply these notes.

Week Ending June 13

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,055, whooping-cough 3,545, diphtheria 17, measles 7,532, acute poliomyelitis 73, dysentery 486, paratyphoid fever 5, and typhoid fever 6.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The incidence of infectious diseases fell in England and Wales during the week ending June 6. The falls in the number of notifications included 286 for measles, from 9,012 to 8,726; 326 for scarlet fever, from 1,084 to 758; 129 for acute pneumonia, from 446 to 317; 108 for dysentery, from 505 to 397; and 105 for whooping-cough, from 2,476 to 2,371.

The largest declines in the incidence of measles were 141 in Yorkshire West Riding, from 1,046 to 905, and 104 in Cornwall, from 305 to 201; while the largest rises were 168 in Surrey, from 132 to 300, and 94 in Lancashire, from 1,492 to 1,586. A small fall in the number of notifications of scarlet fever was recorded throughout the country; the largest declines were 35 in London, from 72 to 37, and 34 in Essex, from 75 to 41. The largest fluctuations in the returns of whooping-cough were falls of 68 in Lancashire,

from 277 to 209, 57 in Durham, from 130 to 73, and 50 in London, from 228 to 178, and a rise of 66 in Yorkshire West Riding, from 152 to 218. 10 cases of diphtheria were notified, 11 fewer than in the preceding week; this total was the lowest ever recorded, being 1 less than the previous lowest level.

51 cases of acute poliomyelitis were notified. These were 6 more for paralytic and 7 fewer for non-paralytic cases than in the preceding week. The cases are concentrated in the south of the country. 24 cases were notified in the south-eastern and south-western counties (excluding London), while only 8 cases were notified in the combined area of Yorkshire, north-western, and northern counties. During the past 10 weeks 386 cases have been notified, compared with 96 to 10 weeks 269 for the corresponding periods during the years 1947 to 1952. The largest returns during the week were Essex 5 (Southend-on-Sea C.B. 2, Ilford M.B. 2), Southampton (Bournemouth C.B. 5), Wiltshire 5 (Calne and county 5), Chippingham R.D. 3), Surrey 4, and Yorkshire West Riding 4.

The largest returns for dysentery were London 68 (Chelsea 13, St. Pancras 9), Middlesex 52 (Willesden M.B. 12, Edmondston M.B. 10), Lancashire 49 (Liverpool C.B. 16), Bedfordshire 35 (Luton M.B. 30), Durham 31 (Stanley U.D. 30), Yorkshire West Riding 24 (Leeds C.B. 11, Sheffield C.B. 9), and Leicestershire 21 (Leicester C.B. 21).

Medical News

First World Conference on Medical Education.—This conference will be held in London from August 22 to 29 this year under the auspices of the World Medical Association, with the collaboration of the World Health Organization, the Council for International Organizations of Medical Sciences, and the International Association of Universities. The president of the conference is Sir Lionel Whitby and the vice-president Professor W. Melville Arnott. The conference will meet in plenary session on Monday, August 24, when Sir Lionel Whitby will give his presidential address on "The Challenge to Medical Education in the Second Half of the Twentieth Century." There will then be addresses by Sir Richard Livingstone on "What is Education?"; by Professor John F. Fulton on "The History of Medical Education"; and by Colonel S. M. K. Mallick on "Medicine—a Technology or a Profession?" During the rest of the week the work of the conference will be done in the following four sections: (1) "Requirements for Entry into Medical Schools"; vice-president, Dr. Victor Johnson, of the Mayo Foundation; rapporteur, Dr. Raymond Whitehead. (2) "Aims and Content of the Medical Curriculum"; vice-president, Sir A. L. Mudaliar, of the University of Madras; rapporteur, Dr. A. Morgan Jones. (3) "Techniques and Methods of Medical Education"; vice-president, Dr. A. Hurtado, of San Marcos University, Lima, Peru; rapporteur, Professor Ian Aird. (4) "Preventive and Social Medicine"; vice-president, Professor René Sand, of the Université Libre, Brussels; rapporteur, Dr. Charles Fletcher. The conference is open to all interested in its work. A registration fee of £4 gives entry to all the sessions and to the excursions and entertainments in connexion with the conference. Early registration is advisable so that places in the excursions may be obtained; the registration bureau will also be opened on Saturday, August 22, on the night of which the B.M.A. Council, acting as the host organization of the conference, will give a reception. The sections will meet in B.M.A. House and the Friends House, Euston Road. Application for registration should be made to Dr. E. Grey Turner, secretary of the local arrangements committee, B.M.A. House, Tavistock Square, London, W.C.1. Communications on the programme of the conference should be addressed to Dr. Hugh Clegg, secretary of the programme committee, *British Medical Journal*, B.M.A. House.

The Lister Institute.—An impressive description of work in progress occupies the greater part of the annual report of the governing body of the Lister Institute of Preventive Medicine, the director of which is Dr. A. A. Miles. The studies carried on at the Institute are divided into three main groups: (a) bacteriological, immunological, and pathological; (b) biochemical; and (c) biophysical and physico-chemical. The Institute also houses the blood group research unit and the blood group reference laboratory of the Medical Research Council. In concluding the report, Sir Henry Dale, O.M., chairman of the governing body, writes of the growing output of important and distinguished work from the different departments of the Institute, and continues: "Such a healthy growth of activities in a period of steeply rising costs inevitably gives cause for some anxiety on financial grounds; but the governing body will explore every possible source of such additional revenue as may be needed to meet any proper development."

"Family Doctor."—An article by Dr. J. A. Hadfield entitled "Is Punishment the Answer?" a profile of an M.O.H., and some facts about sunshine are included in the July issue of *Family Doctor*, which is now out. Other contributions include an article about summer diet, a first-hand account of having a spinal anaesthetic by Harry Cooper, some instructions on life-saving methods, and factual information about contact lenses. Robert T. Lewis has something useful to say about children's comics, and Roger Pilkington contributes another part to the series "How Your Life Began." Seasonable contributions include suggestions for the enjoyment of holidays free from the misery of travel sickness, methods for discouraging germs and flies, as well as a description of animal life on the sea-shore.

Tissue Transplantation.—At recent conferences in London and New York workers in plastic surgery, cancer, zoology, and other fields discussed common problems in tissue transplantation, and in the U.S.A. efforts to increase the exchange of information on this subject have culminated in a proposal to issue a quarterly *Transplantation Bulletin*. This will maintain, and publish at least once a year, a register of all medical practitioners and research workers interested in transplantation problems. The register will cover the fields of plastic surgery, endocrinology, cancer, genetics, immunology, experimental morphology, etc., and will be international in scope. The *Bulletin* will provide a medium for exchange of information and will maintain a bibliography covering the various branches of the subject, but will not publish formal papers. Those interested are invited to send their names and fields of interest to Dr. E. J. Eichwald, University of Utah College of Medicine, Salt Lake City, Utah, U.S.A. The subscription fee to cover cost of the *Transplantation Bulletin* and maintenance of the register and bibliography is \$3, payable after the first issue of the *Bulletin*, which is expected in August, 1953.

Poliomyelitis Research in Scotland.—Two units are to be established in Glasgow for the investigation of cases of poliomyelitis with respiratory paralysis. In addition workers at a special laboratory at the Ruchill Hospital are to study the poliomyelitis virus and the types occurring in Scotland. The Advisory Committee on Medical Research and the Medical Research Council will co-operate with the Western Regional Hospital Board in this research work.

Edward VI and St. Thomas's Hospital.—The charter refounding St. Thomas's Hospital, Bridewell, and Christ's Hospital was granted by Edward VI on June 26, 1553, ten days before his death. To mark the quatercentenary of this event, St. Thomas's is to hold a banquet at the Hospital's sports ground at Stoke d'Abernon on July 4.

Dr. J. O. Irwin has been awarded the Guy Medal in Silver by the council of the Royal Statistical Society in recognition of his contributions to statistical methodology, particularly in the field of bio-assay. Since 1948 Dr. Irwin has been editor-in-chief of Series B of the *Journal of the Royal Statistical Society*.

COMING EVENTS

Contraceptive Technique.—A lecture and demonstration on contraceptive technique will be given by Dr. Marie Stopes, Ph.D., at the Mothers' Clinic, 108, Whitfield Street, London, W.1, on Thursday, July 2, at 2.30 p.m. No fee is charged, but tickets must be obtained in advance.

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Tuesday, June 30

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. R. French: Medico-legal Problems and the Dermatologist. ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnott Demonstration by Professor R. J. Last: Knee Joint. ROYAL EYE HOSPITAL.—5 p.m., Mr. R. P. Crick: Ophthalmic Complications of Pregnancy and the Puerperium.

Wednesday, July 1

OXFORD UNIVERSITY.—At University Museum, 5 p.m., Litchfield Lecture by Professor Wilder Penfield, O.M., F.R.S.: The Learning of Languages —A Consideration of the Neurophysiological Mechanisms of Speech and Some Educational Consequences. POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. E. F. Gale: Mode of Action of Antibacterial Agents. YORKSHIRE SOCIETY OF ANAESTHETISTS.—At Leeds General Infirmary, 8 p.m., Symposium arranged by Dr. T. C. Gray: Facts about Dosage; opening speakers, Dr. J. W. Dundee, Thiopentone; Mr. H. F. V. Riddle, Nitrous Oxide; Dr. T. C. Gray, Relaxants.

Thursday, July 2

EMPIRE RHEUMATISM COUNCIL.—At Royal Society of Medicine, 8.15 p.m., Special Coronation Lecture by Sir Henry Cohen: Concept of Collagen Disease. ● HAMPSTEAD GENERAL HOSPITAL.—3 p.m., Dr. Harold Davis: Bleeding Peptic Ulcer: 4.15 p.m., Brains Trust. INSTITUTE OF CHILD HEALTH.—5 p.m., Professor G. Fanconi (Zurich): Renal Dwarfism. OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Professor W. B. Castle (Harvard): Speculations About the Cause of Polycythaemia Vera. ROYAL COLLEGE OF SURGEONS OF ENGLAND AND INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—At Lincoln's Inn Fields, W.C., 5.30 p.m., Otolaryngology Lecture by Sir Henry Dale, O.M., F.R.S.: Histamine and its Antagonists.

Friday, July 3

INSTITUTE OF NEUROLOGY.—5 p.m., Professor Warren McCulloch: Cerebral Control of Carbohydrate Metabolism.

APPOINTMENTS

EDWARDS, J. R. G., M.B., B.S., F.R.C.S., Senior Registrar in Plastic Surgery Service of Newcastle-upon-Tyne Regional Hospital Board. FARQUHAR, JOHN BURNS, M.B., Ch.B., F.R.C.S., M.R.C.O.G., Part-time Consultant Surgeon in Obstetrics and Gynaecology to the United Leeds Hospitals and to other hospitals in the Leeds district under the control of the Leeds Regional Hospital Board. GLENN, ROBERT, M.B., B.Ch., D.P.H., Medical Officer of Health, School Medical Officer, and Port Medical Officer, Grimsby. GUYMER, R. F., M.D., D.P.H., D.I.H., Part-time Lecturer in Occupational Health, St. Bartholomew's Hospital Medical College, and Chief Medical Officer to Lloyds Bank, Ltd. HAY, ARTHUR WILLIAM, M.B., B.S., D.P.H., Deputy Medical Officer of Health, County Borough of East Ham. HILL, J. NORMAN, M.B., Ch.B., D.P.H., Medical Director, Mass Miniature Radiography Unit based on St. James's Hospital, Leeds. HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—Joseph Luder, M.D., M.R.C.P., D.C.H., Medical Registrar and Pathologist; M. J. Simpkins, M.B., Ch.B., M.R.C.P., Assistant Medical Registrar; Doreen B. Pallot, M.B., B.S., D.A., Junior Resident Anaesthetist; F. L. Richardson, M.B., Ch.B., and Joan M. Wagner, M.B., Ch.B., M.R.C.P., House-physicians; F. C. Hoyte, M.B., B.S., House-surgeon to Orthopaedic and Plastic Departments; D. L. B. Farley, M.B., B.S., F.R.C.S., Surgical Registrar. LAWSON, JAMES GLEN, M.B., Ch.B., M.R.C.O.G., Lecturer in Obstetrics and Gynaecology, University of Aberdeen. LEDINGHAM, LESLIE ANDREWS, M.B., Ch.B., M.R.C.O.G., Consultant Obstetrician and Gynaecologist, Northern Regional Hospital Board, Inverness. LIVERPOOL REGIONAL HOSPITAL BOARD.—G. J. Harrison, L.R.C.P.&S.I., D.P.M., Medical Superintendent (Consultant) to Winwick Hospital; J. Winter, M.B., Ch.B., M.Rad., D.M.R.D., Consultant Radiologist to Mill Road, Newsham General, and Bootle Hospitals; R. Marcus, M.D., Ch.M., F.R.C.S., Whole-time Assistant Consultant General Surgeon to Hospitals in Central Wirral area; L. Couper, M.B., Ch.B., D.P.M., Whole-time Deputy Medical Superintendent (Consultant) to Winwick Hospital; J. Winter, M.B., Ch.B., D.M.R.D., M.Rad., Consultant Radiologist to North Liverpool and Fazakerley Groups of Hospitals. LYONS, SAMUEL E. C., M.B., B.Ch., D.P.H., Medical Officer to Strabane Hospital, Co. Tyrone, Northern Ireland. MURDOCK, JAMES RONALD, M.D., D.P.H., D.C.H., Medical Officer of Health and Chief School Medical Officer, County Borough of Huddersfield. WEIR, IAN B. L., B.Sc., M.B., Ch.B., D.P.H., D.P.A., Medical Officer of Health for the City of Dundee. WHITHEAD, J. P. S., M.R.C.S., L.R.C.P., Assistant Pathologist (S.H.M.O.), Scarborough, Whitby, Bridlington, and Malton Group Hospital Management Committee.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Allbrook.—On June 11, 1953, at the Mengo Hospital, Kampala, Uganda, to Mary, wife of Dr. David B. Allbrook, a brother for Roland—Malcolm Oliver Frith. Clark.—On June 13, 1953, at Aberdeen, to Constance (formerly Eames), wife of Norman S. Clark, M.B., M.R.C.P., D.C.H., a son. Khosla.—On May 31, 1953, at the West Middlesex Hospital, Isleworth, Middlesex, to Sarol, wife of Dr. H. Khosla, a son—Rajiv. Langford.—On June 15, 1953, at British Military Hospital, Hamburg, B.A.O.R., 3, to L08, wife of Colonel R. C. Langford, A.D.M.S., Hamburg District, a daughter.

MARRIAGES

Chovil—Béland.—On June 26, 1953, in Paris, France, Alan Chovil, M.B., B.Chir., of Fareham, Hants, to Mariella Béland, of Quebec, Canada.

DEATHS

Boyd.—On May 19, 1953, at his home, Mount Side, Ilsham Valley Road, Torquay, George Samuel James Boyd, M.R.C.S., L.R.C.P., late of Four Oaks, Sutton Coldfield, Warwick. Cran.—On June 1, 1953, at Grassington Lodge, Dorking, Surrey, Hugh Rose Cran, M.R.C.S., L.R.C.P., late of New Malden, Surrey, aged 75. Grieve.—On May 30, 1953, at Fontainebleau, France, Stewart Cameron Grieve, M.B., Ch.B., Flying Officer, R.A.F., of 8, Meadowbank View, Kirknewton, Midlothian. Harry.—On May 25, 1953, at his home, Dolebury House, Churchill, Somerset, Philip Anthony Harry, M.D., D.P.H., formerly of Rochdale, Lancs. Kessler.—On May 9, 1953, in a London Hospital, Denys Edward Kessler, M.R.C.S., L.R.C.P., of Windwhistle, Ringwood, Hants. Lawlor.—On May 12, 1953, at King's College Hospital, London, S.E., Geoffrey Leo Thomas Lawlor, L.M.S.S.A., of 133, Camberwell New Road, London, S.E., aged 69. Macbeth.—On May 9, 1953, Alison Nicol Macbeth, M.B., B.S., aged 56. Macbride.—On April 1, 1953, Henry John Macbride, M.D., of 103, Embassy Court, Brighton, Sussex, formerly of London, W., aged 60. McCall.—On May 6, 1953, in a nursing-home, James McIntosh McCall, M.B., C.M., M.R.C.V.S., late of Chalfont St. Giles, Bucks, aged 87. McEwan.—On May 26, 1953, at Nakuru, Kenya, George Clazy McEwan, M.B., Ch.B., D.P.H. Mackay.—On April 26, 1953, in Melbourne, Australia, Charles Vincent Mackay, M.D., F.R.A.C.P. McNaughton.—On May 16, 1953, at Lushoto, Tanganyika, James Garvie McNaughton, M.D., M.R.C.P.Ed. Main.—On May 14, 1953, William Robert Main, M.B., Ch.B., of the Garden House, Buckingham. Nicoll.—On May 13, 1953, in a hospital, Exeter, George Stalker Nicoll, M.B., Ch.B., of Low Barley, Gatehouse-of-Fleet, Castle Douglas, Kirkcudbright. Smith.—On May 22, 1953, at Tunbridge Wells, Kent, Mary Anne Smith, L.R.C.P.&S.Ed., L.R.F.P.S., aged 90. Speirs.—On May 11, 1953, at his home, Furze Bank, Diss, Norfolk, Hugh Meredith Speirs, M.D., aged 75. Style.—On May 23, 1953, at Hadleigh, Suffolk, Arthur Hurrell Style, M.D., aged 79. Walker.—On May 23, 1953, at St. Thomas's Hospital, Hydestile, Surrey, Norman Dunbar Walker, O.B.E., M.B., Ch.B., D.P.H., Lieutenant-Colonel, R.A.M.C., retired, aged 76.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Long-standing Warts

Q.—What is the best treatment for long-standing (five years) warts on the arm of a woman?

A.—The most suitable treatment of a crop of common warts on the arm depends to some extent on the number of warts present. If there are not more than half a dozen it will probably be best to treat them individually by freezing with carbon-dioxide snow. Treatment should be sufficient to raise a blister, and, in this situation, 30 to 45 seconds to firm pressure will probably be suitable. If the warts are very numerous it may be better to remove them with the curette. This is not at all difficult, but seems to require a knack of scraping off the warts completely and smoothly in the right plane. Preliminary freezing with an ethyl-chloride spray provides fairly good analgesia, but in nervous patients a short general anaesthesia may be best. After curettage, the areas should be covered with a dry dressing, which is left in place, and kept dry for a week or 10 days. The areas should not be completely occluded with "elasto-plast." At the end of 10 days they will be healed, and if curettage has been complete recurrence is not very likely.

Cartridge Syringes

Q.—Certain syringes in which disposable cartridges are used preclude aspiration of blood before injection. The syringes are obviously convenient, but do the dangers from not being able to tell if a vein has been entered make them unsafe for use in domiciliary practice?

A.—These syringes are convenient, and for most purposes quite satisfactory, despite the objection referred to in the question. On the other hand, when the medicament to be injected is one that can cause untoward effects if it enters a vein, it would seem advisable to use another type of syringe. Among such medicaments are suspensions in oils, and preparations of procaine and other newer forms of penicillin, the accidental intravenous injection of which is believed to have caused serious effects. It would likewise be unsatisfactory to use these syringes for the intravenous injection of drugs which cause local damage when they escape into the tissues.

Vitamin B₁₂ in Pernicious Anaemia

Q.—As a pernicious anaemia patient receiving 50 µg. of vitamin B₁₂ fortnightly and feeling perfectly fit, I often wonder how this microscopical amount of intramuscular B₁₂ meets up with the non-existent intrinsic factor from my achy stomach. The greater would be my wonder had I suffered total gastrectomy. The latest writers on haematology concur in agreeing that pernicious anaemia only rarely follows total gastrectomy. There certainly can be no intrinsic factor in a non-existent stomach. Can you please explain this to me?

A.—In a normal person Castle's extrinsic factor, which is now thought to be identical with vitamin B₁₂, combines with epithelial cells of the small intestine. Here it is bound with another substance and passes to the liver to be stored. The person suffering from pernicious anaemia lacks intrinsic factor, and so fails to absorb the minimum amount of vitamin B₁₂ necessary for the normal maturation of red cells. The average diet in this country contains about 5 µg. of vitamin B₁₂, much of which is not absorbed even by the

normal person, and this explains why the average amount by injection of 3 µg. a day required by the patient with pernicious anaemia is so small.

Total gastrectomy is usually performed for carcinoma of the stomach, and many such patients do not survive long enough to develop a megaloblastic anaemia. In those that do survive, anaemia is not uncommon. Thus, of 53 cases surviving for more than three years, 12 had developed macrocytic anaemia and 5 an anaemia of doubtful nature; only 10 of the remainder had definitely received no liver therapy.¹ It seems probable that intrinsic factor may be present in the duodenal mucosa² of some normal individuals, and that in patients with pernicious anaemia atrophy of the glands producing intrinsic factor is not confined to the stomach. The question is fully discussed by Conway and Conway.³

REFERENCES

- 1 Macdonald, R. M., Ingelfinger, F. J., and Belding, H. W. (1947). *New Engl. J. Med.*, 237, 887.
- 2 Bethell, F. H., Meyers, M. C., Andrews, G. A., Swendsen, M. E., Bird, O. D., and Brown, R. A. (1947). *J. Lab. clin. Med.*, 32, 3.
- 3 Conway, N. S., and Conway, H. (1951). *British Medical Journal*, 1, 158.

Herpes Zoster and Chicken-pox

Q.—Is it established that an attack of herpes zoster in a child will result in immunity to chicken-pox? If so, is the immunity invariable and lasting?

A.—This is a difficult question to answer outright—unless perhaps by saying simply, so far as the first part of the question is concerned, that it has not been established; there is, indeed, no evidence one way or the other that an attack of zoster may result in immunity to chicken-pox. The two infections are, of course, due to the same or closely related viruses. Second attacks of either disease are rare. But chicken-pox does not prevent the development of zoster in later life, possibly, it has been suggested, because zoster results from the reactivation of virus which has remained latent within the body since the original attack of chicken-pox. The collection of adequate evidence in the reverse direction is rendered difficult because chicken-pox is predominantly a disease of childhood, whereas zoster is more frequently encountered in adults.

Ergometrine for Retained Placenta

Q.—Is it a good thing to give intravenous ergometrine when there is a retained placenta?

A.—The use of ergometrine in cases of retained placenta depends very much on the circumstances of the case. If, in addition to retention of the placenta, there is also haemorrhage, and if the attendant is working under conditions of domiciliary practice, then 0.5 mg. ergometrine should be injected intravenously without hesitation. This may or may not be followed by delivery of the placenta, but it will almost certainly control the bleeding. The advantage is that, even if the placenta remains in the uterus, the immediate threat to life is arrested, and the attendant has time to obtain assistance and to make proper preparations for manual removal of the placenta to be carried out as a planned operation.

If the placenta is retained but no haemorrhage is taking place, opinions and practice vary. If the patient is in hospital with all facilities at hand there is much to be said for manual removal of the placenta, delaying the intravenous injection of ergometrine until the moment the placenta is withdrawn. The same is true for domiciliary practice, provided help can be obtained for carrying out the operation without undue delay. There may be circumstances, however, in which ergometrine can be given with advantage, for it may lead to expulsion of the placenta, or promote its separation so it can be expressed. If it fails, however, the placenta still has to be removed manually, and this operation may then be rather more difficult because of uterine spasm. Nevertheless, this difficulty tends to be overrated.

COMING EVENTS

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POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. E. F. Gale: Mode of Action of Antibacterial Agents.
YORKSHIRE SOCIETY OF ANAESTHETISTS.—At Leeds General Infirmary, 8 p.m., Symposium arranged by D. T. C. Gray: Facts about Dosage; opening speakers, Dr. J. W. Dundee, Thiopentone; Mr. H. F. V. Riddle, Nitrous Oxide; Dr. T. C. Gray, Relaxants.

Thursday, July 2

EMPIRE RHEUMATISM COUNCIL.—At Royal Society of Medicine, 8.15 p.m., Special Coronation Lecture by Sir Henry Cohen: Concept of Collagen Disease.
●HAMPSTEAD GENERAL HOSPITAL.—3 p.m., Dr. Harold Davis: Bleeding Peptic Ulcer: 4.15 p.m., Brains Trust.
INSTITUTE OF CHILD HEALTH.—5 p.m., Professor G. Fanconi (Zurich): Renal Dwarfism.
OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Professor W. B. Castle (Harvard): Speculations About the Cause of Polycythemia Vera.
ROYAL COLLEGE OF SURGEONS OF ENGLAND AND INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—At Lincoln's Inn Fields, W.C., 5.30 p.m., Otolaryngology Lecture by Sir Henry Dale, O.M., F.R.S.: Histamine and its Antagonists.

Friday, July 3

INSTITUTE OF NEUROLOGY.—5 p.m., Professor Warren McCulloch: Cerebral Control of Carbohydrate Metabolism.

APPOINTMENTS

EDWARDS, J. R. G., M.B., B.S., F.R.C.S., Senior Registrar in Plastic Surgery Service of Newcastle-upon-Tyne Regional Hospital Board.
FARQUHAR, JOHN BURNS, M.B., Ch.B., F.R.C.S., M.R.C.O.G., Part-time Consultant Surgeon in Obstetrics and Gynaecology to the United Leeds Hospitals and to other hospitals in the Leeds district under the control of the Leeds Regional Hospital Board.
GLENN, ROBERT, M.B., B.Ch., D.P.H., Medical Officer of Health, School Medical Officer, and Port Medical Officer, Grimsby.
GUYMER, R. F., M.D., D.P.H., D.I.H., Part-time Lecturer in Occupational Health, St. Bartholomew's Hospital Medical College, and Chief Medical Officer to Lloyds Bank, Ltd.
HAY, ARTHUR WILLIAM, M.B., B.S., D.P.H., Deputy Medical Officer of Health, County Borough of East Ham.
HILL, J. NORMAN, M.B., Ch.B., D.P.H., Medical Director, Mass Miniature Radiography Unit based on St. James's Hospital, Leeds.
HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—Joseph Luder, M.D., M.R.C.P., D.C.H., Medical Registrar and Pathologist; M. J. Simpkins, M.B., Ch.B., M.R.C.P., Assistant Medical Registrar; Doreen B. Pallot, M.B., B.S., D.A., Junior Resident Anaesthetist; F. L. Richardson, M.B., Ch.B., and Joan M. Wagner, M.B., Ch.B., M.R.C.P., House-physicians; F. C. Hoyte, M.B., B.S., House-surgeon to Orthopaedic and Plastic Departments; D. L. B. Farley, M.B., B.S., F.R.C.S., Surgical Registrar.
LAWSON, JAMES GLEN, M.B., Ch.B., M.R.C.O.G., Lecturer in Obstetrics and Gynaecology, University of Aberdeen.
LEDINGHAM, LESLIE ANDREWS, M.B., Ch.B., M.R.C.O.G., Consultant Obstetrician and Gynaecologist, Northern Regional Hospital Board, Inverness.
LIVERPOOL REGIONAL HOSPITAL BOARD.—G. J. Harrison, L.R.C.P.&S.I., D.P.M., Medical Superintendent (Consultant) to Winwick Hospital; J. Winter, M.B., Ch.B., M.Rad., D.M.R.D., Consultant Radiologist to Mill Road, Newsham General, and Bootle Hospitals; R. Marcus, M.D., Ch.M., F.R.C.S., Whole-time Assistant Consultant General Surgeon to Hospitals in Central Wirral area; L. Couper, M.B., Ch.B., D.P.M., Whole-time Deputy Medical Superintendent (Consultant) to Winwick Hospital; J. Winter, M.B., Ch.B., D.M.R.D., M.Rad., Consultant Radiologist to North Liverpool and Fazakerley Groups of Hospitals.
LYONS, SAMUEL E. C., M.B., B.Ch., D.P.H., Medical Officer to Strabane Hospital, Co. Tyrone, Northern Ireland.
MURDOCK, JAMES RONALD, M.D., D.P.H., D.C.H., Medical Officer of Health and Chief School Medical Officer, County Borough of Huddersfield.
WEIR, IAN B. L., B.Sc., M.B., Ch.B., D.P.H., D.P.A., Medical Officer of Health for the City of Dundee.
WHITEHEAD, J. P. S., M.R.C.S., L.R.C.P., Assistant Pathologist (S.H.M.O.), Scarborough, Whitby, Bridlington, and Malton Group Hospital Management Committee.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Allbrook.—On June 11, 1953, at the Mengo Hospital, Kampala, Uganda, to Mary, wife of Dr. David B. Allbrook, a brother for Roland—Malcolm Oliver Frith.
Clark.—On June 13, 1953, at Aberdeen, to Constance (formerly Eames), wife of Norman S. Clark, M.B., M.R.C.P., D.C.H., a son.
Khosla.—On May 31, 1953, at the West Middlesex Hospital, Isleworth, Middlesex, to Saroj, wife of Dr. H. Khosla, a son—Rajiv.
Langford.—On June 15, 1953, at British Military Hospital, Hamburg, B.A.O.R., 3, to Lois, wife of Colonel R. C. Langford, A.D.M.S., Hamburg District, a daughter.

MARRIAGES

Chovil—Béland.—On June 26, 1953, in Paris, France, Alan Chovil, M.B., B.Chir., of Farcham, Hants, to Mariella Béland, of Quebec, Canada.

DEATHS

Boyd.—On May 19, 1953, at his home, Mount Side, Ilsham Valley Road, Torquay, George Samuel James Boyd, M.R.C.S., L.R.C.P., late of Four Oaks, Sutton Coldfield, Warwick.
Cran.—On June 1, 1953, at Grassington Lodge, Dorking, Surrey, Hugh Rose Cran, M.R.C.S., L.R.C.P., late of New Malden, Surrey, aged 75.
Grieve.—On May 30, 1953, at Fontainebleau, France, Stewart Cameron Grieve, M.B., Ch.B., Flying Officer, R.A.F., of 8, Meadowbank View, Kirknewton, Midlothian.
Harry.—On May 25, 1953, at his home, Dolebury House, Churchill, Lancs, Somerset, Philip Anthony Harry, M.D., D.P.H., formerly of Rochdale.
Kessler.—On May 9, 1953, in a London Hospital, Denys Edward Kessler, M.R.C.S., L.R.C.P., of Windwhistle, Ringwood, Hants.
Lawlor.—On May 12, 1953, at King's College Hospital, London, S.E., Geoffrey Leo Thomas Lawlor, L.M.S.S.A., of 133, Camberwell New Road, London, S.E., aged 69.
Macbeth.—On May 9, 1953, Allison Nicol Macbeth, M.B., B.S., aged 56.
Macbride.—On April 1, 1953, Henry John Macbride, M.D., of 103, Embassy Court, Brighton, Sussex, formerly of London, W., aged 60.
McCall.—On May 6, 1953, in a nursing-home, James McIntosh McCall, M.B., C.M., M.R.C.V.S., late of Chalfont St. Giles, Bucks, aged 87.
McEwan.—On May 26, 1953, at Nakuru, Kenya, George Clazy McEwan, M.B., Ch.B., D.P.H.
Mackay.—On April 26, 1953, in Melbourne, Australia, Charles Vincent Mackay, M.D., F.R.A.C.P.
McNaughton.—On May 16, 1953, at Lushoto, Tanganyika, James Garvie McNaughton, M.D., M.R.C.P.Ed.
Maha.—On May 14, 1953, William Robert Main, M.B., Ch.B., of the Garden House, Buckingham.
Nicoll.—On May 13, 1953, in a hospital, Exeter, George Stalker Nicoll, M.B., Ch.B., of Low Barlay, Gatehouse-of-Fleet, Castle Douglas, Kirkcubright.
Smith.—On May 22, 1953, at Tunbridge Wells, Kent, Mary Anne Smith, L.R.C.P.&S.Ed., L.R.F.P.S., aged 90.
Speirs.—On May 11, 1953, at his home, Furze Bank, Diss, Norfolk, Hugh Meredith Speirs, M.D., aged 75.
Style.—On May 23, 1953, at Hadleigh, Suffolk, Arthur Hurrell Style, M.D., aged 79.
Walker.—On May 23, 1953, at St. Thomas's Hospital, Hydestile, Surrey, Norman Dunbar Walker, O.B.E., M.B., Ch.B., D.P.H., Lieutenant-Colonel, R.A.M.C., retired, aged 76.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Long-standing Warts

Q.—What is the best treatment for long-standing (five years) warts on the arm of a woman?

A.—The most suitable treatment of a crop of common warts on the arm depends to some extent on the number of warts present. If there are not more than half a dozen it will probably be best to treat them individually by freezing with carbon-dioxide snow. Treatment should be sufficient to raise a blister, and, in this situation, 30 to 45 seconds with firm pressure will probably be suitable. If the warts are very numerous it may be better to remove them with the curette. This is not at all difficult, but seems to require a knack of scraping off the warts completely and smoothly in the right plane. Preliminary freezing with an ethyl-chloride spray provides fairly good analgesia, but in nervous patients a short general anaesthesia may be best. After curettage, the areas should be covered with a dry dressing, which is left in place, and kept dry for a week or 10 days. The areas should not be completely occluded with "elastoplast." At the end of 10 days they will be healed, and if curettage has been complete recurrence is not very likely.

Cartridge Syringes

Q.—Certain syringes in which disposable cartridges are used preclude aspiration of blood before injection. The syringes are obviously convenient, but do the dangers from not being able to tell if a vein has been entered make them unsafe for use in domiciliary practice?

A.—These syringes are convenient, and for most purposes quite satisfactory, despite the objection referred to in the question. On the other hand, when the medicament to be injected is one that can cause untoward effects if it enters a vein, it would seem advisable to use another type of syringe. Among such medicaments are suspensions in oils, and preparations of procaine and other newer forms of penicillin, the accidental intravenous injection of which is believed to have caused serious effects. It would likewise be unsatisfactory to use these syringes for the intravenous injection of drugs which cause local damage when they escape into the tissues.

Vitamin B₁₂ in Pernicious Anaemia

Q.—As a pernicious anaemia patient receiving 50 µg. of vitamin B₁₂ fortnightly and feeling perfectly fit, I often wonder how this microscopical amount of intramuscular B₁₂ meets up with the non-existent intrinsic factor from my achyllic stomach. The greater would be my wonder had I suffered total gastrectomy. The latest writers on haematology concur in agreeing that pernicious anaemia only rarely follows total gastrectomy. There certainly can be no intrinsic factor in a non-existent stomach. Can you please explain this to me?

A.—In a normal person Castle's extrinsic factor, which is now thought to be identical with vitamin B₁₂, combines with an intrinsic factor present in gastric juice and enters the epithelial cells of the small intestine. Here it is bound with another substance and passes to the liver to be stored. The person suffering from pernicious anaemia lacks intrinsic factor, and so fails to absorb the minimum amount of vitamin B₁₂ necessary for the normal maturation of red cells. The average diet in this country contains about 5 µg. of vitamin B₁₂, much of which is not absorbed even by the

normal person, and this explains why the average amount by injection of 3 µg. a day required by the patient with pernicious anaemia is so small.

Total gastrectomy is usually performed for carcinoma of the stomach, and many such patients do not survive long enough to develop a megaloblastic anaemia. In those that do survive, anaemia is not uncommon. Thus, of 53 cases surviving for more than three years, 12 had developed macrocytic anaemia and 5 an anaemia of doubtful nature; only 10 of the remainder had definitely received no liver therapy.¹ It seems probable that intrinsic factor may be present in the duodenal mucosa² of some normal individuals, and that in patients with pernicious anaemia atrophy of the glands producing intrinsic factor is not confined to the stomach. The question is fully discussed by Conway and Conway.³

REFERENCES

- 1 Macdonald, R. M., Ingelfinger, F. J., and Belding, H. W. (1947). *New Engl. J. Med.*, 237, 887.
- 2 Bethell, F. H., Meyers, M. C., Andrews, G. A., Swendsen, M. E., Bird, O. D., and Brown, R. A. (1947). *J. Lab. clin. Med.*, 32, 3.
- 3 Conway, N. S., and Conway, H. (1951). *British Medical Journal*, 1, 158.

Herpes Zoster and Chicken-pox

Q.—Is it established that an attack of herpes zoster in a child will result in immunity to chicken-pox? If so, is the immunity invariable and lasting?

A.—This is a difficult question to answer outright—unless perhaps by saying simply, so far as the first part of the question is concerned, that it has not been established; there is, indeed, no evidence one way or the other that an attack of zoster may result in immunity to chicken-pox. The two infections are, of course, due to the same or closely related viruses. Second attacks of either disease are rare. But chicken-pox does not prevent the development of zoster in later life, possibly, it has been suggested, because zoster results from the reactivation of virus which has remained latent within the body since the original attack of chicken-pox. The collection of adequate evidence in the reverse direction is rendered difficult because chicken-pox is predominantly a disease of childhood, whereas zoster is more frequently encountered in adults.

Ergometrine for Retained Placenta

Q.—Is it a good thing to give intravenous ergometrine when there is a retained placenta?

A.—The use of ergometrine in cases of retained placenta depends very much on the circumstances of the case. If, in addition to retention of the placenta, there is also haemorrhage, and if the attendant is working under conditions of domiciliary practice, then 0.5 mg. ergometrine should be injected intravenously without hesitation. This may or may not be followed by delivery of the placenta, but it will almost certainly control the bleeding. The advantage is that, even if the placenta remains in the uterus, the immediate threat to life is arrested, and the attendant has time to obtain assistance and to make proper preparations for manual removal of the placenta to be carried out as a planned operation.

If the placenta is retained but no haemorrhage is taking place, opinions and practice vary. If the patient is in hospital with all facilities at hand there is much to be said for manual removal of the placenta, delaying the intravenous injection of ergometrine until the moment the placenta is withdrawn. The same is true for domiciliary practice, provided help can be obtained for carrying out the operation without undue delay. There may be circumstances, however, in which ergometrine can be given with advantage, for it may lead to expulsion of the placenta, or promote its separation so it can be expressed. If it fails, however, the placenta still has to be removed manually, and this operation may then be rather more difficult because of uterine spasm. Nevertheless, this difficulty tends to be overrated.

Absence of Axillary Hair in a Man

Q.—An athletic young man of 18 suffers considerable embarrassment when changing with other men, as he has no axillary hair and a feminine distribution of his pubic hair. He does not need to shave. His genitalia are normally developed, and he has heterosexual interests. What are the likely causes of this condition, and what treatment is advised?

A.—The usual cause of failure of growth of sexual hair is deficient secretion of testosterone by the interstitial tissue of the testes. On the other hand, it may sometimes be due to resistance of the hair follicles to the normal stimulation of testosterone. This latter cause is probable in the present case, since the patient's genitalia are normally developed. If this is so, there is no effective treatment. However, I suggest that a trial be made with testosterone propionate injected intramuscularly in doses of 50 mg. twice a week. Several months' treatment will be necessary. If injections prove to be inconvenient, methyl testosterone may be given by mouth in doses of 25 mg. daily.

Barrier Creams for Oily Materials

Q.—What barrier creams are useful against oily materials in industry?

A.—Various creams have been advocated as protection against oily materials in industry, but objective laboratory tests¹ have shown that they are penetrated, even when liberally applied, by cutting oils within three-quarters of an hour. The most effective type of cream consists of soap, inert filling powder, and water with small amounts of glycerin; such mixtures certainly facilitate removal of grease and dirt from the hands—for example, of car repairers. But daily application of soapy creams is probably undesirable on many skins. In general, hygienic measures such as good washing facilities and suitable cleansers are more likely to be valuable. The emollient cream of anhydrous lanolin (65 parts) and castor oil (35 parts) described in an earlier question² also assists washing and skin protection.

REFERENCES

- ¹ Cruickshank, C. N. D. (1948). *Brit. J. Industr. Med.*, 5, 204.
² *British Medical Journal*, 1952, 2, 1058.

Castellani's Paint and Myxoedema

Q.—Is there any chance of the resorcinol in Castellani's paint (pig. magent., N.F.) being absorbed through the skin and having an anti-thyroid effect? The paint contains 8% resorcinol. I am using it for recurrent fungus infection of the skin, and treatment may well be prolonged, say, up to a year.

A.—Resorcinol has been shown to be capable of producing myxoedema when applied to varicose ulcers of the leg. In the recorded cases the patients all had large open ulcers, and the ointment had been applied for a long time. It is, however, possible to affect thyroid function if resorcinol is applied to unbroken skin for a sufficiently long time. It seems unlikely that a fungus infection would affect a sufficiently large area of skin to cause a significant risk of myxoedema from the application of 8% resorcinol as a paint. Nevertheless, it would be advisable to keep the possibility in mind, and to note particularly any alteration in tolerance to cold, in the dryness of the skin, in the hair, or in the voice.

Prognosis of Orthostatic Albuminuria

Q.—What is the long-term prognosis for a young man in whom, after full investigation in hospital, a diagnosis of orthostatic albuminuria has been made?

A.—Orthostatic albuminuria is a benign condition; it may disappear spontaneously, and the long-term prognosis is excellent. It would be a wise precaution, however, to maintain contact with the patient for several years and check occasionally the amount of albumin in specimens passed at different times of the day.

NOTES AND COMMENTS

Oestrogens and Vasomotor Rhinitis.—Dr. J. PEPYS (London, S.E.1) writes: The observation of your correspondent on the beneficial effect of oestrogen treatment in a case of vasomotor rhinitis at the menopause ("Any Questions?" May 23, p. 1177) corresponds with that reported by Lucas and Pepys.¹ A very good response to oestrogen treatment was described in 39 women who developed rhinitis at or about the menopause, and a further eight similar cases have been seen by me since that time. These patients correspond in every way with other cases of typical allergic rhinitis, and present the same clinical history of sneezing, itching of the nose, nasal obstruction, and rhinorrhoea; the same nasal mucosal appearances; and the same response to oral administration of palliatives such as antihistaminic drugs or epinephrine. The nasal secretions frequently contain significant numbers of eosinophil cells, and skin testing and clinical trials support their histories, which suggested chiefly inhalant allergens. Treatment by oestrogens alone without any allergic treatment was effective in 33 cases, and six cases required both oestrogen and allergic treatment to obtain the best results. In these cases the response to oestrogens, either ethinyl oestradiol 0.05 mg. daily or stilboestrol 1 mg. daily, is rapid, often complete, and is contemporaneous with their administration. Cessation of treatment can lead to a recurrence of symptoms, which are rapidly controlled again on resumption. Treatment must be continued over a long period just as with the use of oestrogens for other menopausal symptoms, and the best time for tapering off the oestrogen is occasionally found in female asthmatics at the menopause; in one case of severe intractable asthma a remarkably beneficial result was obtained. A possible explanation of this response to the oestrogen treatment is that the hormonal disturbance has lowered the clinical threshold and upset the "allergic equilibrium," thus enabling clinical manifestations to appear.

REFERENCE

¹ *Larynx*, 1951, 65, 598.

Spontaneous Combustion of Alcoholics.—Professor B. BRENDAN HICKEY (Khartum) writes: With reference to "Spontaneous Combustion of Alcoholics" in "Any Questions?" (*Journal*, April 4, p. 793) and the subsequent note by Dr. H. H. MacWilliam (*Journal*, April 18, p. 896), I should like to draw attention to a further account of the alleged occurrence in fiction. Captain Marryat in *Jacob Faithful* describes in a most dramatic fashion the death of Jacob's mother, a confirmed alcoholic who rarely ever left her bunk in a barge. Coming as this description does from so experienced an observer as Marryat, and coinciding so accurately with other descriptions, it is perhaps legitimate to conclude that combustion, spontaneous or otherwise, was seen macabre features usually described.

[The account of this incident is to be found in Chapter 1 of *Jacob Faithful*. It reads as follows:

"Nothing was burning—not even the curtains to my mother's bed appeared to be singed. I was astonished—breathless with fear, with a trembling voice, I again called out 'Mother.' I remained more than a minute panting for breath, and then I ventured to draw back the curtains of the bed—my mother was not there! but there appeared to be a black mass in the centre of the bed. I put my hand fearfully upon it—it was a sort of unctuous, pitchy cinder. . . .

"As the reader may be in some doubt as to the occasion of my mother's death, I must inform him that she perished in that very peculiar and dreadful manner, which does sometimes, although rarely, occur, to those who indulge in an immoderate use of spirituous liquors. Cases of this kind do indeed present themselves but once in a century, but the occurrence of them is too well authenticated. She perished from what is termed *spontaneous combustion*, an inflammation of the gasses generated from the spirits absorbed into the system."

Correction.—The outbreak of food-poisoning caused by the *dansz* variety of *Salm. enteritidis* mentioned in the reply to a question on "Dangerous Mouse Poisons" (May 30, p. 1233) occurred in 1951, and not in 1950 as stated in the answer.

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SUPPLEMENT TO THE
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REHABILITATION THROUGH ALTERNATIVE
WORK

HELP FROM THE GENERAL PRACTITIONER

BY

ROBERT PIPER, M.B., B.Ch., D.P.H.

Imperial Chemical Industries Ltd., Paints Division, Slough

The use of the words "fit for light work" on medical certificates causes waste of man-power to factories, and discouragement and loss of earnings to the patients thus described. "Limited" and "alternative" work are better terms because they encourage man and management to ask the questions, "Limited in what way?" "Alternative work of what kind?" Unfortunately, medical practitioners outside industry are not often able to know what information will help managers best to fit such men into productive work and are seldom in a position to recommend alternative employment for medically handicapped persons. The diagnosis itself would not often help, since managers, as a rule, have insufficient medical knowledge to make good use of it. The aim of this note is therefore to suggest briefly what information in such cases would be of most assistance to managements in placing employees in work which is productive and at the same time consonant with their medical requirements.

Classification

There are four main headings under which the information would be helpful: (1) likely duration of disability; (2) environment in which a patient should not work; (3) physical limitations of the patient (a) with respect to travelling to and from work, and (b) at work; (4) fitness for part-time work.

Duration.—It is most useful to group patients into: (a) *Short-term cases*, whose disability is unlikely to last more than a few weeks—e.g., many convalescent cases, minor injuries, etc. For these, managements are unlikely to make elaborate arrangements for finding special work, except in large organizations with rehabilitation centres. (b) *Medium-term cases*, whose disabilities are likely to last a matter of months, up to about a year. Many of these are post-operative convalescents and will be able to resume their original jobs in due course, but it is often worth while, with men possessing any skill, for managements to place them temporarily in alternative work, which is usually rewarding both in terms of money and satisfaction to the patient and to the industry. (c) *Long-term or permanently disabled men*. These include most industrial

workers over 45 years of age who encounter serious illness, accident, or the surgeon's knife, partly because the prolonged absence from work during illness causes loss of the habit and rhythm of work. It applies particularly to work involving heavy lifting. In relation to the effect of age on limitation of work, it has been shown that over the age of 40 years the proportion of handicapped workers increases *pari passu* with the age of the group (Piper, 1951). As our country has an ageing population, it is evident that the proportion of these men who will require placement in industry will increase steadily for some time. At present it is believed that the proportion of handicapped men is somewhere in the region of 7% of all workers in industry.

Conditions of Work

Environment.—Consideration of the environment is particularly appropriate for cases of chronic respiratory disease and chronic skin disease. With the former, the special points often needed are protection from damp, cold, and irritant fumes and dusts. With the latter, the word "dermatitis" is sufficient to cause most managers to take steps to guard against recurrence, but is frequently misleading; it is probably better to say, "Should not be in contact with skin irritants." The guidance of a physician with industrial experience is often needed in these complicated cases if a man is to continue in his industry.

Physical.—The commonest restriction is that of not lifting heavy weights—the only true use of the term "light work." If it is possible to say the maximum weight permitted, it will sometimes be found that the man can continue with his ordinary work. But there are many other restrictions which could with advantage be mentioned separately. Facilities for occasional sitting are needed for many lower-limb cases, and seats where work can be performed sitting are now a statutory requirement in workshops wherever possible. Persons subject to fits can work safely only where there is no danger of serious injury if they fall. Thus they cannot safely work at heights, on scaffolding or ladders, or on boats, or near moving machinery or railway lines. Usually the patient must tell his management frankly what is wrong, but the practitioner can give much help by pointing out that the patient can do a full job apart from this restriction. Peptic ulcer cases are usually best kept off heavy lifting and work where stooping and bending is a feature, at least for some months after an acute attack. Further, working on the three- (or four-) shift system with the weekly change-about of shift, meaning weekly changing of meal times and probably many sandwich meals, does not give an already handicapped digestion a fair chance of maintaining itself in health.

Part-time Work

It is possible for many patients to return to work part-time long before they are fit to do full-time. It is generally unlikely that anyone except the medical practitioner will think of this, and it is therefore his duty to mention it to the patient when he considers the patient fit enough to do so. The sufferer from pulmonary tuberculosis is one who falls frequently into this category, and the healed quiescent case is able to recommence some work long before fit for a full day's work including travelling. As the latter is often an arduous task in itself, particularly during rush hours, some managements will agree (on a doctor's recommendation) to a patient's arriving half an hour late and leaving half an hour early to avoid the rush.

Form of Certificate

Probably the most useful form of words for the type of certificate that the practitioner can use to help the industrial worker and the industry is: "Fit for ordinary work except . . . (the restriction or restrictions then being specified) for . . . (likely duration)."

Needless to say, it is anticipated that the certificate would be handed to the patient for transmission with his agreement to the management.

Summary

A simple scheme is suggested by which medical practitioners would help disabled persons, convalescents, and so on to more productive and more interesting work, and at the same time assist industry in its struggle for more productivity.

REFERENCE

Piper, R. (1951). *Lancet*, 2, 680.

Notes and News

The New B.M.A. Lounge.—The new members' lounge is a welcome addition to the amenities of B.M.A. House. A transformed Hastings Hall is now underlined by blue carpet, and punctuated by the glow of red leather upholstery and polished mahogany. The discreet professionalism of the writing-desks, drawn a little apart to the windows, harmonizes with the emblazoned symbol on the glass entrance screen, the Roll of Honour, and the portraits of Sir Charles Hastings and Dr. Guy Dain facing each other above opposite fireplaces. And, as a concession perhaps to the feminine element, an occasional alcove attractively lit supports a gay vase to complete the transformation. The whole effect is tasteful and restful, and is a distinct advance on anything that B.M.A. House has had to offer its members or show its guests before.

Civil Service Medical Officers in Northern Ireland.—It is understood that certain Civil Service medical appointments in Northern Ireland are likely to become vacant in the near future. No advertisements for such vacancies have appeared, and it will be remembered that the Representative Body of the Association at the Dublin meeting last year recommended that no advertisement should be accepted for Civil Service appointments owing to the present inadequate salary scale. This applies also to Northern Ireland.

Negotiation and Joint Consultation in Public Services.—Commencing on February 2 the Institute of Public Administration is presenting a series of seven weekly critical discussions on the machinery and procedure for negotiation and joint consultation in various major public services, including the health services. The series will end with a debate on the motion: "That separate standing organizations for negotiation and for joint consultation are wasteful and unlikely to maintain confidence between official and staff sides." Tickets may be obtained from the Director, Institute of Public Administration, Haldane House, 76a, New Cavendish Street, London, W.1 (Langham 8881).

Questions Answered

Car Expenses—Deduction for Private Use

Q.—The inspector of taxes wishes to deduct one-seventh for my car expenses to allow for private motoring. I am in a semi-rural district, averaging 24,000 miles annually, and this would represent just over 3,000 miles. However, I do not agree that the one-seventh should be taken from the car expenses as a whole, but from the petrol and oil bills. Large repair bills and renovations are entirely due to the heavy wear and tear received during practice calls—rough cart tracks, frequent stopping and starting, often from cold.

A.—The point taken by the questioner—i.e., that the cost per mile of motoring over the rough roads in his rural area is greater than the mileage cost of private motoring—seems to be a good one, but needs to be considered in connexion with the amount charged in his yearly account for repairs and renovations. The greater that amount is in fact the more force there is in his contention. Judging from such cases as we have seen a common rate of restriction is one-tenth, and the questioner would apparently be justified in pressing for the substitution of that proportion for the one-seventh proposed by the inspector of taxes.

Maintaining a Larger Flat

Q.—For the convenience of patients on a new housing estate I am taking a larger flat with a view to seeing patients there by appointment and when necessary. Can I claim a proportion of the rent (£250 per annum inclusive), lighting, etc., against my general practice expenses? I have also to provide living accommodation for a married assistant and family. The inspector of taxes asks me to keep a list of every patient I see here and the exact time taken with each. Is this obligatory?

A.—The questioner is undoubtedly entitled to some deduction from his gross receipts for the general expense of maintaining a flat in which he sees patients and does other medical work, but it is obviously a matter of considerable difficulty to estimate what would be a reasonable proportion of the general expenses to regard as incurred in the conduct of the practice. One factor which would affect the estimate would be the number of patients seen at the flat, and the request of the inspector of taxes for information on that point is not unreasonable. On the other hand, the major consideration is the extent to which parts of the flat are used either wholly or partially for the reception of patients—e.g., if one room is set aside for that purpose it is immaterial whether the weekly number of patients using the room is 10 or 50. It is suggested that, if the facts support the proposal, the questioner should offer to agree to an allowance of, say, one-sixth of the expenses, undertaking at the same time to keep a record from which the number of patients calling at the flat can be ascertained and the question reconsidered as regards future years.

Registrar's Retention of Seniority on Moving

Q.—Is a registrar, going from one post to another of similar grading, allowed to continue on the maximum salary of that grading? If so, would you please give the official reference?

A.—A practitioner holding an appointment in one of the registrar grades is permitted, on being appointed to another post in the same grade, to retain such seniority and increments of salary as he has already received in the post he has left. (R.H.B. (50) 44, paragraph 3 (b).)

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

Correspondence

Medical Establishment of Teaching Hospitals

SIR.—In the *Supplement* of November 22, 1952 (p. 206), you kindly gave me the opportunity of commenting upon a circular letter sent shortly before by the Ministry to boards of governors of teaching hospitals concerning their medical establishments. Following a recent meeting between the Joint Consultants Committee and the Ministry, I am now able to give some further information about the Ministry's letter which may go some way to relieving the disquiet it has caused among members of boards of governors and their senior medical staffs.

At this meeting the Joint Committee was informed that the proposals on medical staffing sent to boards of governors are simply the recommendations of the inspecting teams which had carried out a survey of hospital staffing. They are not, and should not be regarded as, the conclusions which the Ministry itself has formed or is seeking to impose upon the boards. It is thus open to each board of governors, and particularly to its medical staff committee, to consider the proposals freely and without prejudice, and to interpret them in the light of their local knowledge.

Boards of governors and their medical staffs will, I feel certain, be glad to know that their hands are not tied and that the Joint Committee has been promised further consultations with the Ministry before firm decisions are taken. In these we shall discuss with the Ministry the security of tenure of consultants and senior hospital medical officers, and the possible effects of a reduction in establishments upon the prospects of senior registrars.—I am, etc.,

London, S.W.1.

W. RUSSELL BRAIN,
Chairman, Joint Consultants Committee.

Integration of Medical Practice

SIR.—Before attempting to consider the points raised by Dr. D. Saklatvala (*Supplement*, December 27, 1952, p. 237), I wish to register my resentment at his uncalled-for attack on the preventive medical services of this country, which are acknowledged all over the world to be without equal, and which have played a big part in the improvement of the social and health conditions of our nation.

Did the local authorities really "rush in" to set up personal health services? Surely Dr. Saklatvala as a member of a local health authority knows that local authorities are rarely eager to put up their rates despite the pressures from medical officers of health. These services were surely due in part to just such an evolutionary process within the medical profession as he denies, in that they were initiated, extended, and guided by the minority of doctors who were particularly interested in preventive medicine and had an acute sense of social responsibilities that had led them to become medical officers of health—never the most lucrative posts available to competent doctors.

While it can be argued, not unreasonably, that the ambulance service should be managed by the hospital service, it is quite naive to suggest that a glib, catchpenny phrase reminiscent of the hustings, such as "liaison at the bedside," will solve all the problems of socio-medical care and of personal health services. How can the G.P. coping with an influenza epidemic manage to attend a school health examination (which entails the giving of advice to mother as well as examining and classifying the child) to which parents have been invited some days previously and at which a school nurse is booked to attend, let alone arrive punctually, as he must, in order to cope with staggered appointments for mothers? How can he attend both Mrs. A.'s unexpectedly early confinement and also on the same afternoon the regular child-welfare clinic which has been held on that afternoon for the last twenty years? Who will hold the balance between the claims of G.P.s competing for the services of nursing staff? How is this G.P. at the bedside to cope with the machinery of the Lunacy Acts, the medico-social care of mental illness in

the home, and the medico-legal niceties of the Mental Deficiency Acts? Lastly, are the personal health services designed to "by-pass the general practitioner" or, in fact, to pick up cases of early deviations from health which otherwise most doctors would never see, and this through no fault of theirs?

In conclusion, allow me to quote from *Life and Letters* by Creighton: "It is a cheap line to denounce—it satisfies the sense that something ought to be done; I am weary of denunciation. . . . The world's evils are many and patent. We can all do much to cure them. 'Here a little and there a little,' but do not let us expend our energy in meaningless abuse. Mankind will not be saved by that."—I am, etc.,

Exeter.

J. H. WHITTLES.

Cost of Prescribing

SIR.—As a hospital pharmacist, Mr. F. R. Elkins (*Supplement*, January 3, p. 5) is fully entitled to his own views on the relative therapeutic value and prices of branded medicines and official preparations. There could be no justification, however, for misuse of public money in establishing, as he proposes, an "official office" devoted to propaganda against the prescribing of ethical proprietaries.

This association has no interest in excusing extravagance, or in commenting on prescribing, which is of course the province of the medical profession, but since the cost of ethical proprietaries comprises only around 4d. in the £ of the bill for the National Health Service, the initial saving to the nation, if Mr. Elkins's plan for reducing prescriptions to official preparations was to be effective, would be far outweighed in the resulting gradual decline of pharmaceutical progress. The removal from the laboratories of the pharmaceutical houses of all incentive, not only for original research but for development, implicit in Mr. Elkins's proposals, would have far-reaching and disastrous effects on the health of the nation.—I am, etc.,

London, W.C.1.

GORDON SMITH,
Secretary, Association of British
Pharmaceutical Industry.

SIR.—Mr. F. R. Elkins (*Supplement*, January 3, p. 5) appears to want the best of two worlds. Whilst he is quite prepared to take advantage of what he terms "new chemical entities exhibiting new types of pharmacological activity," he is not willing to allow the famous drug-houses, whose money and research make the discovery of these possible, the means to make the necessary profits to continue this valuable work. It would be tragic if the leading drug-houses felt that, due to economic pressure, they had to cut down their research programmes.

Most practitioners will testify that a very high percentage of the special preparations introduced frequently by these firms are of the highest possible value, and it would be most unjust to regard them as unremarkable mixtures in what Mr. Elkins terms "group 2."—I am, etc.,

Shipley.

J. A. FRAIS.

Interests of Whole-time Specialists

SIR.—In recent weeks several letters have been published in the *Supplement* expressing dissatisfaction with travelling allowances and income-tax allowances as applicable to whole-time specialists. In many cases the whole-time specialist has a greater need of a motor-car and does a larger monthly mileage than many of his part-time colleagues. This is particularly evident in hospital groups in country districts, where registrars and housemen are sometimes difficult to get and may not be considered necessary in certain specialties by the regional hospital board. This is the case in the anaesthetic department in the West Dorset group of hospitals, where the majority of the emergency anaesthetics are administered by my senior whole-time colleague and myself. There is no specialist in this group who has more need of a motor-car than we have. Our total monthly mileage compares favourably with any, and is greater than most, of the part-timers. Even in cases where "home to duty" mileage is paid there is a con-

siderable disparity between the two systems of payment. This is obviously wrong.

Similarly with income tax; I cannot see how anyone can argue that the need of the whole-timer to maintain a library, to join learned societies, and to attend medical meetings is any less than that of the part-timer.

I consider the most urgent problem for discussion is "betterment." I think most hospital doctors are agreed that the general practitioner is worth his 100% on Spens. Do all general practitioners realize that our betterment factor is 15% to 20%? Are they satisfied that this is fair and just? This does not affect only the whole-time specialist; many part-timers are making very little in private practice and only remain on a part-time contract because of the income-tax allowances and increased travelling allowances. Merit awards, too, are a minority distinction. Is it not possible and reasonable that, because the value of money has declined so considerably since 1948, a revision of the betterment factor should be pressed for? Many of us had hoped that by now some comment would have appeared in the *British Medical Journal* on this matter. One is forced to the conclusion, which many have reached, that the Association is concerned primarily with the general practitioner. Of the specialists, the part-timer is worthy of some consideration but the whole-timer is not worth bothering about. I have accordingly resigned my membership.

This letter represents the feelings of many specialists, and perhaps it may stimulate others to express their views.—I am, etc.,

Osmington, Dorset.

JOHN WARWICK.

Association Notices

Diary of Central Meetings

JANUARY

- 19 Mon. Scientific Exhibition Subcommittee, Arrangements Committee (at B.M.A. House, 195, Newport Road, Cardiff), 4 p.m.
- 20 Tues. Joint Meeting of Representatives of Radiologists and Tuberculosis Group Committees, 2 p.m.
- 21 Wed. Planning Subcommittee, Occupational Health Committee, 10 a.m.
- 21 Wed. Planning Subcommittee, Occupational Health Committee. Joint meeting with Social Insurance Committee, T.U.C. (at Transport House, Smith Square, London, S.W.), 4 p.m.
- 22 Thurs. Subcommittee to Prepare Evidence for the Central Health Services Council's Committee on General Practice, G.M.S. Committee, 10.30 a.m.
- 22 Thurs. Staff Side of Committee C, 11 a.m.
- 22 Thurs. Tuberculosis and Diseases of the Chest Group Committee Conference, 12.30 p.m.
- 22 Thurs. Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.
- 22 Thurs. Full Committee C (at 14, Russell Square, London, W.C.), 2.30 p.m.
- 23 Fri. Remuneration Subcommittee, Occupational Health Committee, 11 a.m.
- 23 Fri. Executive of Central Consultants and Specialists Committee, 12 noon.
- 23 Fri. Joint Subcommittee re National Coal Board Medical Service, Private Practice and Occupational Health Committees, 2 p.m.
- 26 Mon. Joint Committee of Psychological Medicine Group and Royal Medico-Psychological Association, 2.15 p.m.
- 28 Wed. General Practice Review Committee, 10.30 a.m.
- 29 Thurs. Charities Committee, 11.30 a.m.

FEBRUARY

- 6 Fri. Overseas Committee, 2 p.m.
- 11 Wed. Physical Medicine Group, 2 p.m.
- 13 Fri. Registrars Executive Committee, 2 p.m.
- 18 Wed. Occupational Health Committee, 2 p.m.
- 25 Wed. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 12 noon.
- 25 Wed. Joint Formulary Committee, 2.30 p.m.
- 27 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.

MARCH

- 13 Fri. Consulting Pathologists Group Committee, 2.30 p.m.

Branch and Division Meetings to be Held

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, January 20, 8.30 p.m., meeting. Lecture by Reverend Canon B. S. W. Green, B.D.: "Medicine and Religion."

BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Boscombe, Friday, January 23, 8.15 p.m., meeting. Address by Dr. Robert Cruickshank: "The Use and Abuse of Antibiotics" (illustrated).

COVENTRY DIVISION.—At Coventry and Warwickshire Hospital, Stoney Stanton Road, Tuesday, January 20, 8.30 p.m., clinical meeting. Discussion and demonstration by Mr. A. J. Watson: "The Treatment of Fractures in the Aged."

FINCHLEY DIVISION.—At Finchley Memorial Hospital, London, N., Friday, January 23, 8.45 p.m., meeting. Mr. Basil Hume: "The Practitioner and Surgery To-day."

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Royal Oak Hotel, Alderley Edge, Wednesday, January 21, 8.30 p.m., meeting. Film: "Studies in Human Fertility."

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, January 20, 8.45 p.m., meeting. Dr. Robert Forbes: "Legal Hazards." All members of the medical profession are invited.

ROCHDALE DIVISION.—At Red Lion Hotel, Rochdale, Monday, January 19, 8.30 p.m., clinical meeting. Dr. R. M. Corbet: "Malignant Gynaecology as seen in General Practice."

SOUTHAMPTON DIVISION.—At Conference Room, Civic Centre, Southampton, Wednesday, January 21, 8 p.m., Ladies Night. Professor W. T. Williams: "Some of the Medical Problems of Sherlock Holmes." Members' wives are invited.

STIRLING BRANCH.—At Falkirk Royal Infirmary, Tuesday, January 20, 8.30 p.m., clinical meeting. Dr. R. H. Girdwood: "Recent Advances in the Investigation and Treatment of Blood Disorders."

WEMBLEY DIVISION.—At Myllet Arms, Wednesday, January 21, 8 for 8.30 p.m., dinner dance.

WIGAN DIVISION.—At Lewis's Restaurant, Wallgate, Wigan, Thursday, January 22, 8.15 p.m., third clinical meeting. Lecture by Dr. H. Coates: "Psychiatric Problems in General Practice" (illustrated by sound film). To be followed by short general meeting and supper.

WILLESDEN DIVISION.—At Central Middlesex Hospital, Park Royal, N.W., Thursday, January 22, 4.30 p.m., meeting concerning Central Middlesex Hospital out-patient arrangements.

H.M. Forces Appointments

ARMY

Colonel (Temporary Brigadier) A. Sachs, C.B.E., Q.H.P., late R.A.M.C., to be Brigadier.
Lieutenant-Colonels H. C. Benson and W. R. M. Drew, C.B.E., from R.A.M.C., to be Colonels.

ROYAL ARMY MEDICAL CORPS

Captain D. L. Scott to be Major.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major (Honorary Lieutenant-Colonel) P. R. Mitchell, O.B.E., T.D., from T.A.R.O., to be Major, and has been granted the acting rank of Colonel.

National Service List.—Captain A. P. Dignan, from R.A.R.O., National Service List, to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Captain J. Newall to be acting Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Major (Honorary Lieutenant-Colonel) H. E. W. Waters has relinquished his commission.

Captain (War Substantive Major) (Honorary Lieutenant-Colonel) D. H. Thompson, O.B.E., has relinquished his commission.

ROYAL AIR FORCE

Squadron Leaders R. Mortimer, P. H. Blackiston, and D. W. Boatman to be Wing Commanders.

Woman Officer Employed with the Medical Branch, R.A.F.—Squadron Leader L. G. Moore to be Wing Commander.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 24 1953

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British Medical Association

PROCEEDINGS OF COUNCIL

A meeting of the Council of the British Medical Association was held at Tavistock Square, London, on January 14. Dr. E. A. GREGG was in the chair.

Congratulations were tendered to those members of the Association whose names appeared in the recent Honours List.

The deaths were reported of Dr. David Lawson, a former member of Council, Dr. Harold Orr, President of the Canadian Medical Association, and Mr. C. Wontner-Smith, successor to the late Sir Edwin Lutyens as architect to the Association, and the Chairman was authorized to send letters of condolence to the relatives.

An invitation was received to appoint delegates to the first World Conference on Medical Education, to be held at B.M.A. House, London, in August, and the following were appointed: the Chairman of Council, Sir Henry Cohen, Dr. R. P. Liston, Mr. Nicholson-Lailey, Dr. Talbot Rogers, and Dr. F. M. Rose.

It was reported in connexion with the establishment of a Branch of the Association in the Gold Coast that the chairman of the Overseas Committee found it impossible to go there and that Mr. Ian Fraser, of Belfast, had consented to do so. In addition to his immediate mission Mr. Fraser would give demonstrations and lectures in surgery.

Other appointments were made to representation of the Association on outside bodies and at forthcoming conferences, and nominations were made in connexion with vacancies on the Central Health Services Council and certain of its standing advisory committees.

Visits Overseas

An increasing number of requests were received by the Association for the sending of representatives overseas to attend conferences or perform other functions. The CHAIRMAN said that the Association was naturally anxious to give all possible help in such matters, but the question of expenditure, in view of the straitened economy of the Association, presented a great difficulty.

Dr. J. C. ARTHUR asked whether some general statement of Government policy in such matters could not be sought. Would it not be possible for the Government to make some grant towards the cost of such journeys? The Foreign Office should be made aware of these repeated requests.

The CHAIRMAN reminded the Council of the visit paid to India last March and of recent visits to other parts of the Commonwealth. It was very important that advantage should be taken of these opportunities, but equally important that the right sort of people should go—knowledgeable people and without political prejudice. It was not possible for the Association, with the greatest good will in the world, always to pick such persons "from the shelf." Many people who would be most acceptable in these capacities had very full commitments in this country.

Mr. LAWRENCE ABEL suggested that there were still in this country some wealthy persons who, especially now that some calls for benevolence had ceased, would be willing with a little encouragement to subsidize enterprises of this kind. Every effort should be made to raise voluntary funds for providing people and organizations for this sort of work.

It was agreed to approach the Foreign Office and the Commonwealth Relations Office on this matter.

Annual Meetings

Arrangements were mentioned in connexion with the proposed Annual Meetings in Cardiff, 1953, Glasgow, 1954, Toronto, 1955, and Brighton, 1956. Thanks were extended to the Northern Ireland Branch for an invitation to hold the meeting of 1957 in Belfast. This last proposal was left over for later decision.

Joint Emergency Committee of Professions

It was reported that the Joint Emergency Committee of the Professions, which was formed at the time of the Durham "closed shop" policy after the associations (which included the B.M.A.) had failed singly to persuade the Durham County Council to resolve the deadlock, had asked

its six constituent organizations to consider the desirability of establishing some permanent joint professional committee.

Dr. J. M. GIBSON supported the proposal. The Emergency Committee had proved a very effective weapon, and something of the kind ought to be continued. The Council approved the proposal in principle and authorized the Secretary to make certain inquiries.

Association Finance

The TREASURER (Mr. A. M. A. Moore) said that the Finance Committee had considered a memorandum on the operation of budgetary control, prepared by Messrs. Harold Whitehead and Partners Ltd., in which each item of Association income and expenditure was related to one of the "spending" committees, which would have to submit a budget each year. Mr. Moore added that it was obvious from a first inspection of the preliminary figures that the Association would have still to pursue a line of strict economy. At the next meeting of the Council the accounts for last year would be available in detail. It was absolutely vital to economize if the decision of the Representative Body was to be implemented whereby 50% of the additional revenue from subscriptions following the recent increase would be earmarked for debt redemption.

He was informed that up to date the subscriptions for 1953 of just over 16,000 members of the Association had been received, which was approximately the same position as at the corresponding date last year. Every year there was a certain hard core of resignations, which usually fluctuated between 300 and 500; this year it was just over 1,000. Since January 1, 1953, 480 new members had joined the Association, compared with 270 in the same period the previous year.

Mr. DOUGAL CALLANDER suggested that a more vigorous personal contact might be made through secretaries of Divisions with those who were not members of the Association. He was quite convinced from what he had been able to do in his own Division that if they made up their minds to go into this campaign with vigour there was no reason why they should not increase the membership by 1,000 or 2,000. Mr. LAWRENCE ABEL suggested that the Assistant Secretaries at Headquarters should devote a certain part of their time to assisting divisional secretaries to gain new members.

In putting the report of the Finance Committee to the Council the CHAIRMAN drew attention to the closing paragraph:

"In the meantime the Finance Committee asks the Council to draw the attention of chairmen of committees to the need for the strictest possible economy, particularly during the early months of the present year, until the probable income and expenditure can be more accurately assessed."

Advertisement Policy

The report of the Journal Committee, presented by Dr. O. C. CARTER, contained a reference to the policy to be adopted with regard to advertisements for houses for sale. The Journal Committee had resolved that in normal circumstances all advertisements for the sale of houses should be accepted, but that a general cautionary note be published to the effect that the appearance of an advertisement did not imply the possibility of opening up a practice.

Dr. H. H. D. SUTHERLAND moved that it be an instruction not to accept advertisements for houses or consulting-rooms against the wishes of the local medical committee of the area concerned. A statement or request from the local medical committee if it did not favour acceptance might be regarded as removing the case from "normal circumstances." Dr. D. F. HUTCHINSON seconded, and said that on quite a number of occasions the Middlesex Local Medical Committee had been asked its view as to whether such an advertisement should be accepted, and from its local knowledge had urged that it should not. Such an advertisement would give a man contemplating setting up in the area a wrong idea of the position.

Mr. LAWRENCE ABEL asked why, for example, a medical officer of health or a private practitioner should be debarred from taking any premises. He reminded the Council that there were 2,000 doctors not in the National Health Service and the Association had equally their interests at heart. What had the local medical committee to do with it if he wanted to buy or sell a house? Dr. SUTHERLAND said it was naturally assumed that the local medical committee would on any specific occasion give its reasons. There had never been any attempt to dictate what the policy of the Journal Committee should be.

Dr. W. E. DORNAN said that what it really boiled down to was that many house agents thought that a doctor would be a good tenant. There were instances where a doctor's house was advertised and bought but the man who bought it, although he had a medical qualification, actually practised dentistry and there was no possibility of practising medicine from those premises at all.

The amendment was lost, and the statement of policy set out in the Journal Committee's report was approved.

In dealing with matters concerning *Family Doctor* Dr. CARTER reported that many of the main difficulties in connexion with the magazine were now under control. The fundamental consideration was to run *Family Doctor* during 1953 at no cost to the Association funds.

Central Consultants and Specialists

In the absence of Dr. T. Rowland Hill, owing to illness, the report of the Central Consultants and Specialists Committee was presented by Mr. H. H. LANGSTON. It was agreed, on the recommendation of the Committee, that a meeting of honorary secretaries of regional consultants and specialists committees be arranged annually for an informal discussion of current problems and matters of common interest. Recommendations varying the constitution of the Anaesthetists Group and the Venereologists Group were approved.

Dr. WAND raised the question of the representation of whole-time officers. He understood that this unrest on the part of whole-time officers was being expressed by a higher number of resignations from that group than from any other. Here was the germ of some major difficulties in the not too distant future.

It was agreed to refer these matters to the Central Consultants and Specialists Committee.

The Association Building

Mr. DOUGAL CALLANDER, chairman of the Building Committee, referred to negotiations which had been proceeding for the acquisition of the Burton Street site at the rear of B.M.A. House, an area of about 10,600 sq. ft. In the opinion of his Committee the site would make a valuable addition to the existing accommodation and provide space for the future needs of the library and other departments. It therefore recommended the Council to accept a lease from the Bedford estate and to compensate the present leaseholder for the surrender of his rights. Thanks to the services of the architect and the Association's Financial Comptroller, a substantial reduction had been obtained on the amount originally proposed for the ultimate rental and on the compensation to be paid to the leaseholder.

The recommendations of the Committee were approved. Dr. H. R. FREDERICK said that some members of Council were able to recall the work of the late Sir Robert Bolam in securing the Tavistock Square premises nearly 30 years ago. The events had justified his vision.

The Report on General Practice

The associated questions of the report of the General Practice Review Committee and of the evidence to be tendered by the Association to the Committee on General Practice of the Central Health Services Council (the Cohen Committee) again came forward. The CHAIRMAN reminded the Council that at its last meeting it had been agreed that the report of the Review Committee was not to be pub-

lished as a report of the Council, but as a report of the Committee itself, and that before publication it would be edited by the Committee. The report would be considered by the Divisions and local medical committees, again not as a report of the Council, nor necessarily embodying its views, but as the report of a very important special committee which the Council had set up. The date of publication would be subsequent to the giving of evidence before the Cohen Committee, the preparation of which was the immediate task.

Filling of Vacancies

Dr. TALBOT ROGERS, in presenting the report of the General Medical Services Committee, said that the Committee's attention had been drawn to partnerships which had been formed between an established single-handed doctor who intended shortly to retire and a doctor who was new both to the practice and the district, the intention being to enable the latter to secure a succession to what was essentially a single-handed practice. This was against the best interests of the Service, and it had therefore been agreed with the Ministry that in future the Medical Practices Committee would not, unless there were special circumstances, accept one partner as a logical successor to another who had died or resigned unless the partners had been in active practice together for about a year. The Medical Practices Committee would, of course, retain full discretion if the circumstances of any particular case merited special consideration.

Dr. J. A. GORSKY moved that this should not be accepted until the principle had been more fully discussed. A draft E.C.L. seemed to introduce into the National Health Service a new principle. It suggested that the attention of the Ministry had been drawn, presumably by the General Medical Services Committee, to what were considered to be "phony" partnerships. It might be true that there had been such partnerships. Bad law in 1946 made worse law when E.C.L.s were introduced. He was told that the onus was upon the new partnership to prove that it was not "phony." That was a new principle in English law. It was for the Department itself to declare that a partnership was "phony" and to give those accused an opportunity to defend themselves. He read the judgment of the Master of the Rolls given on January 18, 1952, in which he stated that the prohibition concerning the sale of goodwill was the only prohibition in the Act, but that prohibition did not have the effect of destroying the goodwill, still less of vesting it in the State or any emanation of the State. The goodwill remained one of the assets of the firm, and for as long as the firm carried on the goodwill must necessarily remain its asset. From the moment he entered into a contract to go into a partnership that goodwill belonged to one or other or both the partners. There was no one, either in the Ministry or in any department, who had the right to say that unless this partnership went on for one year a vacancy might be declared. What was now suggested was that in the case of any partnership that had not existed for twelve months the onus was upon the partners to prove that it was not "phony," and to that principle he strongly objected.

Dr. TALBOT ROGERS said that when there was a definite partnership, if one practitioner died or retired it had been the practice to allow the other partner to choose a new partner to come into the practice, and that seemed a wise and proper course. There had been some cases, however, in which one of the partners was elderly and infirm and immediately before he retired from the practice a partnership agreement had been made with another doctor, and then, almost as soon as the partnership agreement had been signed and sealed, the first doctor had retired. This acted unfairly against those doctors who wanted to be appointed to a vacancy, and it had been the object of his Committee to find some way which would act evenly and justly in all such cases and at the same time not penalize anybody who was genuinely in a partnership practice. This matter

had been discussed on two occasions in the General Medical Services Committee, and on each occasion they had had the advantage of Dr. Gorsky's legal mind, but what he had set out at the beginning and was embodied in the present report had the approval of the Committee.

Dr. W. E. DORNAN said that the Medical Practices Committee had had the greatest difficulty in restraining some executive councils from declaring a vacancy when one partner had given notice of retirement. In the ordinary way the surviving partner should be allowed to choose another partner, but there were cases where the course described was necessary.

Dr. GORSKY, in replying on the discussion, said that this was an attempt by the Ministry to effect a change in the National Health Service by way of an E.C.L. and not by amendment of the Act. There were comparatively few cases, compared with the number of partnerships in this country, which were "phony," yet because they could not settle this business by some other means they were introducing a restrictive E.C.L. which was going to penalize the innocent as well as the guilty. He instanced the case in which in a partnership one doctor, suffering from coronary atheroma, took an assistant into partnership. That assistant in a matter of six months acquired a list of 600 or 700 people. Then the other doctor died of coronary thrombosis and the E.C.L. would give the right to declare a vacancy for the whole of that practice. The practice would be advertised and the 600 or 700 patients would be transferred to another doctor. It was for the Ministry to prove that any partnership was "phony."

The amendment by Dr. Gorsky, which was seconded by Dr. Sutherland, that the reference to this subject be deleted from the report, was lost.

Service Pay

General J. C. A. DOWSE, chairman of the Armed Forces Committee, presented a report on action taken in connexion with Service pay. Representations had been made to the Ministry of Defence stressing the knowledge and experience of the Association in matters of remuneration in all branches of medicine, and requesting that a memorandum from the B.M.A. might be considered. The Ministry warmly welcomed the Association's offer, and with some necessary urgency a memorandum was prepared and submitted in confidence to a working party of the Ministry. The memorandum covered a number of factors likely to affect recruitment to the armed Forces, including clinical opportunities, postgraduate study, employment in civil and Service life after retirement, widows' pensions, and the prestige of the Medical Branches of the armed Forces, but the main emphasis was upon remuneration, and detailed tables incorporating proposals for new scales of remuneration were submitted. He (General Dowse), together with members of the secretariat, had since had the opportunity of meeting members of the Working Party to discuss the Committee's proposals, but the recommendations of the Working Party were not yet known. An assurance had been received that, in the light of any further information which may be forthcoming, the Association retained its right to seek an interview with the Minister of Defence.

The action taken by the Armed Forces Committee was approved, and the CHAIRMAN in the name of the Council thanked the Committee for such prompt action undertaken in an emergency.

International Relations

Dr. J. A. PRIDHAM, chairman of the International Relations Committee, presented a report which set out the arrangements for the first World Conference on Medical Education, to be held at B.M.A. House, London, in August next. The Conference was being held under the joint auspices of the World Medical Association and the World Health Organization, with the collaboration of other international bodies. Sir Lionel Whitby would be president of

the Conference, and the general secretary would be Dr. Louis H. Bauer, the programme secretary Dr. Hugh Clegg, and the local arrangements secretary Dr. E. Grey Turner. The attendance was expected to be in the region of 1,000.

The Council agreed, on the recommendation of the Committee, to authorize the offer of a reception to the Conference at a cost not exceeding £400.

It was also agreed that a subscription dinner be held in honour of the Council of the World Medical Association in August, 1953, no charge to fall on Association funds.

The amount of subscription to the World Medical Association was also considered. The present subscription is based, by a special concession, on the exchange rate prevailing before the pound sterling was devalued. On the recommendation of the International Relations Committee, and with the concurrence of the Finance Committee, it was agreed that for 1953 (without prejudice to the payment in subsequent years) the subscription based on the full current rate of exchange should be paid. This, calculated at the current rate of 12 Swiss francs to the pound, makes the amount of the subscription £833.

At the previous meeting of Council notice had been taken of a statement issued by the World Medical Association on the medical aspects of social security which drew attention to opinions on the medical aspects of social security expressed by an international consultant group set up by I.L.O., and it had been resolved that an approach be made to the Chief Medical Officer of the Ministry of Health in the first instance with a suggestion that the B.M.A. might be consulted when persons were being nominated as representatives of Great Britain to take part in discussions on medical aspects of social security under the auspices of W.H.O. or I.L.O. A reply was now received to the effect that the Council was under a misapprehension in supposing that the British representative on the medical consultant group of I.L.O. was selected and appointed by the Government. The Director-General of W.H.O. was responsible for constituting "consultant groups" and was under no obligation to consult Governments in their selection, although Governments were informed of the choice made. The question had arisen because the consultant group set up by I.L.O. on the advice of W.H.O. had made recommendations on medical aspects of social security, which included a whole-time salaried service, which were contrary to the views of the B.M.A. and the W.M.A.

Other Business

A report was made to the Council on the formation of the College of General Practitioners, and the Council sent forward a unanimous expression of good wishes.

It was decided to present an address to the Royal Photographic Society on its centenary.

The Council unanimously endorsed as a recommendation to the Representative Body the nomination by the Glasgow Division of Professor Sir John McNee as President-elect for 1953-4 and President for 1954-5.

A resolution from the Tower Hamlets Division asking the Council to use its influence with the Government to allow the export of antibiotics to the medical profession in China was passed to the International Relations Committee for its observations.

Correspondence which had taken place between the Financial Secretary to the Treasury and the Civil Service Medical Officers Joint Negotiating Committee concerning the salaries of Civil Service medical officers was reported to the Council. This matter was still in an indeterminate stage and awaiting the result of a meeting shortly to take place. Dr. WAND suggested that they should intimate to the Joint Committee that the Association was behind them in their search for proper machinery which would enable these officers to obtain justice, and this course was agreed to.

The Council approved the award of one ordinary research scholarship of £200 in 1953, in addition to the Ernest Hart and Walter Dixon scholarships, each of £250. Mr. ABEL

urged that the Science Committee be instructed to award scholarships only for work of the highest academic quality. The Council discussed the expenditure by the Association on reception and hospitality, and the availability of the general funds of the Association for this purpose. Legal opinion was that the Association might properly use its general funds for providing hospitality at certain functions centrally arranged, such as receptions to a new Minister of Health or to distinguished visitors from overseas. It was agreed that the cost of such hospitality be defrayed from the general funds, after the present balance in the hospitality fund, amounting to £120, had been exhausted, and that the Office Committee be authorized to arrange functions the cost of which did not exceed £100. This matter is to come forward again on the consideration of the Association's budget.

Appeals Machinery for Northern Ireland

On a recommendation from the Public Health Committee it was agreed that a formal approach be made to the Government of Northern Ireland with a view to the establishment of appropriate appeals machinery for medical practitioners employed in the National Health Service. Dr. J. M. GIBSON, who acted for the chairman of the Committee, said that public health officers had not taken kindly to the machinery as it stood. If the Council approved it was proposed to send a deputation to the Ministry of Health and Local Government.

The Staffing Committee reported that after interviewing three selected candidates it had decided to appoint Mr. M. W. Webb Business Manager to the *British Medical Journal*.

Dr. H. H. D. SUTHERLAND, reporting for the Amending Acts Committee, said that the Committee still had a number of matters under consideration for inclusion in its second report to Council. One of these followed upon the reference to Council by the Representative Body of the question of examining and reporting upon ways and means of procuring the restoration of goodwill in practices for those who wished to reacquire it. It had been decided that a full report of the arguments for and against this proposal should be included in the General Medical Services Committee's report to the Annual Conference in order that the opinion of local medical committees might be ascertained.

The Film Committee through Dr. Liston reported some interesting additions to the Film Library, and stated that it was endeavouring to secure the showing of medical films and of visual aids used in medical education in connexion with the forthcoming World Conference on Medical Education.

The War Memorial

It was mentioned that no promise could be made by the authorities concerned of an early licence for all the work involved in the Association's War Memorial, but the Chief Licensing Officer had undertaken to consider favourably an application for a licence to proceed with the courtyard repairs and the preparation of the memorial foundations.

A letter was read from Sir Henry Cohen acknowledging the honour which the Council had done him in proposing his name to the Representative Body for Vice-Presidency of the Association. "I look back upon my period of office with the Association as one of the happiest and most satisfying, and, as I wrote you some months ago, I learnt to appreciate in the inner Council what a tremendous contribution the Association makes to the welfare of our profession. Not the least satisfaction which the Vice-Presidency will give me is that it perpetuates my connexion with the Association."

Dr. H. Alexander was appointed to a vacancy in the representation of the Association on the Joint Tuberculosis Council. It was reported that Dr. Denis H. Brinton had accepted the Council's invitation to act as the representative of the parent body when he attended the New Zealand Branch Biennial Conference, 1953.

The Council, which had met at 10 a.m., concluded its business at 5.30 p.m.

JOINT CONSULTATION ON HOSPITAL AND CONSULTANT SERVICES

DEPUTATION TO MINISTRY

On January 6 the members of the Joint Consultants Committee met Sir John Hawton and other officers of the Ministry, and had a full and frank discussion on the question of consultation between the Ministry and the Committee on matters relating to the hospital and consultant services.

Profession Disturbed

The Chairman of the Committee, Sir Russell Brain, stated that the profession was extremely disturbed by recent events which seemed to point to an unwillingness on the part of the Ministry to consult the Joint Committee or even to keep it informed on matters in which it was vitally interested, and upon which its advice would be of the greatest help to the Ministry. There also appeared to be a growing belief on the part of the Ministry that the hospital and consultant services should, and could, be controlled in detail from the centre.

Staffing Circular

Referring to the recent circular letter to boards of governors of teaching hospitals concerning medical establishments,¹ Sir Russell Brain reminded the Ministry that an undertaking had been given that the results of the medical staffing survey undertaken by inspecting teams would be discussed with the Joint Committee in general terms before any decisions were taken. Although the matter was one which profoundly affected consultants, that undertaking had not been fulfilled. On the contrary the communication to boards of governors had been followed—again without the knowledge of the Joint Committee—by the recent circular to hospital boards and committees² imposing a 5% reduction in certain categories of hospital staff, freezing the establishment of medical staff, and prohibiting any expansion except with the consent of the Minister. While medical staffs were excluded from the 5% reduction, Sir Russell Brain pointed out that an examination of the recommendations of the inspecting teams revealed that if put into effect they would achieve almost exactly a 5% reduction in the consultant establishment of teaching hospitals. If the inspecting teams' recommendations involved a similar reduction in the case of regional board hospitals it would mean the termination of the contracts of some 300 part-time consultants.

Ministry's Intentions in Doubt

It was true that the matter had not gone beyond the stage of recommendations; nevertheless, it was difficult to avoid the assumption that the recommendations indicated the Ministry's intentions. Moreover, the Ministry's instructions on economy in staffing made no distinction between hospitals which were economically planned and those which were not, and Sir Russell Brain wondered what could be more discouraging to a conscientious hospital authority. The Ministry's attention was also drawn to the damaging effect of the recent instructions on the problem of absorbing the surplus of senior registrars.

Increasing Centralization

Sir Russell Brain pointed out that further evidence of increased centralization was to be found in the recent instructions for statistical recording of the work of pathological and radiodiagnostic departments.³ The measures suggested were open to serious criticism, and there was a very real danger of over-standardization. Apart from the fact that these instructions involved an elaborate recording system which would require additional clerical assistance, they implied a belief that the work of these departments could be assessed in terms of statistics and ignored the human element of its value to the community.

¹ Supplement, November 22, 1952, p. 206.
² Ibid., January 3, 1953, pp. 1 and 2.
³ Journal, January 10, 1953, p. 86.

Invidious Position

Sir Russell Brain reminded the Ministry that the Joint Committee had repeatedly urged the need for consultation with the profession at all levels in the Service. The Committee and consultants generally were very willing to help the Ministry, but could not do so unless they felt that they had the Ministry's confidence. Unfortunately, on a number of occasions the Committee had been placed in an invidious position. It has either had to explain to the profession that it had no prior knowledge of the Ministry's intentions in a particular matter, or to remain silent and appear to consent to something it felt it should criticize.

MINISTRY'S REPLY

In reply, Sir John Hawton stated that, although he readily admitted that there had been occasional failures on the part of the Ministry to consult the Joint Committee, these were lapses in performance rather than in intention. The Ministry from the outset of the Service had always been anxious to consult with all the bodies concerned with hospital policy. They had no wish to depart from this position.

Unintentional Error

Dealing with the communication to boards of governors on medical staffing, Sir John Hawton agreed that it would have been better if the Joint Committee had been consulted, but the failure to do so was an error, and not an intentional one. He wished, however, to correct any mistaken impressions on the matter. The proposals that had been sent to the teaching hospitals were simply those of the inspecting teams. They were not the conclusions reached by the Ministry itself, nor was there any intention on the part of the Ministry to impose them on the boards. It was open to each hospital, and particularly to its medical staff committee, to look freely at them and interpret them in the light of their local knowledge. The Ministry was only too anxious to have the views of the hospitals themselves.

Referring to Sir Russell Brain's comment upon a possible reduction of medical staff arising out of the staffing survey, the Permanent Secretary stated that similarity with the 5% reduction called for in the other grades of hospital staff was purely coincidental. There was no intention of imposing a 5% cut on medical staffs, and the Ministry had at the moment reached no conclusions.

No Desire for Centralization

Regarding other lapses in consultation, Sir John Hawton hoped that the Committee would appreciate that on occasion it was necessary for the Department to announce an important item of Government policy without prior consultation with the profession, but fortunately this would be a rare occurrence and did not affect the general position. He added that there was no desire for increasing centralization, and if centralization had increased since the Service began it was due not to any desire for it for its own sake but to the need for an overall control of hospital expenditure, for which the Minister was responsible to Parliament.

Need for Consultation Agreed

Sir John Hawton stated that the Ministry was in full agreement with the Joint Committee on the need for effective consultation. He did not think this need could be formalized; it was rather a matter of the two sides keeping in close touch with one another.

The Permanent Secretary gave an assurance that the Ministry, for its part, would do all in its power to provide effective consultation with the Joint Committee on all matters affecting consultants in the hospital service. The Joint Committee need be in no doubt as to the Ministry's recognition of the Committee as the body speaking for consultants and members of hospital staffs, and of its very real desire to co-operate with the Ministry for the good of the Service.

GENERAL MEDICAL SERVICES COMMITTEE

DISCUSSIONS WITH MINISTRY OF HEALTH

A meeting of the General Medical Services Committee was held on January 15, under the chairmanship of Dr. A. TALBOT ROGERS. The agenda were lighter than usual, but the meeting lasted all day.

On the question of entitlement to initial practice allowances and the amount of payment, the Ministry had been asked to indicate its views on the position of the general practitioner in certain circumstances which did not appear to be fully covered by the terms of the circular issued to executive councils. A reply from the Ministry was now before the Committee and was judged to be satisfactory. The existing circular is to be amplified to meet these points.

The Committee devoted considerable time to the draft model distribution scheme forwarded by the Ministry. The scheme covers payments to be made by executive councils under capitation, loadings, emergency treatment, temporary residents, and other headings. The twenty paragraphs were carefully examined, and certain points were noted for further discussion with the Ministry.

The Inducement Fund

Discussion had also taken place with the Ministry on proposals for the future administration of the inducement fund. The Ministry, however, had intimated that it was not yet ready to discuss the revision of the scheme of payments to doctors or the suggestion that an increase of payments might be made retrospective in the light of the Dankwerts award.

Dr. J. T. BALDWIN said that the discussions with the Department of Health for Scotland had been concluded, and he gave an outline of the proposals as they would affect Scotland. It was agreed that these were very satisfactory, and that they should be brought to the notice of the Ministry of Health when discussions were resumed.

Among other matters discussed with the Ministry was the question of payment for the treatment of dental haemorrhage. The Ministry had pointed out that, although it was true that a doctor could not charge a patient on his list for such treatment following extraction by a private dentist, there was nothing to prevent him from claiming his fee from the dentist, who would, of course, try to come to some arrangement with the patient. The representatives of the Committee had undertaken to discuss the matter again with the British Dental Association.

Mileage

On the question of mileage, which had also been raised in the talks with the Ministry, the Scottish members pointed out that the question was quite different in Scotland from what it was in England, and it had been agreed that an observer from the Department of Health for Scotland and from the General Medical Services Subcommittee (Scotland) should attend meetings of the English Mileage Committee. It was also suggested by a Scottish member that it would be useful if an observer from England were sent to the Scottish discussions on mileage.

The CHAIRMAN thought that a reasonably satisfactory answer had been given by the Ministry on a point raised in connexion with reports of medical service committees. The Ministry had undertaken to consider including in its notes for the guidance of service committees a suggestion that riders dealing with, for example, the methods adopted in a particular practice would be best made in a form which was not sent to the patient or to the Press.

Allegations of excessive prescribing and particularly the delay in investigating them had also been discussed with the Ministry. The Ministry stated that it appreciated the need, in the interests of respondent doctors and of the service, of accelerating the procedure of investigation. Some delay was inevitable with the present appeals machinery if the rights of the appellants and the freedom of the referees

was not to be unduly circumscribed, but the department was constantly searching for ways of shortening the time between the issue of the prescription and the final decision in particular cases.

A hypodermic syringe for diabetic patients, which was recommended by the Ministry, was passed round among members of the Committee. It had been approved by the relevant committee of the British Standards Institution and by the Diabetic Association. The Ministry proposed to publicize the existence of the syringe to secure its wider production. Some suggestions for modifications in detail were made by members of the Committee.

The Defence Trusts

At one point in the meeting the members sat as the National Insurance Defence Trust and the General Medical Service Defence Trust, and Dr. KATHERINE HARROWER, the deputy treasurer, submitted reports. The CHAIRMAN said that in view of the importance of the work of the Committee it was essential that they should maintain the regularity of their meetings notwithstanding the appeal of the Council to committees generally that the number of meetings should be cut down so far as possible. But they were anxious that the whole cost should not fall upon the British Medical Association, and accordingly the executive of the National Insurance Defence Trust recommended that for the year beginning January 1, 1953, the British Medical Association should again be reimbursed from the Trust funds for all expenditure in excess of £1,000 per annum incurred on behalf of the Committee, including the expenses of the conferences of local medical committees. This was agreed to.

Ownership of Goodwill

The Committee next considered in detail a draft statement for inclusion in the Committee's report to the Annual Conference embodying the conclusions arrived at at a previous meeting on a memorandum submitted by the Amending Acts Committee on the optional restoration of the right to buy and sell the goodwill of practices. After certain amendments had been made in the draft the question of attaching a recommendation to the conference on this subject was considered. Dr. F. M. ROSE thought that the Committee should formulate its opinion for transmission to the conference, otherwise if the matter were left in the air it would lead to waste of time in prolonged debate. Other members urged that it was the duty of the Committee to make up its mind and present a clear recommendation.

Dr. S. WAND moved "That the Committee, having heard the evidence from other Association committees, recommends the conference not to press for the optional return of the right of purchase and sale of practices." Dr. I. G. INNES seconded. This proposition was criticized as being too weak, and was lost on a show of hands. Another form of words was moved by Dr. A. BEAUCHAMP: "That this Conference, representing the opinion of general medical practitioners in the National Health Service, is not in favour of optional restoration of the right to buy and sell the goodwill of practices." To this Dr. J. C. ARTHUR moved an amendment that the Amending Acts Committee's proposal for the optional restoration of goodwill was regarded by the General Medical Services Committee as impracticable, and the Committee was not in favour of action being taken along those lines. This amendment was carried, and again as the substantive motion, and it was decided that this recommendation should be included in the annual report to the conference.

Employment of Salaried Assistants

Dr. L. RUSSELL, on behalf of the Assistants and Young Practitioners Subcommittee, brought forward the following recommendation:

"That save for a period of three years no principal in single-handed practice should be permitted to have a list of over 3,500

patients by virtue of the employment of an assistant, and, failing this, that regulations should be introduced governing salaries and terms and conditions of service for assistants."

He hoped that this matter would be considered sympathetically. His subcommittee felt that if a principal went on for three years employing an assistant there was no intention on his part to take a partner. He understood that the number of assistants in the country was 2,500. This was far too high a ratio, and some positive steps should be taken.

Dr. F. M. ROSE hoped that this recommendation would not be passed. Young practitioners were apt to be obsessed with the idea that they were being exploited by principals. The training-ground for the young practitioner must be as an assistant. There were cases in which the limiting period of three years would be most unjust, as, for example, in the case of a practitioner in an isolated area of the country who had a list not big enough to carry a partner. Moreover, there were assistants who desired to remain permanently as such.

Dr. A. B. DAVIES, speaking as an individual member and not as a member of the Assistants Subcommittee, also opposed the resolution. He thought that in view of the new distribution scheme it would be most unwise to pass a resolution of this kind. Dr. J. A. PRIDHAM hoped they would not turn it down flat. He knew the difficulties of some of the younger practitioners in getting into a job "with a view." The CHAIRMAN said that he fully agreed that such a resolution as this should be considered very seriously. It was a matter of sufficient importance to form part of their report to the Annual Conference, whether they agreed with the recommendation or not.

Dr. A. BEAUCHAMP moved the reference back. He said that he did so not unsympathetically but in order that the assistants might have another look at the question and see whether they could not put forward something more concrete. Dr. C. F. R. KILICK objected to the suggestion made by one of the members that many of the proposals of the Assistants Subcommittee had been turned down. On the contrary, many of them had been accepted. He also reminded the Committee that there were assistants who wanted to remain as such and it would be unfair to stop them. They were people who did not care for the responsibility of partnership or principalship and appreciated the steady income of an assistant. Dr. J. T. BALDWIN supported the proposal to refer back. Dr. Russell had said that there were 2,500 assistants in this country. He wondered whether that included trainee assistants, who in the nature of things could not be employed on that particular job for more than one year.

Dr. J. C. ARTHUR said that there was a growing tendency, which he deplored, to consider employment by the State as a commendable thing but employment by a private individual as something to be deprecated. Dr. J. A. GORSKY complained that the recommendation was badly worded, and he objected to the "blackmail" which suggested that if what was now proposed were not done regulations should be introduced governing salaries for assistants. This meant the thin edge of a salaried service. Dr. S. WAND said that he did not think the subcommittee had fully understood either the implications or the mathematics of this problem. The proposal had come along because of certain abuses, but these were not large in number although very annoying to the man who had to put up with them. He thought it would be a better thing to send this recommendation back to the subcommittee in order that they might put forward something more fully considered. He thought they might well wait and see where the Dankwerts award took them. He agreed that there were abuses, but there were also some very good principals indeed, and there were many principals who had been assistants and who would be the first to say that they were grateful for the experience they had gained in that way. Dr. J. A. BROWN pointed out that there were a certain number of assistants who would never in any case be principals, and if this recommendation were carried they would be thrown

out of employment. Dr. RUSSELL, in reply, said that he was prepared to take the matter back to his subcommittee with a view to putting forward constructive proposals. But his subcommittee felt very strongly on this matter. The figure which he had given of 2,500 assistants did include trainees, but only about 400 of them.

It was agreed that the recommendation should be taken back with a view to framing a reasoned statement and that in any case the matter be reported to the Annual Conference.

Inflation of Lists

Following upon the proposals in the Ministry's draft E.C.L. on inflation, which the Committee at its previous meeting had decided would not be effective for the purpose, a long reply from the Ministry was placed before the Committee. The Ministry criticized a new system of numbering propounded by the Executive Councils Association which the Committee had urged should be at least explored. It stated that in its view this scheme was quite impracticable, and that it made certain unwarranted assumptions, such as that people always gave correct particulars of the date of their birth. Moreover, the Ministry urged that to change the system now would involve enormous expense and labour in altering the records relating to some 45 million people.

The Ministry added that it was as much concerned as the Committee with the problem of inflation, to which it had given a considerable amount of attention during the last two years, but it could not agree that, by and large, the present machinery was so far from satisfactory as the Committee had suggested. The scheme in its present form had been in existence for less than a year, and it would be remarkable if no difficulties had arisen during this initial period. The Ministry had in fact been agreeably surprised at the relative success of the scheme. Little fresh inflation had taken place during the last nine months, and the operation of the scheme would be gradually improved as the public became more aware of what was expected of them. In the circumstances the Ministry had to ask the Committee to agree to the issue of the draft E.C.L. as soon as possible.

WHOLE-TIME CONSULTANTS

DISCUSSIONS ON CONDITIONS TO BE REOPENED

The Staff Side of Committee "B" of the Medical Whitley Council at its meeting on December 19, 1952, received a deputation from the Association of Whole-time Salaried Specialists (Supplement, December 20, p. 234) to discuss the position of whole-time consultants and, in particular, their lack of representation on the Staff Side. A report of the discussion has been referred to the Joint Consultants Committee, which is responsible for the nomination of the representatives of the profession on the Staff Side of Committee "B." This question of representation has been raised because of the grievances of whole-time officers regarding their conditions of service and, particularly, the inadequacy of their allowances.

Whole-time Consultants to be Present

The Joint Committee is very conscious of the problems facing whole-time officers. It has already vigorously brought these problems to the notice of the Management Side. To meet the immediate situation the Joint Committee has decided to make a further determined attempt to secure an improvement in the conditions of whole-time service and has obtained the consent of the Management Side to reopen discussions and to invite a number of whole-time consultants to be present and to take part. Arrangements are being made for an early meeting with the Management Side, and it is hoped that whole-time consultants, through their representatives, will seize this opportunity of putting their particular problems to the Management Side.

Representation of Whole-time Consultants on Committee "B"

The Joint Committee has also considered the general position with regard to representation. On this the Joint Committee feels that there are channels already available whereby whole-time officers can secure representation on the Staff Side of Committee "B." For example, the Central Consultants and Specialists Committee of the Association consists mainly of members elected by the various Regional Consultants and Specialists Committees throughout the country. In turn the Central Consultants and Specialists Committee elects six members to serve on the Staff Side of Committee "B."

The Joint Committee has always held it to be impracticable for the Staff Side to include members representing a particular specialty or some sectional interest, and, once the immediate problems have been dealt with on the lines proposed above, it is hoped that whole-time officers will renew their efforts during the coming year to secure representation on the Staff Side through the normal channels open to them.

REMUNERATION OF HOSPITAL MEDICAL STAFF**WHITLEY COMMITTEE "B" DISCUSSIONS**

As announced in the *Supplement* (January 10, p. 7), the Staff Side of Committee "B" of the Medical Whitley Council met the Management Side on Tuesday, January 13, and discussed further its claim for a review of the remuneration of hospital medical staffs. After a general discussion the Management Side put a number of questions arising out of the claim, and the Staff Side undertook to consider them and to submit a written reply. A further meeting will be held with the Management Side within the next few weeks.

MINISTER AT DIVISION DINNER**ENFIELD AND POTTERS BAR**

The Enfield and Potters Bar Division, one of the youngest Divisions of the Association, held its second annual dinner and dance on January 15. The Division's chief guest was Mr. Iain Macleod, Minister of Health, in his capacity as Member of Parliament for the constituency within which the Division lies. An added pleasure was that Mr. Macleod was accompanied by Mrs. Macleod, this being her first public appearance after her long and serious illness.

Special Welcome for Mrs. Macleod

The vice-chairman of the Division, Dr. Gerard Lang, acting in the absence of the chairman, Dr. J. Hutton Chisholm, owing to illness, in welcoming Mr. and Mrs. Macleod, said that it was Mrs. Macleod's courage and gaiety which had carried her through such a difficult time, and that he knew she had expressed the wish that her first public appearance should be on an occasion associated with the medical profession. He expressed the particular delight of the Division that she had been able to accompany her husband.

Praise for General-practitioner Hospitals

Dr. Lang made particular reference to the work of the general practitioner and to the fact that within the Division there were two general-practitioner hospitals which had remained as such in spite of the National Health Service—a fact for which all general practitioners in the area were very grateful. The Minister, in his reply, expressed his pleasure at being able to be present, and stated that he felt he was off-duty for the night and that he did not propose to make any profound statements regarding the National Health Service. His remarks, however, when he said that the preservation of general-practitioner hospitals, and indeed the extension of such hospitals, was a matter very near to his heart, were warmly received.

Scottish News**CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE (SCOTLAND)****ANNUAL REPORT, 1951-2**

The Annual Report of the Central Consultants and Specialists Committee (Scotland) for 1951-2, just published, records a year of activity on all matters pertaining to consultants and specialists in Scotland. The following are a few of the many items covered by the Report.

Legal Responsibilities of Hospital Authorities

The Committee feels that the position steadily being established by English courts, that hospital authorities are responsible in law for the acts and omissions of their medical staffs of all grades whilst they are "acting within the power of the Act," might have unforeseen and undesirable consequences on the relationship of the doctor with both the hospital authority and his patients. In Scotland the responsibility for such acts or omissions is still held by the courts to lie solely with the doctor concerned, but the Committee considers that this satisfactory position would be difficult to maintain in view of the provisions of Section 70 of the National Health Service (Scotland) Act, 1947, relating to the protection of statutory bodies and their officers. The Scottish Joint Committee is to be asked to discuss with the Department of Health the legal implications of Section 70.

Confidentiality of Hospital Records

The Committee reports that it had received complaints that in one region an instruction had been issued to hospital medical staff that any reports upon patients, or ex-patients, of a hospital requested through the medical superintendent by a solicitor must be submitted to the solicitor of the regional hospital board before being sent to the inquirer. The view of the Committee, having obtained legal opinion, is that hospital authorities have no legal right to require that reports on patients examined in hospital under category II of the Terms and Conditions of Service should be submitted to the regional hospital board solicitor before being issued to the inquirer, and that should such a request be received by a member of a hospital staff he should be recommended to notify the medical superintendent that a copy of the report would be submitted if permission to do so were received in writing from the originator of the inquiry.

Consultants' Form of Contract

The report records a protest sent to the Scottish Joint Committee in connexion with its failure to communicate with the constituent bodies before approving amendments to the consultants' form of contract with regional hospital boards. The amendments stated that should a regional hospital board find it necessary to vary the duties attached to an appointment, three months' notice of any change would be given after consultation with the consultant. Similarly, the consultant would be required to give three months' notice of any reduction in his duties that he wished the board to consider. Regional hospital boards would also reserve the right to review their estimate of the time required by a consultant's duties, and three months' notice would be given of any change to be made.

Although the Committee agrees that the intention of the amendments is reasonable, it is considerably perturbed by the implications, and considers that they could in this form be used by the boards gradually to reduce a consultant's sessional work until he was forced out of the hospital service. Legal advice as to the validity of the present contracts has been obtained, and this states that anyone

who receives an annual salary, even if paid in quarterly instalments, is entitled in the absence of any specific provision to a year's notice of any alteration or termination of service. Consultants who have signed the amendments to the contract, however, are now entitled to only three months' notice of alterations—there being, of course, an agreed procedure for appealing against termination of contract.

INCREASE IN INDUCEMENT PAYMENTS IN REMOTE AREAS

The General Medical Services Subcommittee (Scotland) has been negotiating with the Department of Health regarding an increase in inducement payments in the light of the higher level of remuneration to general practitioners following the Danckwerts award.

The matter has now been brought to a satisfactory conclusion. The Department has intimated that the figure of £1,000, which has hitherto been taken as a guide to the level of net professional income normally appropriate to such cases, will be raised to £1,400. Payments current in individual cases will be revised on this basis as from April 1, 1953, regard being had, in determining the precise amounts, to any special circumstance of each case. The Department has also agreed that for the past years covered by the back payments made under the Danckwerts award the same percentage increases as have been added to capitation-fee payments will now be added retrospectively to inducement payments. These percentage arrears are:

For the year to March 31, 1949	..	..	..	13.77%
" " " " " " 1950	..	..	..	11.39%
" " " " " " 1951	..	..	..	22.08%
" " " " " " 1952	..	..	..	22.83%

The percentage figure for the year to March 31, 1953, is at present being ascertained, and it is likely that it will be slightly lower than the figure for the year to March 31, 1952.

Those practitioners concerned can expect to receive payment of their increases from their executive councils, without any need for application on their part, not later than the end of March.

Notes and News

Exchange Visits Between B.M.A. and A.M.A.—An unexpected vacancy has arisen for one doctor to go to the U.S.A. on or before March 31, 1953—i.e., during the present financial year. The doctor may deposit up to £200 with the British Medical Association in London and draw the equivalent in U.S. dollars on his arrival in the U.S.A. For full details apply to the Secretary of the B.M.A. as soon as possible.

Training School for Nurses.—The South-east Metropolitan Regional Hospital Board's first new preliminary nurses' training school to serve both general and mental hospitals was opened by the Parliamentary Secretary to the Ministry of Health at Maidstone on January 14. In her speech the Parliamentary Secretary drew attention to the fact that, although the number of students in all types of hospital had increased by over 20% during the last four years, the total number of students in mental hospitals had decreased by about 14%. She stressed the valuable part that could be played by training schools of this kind covering both general and mental health nursing. The school embraces eight hospitals, and four hospital management committees have combined to run it.

Questions Answered**Car Expenses and Allowance**

Q.—As a part-time consultant my travelling expenses in the past year have exceeded my allowance by a considerable amount owing to a major overhaul (after deducting amounts applicable to personal use). The local tax inspector states that "it is not the policy of the income tax authorities to allow expenses for amounts claimed in excess of the travelling allowance already paid." A certain proportion of this claim only would be allowed for the private side of my practice. Would I be justified in taking my claim for the larger amount before the Tax Commissioners?

A.—The questioner is presumably assessed under Schedule E for his salary as part-time consultant and under Schedule D for the profits of his private practice. If the tax office would agree to assess both sources of income in one sum under Schedule D it would simplify the whole matter. The relevant rule under Schedule E requires allowable expenses to have been expended "wholly, exclusively, and necessarily in the performance of the duties," and the inspector of taxes is apparently willing to admit that such expenditure is allowable up to but not exceeding the amount of the car allowance received from the employing authority. That may be reasonable enough in normal circumstances, but there must be some cases in which, even on a strict application of the statutory rule, the allowable expenses exceed the amount received. This case seems to be of that class, and, provided the questioner can establish the facts, personal appeal to the Commissioners concerned is advisable. The inspector's statement as to "the policy of the income tax authorities" has no merits as a legal argument. It should, however, be borne in mind that abnormal expenditure in one year may result in sub-normal expenditure in the following year, when the car allowance received may possibly exceed the allowable expenditure. If the appeal succeeds it might prove impossible to resist assessment on a following year's "profit" on the car allowance.

Assistant's Purchase of New Car

Q.—As an assistant my salary is £850, plus £150 free of tax for car expenses. In January I bought a secondhand car for £335 and sold it in March for £285 when I received a new car, paying the total cost (£610) in one payment. I do as much mileage as my principal, and think I should be entitled to the initial allowance of 40% of the cost of the car. I have heard nothing since I submitted a car allowance claim in April.

A.—The capital allowances appropriate to the transactions are as follows: *Car No. 1*—balancing allowances £335-£285=£50. *Car No. 2*—initial allowance 40% of £610=£244. Even assuming that some proportion of these amounts should be regarded as applicable to private use of the car it is clear that the capital allowances far exceed the amount of the car allowance which the questioner would receive from his employer for the three months to April 5, 1952, and that without taking running expenses into account. There are, however, two or three factors which should be considered before a claim of this nature is pressed. (1) For 1952-3 and following years the annual allowance must be calculated on the written-down basis—i.e., if £244 initial allowance is claimed for 1951-2 the annual allowance for 1952-3 will be 25% of £610-£244=£366 only. (2) The questioner does not state whether he was in receipt of professional earnings before January 6, 1952. If he was not, or if such earnings were small, he would in the long run lose by concentrating a car allowance into the financial year 1951-2, because presumably his liability for that year would be at only a low rate of tax. (3) Capital allowances cannot be claimed as separate items of deduction: they must be regarded as

part of the total expense of using the car, and presumably if a claim is established for one year that the expense exceeded the allowance received from an employer, the Revenue authorities would claim the right in future years to call for evidence to show that the converse had not given rise to liability to tax on some part of the allowance then received by the employee.

Allowance for New Car

Q.—What is the minimum tax allowance on a new car?

A.—The questioner's inquiry is assumed to relate to the "initial" and "annual" allowances. The initial allowance is 40% of the amount which became legally due in the last practice year, but no allowance is due in respect of payments becoming due after April 5, 1952. The annual allowance is 25%—of the total cost in the first year and of the written-down value in subsequent years. An example may make the matter clearer.

Suppose the practice accounts are made up to December 31 each year and that a car was bought in 1951 for £700, of which £250 was payable by December 31, 1951. Then the allowances to be made in calculating the liability for the financial year commencing April 5, 1953, would be as follows:

	£	£
Cost of car	..	700
Initial allowance on £250 @ 40%	..	100
Annual allowance on £700 @ 25%	..	175
Total allowance		275
Written-down value	..	425
Annual allowance for 1953-4 @ 25%	..	106
		319

(Subject to an additional initial allowance for 1953-4 calculated at 40% on the capital payments due in the period from January 1, 1952, to April 5, 1952.)

Service in the Forces—Expenses

Q.—I am doing national service in the R.A.M.C. Can I claim allowance for subscription to the B.M.A. and to the Medical Defence Union?

A.—Official pay is chargeable to tax under Schedule E, and the rule under that Schedule requires allowable expenses to have been incurred wholly, exclusively, and necessarily in the performance of the duties for which the remuneration is payable. Subscriptions such as those payable to the B.M.A. or to the Medical Defence Union have been held by the High Court not to come within that category, and therefore are not allowable expenses in calculating tax payable on Army pay.

Income-tax Liability of Children's Income

Q.—(a) What is the maximum income a child (minor), unearned, may receive before becoming liable to income tax? (b) If the income should exceed the tax-free limit, is the whole amount liable for tax or only the excess? (c) Is there any option given to the parent, should the excess not exceed the child allowance of £60, either to pay tax on the excess or not to claim the child's allowance, whichever is more advantageous? (d) Does the income, or the excess, have to be included with the parent's income and taxed at his rate?

A.—It is assumed that the child has a legal right to the income, and that it does not fall within the class of income which, though legally that of the child, is nevertheless deemed for income-tax purposes to be that of the parent. On that basis the replies to the questions put are as follows. (a) £120 for 1952-3—i.e., the amount of the personal allowance applicable to an unmarried individual. (b) Only the excess over that sum is taxable. (c) The parent has no such option. (d) No, the income is the income of the child, who ranks as an independent taxpayer, though the parent is normally the individual liable to account for any tax liability there may be.

Correspondence

Appointment Option

SIR.—I note from the *Supplement* (January 10, p. 11) that the Newcastle Regional Hospital Board has agreed to allow future applicants for consultant and specialist posts to have the option of giving whole-time or maximum part-time service, but that psychiatrists are specifically excluded from this benefit.

With one or two notable exceptions, this state of affairs exists in every regional hospital board in the country, and in company with many of my colleagues I am much concerned regarding the principle involved. Whereas some of us might prefer to remain as whole-time consultants and specialists, we feel that an injustice is created, as we have not been allowed any option. I should be interested to learn why this discrimination exists against psychiatrists.—I am, etc.,

Portsmouth.

W. LIDDELL MILLIGAN.

Radiology on Points

SIR.—Dr. J. W. D. Bull (*Supplement*, January 10, p. 11) is quite right. The new obligatory unit system for recording radiological work in its present form makes little sense. The schedule of unit values is incomplete and provides a strait-jacket regulation for the sake of bogus efficiency. It disregards the individual aspect of each x-ray examination, and, to bear out Dr. Bull's example, many post-operative x-ray examinations of the lumbo-sacral spine at my hospital are done in plaster-of-Paris casing, requiring the attendance of two radiographers and one nurse. The length of the examination and the number of films used are dependent on the patient's condition (spine, one area, two units). The present unit system is ill-devised, omits unit values for some important investigations, and makes no allowance for individual radiological work. It is inferior to a unit system which, experimentally, I have been trying out for the South-west Metropolitan Regional Hospital Board since August, 1951.

For those willing to discern the signs of the times, it is another step towards drab uniformity, ultimately reducing the work of hospital departments always to the lowest and cheapest common denominator. Nevertheless, if the present unit system is hastily introduced, it need not be thrown overboard, for the solution is relatively simple. After some alterations, which should include higher unit values for x-ray examinations on in-patients, it can provide basic units for radiological work. However, before the returns are made, the head of each x-ray department should be asked to specify additional units he might require for any particular technique or type of work done in his hospital. One further form would have to be completed, hardly noticeable amongst the spate of others, but it would provide for some individual adjustments for teaching and major non-teaching hospitals throughout the country. It certainly would allow a more reliable analysis of the x-ray work for comparative costing, and at the same time some individuality might still be preserved.—I am, etc.,

Fishers Hill, Surrey.

HENRY W. GILLESPIE.

SIR.—Your annotation (*Journal*, January 10, p. 86) on the above subject and the letters from Dr. J. W. D. Bull and Dr. Hugh W. Davies (*Supplement*, January 10, p. 11) are timely, the first because of the conduct of the Ministry in matters of this sort, and the letters because of the utter futility of the whole business.

There is a mania for statistics. In this region there is believed to be a statistical department equipped with costly calculating machines. This may or may not be true, but this is the only reasonable explanation for the repeated requests for statistical returns from all and sundry. Having got other people to do much of its work the department is

hard put to find justification for the initial expenditure on the machines and must think up more "returns" for others to work out and send in. One particular one is a request for the number of films used in each department. This is regardless of size of film. An x-ray department in a dental hospital where dental films are used in packs with two in each envelope will apparently do twice as much work per patient as the hospital where the single pack is used. I always advise that this particular figure is "not available." I did on one occasion suggest that the group secretary might "multiply the number of attendances by 1.8," and heard no more about it. The figure came out of my head, but I believe I once read something on these lines somewhere. It is comparatively easy to work out the ratio of the number of "points" to attendances or examinations in any one department. If the figure is marked "approximate" one is not being dishonest and the figure would be as valuable as any figure of this sort could be. It would keep calculating machines busy and give the statisticians something to play with, and provide a reason for increasing their staffs and costs.

Is the time not ripe for the appointment of a statistician to study the statistical returns made by the statistical departments in their studies of statistical returns? "Big fleas have little fleas . . . and so *ad infinitum*."—I am, etc.,

Worcester.

ANTHONY A. VICKERS.

SIR.—May I, as a general practitioner far from the inner circle of radiologists, congratulate Dr. J. W. D. Bull on his justifiably indignant letter (*Supplement*, January 10, p. 11), which seems to me to score maximum points—would that be 10?—by hitting the target in the middle? On a point of phraseology, however, may I venture to believe that when Dr. Bull is working at arteriography he does not in practice exercise the ability he mentions to continue in any vein at all—definitely or indefinitely?—I am, etc.,

Sheffield.

G. EDWIN TILSLEY.

Delay in Hospital Reports

SIR.—I am one of the doctors in the area Dr. Harold J. Selby refers to in his letter (*Supplement*, January 10, p. 12), and in fairness I must say that my experience has been a very different one. Letters from the hospital authorities have been prompt, courteous, and satisfactory, and without taking up the cudgels on behalf of the consultant and house officer—they can well look after themselves—I have a feeling that too many cases with too little reason are being sent to the general hospitals, cluttering up the out-patient departments.

It may be that the absence of a fee has something to do with this, or, to a lesser degree, an aversion to the health scheme as a whole, contributing to an attitude that the sum total of the effort required to discharge one's obligations is the writing of a simple prescription. I have no doubt the hospital authorities have an adequate answer to these complaints, and I should be glad to hear their point of view.—I am, etc.,

Blakeney, Glos.

J. ASHTON.

Integration of Medical Practice

SIR.—Dr. J. H. Whittles (*Supplement*, January 17, p. 17) wrongs me when he says that I (*Supplement*, December 27, 1952, p. 237) have attacked our preventive medical services. Preventive and curative medicine are not watertight compartments each to be occupied by different doctors, and in practice local authority doctors seem to have difficulty in confining themselves to preventive work. It is when the "clinic doctor" treats impetigo, a feeding difficulty, or a psychological disturbance, etc., without reference to the a psychological disturbance, etc., without reference to the family doctor that he generates friction and creates confusion. Preventive and curative medicine merge. My paper suggested a division which is absolute, and which should be ever in the minds of local authority doctors. I distinguish between a person submitting himself to a routine examination and anyone personally needing medical

advice. In the latter case I do contend that it is vital to the patient's long-term welfare that his family doctor should be constantly in the picture. The rules which govern the relationship between consultants and general practitioners should also, in our three-part service, control the relationship of the general practitioner and the local authority doctor where the latter's work (and Dr. Whittles cites but a few of many examples) is outside the unaided competence of the general practitioner. Where his work is of a kind which is within the competence of the general practitioner there is a duplication which is indefensible. In a two-part service, doctors doing these special types of work would transfer into the jurisdiction of a hospital authority and do their work as do other specialists. Local authorities would still need their medical officers, but such officers would take no part in personal dealings with individual patients. Doctors whose interest lay in any aspect of the personal care of individuals would find their interest catered for by one or other of the two parts. Education authorities, like industrial concerns, might need medical officers, but these should not look upon themselves as part of the central structure of the country's medical services, but as ancillary thereto. Where they "pick up cases of early deviations from health which otherwise most doctors would never see" it should be their simple duty only to ensure that the patient's family doctor does see it forthwith.

It is not at all obvious to me that in advocating a two-part medical service I am, *ipso facto*, advocating that the general practitioner should attend a child welfare centre. Clearly the details of a two-part service could only be arranged after full discussion between the Whittleses, the Saklatvalas, and many others. But, should it be necessary for the general practitioner to attend clinics, he would reconcile his responsibilities to this fixed-time work with his responsibility for emergencies in the way in which he already does deal with conflicting claims on his time. Every general practitioner has fixed-time surgeries, and does many other parts of his work by appointment, and the consultant, too, has to contrive to cover both appointments and emergencies. We all manage, and to the satisfaction of our patients.—I am, etc.,

West Bromwich.

D. SAKLATVALA.

The Cost of Prescribing

SIR.—I should like to endorse the very important letter written by Mr. F. R. Elkins (*Supplement*, January 3, p. 5). In particular, I support the suggestion of a "counterblast" to the blatant propaganda of some manufacturing chemists. *Prescribers' Notes* has already taken up this idea, and I hope that future publications will endeavour to stimulate sound economy in prescribing to the degree that the "shiny literature" seems to stimulate extravagance.

These notes, although simply presented, should be gracefully accepted by our learned profession, because they are spotlighting waste on a national scale which it is impossible to envisage from the prescribers' end without help.—I am, etc.,

Newport, Mon.

D. N. JOHN.

Civil Service Medical Officers

SIR.—The wheel has turned full circle if one is to judge by the letter from "Old Sweat" (*Supplement*, December 27, 1952, p. 241) regarding remuneration for M.O.s in the Civil Service. The same sentiments were expressed in a less succinct fashion in my own letter (*Supplement*, 1950, 1, 81) some two years before the Danckwerts award. How much worse is our position *vis-à-vis* the G.P.s who are still being encouraged to elbow us out of a proper remuneration.

This is not in any sense an attack on G.P.s, who are my very good friends and occasional employers when financial stringency compels me to forgo leave and do a locum in order to make ends meet; but I feel that a little solidarity in the profession would help the underpaid minority of Civil Service M.O.s a great deal. I suppose it is really too much to ask that G.P.s and retired officers refuse to do

Government work on a part-time basis until the full-time counterpart has been given adequate remuneration.—I am, etc.,

"ANOTHER CIVIL SERVICE M.O."

Doctors' Telephone Accounts

SIR,—There is nothing new about doctors' telephones being charged as "business" (*Supplement*, January 10, p. 13). I have paid this rate ever since I had my own practice. In Middlesex it was compulsory to have a telephone at the branch surgery, and the calls there worked out at about 2s. 6d. each.—I am, etc.,

Lee-on-the-Solent.

BARBARA J. HICK.

Interests of Whole-time Specialists

SIR,—Some of the statements in the report of the December meeting of the Central Consultants and Specialists Committee (*Supplement*, January 3, p. 2) cannot be allowed to go unchallenged. First, we learn with surprise that two members of the Regional Hospital Consultants and Specialists Association were co-opted on the Central Consultants and Specialists Committee. Surely some whole-time staff should have been co-opted instead? Later we read that the "Joint Committee had been careful to brief itself on the problem of full-time officers, and its failure to obtain any improvement was due not to lack of knowledge of the problems but to the unbending attitude of the Management Side of Committee B." How the Joint Committee "briefed itself" is not clear. That it was inadequately briefed is certain from the fact that it did not consult the only representative body, the Association of Whole-time Salaried Specialists, before negotiating the new mileage rates, and that it needed to ask the Association's representatives for concrete instances "of the unsatisfactory mileage arrangements and the anomalies that arise out of them" (*Supplement*, January 10, p. 12).

We realize the unsatisfactory nature of the present Whitley machinery, which gives the Management Side the right to refuse arbitration in any dispute, and urge the B.M.A. to take this matter up in the proper quarters. However, the Staff Side have not, until recently, made very determined efforts to improve the lot of whole-time staff except in response to strong external pressure. We cannot forget that they refused to take up the question of payment of whole-time specialists for domiciliary visiting not so long ago, and that they probably could have secured the implementation of this proposal of the Spens Committee if they had pursued the matter energetically enough in the early days of the scheme when whole-time specialists were in fact paid for these visits.

Before we can believe implicitly in this committee's change of heart and future good intentions we must have more convincing proof of its sincerity than the fulsome and adulatory notices in the *British Medical Journal*. Its first step should be to ensure that whole-time staff, who do at least a third of the hospital work in the National Health Service, have the same proportional representation on the negotiating committee, and the opportunity for this may soon occur, as we believe that the charters of some of the royal colleges do not permit their members as such to sit on the Joint Committee, and so its constitution will have to be amended.—We are, etc.,

LEO GILCHRIST.

KEITH RANDALL.

LOUIS L. GRIFFITH.

J. Y. D. WAKEHAM.

D. G. MADIGAN.

I. G. WILLIAMS.

Farnborough, Kent.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

Association Notices

Diary of Central Meetings

JANUARY

- 26 Mon. Joint Committee of Psychological Medicine Group and Royal Medico-Psychological Association, 2.15 p.m.
28 Wed. General Practice Review Committee, 10.30 a.m.
29 Thurs. Charities Committee, 11.30 a.m.

FEBRUARY

- 4 Wed. Subcommittee to Consider Special Conference Rider, G.M.S. Committee, 2 p.m.
6 Fri. Ophthalmic Qualifications Committee, 1.45 p.m.
6 Fri. Ophthalmic Group Committee, 2 p.m.
6 Fri. Overseas Committee, 2 p.m.
10 Tues. Central Ethical Committee, 12 noon.
11 Wed. Physical Medicine Group, 2 p.m.
12 Thurs. Central Consultants and Specialists Committee, 12 noon.
12 Thurs. Rural Practices Subcommittee, G.M.S. Committee, 2 p.m.
13 Fri. Registrars Executive Committee, 2 p.m.
18 Wed. Occupational Health Committee, 2 p.m.
25 Wed. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 12 noon.
25 Wed. Joint Formulary Committee, 2.30 p.m.
27 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.
27 Fri. Library Subcommittee, Science Committee, 12 noon.
27 Fri. Science Committee, 2 p.m.

MARCH

- 13 Fri. Consulting Pathologists Group Committee, 2.30 p.m.

Branch and Division Meetings to be Held

BROMLEY DIVISION.—At Royal Bell Hotel, Bromley, Tuesday, January 27, 8.20 for 8.45 p.m., meeting. Address by Mr. A. Lawrence Abel: "Some Common Diseases of the Rectum and Anal Canal." To be followed by coloured cinematograph film of modern operation for carcinoma of the rectum.

CITY DIVISION.—At Burroughs Wellcome's Auditorium, 183, Euston Road, London, N.W., Tuesday, January 27, 8.30 p.m., meeting. Scientific and medical films.

EAST KENT DIVISION.—At Winter Gardens, Margate, Friday, January 30, 8.30 p.m. to 2 a.m., annual supper and ball.

FURNESS DIVISION.—At Orthopaedic Department, North Lonsdale Hospital, Tuesday, January 27, 8 p.m., meeting of Clinical Society. Film show.

MID-HERTS DIVISION.—At Sisters Hospital, St. Albans, Friday, January 30, 8.45 p.m., meeting. Dr. Robert Forbes: "The Legal Hazards of Medical Practice."

OLDHAM DIVISION.—At Oldham Hotel, Monday, January 26, 9 p.m., meeting. Professor R. Platt: "Medical Treatment of Hypertension."

OXFORD DIVISION.—At Radcliffe Infirmary, Oxford, Wednesday, January 28, 8.15 p.m., meeting. Dr. G. A. Ballance: "Infective Hepatitis in a College"; Dr. J. B. M. Davies: "Bornholm Disease."

ROCHESTER, CHATHAM, AND GILLINGHAM DIVISION.—At St. Bartholomew's Hospital, Rochester, Thursday, January 29, 8.30 p.m., clinical meeting. All medical practitioners in the area of the Division are invited.

SOUTH SHIELDS DIVISION.—At Ingham Infirmary, Friday, January 30, 8.30 p.m., clinical meeting. Films: "Malignant Conditions," with commentaries by Mr. C. J. L. Thurgar.

TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Devon's Road, Bow, E., Friday, January 30, 3 p.m., meeting. Dr. Hume Kendall: "Physical Medicine."

WANDSWORTH DIVISION.—At South London Hospital for Women and Children, South Side, Clapham Common, S.W., Sunday, January 25, 10 for 10.30 a.m., clinical meeting.

WARRINGTON DIVISION.—At Warrington Infirmary, Friday, January 30, 8.15 p.m., clinical meeting. Dr. F. F. Hellier: "Some Dermatological Errors."

WIGAN DIVISION.—At Royal Infirmary, Wigan, Friday, January 30, 3 p.m., clinical demonstration.

WILLESDEN AND WEMBLEY DIVISIONS.—At Abbey Hotel, North Circular Road, N.W., Tuesday, January 27, 8.45 for 9 p.m., combined meeting. B.M.A. lecture by Dr. J. F. Loutit: "Medical Aspects of Atomic Activity."

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 31 1953

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COLONIAL MEDICAL SERVICE

PROGRESS REPORT

On December 31, 1949, an account was published in the *Supplement* (p. 278) of negotiations which had taken place between the Colonial Office and the British Medical Association on the subject of remuneration in the Colonial Medical Service. It was stated that negotiations were in progress in respect of clinical specialists and senior medical administrative officers, and, further, that discussions were about to be undertaken on remuneration in the smaller territories. From time to time the fruits of these negotiations have been published in announcements of improved remuneration in a number of Colonies, and the Colonial Medical Service in most areas now offers a reasonably well paid and attractive career. The time has come for a further short progress report.

Future Prospects in Thirty-six Colonies

It is difficult to generalize about the Colonial Medical Service, because there are 36 Colonies and the terms and conditions of service are different in each. The "average man" in the service (if the existence of such a person can even be postulated) probably spends about half of his career as a medical officer and the other half as a senior medical officer. The medical officer scale of salary in the large Colonies extends roughly from £900 to £1,600 per annum, and the senior medical officer's salary is roughly £1,700.* Salaries are bigger in Hong Kong, where the cost of living is exceptionally high. In all large Colonies medical officers are rewarded with a holding approved higher qualifications are rewarded with a bonus of four increments in the salary scale (two in Hong Kong). This is designed to attract doctors with higher qualifications into the service, and to encourage junior members of the service to obtain higher qualifications and thus to provide a pool of potential specialists.

Clinical Specialists

The man who wishes to rise higher has two possible avenues of advancement. He can become a clinical specialist, or, alternatively, he may achieve high administrative rank. It has been agreed with the Colonial Office that junior specialists should receive the same salary as senior medical officers, and this agreement has been implemented in all the large Colonies. It has been further agreed that

*Colonial medical officers pay colonial income tax, which is everywhere much lower than income tax in the United Kingdom. It is necessary to add roughly 25% to all the figures in this article (which include expatriation pay) in order to arrive at equivalent salaries under U.K. taxation.

in large Colonies there should be a grade of senior specialists on the same salary level as deputy directors of medical services (roughly £1,800–£2,000). This intention has been broadly carried out in Hong Kong, Malaya, Singapore, Kenya, and Nigeria. The Governments of Tanganyika, Nyasaland, and Northern Rhodesia have each appointed one senior specialist, but the Government of Uganda has so far declined to create any posts in this grade. In all areas specialists are permitted to charge fees when called into consultation by private practitioners.

Some time ago the Association suggested to the Colonial Office that there should be a grade of "super-specialists" or consultants who would be appointed for groups of colonies. They would receive a flat-rate salary (£2,500 was the suggested figure) and they would be debarred from private practice. The Association considered that the creation of a small number of top-class consultant posts in the Colonial Medical Service would be immensely beneficial. This suggestion has been discussed by the Colonial Office with the large Colonies, but has not yet been accepted in any area.

Senior Medical Administrative Officers

Objections can be raised against hierarchical systems of remuneration, but it is difficult to escape from them in Colonies where the official community is small and where the salaries of Government officials are published in the annual estimates for all to see. It has been generally agreed with the Colonial Office that the Director of Medical Services in a large Colony should receive the same remuneration as the Attorney-General and the Financial Secretary. This suggestion has been broadly implemented, except in Colonies where the Attorney-General or the Financial Secretary carries a ministerial portfolio in addition to his responsibilities as a chief official. Directors of Medical Services in the large Colonies now receive salaries in the region of £2,000–£2,500.

From East Africa have come complaints that the starting salary for medical officers has been rendered inadequate by recent steep rises in the cost of living. The remedy for this is to introduce a temporary cost-of-living allowance, and this has been done in most cases. The situation in West Africa is not yet stable. There has been a reorganization of the medical services in Nigeria and new salaries have been introduced which will be published shortly. In the Gold Coast extensive reorganization of the medical department has been recommended by the Maude Commission. The report of this Commission has met with some criticism from members of the medical profession in the Gold Coast, and Mr. Ian Fraser is due to pay a visit to

the territory during March on behalf of the Council of the Association. A salaries commissioner is reviewing the remuneration of the Government medical staff in Sierra Leone.

Smaller Colonies

The small Colonies present a difficult problem, because in many cases they are economically not strong enough to afford the same expenditure on health services and the same salaries for their medical staffs as large Colonies, and they are therefore unable to compete in the attraction of recruits on equal terms with the Colonial Medical Service in other areas and with the National Health Service in the United Kingdom. Some small Colonies have special attractions, however, and financial inducements can be offered in the way of private practice. Unfortunately, the Governments of some small Colonies object to private practice by their medical officers. It is the view of the Association that private practice by Government medical officers should be permitted.

There have been improvements of remuneration in Fiji and the Western Pacific, though the new salaries are lower than those which were proposed by the Association. Negotiations are proceeding with the Colonial Office about the medical services in Borneo and the Seychelles, and it is not possible at present to forecast a satisfactory outcome. Meanwhile, a salaries commissioner has been at work in Mauritius. Satisfactory improvements were introduced some time ago in Aden and British Somaliland.

The condition in Cyprus is unsatisfactory. It may be observed that the Association, for its part, co-operated with the British Council in sending a distinguished surgeon to Cyprus last year on a visit which was of much benefit to the island's medical service.

As regards the Caribbean Colonies, certain proposals for standardized remuneration were worked out by the Caribbean Conference of the B.M.A. at Trinidad in January, 1951, and these have been under prolonged consideration by the Caribbean Governments, whose views are expected shortly.

Changing Status of Colonies

This brief summary of recent progress will show that the interests of the members in the Colonial Medical Service are constantly in mind. The service has many problems other than remuneration. One of the chief is the uncertain future that faces Colonial medical officers as a result of the changing status of many of the Colonies. This is a question which is under careful consideration by the Association and doubtless by the Colonial Office, but, whatever political developments may lie ahead for the Colonies, there is no doubt that they will require the help and advice of British medical men for many years to come. There is in the Colonies an immense and fascinating field of clinical work, in which doctors of all-round capabilities and interests can find a worth-while career.

PRESCRIPTIONS FOR DISINFECTANTS

The General Medical Services Committee has discussed with the Ministry of Health ways and means of lessening the burden which has been placed upon local medical committees in investigating prescriptions for disinfectants. As a result, the Ministry has taken certain steps which should in future avoid unnecessary reference of these prescriptions, and the position will be carefully watched.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

MEDICAL WHITLEY COUNCIL COMMITTEE "C"

CLAIM FOR ASSISTANT MEDICAL OFFICERS TO GO TO ARBITRATION

At a meeting of Committee "C" of the Medical Whitley Council held on January 22 Dr. John Gibson was elected as Chairman of the Committee for the session and Alderman J. Hoy as Vice-Chairman. In the absence of both Chairman and Vice-Chairman, Dr. W. G. Clark was elected chairman for the meeting.

The claim put forward by the Staff Side for an adjustment in the remuneration of assistant medical officers was the main item of business, and after prolonged discussion and negotiation agreement was not reached. The Staff Side then formally requested that the matter should go to arbitration. The Management Side agreed to this course, and the necessary formal action is now being taken.

The Committee discussed certain other matters, including three additional conditions of service for medical officers of health. These conditions were agreed, and the details will be published shortly.

EXCHANGE VISITS WITH CANADA AND THE U.S.A.

The scheme which was initiated two years ago, with the approval of the Bank of England, for exchange visits between members of the American, British, and Canadian Medical Associations will be continued this year.

Procedure

Three doctors from Britain may visit Canada in exchange for three doctors from Canada. Each doctor from Britain will be required to deposit up to £200 with the B.M.A. in London. On arrival in Canada he will be met by a representative of the Canadian Medical Association, who will present him with the equivalent in Canadian dollars. Similarly, each Canadian doctor on arrival in Britain will be met by a representative of the B.M.A., who will present him with the sum deposited in sterling.

Three doctors from Britain may visit the U.S.A. in exchange for three doctors from the U.S.A. Each doctor from Britain will be required to make all his own travel arrangements and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in the U.S.A. he will be met by a representative of the Medical Society of the State of New York, who will present him with the equivalent in U.S. dollars. Similarly, each U.S. doctor on arrival in Britain will be met by a representative of the B.M.A., who will present him with the sum deposited in sterling.

Duration of Visit

The duration of the visits is left to the discretion of the doctors concerned. The American, British, and Canadian Medical Associations cannot accept any responsibility for a doctor who allows his visit to outlast the money placed at his disposal.

Applications are invited from members of the B.M.A. to take part in such exchanges during the next financial year—that is, April 1, 1953, to March 31, 1954. Each applicant must state the object of his visit. Medical practitioners in all branches of the profession, including general practice and public health, are eligible. Applicants should also give approximate dates of the visit desired. Successful applicants will in due course be required to furnish exact dates and details of travel. Applications must be received by the Secretary of the B.M.A. by March 1, 1953.

Correspondence

New B.M.A. Subscription Rates

SIR,—I should like, through the medium of your columns, to be allowed to point out what appears to be one more grave injustice which the whole-time officer has now to suffer. A short time ago I received a statement of the new subscription rates for B.M.A. membership, and noticed that the list was headed by the apparently harmless words, "Ordinary Subscription £6 6s." How many realize that out of all the tens of thousands of members the only ones who will actually pay that six guineas in its entirety are whole-time officers receiving a salary of over £1,500 per annum? Admittedly part-time specialists and general practitioners appear to pay this also, but it is allowed against income tax, and the amount which is paid in practice will be about one-half of this—substantially less, in fact, than the rate for a registrar who has been qualified over five years. Remaining members, apart from hospital officers and general practitioners, nearly all fall into one or other of the groups listed at reduced subscription rates, the highest of which is four guineas.

Whilst I am sure that any whole-time officer will be the first to appreciate the increased expenditure now necessary to produce the *British Medical Journal*, can anyone reasonably claim that it is fair to allow the maximum increase over the old subscription rate to be borne solely by whole-time officers—a group of members who already probably suffer more financial hardship and fewer income-tax concessions than any other group of doctors? Surely these new subscription rates could be altered in some way such that the net amount contributed by the whole-time officer, after income-tax deductions have been taken into consideration, is at least no more than that given by his part-time colleague, instead of, as is the case at present, twice as much. If there is no likelihood of this I am sure that many whole-time officers will be forced, for purely financial reasons, to take what must be to them a most unwelcome and undesirable step, and resign their membership from the Association.—I am, etc.,

Birmingham.

JAMES ACKERLEY.

* * This letter is referred to in a leading article on p. 262. —ED., B.M.J.

Radiology on Points

SIR,—The expansion of radiological services since the end of the war has been in the region of 200% over the whole country, and it shows no sign of diminishing. Practically every new advance in medicine and surgery demands increased effort and increased output from radiological departments, with a corresponding increase in costs. Since a financial limit has of necessity been applied to the National Health Service, it is essential that the funds available for radiological examinations should be used to maximum advantage in the interests of efficiency and economy. It may not be generally appreciated that in many instances the cost of a patient's x-ray investigations may be greater than the combined cost of the whole of his treatment.

It is known by radiologists that the usual methods of assessing the work done in x-ray departments are unreliable and of no comparative statistical value, and there is general agreement on the need for a more reliable system. The Nuffield Provincial Hospitals Trust, in collaboration with a number of radiologists, carried out an experiment in what is now called the unit system of recording. The authors of this report emphasize that the experiment was not conducted "over a sufficiently long period to demonstrate the usefulness of their suggestions."

The Faculty of Radiologists, whose help at one period was sought by the Nuffield Trust, had, in the early days of this experiment, realized the difficulties which would arise in applying the results of a localized survey on a national

scale. The Faculty is aware of the danger in any such system of wrong inferences being drawn as to the quality of the work done in a radiological department. It has, however, been assured by the Ministry of Health that this is not a matter of controlling the way in which medical work is done but only of recording its amount in a form which makes some allowance for the varying complexity of different examinations. There is no intention of seeking uniformity, which in any case is impossible; but study by individual departments of their own problems as compared with others in the light of these statistics might enable them to raise their own standards of efficiency, while at the same time decreasing costs.

Following publication of the Memorandum R.H.B. (52) 130/H.M.C. (52) 118/B.G. (52) 124, the Ministry of Health informed the Faculty that it was recognized that the unit values might be found to need alteration in the light of experience and would be glad to receive any observations on them which the Faculty might wish to make from time to time. The Faculty has therefore appointed a committee composed of:

Sir Harold Graham-Hodgson, Middlesex Hospital (chairman); Dr. Hugh Davies, National Hospital for Nervous Diseases; Professor A. S. Johnstone, Leeds General Infirmary; Dr. J. W. McLaren, St. Thomas's Hospital; Dr. P. H. Whitaker, Liverpool United Hospitals; and the President and Honorary Secretary *ex officio*.

This committee will study at regular intervals the problems arising out of the units system referred to it by the Ministry.

In the light of experience, the Faculty will doubtless have sufficient information to enable it to advise the Ministry on the desirability of retaining the scheme with appropriate modifications or replacing it with a more satisfactory scheme.—We are, etc.,

PETER KERLEY,
President,
ROHAN WILLIAMS,
Hon. Secretary,
The Faculty of Radiologists.

London, W.C.2.

Remuneration of Hospital Medical Staff

SIR,—I read with interest (*Supplement*, January 10, p. 9) that the betterment factor for consultants and specialists stands at 20%. In the *British Medical Journal* dated March 19, 1949, I read on page 487 that "the increase over the Spens figure is 13% at the start and 10% at the finish. If allowance is made for the 8% which is the contribution of the Government to superannuation it is seen that a betterment factor of 22% is applied to the starting salary, and 19% to the salary reached at the age of 40." It seems to me that allowance should not be made for the 8% Government contribution unless it can be regarded as income, and it is clearly not to be so regarded, because (a) it is not subject to income tax, and (b) if a specialist resigns from the Service this 8% contribution is not refunded to him. It therefore does not belong to the specialist, and in my opinion should not be taken into consideration in assessing the betterment factor.

I hope this will be borne in mind in the negotiations about to take place. It appears to me that the true figure of the betterment factor now being received is, as stated in the *Journal* of March 19, 1949, still 13% at the starting salary and 10% at the salary from age 40 onwards.—I am, etc.,

Boston, Lincs.

C. MACLAY.

SIR,—In view of the present negotiations relative to the salaries of specialists, may I stress the following points as a matter of urgency?

Two years ago Lord Moran prophesied that within 10 years private practice would be a thing of the past, and there is no doubt that even now there are a large number of part- and full-time specialists who are unable to augment their income by private practice, or who have no private means available. Such specialists have for the last four

years been struggling to make ends meet in a world where prices are at least 100% over pre-war, on a salary which has been increased 20% over pre-war values. Mr. Micawber's classic quotation is particularly applicable.

The Spens Report, upon which we entered the Service, was accepted in principle by Mr. Bevan, and in that report the quoted figures were to be adjusted by a betterment factor. The Government's cost-of-living index bears no relation whatsoever to the applied betterment factor, and therefore we are entitled to say that the Government's promise upon which we entered the Service has not been implemented. Specialists have as equally a strong moral claim for retrospective adjustment of salary as the general practitioners, and if this is neglected the year 1953 will mark the start of an era in which the status of the specialist is lower than ever before in the history of the profession. The "global sum" involved may seem large, but it must be remembered that half to three-quarters of the amount would immediately be repaid in taxation. When, however, at the age of 65 we are compulsorily retired, and have no means of further income (in contrast to general practitioners, who may work as long as they are able), the difference in pension may mean comfort as opposed to penury.

If negotiations are not proceeding to the entire satisfaction of the Joint Committee adequate time should be allowed to refer the matter to the periphery, where the need is probably greatest, rather than to accept a makeshift offer which might prove to be another tombstone in the history of medical politics.—I am., etc.,

Southampton.

BERNARD SUGDEN.

Delay in Hospital Reports

SIR,—Surely Dr. H. J. Selby (*Supplement*, January 10, p. 12) expects too much from the welfare State. In my part of the world I have yet to be informed of a death occurring in hospital. Kindly consultants write me personal letters about my patients' progress, no doubt in their own time at their own expense. Official letters follow weeks later when they are no longer of value.

Dr. Selby should read *Alice in Wonderland* again: "If it is so it might be, and if it were so it would be, and if it isn't it ain't. That's logic." Lewis Carroll anticipated the Bevan era by nearly 100 years, but the B.M.A. has yet to learn that you reap what you have sown.—I am., etc.,

London, S.E.3.

GUY NEELY.

Association Notices

Diary of Central Meetings

FEBRUARY

- | | | |
|----|--------|--|
| 3 | Tues. | Alcohol and Road Accidents Committee with Royal Institute of Chemistry, 2.30 p.m. |
| 4 | Wed. | Subcommittee to Consider Special Conference Rider, G.M.S. Committee, 2 p.m. |
| 6 | Fri. | Ophthalmic Qualifications Committee, 1.45 p.m. |
| 6 | Fri. | Alcohol and Road Accidents Committee, 2 p.m. |
| 6 | Fri. | Ophthalmic Group Committee, 2 p.m. |
| 6 | Fri. | Overseas Committee, 2 p.m. |
| 10 | Tues. | Central Ethical Committee, 12 noon. |
| 11 | Wed. | Physical Medicine Group, 2 p.m. |
| 12 | Thurs. | Central Consultants and Specialists Committee, 12 noon. |
| 12 | Thurs. | Rural Practices Subcommittee, G.M.S. Committee, 2 p.m. |
| 13 | Fri. | Registrars Executive Committee, 2 p.m. |
| 18 | Wed. | Occupational Health Committee, 2 p.m. |
| 19 | Thurs. | G.M.S. Committee, 10.30 a.m. |
| 19 | Thurs. | Joint meeting of representatives of Radiologists and Tuberculosis Group Committees, 1.45 p.m. |
| 19 | Thurs. | Tuberculosis Group Committee, 2.30 p.m. |
| 25 | Wed. | Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 12 noon. |
| 25 | Wed. | Joint Formulary Committee, 2.30 p.m. |
| 27 | Fri. | Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m. |
| 27 | Fri. | Library Subcommittee, Science Committee, 12 noon. |
| 27 | Fri. | Science Committee, 2 p.m. |

Branch and Division Meetings to be Held

CHELSEA AND FULHAM DIVISION.—At West London Hospital, Hammersmith Road, W., Friday, February 6, 8.30 p.m., clinical evening. Dr. Geoffrey Konstam: "The Heart"; Dr. E. Hudson: "Modern Treatment of Emphysema and Bronchitis"; Mr. Harold Burge: "Indications for Surgery in Peptic Ulceration and the Imperfections of Partial Gastrectomy"; Dr. Oswald Savage: "Use of Cortisone in Rheumatic Cases." Guests are invited.

COVENTRY DIVISION.—Tuesday, February 3, Medical Films.

EAST NORFOLK DIVISION.—Wednesday, February 4, 2.30 p.m., Tour: Steward and Patteson's Brewery (Pockthorpe), Norwich.

HAMPSTEAD DIVISION.—At Hampstead General Hospital, Haverstock Hill, N.W., Wednesday, February 4, 8.30 p.m., meeting. Sir Zachary Cope: "The Advance of Medicine During the Second World War, 1939-1945."

LEWISHAM DIVISION.—At Lewisham Hospital, S.E., Friday, February 6, 8.30 p.m., meeting. Dr. R. Donald Teare: "Homicide," illustrated by lantern slides.

MARYLEBONE DIVISION.—At Medical Society of London, 11, Chandos Street, W., Thursday, February 5, 8.30 p.m., meeting. B.M.A. Lecture by Sir Horace Evans: "Peripheral Arterial Disease." All members of the Paddington and St. Pancras Divisions are invited.

NUNEATON AND TAMWORTH DIVISION.—At Red Lion Hotel, Atherstone, Tuesday, February 3, 8 p.m., informal supper; 8.45 p.m., symposium arranged by Dr. A. C. Kendall: "Respiratory Affections of Infants and Young Children."

SALISBURY DIVISION.—At Guildhall, Salisbury, Tuesday, February 3, 7.15 p.m., annual medico-legal dinner. All medical practitioners in the area of the Division are invited.

SOUTH BEDFORDSHIRE DIVISION.—At Luton and Dunstable Hospital, Friday, February 6, 8.30 p.m., clinical meeting.

SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Thursday, February 5, 9.15 p.m., meeting. Sound film: "Some Aspects of Accessible Cancers (Skin and Breast)."

WEST SUSSEX DIVISION.—At Southlands Hospital, Shoreham-by-Sea, Thursday, February 5, 2.30 p.m., clinical session. Members of the Brighton Division and medical friends of members are invited.

Meetings of Branches and Divisions

KENSINGTON AND HAMMERSMITH AND CHELSEA AND FULHAM DIVISIONS

A general meeting was held jointly by the Kensington and Hammersmith and the Chelsea and Fulham Divisions at St. Mary Abbots Hospital, W.8, on January 6, the agenda being: "Further consideration of the Working Party's scheme for distribution of the Danckwerts award." There were 83 members and guests present. The chairman, Dr. C. Watney Roe, said that "further consideration" was somewhat of a misnomer. There was no real study of detail last June, and Divisions were advised to accept the scheme without amendments because delay might lead to loss of the promised money.

Dr. H. D. Sutherland said that he was now sitting on a subcommittee for the purpose of finding a way to help the small-list doctor. Unfortunately it would be a year before they would know the exact amount of surplus money in the pool and so it was impossible to come to a decision at the moment. Dr. Charles Schiff said that the G.M.S. Committee knew all the answers last June, so he failed to understand why it needed now to wait a year for further information. It should be quite easy to alter the loading to the first 1,000 patients. He pointed out the danger of having a core of underpaid doctors with small lists, as these would form a nucleus utilizable by any Government which decided to attack the incomes of those with medium and large lists. Dr. Russell pointed out that those doctors with lists of 700 or less were worse off financially than a year ago. He also quoted figures to show that in 1948 there were 560 full-time assistants, whereas in 1951 the number had risen to 2,000. Dr. A. C. E. Breach stated that he had resigned from the G.M.S. Committee because he objected to the way the scheme was rushed through. He stressed the imperative need for a financial reserve. All business fees would produce £1m. He was against any restriction in the size of lists, but would taper the capitation fee above 3,000 so as to make larger numbers financially unattractive. Dr. Bruce Cardew said that the present method of distribution was unfair because expenses do not increase proportionately with the size of the lists. He therefore advocated loading on the first 2,000 patients scheme as a means of encouraging partnerships was unsatisfactory and would not reduce the number of assistants. Practitioners after taking a partner or to reduce their lists. Many others took part in a general discussion.

Dr. Sutherland explained the difficulties of the G.M.S. Committee, and ended by saying that he would agree that loading motion, "That this meeting records its dissatisfaction with the Working Party's distribution scheme and urges that the loading should begin with the first 1,000 patients in accordance with the Association's unchanged policy," was carried *nemine contradicente*.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 14 1953

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British Medical Association

ANNUAL MEETING—CARDIFF, JULY 9-17, 1953

President-Elect: J. W. TUDOR THOMAS, D.Sc., M.D., M.S., F.R.C.S.

PROVISIONAL PROGRAMME

The 121st Annual Meeting of the British Medical Association will be held in Cardiff from Thursday, July 9, to Friday, July 17, 1953, inclusive.

On the evening of Wednesday, July 8, there will be a Sherry Party for Representatives and their Ladies, arranged by the Cardiff Division.

The Annual Representative Meeting will begin on Thursday, July 9, and continue on Friday, Saturday, and Monday, July 10, 11, and 13.

The Representatives' Dinner and Ladies' Dinner take place on Thursday, July 9, followed by a dance.

The Overseas Luncheon is arranged for Friday, July 10.

On Sunday, July 12, a visit has been arranged for Representatives and their Ladies to St. Donat's Castle, and that evening there will be a Welsh Choral Concert.

The adjourned Annual General Meeting and President's Address will take place in the Park Hall Cinema on the evening of Monday, July 13, and the President's Reception, which follows, will be at the National Museum of Wales.

The Annual Scientific Meeting and associated functions occupy the period from Tuesday morning, July 14, to the evening of Friday, July 17.

The Official Religious Service will be held in St. John's Church, Cardiff, on the afternoon of Tuesday, July 14.

Arrangements for a Roman Catholic Service are also being made.

The Annual Dinner of the Association will be held in the City Hall on Thursday, July 16.

A social programme is being arranged, including evening Receptions and Garden Parties, as well as functions especially arranged for the Ladies accompanying members. The usual Golf Competitions will take place.

The Overseas Conference will be held on Wednesday afternoon, July 15, followed by an "At Home" for Overseas Delegates given by the Empire Medical Advisory Bureau.

The Reception Room for registration in the Sophia Gardens Pavilion will be opened on Monday, July 13, at 9 a.m.

Three Plenary Scientific Sessions are arranged as follows: Tuesday morning, July 14, subject "Coronary Disease";

Thursday morning, July 16, subject "Fibrositis"; Friday afternoon, July 17, subject "Overweight."

Seventeen Scientific Sections have been arranged, the meetings to take place on Wednesday morning and Wednesday afternoon, July 15, and Friday morning, July 17. The arrangements so far are as follows:

Medicine	July 15 (a.m. and p.m.)
Surgery	July 15 (a.m. and p.m.)
Obstetrics and Gynaecology	July 15 (a.m. and p.m.)
Anaesthetics	July 15 (a.m.)
Cardiology	July 15 (p.m.)
Child Health	July 15 (p.m.)
Dermatology	July 15 (p.m.)
Diseases of the Chest	July 17 (a.m.)
Neurology	July 17 (a.m.)
Occupational Health	July 17 (a.m.)
Ophthalmology	July 17 (a.m.)
Orthopaedics	July 17 (a.m.)
Oto-rhino-laryngology	July 17 (a.m.)
Pathology	July 15 (a.m.)
Preventive Medicine	July 15 (a.m.)
Psychiatry	July 15 (p.m.)
Radiology	July 15 (a.m.)

Individual programmes for these Sections will be published in a later issue of the *Journal*.

The Ladies' Club will be situated in the University College and will be open throughout the Meeting.

The Annual Trade Exhibition of Surgical Appliances, Foods, Drugs, and Books will be housed in the Sophia Gardens Pavilion. The official opening will take place on Monday, July 13, at 9 a.m., and the Exhibition will remain open on July 14, 15, 16, and 17 from 9 a.m. to 6 p.m.

The Scientific Exhibition will also be held in the Sophia Gardens Pavilion and will be open daily from July 13 to 17. Demonstrations will be given at fixed advertised times. A wide field of medical interests will be covered. A section will be devoted to problems of industrial health, with special local emphasis on coal-mining problems and pneumoconiosis and nystagmus. The medical exhibits will include diagnosis in haematemesis and melaena, electrolyte disturbance, heart disease, and the work of a diabetes unit. Preventive medicine will

* Also Aberdare Hall, Cathays Park, Cardiff, a Students' Hostel with excellent accommodation for 118 guests.
† Also Llandaff House, Penarth, with 36 beds.
Booking arrangements for Aberdare Hall and Llandaff House will be announced shortly.

8.30 a.m.—Annual Medical Missionary Breakfast, New Continental Café.
9.00 a.m.—Reception Room and Trade Exhibition open, Sophia Gardens Pavilion.
9.00 a.m.—Scientific Exhibition open, Sophia Gardens Pavilion.
9.30 a.m.—Ladies' Club open, University College.
10.00 a.m.—*Scientific Sections* at University College.
10.00 a.m.—Notts Ladies' Challenge Cup Golf Competition, Leys Golf Club.
10.00 a.m.—Leinster and Childe Cup Golf Competition, Radway Golf Club.

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A.—In considering this question one must first have regard to the legal position, and that, undoubtedly, is that the remuneration receivable from the regional board is assessable under Schedule E and the earnings from private practice under Schedule D. There is an advantage in having the whole of the earnings assessed in one sum under Schedule D, because the taxpayer thereby avoids the application to his claim for expenses of the stricter and more restrictive rules applicable to assessments under Schedule E. For many years there has obtained a practice of assessment throughout the country, the essence of which was to avoid the inconvenience, both to the taxpayer and to the Revenue Department, of making assessments under Schedule E on subsidiary items of professional earnings, such as salaries for acting as medical officers at hospitals, for work as coroner, etc. What is now coming up for decision is whether the same course is to be followed in

The General Medical Services Committee wishes to make it clear that no official form exists for this purpose, and that the only action which is necessary on the part of general practitioners is to send a communication to the clerk of the executive council, stating that they wish to take advantage of the notional list arrangement. General practitioners in partnership should apply to the executive council in whose area the majority of the partners in the firm reside. If the doctors in any partnership are equally divided between more than one executive council, application should be made to the executive council where they have the majority of their patients. The executive council which deals with their

Correspondence

Employment of Assistants

SIR,—The rights and wrongs of assistants are one of those problems for which it is very difficult to obtain informed and yet impartial consideration. Those like myself who have never had an assistant—and hope they may never have to take one—are fairly impartial in our approach to the problem, but we cannot claim to be fully informed of its intricacies. For the rest, the assistants themselves and their employers are at an even greater disadvantage in trying to look at the matter objectively.

It is an unfortunate fact that medico-political issues tend to be settled by the "haves," and it is difficult to see how this can be avoided; for it is only those who are well established in practice and who have assistants or compliant junior partners who can afford the time for committee work. Especially is this true of the General Medical Services Committee, whose meetings occupy about 14 whole days a year and whose vast agendas require two complete evenings before each meeting for their digestion. And so it is rare in its discussions to hear the point of view of the single-handed practitioner presented with first-hand knowledge, whilst those of small-list and unestablished practitioners tend to be ignored or misunderstood for sheer lack of representation. This ignorance has been clearly demonstrated in the recent distribution scheme.

The recently appointed Assistants and Young Practitioners Subcommittee, whilst nominally providing for representation of that point of view, tends at present to be dominated by those of its members who are appointed by the G.M.S. Committee from its own members and who are experienced politicians. And so one is not altogether surprised to read in the official account of the last G.M.S. Committee meeting (*Supplement*, January 24, p. 24) of the whole-hearted rejection of the Subcommittee's report; and that at least one of the appointed members of the subcommittee helped to secure the rejection. Yet something must be done to correct the abuses that too often attend the employment of assistants, abuses which bring dishonour to the profession as a whole. Can we not handle this matter in good faith ourselves without invoking the help of Whitehall? There is a certain amount of badly soiled linen here; shall we not wash it at home?—I am, etc.,

Orpington.

A. C. E. BREACH.

Assistantship

SIR,—Permit me space to inform the General Medical Services Committee that I am one assistant, at least, who does not wish to continue as an assistant throughout the rest of his life. If I am going to be employed permanently on my present basis I would welcome the setting up of a State salaried service. I would have a feeling of greater equality and less frustration than I have at the present time. I know of no reason why any normal male practitioner who wishes to marry and settle down should wish to be a permanent whole-time assistant. Female practitioners may prefer permanent assistantships. I think that the money wasted in trainee assistantships could be spent to better advantage, to young doctors and the public, in compensating principals for any loss of income on taking on partners.—I am, etc.,

Rochford, Essex.

W. J. HASTINGS SAYERS.

Trainee Assistants' Remuneration

SIR,—The Department of Health for Scotland has increased inducement payments "in the light of the higher level of remuneration to general practitioners following the Danckwerts award" (*Supplement*, January 24, p. 27). This means that the Department of Health for Scotland has given certain general practitioners a betterment factor (in this case 22%) from moneys outside the central pool.

The main argument against giving trainee assistants an increase in remuneration is that the money for this would

the many cases where under the National Health Service arrangements the Schedule E element in the total earnings is by far the greater—and, if it is to be followed, whether there is any limiting ratio of Schedule E to Schedule D earnings. Where income-tax procedure is concerned it is difficult to secure uniformity of treatment when the rule or practice to be applied is extra-statutory. In the last resort the decision rests with the District Commissioners of Taxes, and it is possible that different bodies of those commissioners may hold differing views as to their responsibilities and to the line that should be followed. It is at least conceivable also that individuals in the service of the Inland Revenue Department may not be of the same opinion as to what should be done in a particular case.

It would be helpful if the Board of Inland Revenue could give some indication as to the ratio of Schedule D to Schedule E earnings which they would regard as justifying an omnibus assessment under Schedule D, though of course that would not be binding on the commissioners, in whose hands rests the ultimate authority. At present all that can be said is that the Schedule D element should be material—a transfer of liability from Schedule E merely on account of the existence of private earnings to the extent of 5% or 10% seems hardly fair to the large number of whole-time salaried employees—and that a ratio of one unit of private earnings to four units of consultant's salary would seem to be sufficient to justify the omnibus Schedule D assessment.

Travelling Expenses Between Places of Practice

Q.—As an ophthalmic medical practitioner I live and practise in Eastbourne, and also have a consulting-room in London where I practise three days a week. Can I claim the cost of a first-class railway season ticket in my expenses? I have always done so, but now this is being queried.

A.—It is stated that the questioner practises in Eastbourne and it is assumed that this implies that he has a consulting-room—or uses accommodation at his flat for consultations—there, and that the liability for the earnings which result are assessed under Schedule D. If so, it should be made clear to the Inspector of Taxes that there is a single practice which is in fact carried on at two places, and that the cost of travelling between them is therefore allowable. The inspector may have in mind a fairly recent case in which the High Court refused expenses of a similar nature in the case of a professional man who practised in London but who did a certain amount of work at home, but not, apparently, to the extent of seeing clients at his residence or holding it out as a place where consultations would be arranged in the normal course. It may be advisable to lay some stress on the difference between such a case and the circumstances in which it is understood that the questioner's practice is conducted.

Notes and News

Higher Pay for Nurses.—Hospital authorities in England and Wales have now received full details of the new scales of pay for nurses and midwives which have been agreed by the Nurses and Midwives Whitley Council. The increases, with arrears as from June 1, 1952, will be paid as soon as possible. Under the new scales a student nurse in her first year will receive £225 as against £200, and a ward sister £425 as against £375. Matrons will get an increase of £60. The extra cost to the hospitals is likely to be about £5,250,000 in a full year.

Visit to the Gold Coast.—Mr. Ian Fraser, president-elect of the Royal College of Surgeons in Ireland and a member of the Council of the British Medical Association, is to spend a fortnight in the Gold Coast. He will arrive at Accra on Thursday, March 5, and will return on Friday, March 20.

FEB. 14, 1953

not come out of the central pool. What now stands in the way of the Department of Health for Scotland increasing the remuneration of trainee assistants? Since a betterment factor of 22% would ensure for the Department an additional expenditure of £15,000 per annum, to give anything less would indeed be paltry.—I am, etc.,

London, N.W.6.

G. GOULD.

Representation of Whole-time Specialists

SIR,—We, and probably many others, were interested to read your comments (*Supplement*, January 24, p. 25) on the representation of whole-time consultants on Committee "B." You state that the Central Consultants and Specialists Committee of the Association consists mainly of members elected by the various regional and specialists committees throughout the country. We have been in our present area for three years and have no knowledge of any election ever having been held. Is this truly representation?—We are, etc.,

R. GRENVILLE-MATHERS.
A. W. ANDERSON.

Harrow.

Cost of Prescribing

SIR,—Mr. G. Smith (*Supplement*, January 17, p. 17) takes Mr. F. R. Elkins to task for his very timely suggestions to reduce prescribing of proprietary medicines to a minimum. We are warned by Mr. Smith that such measures would remove from the industry "all incentive, not only for original research but for development" with "far-reaching and disastrous effects on the health of the nation." This emotionalism, so characteristic of the propaganda brochure, in no way deals with the point at issue. Having worked in a pharmaceutical firm for nearly three years and having friendly contacts with a few more, I find myself unmoved by Mr. Smith's picture of altruism in the industry.

No one can deny the existence of many proprietary remedies which have no B.P. equivalent and which have been brought into use by research financed by individual firms. For these products, the firms concerned have a wide margin of profit and rightly so. And, before long, the firm concerned can make up its outlay and continue to charge the same price so as to acquire more money for research and development. These comprise Mr. Elkins's Group 1. Group 2, the blunderbuss and shotgun mixtures—the 'witches' brews of hormones, of vitamins, of anti-anæmic preparations—these are the proprietaries for which there is neither rhyme nor reason. They are designed purely to catch the gullible—to make easy money either from the authorities or the patient. Do Mr. Smith and the industry defend these? The good firms, including the one I worked for, have eliminated such concoctions, but many are still available and widely advertised. The industry wastes money and time in making these preparations and more money in advertising them. One has only to see chemists carefully calculating the amount of copper, cobalt, and manganese to be added to iron salts for anaemia preparations (trace metals already present in the iron salts) to realize the fatuity and stupidity behind many of the proprietaries in Group 2.

In addition to the unwelcome shoal of half-truths and doctored facts coming through our letter-boxes daily, our intelligence is further insulted when we open our medical journals. There, pre-eminently with the blessing of the B.M.A. and the profession, are full-page advertisements for mixtures which are condemned by the all. Not only should these mixtures be refused by our industry itself, but their advertising should be refused by our medical journals. The journal *Blood*, through its editorial board, proposed this step a few years ago and appears to adhere to these principles. Cannot our British journals help to convince the pharmaceutical industry that shotgun mixtures are bad ethically as well as therapeutically?

Proprietaries, Mr. Smith tells us, account for only 4d. in the pound of the cost of the National Health Service. He was wise to quote the cost in this way. It works out at £6m. was wise to quote the cost in this way. It works out at £6m. Even if only one-sixth to one-seventh of this were wasted in Group 2, it is still something we cannot afford. I believe it to be true that the pharmaceutical industry fully expected more stringent Government control of their activities on the introduction of the National Health Service. Even full nationalization was feared. This latter tragedy was averted, but, if the industry will not clean itself, it will find itself eventually forced to do so. Meanwhile

we in the profession should not prescribe the type of proprietaries referred to above. If no one prescribes them, their sponsors will stop their production. Only then will those firms who refuse to produce these mixtures be given the moral support they have every right to expect from us.—I am, etc.,

London, N.19.

J. G. A. MCSORLEY.

SIR,—The high cost of the pharmaceutical services at the present time is a matter which should cause each general practitioner to ask himself if what he prescribes is the best he can do with regard to the patient who is the consumer, the State which is the payer, and the manufacturing companies who are the producers.

Naturally, the patient is our first concern. In my opinion the *National Formulary* preparation will usually suffice, but it should be noted that in some respects prescribing a proprietary remedy is cheaper than a *National Formulary* equivalent, and therefore represents a small saving to the State. For example, although "benlylin" expectorant by Parke Davis is 5d. an ounce and linctus codeine N.F. is 4d. an ounce, the total cost to the State of a 6-oz. bottle of the former is 3s. 8d., while the cost of the latter is 4s. 3d. owing to the different dispensing fees (1s. 2d. as opposed to 2s. 3d.). A similar state of affairs exists in respect of "tonics" like "syrup minadex" by Glaxo, and certain alkaline mixtures, ear and nose drops, lotions, liniments, gargles, etc. A ½-oz. bottle of auristillae phenolis N.F., which has an ingredient cost of 2½d., costs the State, eventually, over 2s. 6d. A 2-oz. bottle of lotio calaminae N.F. with an ingredient cost of 3d. will cost the State over 2s. 6d. These examples serve to show where much of the money goes. It is not generally known what an expensive substance menthol is, costing 13s. an ounce, and it is in common use as an inhalant, whereas the excellent vapor. benz. N.F. is 4½d. an ounce, although the prescription of an ounce bottle of the latter eventually costs the State about 2s. 9d. I have found tab. ergot. praep. N.F. an efficient preparation. These tablets cost 11d. a dozen. A more refined preparation with a similar action is tab. ergometrin. maleat. These tablets cost 14s. 2d. a dozen, which is their main difference from the former. Many other such examples could be given.

It is essential for all practitioners at least to be able to price their own prescriptions and know just how much of the State's money they are signing away. A knowledge of certain excellent, and cheaper than official equivalent, proprietaries will help to effect a saving. There will, however, always remain some proprietary preparations which are away ahead of the official equivalents and, of course, the excellent preparations which have no equivalent. The supply of these preparations should provide the first-rate and highly ethical drug companies with the necessary trade to maintain their excellent research establishments, which are indispensable to medicine in this country and, indeed, the world.

Briefly, therefore, proprietary preparations are not always the dearer. Official remedies of substantially similar pharmacology often display extreme dissimilarity in cost. The dispensing fee paid to chemists for official liquid medicaments could in many cases probably stand review. Tablets could in many cases replace mixtures and with a gain in efficiency—e.g., tab. ferri. sulph. co.—I am, etc.,

Lanark

THOMAS M. GLAISTER.

New B.M.A. Subscription Rates

SIR,—On opening this week's *British Medical Journal*, I turned to the *Supplement*, and, after looking at the appointments vacant—I always do—I read Dr. James Ackerley's letter (*Supplement*, January 31, p. 33). This put clearly the injustice suffered by whole-time salaried doctors in relation to the British Medical Association subscription. I turned immediately to your leading article (*Journal*, p. 262) in the hope of finding at any rate some comment on the letter if, as was the case, no reply was possible. Instead I found only that the substance of Dr. Ackerley's letter had been ignored, presumably because it was unanswerable, and that he had only been taken up on two minor points—that six guineas in his view is a large subscription, and that the increase is due to the increased cost of the *Journal*. In both cases he was accused of a misconception. Now, as regards the first, surely this is a matter of opinion rather than a misconception, and I at any rate agree whole-

heartedly with him. The second is admittedly a misconception. I myself am only too well aware of the fact that the cost of providing the *Journal* for the 65,000 members of the Association is covered by the *Journal* subscriptions of the 13,000 non-members, who pay for the *Journal* six times what it costs to produce. But Dr. Ackerley's misconception is easy to understand. After all, like myself, he probably feels that the *Journal* is the only return he gets for his subscription, and imagines that is what his subscription is for.

I believe that, if it were possible for a non-member of the Association to get the *Journal* for a figure representing the cost of production and reasonable profits, the membership of the Association would fall sharply. The subscription to the *Journal* is kept at the same figure as the subscription to the Association, so that doctors who are not paid a full-time salary, and are not liable to income tax on the membership subscription but would be liable to income tax on the *Journal* subscription, can get the *Journal* for not much more than half as much as members as they would do as non-member subscribers. So, whether or not they agree with the policies of the Association, they retain their membership. I maintain that it should be possible to obtain the *Journal* at a figure representing the cost of production plus reasonable profits, without being a member of the Association. At any rate your editorial does not make any reply to Dr. Ackerley's letter. How can you justify the whole-time salaried officer, who is not generally as well paid as doctors who do not come into that category, having to pay, through the peculiarities of the income-tax system, nearly twice as much for Association membership?—I am, etc.,

Andover.

JOHN SLEIGH.

Association Notices

FORMATION OF MIDLANDS BRANCH, SOUTHERN RHODESIA

Notice is hereby given by the Council of the formation of a Midlands Branch in Southern Rhodesia. The area of the Branch will be as follows: districts of Gwelo, Hartley (south of Umsweswe River), Selukwe, Chilimanzi, Gutu, Bikita, Ndanga, Victoria, Chibi, Belingwe, and Nuanetsi.

The areas of the remaining three Branches in Southern Rhodesia will now be as follows:—*Manicaland*: districts of Makoni, Inyanga, Umtali, Melssetter, and Chipinga. *Mashonaland*: districts of Sebungwe, Urungwe, Hartley (north of the Umsweswe River), Lomagundi, Darwin, Mazoe, Salisbury, Marandellas, Charter, Buhera, Mrewa, and Mtoko. *Matabeleland*: districts of Wankie, Shangani, Bubi, Nyamandhlovu, Bulawayo, Bulalima, Mangwe, Matobo, Insiza, and Gwanda.

A. MACRAE,

Secretary.

Diary of Central Meetings

FEBRUARY

- 17 Tues. Organization Committee, 2 p.m.
- 18 Wed. International Conference on Medical Education, Local Arrangements Committee, 11 a.m.
- 18 Wed. Occupational Health Committee, 2 p.m.
- 19 Thurs. G.M.S. Committee, 10.30 a.m.
- 19 Thurs. Joint meeting of representatives of Radiologists Committee and Tuberculosis and Diseases of the Chest Group Committee, 1.45 p.m.
- 19 Thurs. Tuberculosis and Diseases of the Chest Group Committee, 2.30 p.m.
- 20 Fri. Public Health Committee, 2 p.m.
- 24 Tues. Building Committee, 2 p.m.
- 25 Wed. Joint Committee of B.M.A. and British Veterinary Association, 11.30 a.m.
- 25 Wed. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 12 noon.
- 25 Wed. Joint Formulary Committee, 2.30 p.m.
- 27 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.
- 27 Fri. Library Subcommittee, Science Committee, 12 noon.
- 27 Fri. Science Committee, 2 p.m.

- MARCH
- 2 Mon. Armed Forces Committee, 2 p.m.
 - 4 Wed. Private Practice Committee, 11.30 a.m.
 - 4 Wed. Joint Conference, Occupational Health and Public Health Committees, and Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
 - 5 Thurs. Subcommittee on Constitution and Procedure of Medical Service Committees, G.M.S. Committee, 2 p.m.
 - 13 Fri. Consulting Pathologists Group Committee, 2.30 p.m.
 - 18 Wed. Council, 10 a.m.
 - 25 Wed. Joint B.M.A. and T.U.C. Committee, 2.30 p.m.

Branch and Division Meetings to be Held

- CHESTERFIELD DIVISION.**—At Walton Sanatorium, Chesterfield, Friday, February 20, 8.45 p.m., Professor G. L. Roberts: "Recent Advances in Dental Surgery."
- COVENTRY DIVISION.**—At Coventry and Warwickshire Hospital, Tuesday, February 17, 8.30 p.m., clinical meeting. Dr. A. C. Kendall: "The Child with the Chronic Cough."
- DARTFORD DIVISION.**—At Joyce Green Hospital, Dartford, Tuesday, February 17, 8.45 p.m., meeting. Scientific film by Mr. James Robertson: "A Two-Year-Old Goes to Hospital."
- ENFIELD AND POTTERS BAR DIVISION.**—At St. Michael's Hospital, Chase Side Crescent, Enfield, Wednesday, February 18, 8.30 p.m., meeting. Clinical papers, Dr. N. S. Levantine: "A Case of Recurrent Haematemesis"; Dr. J. M. Benjamin: "The Chronic Chest"; Dr. G. G. Doel: "Through a Glass Darkly"; Dr. W. E. Hayes: "What, Again? Curse It!"
- GREENWICH AND DEPTFORD DIVISION.**—At Miller General Hospital, Wednesday, February 18, 8.30 p.m., Mr. John E. Buck: "Some Common Orthopaedic Foot Conditions." Members of the Woolwich Division are invited to attend the meeting.
- LAMBETH AND SOUTHWARK DIVISION.**—At Clinical Lecture Theatre, St. Thomas's Hospital, London, S.E., Tuesday, February 17, 8.30 p.m., clinical meeting.
- NORTH STAFFS DIVISION.**—At North Stafford Hotel, Thursday, February 19, 7 for 7.30 p.m., dinner. Annual lecture by Dr. Frangcon Roberts: "Disease and Civilization."
- OLDHAM DIVISION.**—At Oldham Hotel, Monday, February 16, 9 p.m., meeting. Professor W. I. C. Morris: "Management of Breech Presentations."
- SOUTH SHIELDS DIVISION.**—At Ingham Infirmary, Friday, February 20, clinical meeting. Symposium by Consultant Staff of Ingham Infirmary.
- STIRLING BRANCH.**—At Stirling Royal Infirmary, Thursday, February 19, 8.30 p.m., Mr. William Mair: "Legal Pitfalls of the Doctor in General and Hospital Practice."
- STRATFORD DIVISION.**—At Geriatric Unit, Langthorne Hospital, Leytonstone, E., Thursday, February 19, 2.30 p.m., clinical meeting.
- WEST BROMWICH AND SMETHWICK DIVISION.**—At West Bromwich and District Hospital, Tuesday, February 17, 8.30 p.m., therapy. Dr. G. E. Owen Williams: "Some Practical Aspects of Chemotherapy."
- WEST DENBIGH AND FLINT DIVISION.**—At Marine Hydro Hotel, Rhyl, Friday, February 20, 7.45 p.m., dinner; 9 p.m., B.M.A. Lecture by Professor E. J. Wayne: "Problems of Prescribing in the Light of Recent Advances in Pharmacology."
- WEST SOMERSET DIVISION.**—At Musgrove Park Hospital, Taunton, Thursday, February 19, 8.30 p.m., clinical meeting. B.M.A. Lecture by Dr. Francis Camp: "Death and Injury on the Road." Short supporting addresses by Mr. R. F. Winckworth and Mr. F. W. Snell.
- WEST SUFFOLK DIVISION.**—At Everard's Hotel, Bury St. Edmunds, Tuesday, February 17, 8.30 p.m., A.G.M.

Meetings of Branches and Divisions

UGANDA BRANCH

The annual clinical conference was held in Kampala from December 5 to 7. Over 70 members and visitors attended. Dr. A. B. Raper, president, opened the conference with a historical account of the *East African Medical Journal*. The programme included talks on "Modern Advances in Obstetrics and Gynaecology" (Dame Hilda Lloyd), "Some Aspects of the Portal Ulcer" (Mr. I. W. J. McAdam), "The Problem of Old Age in of Tick-borne Relapsing Fever" (Dr. J. K. Cherry), "Pneumonic Plague in Toro, 1952" (Dr. W. H. Timmis), "Therapeutic Problems in African Tuberculosis" (Dr. P. W. Hutton), and a medical administrative survey of the native population in a small district in the Eastern Province (Dr. A. Kagwa). Dr. R. Y. Dunlop led an open discussion on "Housing and Health in Uganda," and a film on cardiac surgery was introduced by Professor Milnes Walker.

The Uganda Branch is a flourishing and active one. The membership now exceeds 150, out of a total of less than 200 doctors in the Protectorate.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 21 1953

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OCCASIONAL COMMENT

CONSULTANTS' CONTRACTS

A number of uncomplimentary adjectives were used in the Central Consultants and Specialists Committee on February 12 to describe a series of circulars sent out recently from Savile Row to hospital boards without prior consultation with representatives of the profession. There was considerable disquiet as one member of the committee after another alleged that attempts were being made by the boards, stimulated by the "economy" circular, to save money by apparently unreasonable refusals to replace retiring consultants and to arrange additional sessions for increased work. The committee was anxious lest an actual reduction of sessions should be forced on consultants unfairly.

Appeal Procedure

There is of course a measure of protection in paragraph 16 of the Terms of Service. This paragraph states that, where a consultant considers that his appointment is being unfairly terminated by a board, he shall be entitled to send a full statement of the facts to the Minister, who will then obtain the written views of the board and place the case before a professional committee (consisting of representatives of the Ministry and of the profession) for their advice. The interpretation of paragraph 16 has been discussed with the Ministry by the Joint Committee, which has maintained that a consultant who thinks that he is being treated unfairly is entitled to use the appeal machinery, no matter what the circumstances in which the termination of his appointment is proposed. It is generally agreed, however, that changed contracts, by increase or decrease of sessions, may result inevitably from changed circumstances; and that, although a change may be unfortunate for the consultant concerned, what is unfortunate is not necessarily a consequence of any unfairness. In short, paragraph 16 is by no means a complete safeguard against diminution of work or of income. It is merely, in the words of the old Scots proverb, the "wee bush" that is "better than nae bield."

The Association is advised that a revision of a consultant's contract, except by agreement with the consultant concerned, amounts to a termination of the appointment for the purposes of paragraph 16, since it can be effected only by the board giving formal notice of termination of the existing contract and offering a new contract with a changed assessment of time. The appeal procedure was originally provided only for consultants, but is now available also to senior hospital medical officers.

The Whitley Claims

The Staff Side of Committee "C" is preparing with all possible dispatch the detailed case for the arbitration on the remuneration of assistant medical officers in the public health service, and preliminary discussions have taken place with the solicitors and with counsel. The Staff Side of Committee "B" is trying to arrange an early meeting for further discussion of its claim with the Management Side. There will be no avoidable delay on the part of either Staff Side in these important proceedings.

A Point of Ethics

Dr. A's practice falls vacant and is looked after by a neighbour, Dr. B, until the successor, Dr. C, takes it over. Is it right and proper that Dr. B should then accept any patients of the practice who may choose to apply for admission to his list? Certainly there is nothing in the N.H.S. regulations to prevent his doing so. But what is lawful is not necessarily ethical. May not Dr. B, in the circumstances, be much more likely than the other local doctors to attract patients from Dr. C's practice? Is it fair to Dr. C that he should lose patients, possibly in considerable numbers, who might be content to remain with him had they no opportunity of acceptance by Dr. B? On the other hand, is it fair to Dr. B that he alone among the local doctors should be debarred from accepting patients of Dr. C's practice, merely because he has worked for a short time in that practice? Does experience suggest that a restriction of this kind is necessary to prevent serious harm to the interests of Dr. C? Would the restriction, even if operating only for a limited period, be an unjustifiable interference with the freedom both of Dr. B and of the patients concerned? Might it lead to difficulty in finding a local Dr. B willing to hold a practice together during a vacancy? These questions are being discussed in the Central Ethical and General Medical Services Committees, which have not yet arrived at unanimous answers.

Hardship in the Pre-Registration Year

When the financial position of the provisionally registered ex-Service house-officer was discussed in Parliament it was stated that his income would be much the same as the income he had received as a medical student under the Further Education and Training Scheme of the Ministry of Education. Closer examination of the matter suggests that certain relevant considerations may then have been overlooked. Indeed, it now appears that some married ex-Service students, on becoming house-officers, may suffer a reduction of net income sufficient to cause real hardship

The Association, which has been greatly helped by the British Medical Students' Association in its investigation of the position, has sent a comprehensive memorandum to the Government Departments concerned and has asked for an early opportunity of personal discussion of the problem. The memorandum stresses, in particular, the urgent need for measures to assist the newly qualified practitioner who has no income from any source while awaiting an opportunity of taking up an approved pre-registration post.

Finance

The Association's budget for 1953 will be examined by the Finance Committee early next month. Already there seems reason to believe that there will probably be no great difficulty in carrying out the instruction of the Representative Body that not less than one-half of the increase in revenue from membership subscriptions should be used for debt redemption. The estimates for the *British Medical Journal* and the special journals, including *Abstracts of World Medicine*, show that these publications, considered together, have regained a distinctly healthy financial condition, and in other departments substantial economies have been achieved by changes of organization and methods.

Payment of Subscriptions

For most people the first week in January is perhaps not an exceptionally suitable time for the writing of cheques, but it may be that many of those members of the Association who usually wait for the second subscription reminder could conveniently pay a little earlier. If all such would kindly do this, a useful saving would result through reduction of office expenses and overdraft charges.

Members in various subscription categories have drawn attention to what they regard as anomalies in the new rates, and their observations will receive careful study by the Organization Committee.

CONSULTANTS AND SPECIALISTS

MEETING OF CENTRAL COMMITTEE

A meeting of the Central Consultants and Specialists Committee was held at B.M.A. House, London, on February 12. In the absence of Dr. Rowland Hill on account of illness, the chair was taken by Mr. T. HOLMES SELLORS. A message of sympathy was sent to Dr. Hill.

Consultants' Contracts

This matter was discussed in detail, and is referred to in "Occasional Comment" at page 45 of this issue.

Function of Joint Committee

An alteration in the terms of reference of the Joint Committee was reported, and it was recommended that they should read, "To negotiate with the Ministry of Health on all matters concerning consultants and specialists' practice or affecting members of hospital medical staff, other than those within the scope of Committee 'B' of the Medical Whitley Council." The alteration became necessary because negotiations, so far as they concerned remuneration, would be conducted by Committee "B," and not by the Joint Committee.

Remuneration of Hospital Medical Staff

It was reported that discussions were continuing with the Management Side of Committee "B" on the claim by the Staff Side for a review of remuneration of hospital medical staff. Mr. H. H. LANGSTON recalled that when this matter was raised last year there was full agreement on the need for such a review, and was of opinion that the time had

now come when it was important to press for it with the utmost vigour. This view was strongly supported by the Committee.

The Position of Registrars

The problem of the registrar again exercised the Committee. The CHAIRMAN pointed out that this problem was becoming more acute as time went on. Dr. R. M. FORRESTER, on behalf of the registrars' group, said that there must now be well over one hundred senior registrars in their fourth year liable to dismissal. When the senior registrar came to the end of his four years he should be entitled to apply again for his post or a post in the same specialty. One member suggested that a happy solution would be the employment of the registrar as a part-time general-practitioner specialist, with hospital sessions. It was pointed out, however, that the number of suitable vacancies in general practice was very limited, especially in rural areas. Mr. LANGSTON said that no progress in this question would be possible until the complete figures of the number of impending dismissals were in their possession. The CHAIRMAN said that they would press the Ministry very hard for the figures. He understood that the General Medical Services Committee was also giving the matter consideration.

On the question of the falling off in recruitment at registrar level in non-teaching hospitals, one member suggested that, while many holders of registrar posts would not become senior registrars, they would have the opportunity in their posts of obtaining a higher degree in medicine or surgery. On the other hand, Mr. C. E. KINDERSLEY asked what was the advantage of obtaining a higher degree when the individual found that his chances of entering general practice decreased the longer he stayed in his post.

The view was generally accepted by the Committee that practitioners would be encouraged to seek registrar posts in non-teaching hospitals if the teaching hospitals reversed their present policy and indicated that in appointing senior registrars preference would be given to those who had spent some time in a non-teaching hospital. It felt also that the desirability of a further increment of salary for registrars in their second post might be considered.

Retirement Age

From the younger practitioners the Committee turned its attention to the elder and their superannuation. It was pointed out that the older consultants, while they did not qualify for a pension by reason of their age of entry into the National Health Service superannuation scheme, would in the ordinary way have made provision for their retirement. They were, however, suffering an unexpected hardship on account of the rise in the cost of living and the decrease in private practice, which made such provision barely adequate. The only practical suggestion the Executive Committee could make was that hospital boards should be encouraged to utilize the services of retired consultants as locumtenents.

Some discussion ensued on the period of honorary service in hospital before the "appointed day." This, where it occupied more than half the practitioner's time, is recognized for qualification for superannuation. Professor G. I. STRACHAN brought forward a resolution from the Welsh Regional Committee that, in view of the fact that hospital service prior to the "appointed day" counts as a qualifying period for pension, negotiations should be reopened with a view to securing that a portion of those years be accepted as loading for pension rights. It was promised that this matter should be taken up in the proper quarter.

Reference was also made to the retirement of mental health officers. The normal retirement age of these officers is 60, or five years earlier than for hospital medical staff. It was the view of the Committee that a case for special consideration with regard to their pension should be pressed on behalf of the men who had had to retire at 60 instead of 65.

Full-time Salaried Officers

On the question of the claim of full-time salaried officers for direct representation in the Whitley machinery, it was reported that the Joint Committee felt doubtful about the wisdom of giving direct representation to one section of hospital staff, and, moreover, that there were already channels available, through the constituent bodies of the Joint Committee, for the representation of whole-time medical officers. But it had been agreed with the Management Side that a subcommittee of Committee "B" be set up on which whole-time officers would be invited to serve, to reopen discussions on the subject of their special grievances.

What was described by the Chairman as a satisfactory result on the whole concerning the complicated matter of dual appointments had been achieved. A circular issued by the Ministry to regional boards and committees regarding joint use of medical staff by hospital and by local health authorities provided for the appointment of a small joint advisory committee, consisting of representatives of the employing authorities and the British Medical Association, to deal with cases of difficulty.

An anomaly which it was decided to take up arose out of a complaint of an orthopaedic surgeon that he was called in urgently to attend a newly born baby in a private maternity home, but subsequently his claim for a fee under the domiciliary consultation arrangements was refused by the board on the ground that he was not a paediatrician.

Two matters of legal interest occupied the Committee at the end of its proceedings. One was the introduction of a private Member's Bill into Parliament adding a proviso in the form of two sub-clauses to the appropriate section of the Offences against the Person Act, 1861 (which makes it a felony to administer drugs or use instruments to procure abortion). One sub-clause in the proviso reads: "No person shall be found guilty of an offence under this section unless it is proved that the act charged was not done in good faith for the purpose of preserving the life of the mother. . . ." Professor STRACHAN pointed out the complicated wording of this and the other sub-clause with their double negatives, and in the one case the use of the word "person" and in the other, in the same connexion, of the words "registered medical practitioner." Other members thought it desirable that in any such legislative provision there should be set out the necessity for a second opinion. The other matter concerned the case involving the legal liability of a casualty officer (*British Medical Journal*, January 17, p. 166). Dr. COCHRANE SHANKS gave an account of the case and the legal issues involved as seen by the Medical Defence Union. The Committee expressed its concern that a wrong diagnosis might lead to a penalty even when a most careful examination had been carried out.

G.M.S. SUBCOMMITTEE (SCOTLAND)

The General Medical Services Subcommittee (Scotland) has met twice since the last report (*Supplement*, November 15, 1952, p. 195). The following are some of the matters which have been discussed:

Representation on Assistants and Young Practitioners Subcommittee

The Subcommittee is of the opinion that the most suitable method for appointing Scottish representatives to the Assistants and Young Practitioners Subcommittee is through nomination by the Subcommittee from names submitted by local medical committees. The attention of assistants and unestablished practitioners in Scotland has been drawn to the fact that they are represented, and they have been invited to communicate with their representative through the Scottish Office if they have any questions to

raise. Every local medical committee in Scotland has been asked to consider the desirability of co-opting an assistant from among the assistants in the area.

Group Practice

The possible allocation of £100,000 from the Central Pool for the purpose of stimulating group practice has raised the question of what constitutes "group practice." The Subcommittee feels that some clear definition should be arrived at before a satisfactory method can be devised for utilizing any money available for this purpose. This matter is being considered further in an endeavour to arrive at a suitable definition.

Excessive Prescribing

The Subcommittee has been concerned for some time with the question of extravagant and/or excessive prescribing. Some local medical committees have been experiencing difficulty in dealing with cases referred to them for investigation. Representations have been made to the Subcommittee for guidance on the principles to be observed in order that some degree of uniformity may be obtained in deciding whether or not a practitioner's prescribing is excessive or extravagant and also on the amount of the surcharge, if any, to be imposed. The Subcommittee feels that no hard-and-fast rules can be laid down—since the decision as to whether or not excessive or extravagant prescribing has taken place must lie with the local medical committee according to its detailed knowledge of the case. It is hoped, however, that a memorandum on the subject will be issued to local medical committees in the near future.

An exhibition prepared by the Department of Health to illustrate the cost of certain drugs and dressings has been viewed by members of the Subcommittee. The Subcommittee has recommended to the Scottish Committee that this should be shown to general practitioners and consultants through the divisions of the Association.

Initial Practice Allowances

The Scottish Medical Practices Committee has produced a memorandum on the criteria to be adopted in dealing with applications for initial practice allowances. Local medical committees were given an opportunity of commenting upon it. The Subcommittee thinks that, once the new distribution scheme is brought into operation and applications for initial practice allowances are being considered, difficulties which cannot now be foreseen may arise. It has suggested, therefore, that adequate means of consultation between the various bodies concerned—i.e., the Scottish Medical Practices Committee, executive councils, and local medical committees—should be established for the purpose of solving any problems as and when they occur.

Initial Practice Allowance Appeals

The Subcommittee, at an earlier meeting, had decided that an appeal against the decision of an executive council to grant or continue an initial practice allowance to a particular doctor should be determined by the Secretary of State. The Department of Health, however, has been reconsidering the question and has now proposed that appeals should be determined by the Scottish Medical Practices Committee, with two members of the Subcommittee, without voting powers, sitting with it. The Subcommittee decided to agree to the Department's proposal on the understanding that the two observers would be nominated by the Subcommittee as and when required.

The Subcommittee has agreed that the machinery for determining appeals in connexion with notional lists should be the same as that for the hearing of I.P.A. appeals.

Men Returning from National Service

At the Subcommittee's request the Department undertook to examine the possibility of Servicemen's names being left on their doctors' lists during their period of National

Service, but found this to be impracticable in view of the element of inflation which would be involved. The question of automatic reinstatement was also considered by it to be impracticable, having regard to the large number of Servicemen who did not return to their former address. The Subcommittee is not satisfied with the present position and the problem is to be examined further.

The Subcommittee has agreed with the Department that the names of long-stay patients in mental homes (two years or longer) should be removed from doctors' lists. The same change has been agreed to in England.

CENTRAL ETHICAL COMMITTEE

The Central Ethical Committee of the Association met on February 10 with Dr. R. Forbes in the chair. The Committee had a long agenda, which included an inquiry into an ethical complaint. Certain items of the agenda which the Committee did not have time to consider were referred to the Standing Ethical Subcommittee.

Examination of Patients by Psychiatrists without Reference from General Practitioner

The Committee considered the ethical aspects of the principle raised in a letter received from a psychiatrist who sought advice on the problem which arose when patients applied for an appointment but were unwilling to discuss their belief in their need for psychiatric or psycho-analytical treatment with their general practitioner. The Committee reaffirmed the guiding principle that all forms of consultation should be arranged through the patient's own general practitioner.

Indirect Methods of Advertising

The following resolution was adopted by the Representative Body of the Association in June, 1951: "That, while recognizing that public education on selected health matters is eminently desirable, this Meeting is of opinion that a close liaison should be established between the B.M.A. and the B.B.C. to control the selection of subjects and the scope of material presented to the public, and that practitioners approached to appear in such programmes, whether for 'sound' or 'visual' broadcasting, should insist on anonymity as part of the contract."

The Committee has recently reviewed the whole question of indirect advertising in the light of this resolution of the Representative Body and with special attention to the problems of broadcasting and television. The Committee drew up a draft statement on the subject for the consideration of the Council.

Propriety of Accepting Former Hospital Patients

The Committee considered a request for advice from a general practitioner as to the propriety of his accepting on his medical list patients previously seen by him in a hospital where he held an appointment as resident obstetric officer. The practitioner in question still held a part-time appointment as clinical assistant, and had been informed by the chairman of the local medical committee that he should not accept on his list any patients previously seen by him in hospital until a year had elapsed.

The Committee did not make a definite ruling on the matter, but were of the opinion that, if the practitioner in question did accept on his list patients previously seen by him in hospital at the time when he was resident obstetric officer, he might find himself in conflict with his colleagues and perhaps called upon to answer an ethical complaint. The practitioner was advised to follow the advice of a senior colleague in his locality.

Other Business

Matters left over for consideration by the Standing Ethical Subcommittee at its next meeting included a request for advice on the submission of staff medical reports to a borough treasurer, the association of ophthalmic consultants with contact lens centres, the placing of a doorplate on rooms used also for purposes other than a surgery, the Abortion Act, 1952, and other matters.

EXCHANGE VISITS WITH CANADA AND THE U.S.A.

The scheme which was initiated two years ago, with the approval of the Bank of England, for exchange visits between members of the American, British, and Canadian Medical Associations will be continued this year.

Procedure

Three doctors from Britain may visit Canada in exchange for three doctors from Canada, and three doctors from Britain may visit the U.S.A. in exchange for three doctors from the U.S.A. Each doctor from Britain will be required to make all his own travel arrangements and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in Canada or the U.S.A. he will be met by a representative of the Canadian Medical Association or of the Medical Society of the State of New York, who will present him with the equivalent of his deposit in Canadian or U.S. dollars. Similarly, each Canadian or American doctor on arrival in Britain will be met by a representative of the B.M.A., who will present him with the sum deposited in sterling.

Duration of Visit

The duration of the visits is left to the discretion of the doctors concerned. The American, British, and Canadian Medical Associations cannot accept any responsibility for a doctor who allows his visit to outlast the money placed at his disposal.

Applications are invited from members of the B.M.A. to take part in such exchanges during the next financial year—i.e., April 1, 1953, to March 31, 1954. Each applicant must state the object of his visit. Medical practitioners in all branches of the profession, including general practice and public health, are eligible, but it must be noted that this is not a scheme for the exchange of employment. Applicants should also give approximate dates of the visit desired. (Successful applicants will in due course be required to furnish exact dates and details of travel.) Applications must be received by the Secretary of the B.M.A. by March 1, 1953.

ANNUAL MEETING—CARDIFF, JULY 9-17, 1953

HOSTEL ACCOMMODATION

Accommodation is available for 118 guests in double and single rooms in the Aberdare Hall, Cathays Park, Cardiff. This is a well-equipped, modern students' hostel very conveniently situated to the meeting-places. Its amenities include a bar and ample bathrooms. The charge will be 30s. per person per day, which will include full board, but no reduction can be made for meals not taken. Ration books and towels and soap must be brought by guests. Parking space for cars is available near by.

Members wishing to book at this hostel should write direct to Dr. J. D. Williamson, 175, Newport Road, Cardiff, stating any particular requirements.

NEW SALARY SCALES IN NIGERIA

The following improved salaries in the Government Medical Service in Nigeria can now be announced:

Inspector-General of Medical Services: £2,485, plus £350 expatriation pay.

Deputy Inspector-General of Medical Services: £2,000, plus £350 expatriation pay.

Director of Medical Services (Regional): £2,000, plus £350 expatriation pay.

Deputy Director (Regional); Adviser on Rural Health; Leprosy Adviser; Senior Specialist: £1,835, plus £350 expatriation pay.

Assistant Director (Regional); Assistant Director (Laboratory Services); Assistant Inspector-General: £1,780, plus £350 expatriation pay.

Adviser Maternity and Child Welfare; Dermatologist; Senior Malarialogist; Specialist: £1,675, plus £350 expatriation pay.

Senior Health Officer; Senior Leprosy Officer; Senior Medical Officer; Senior Pathologist; Principal, Medical School: £1,610, plus £350 expatriation pay.

Medical Officer; Medical Officer of Health; Medical Research Officer; Pathologist; Sleeping Sickness Medical Officer; Tuberculosis Officer: £770 by £40 to £1,290 by £60 to £1,350 by £40 to £1,470 by £30 to £1,500, plus expatriation pay of £180 on £770 to £350 on £1,500. (Note: non-specialists remain for three years at £1,290.)

Questions Answered

Methods of Assessment

Q.—(a) My earnings, since I was employed first by a hospital and then by the R.A.F., are taxed under Schedule E, but my wife's earnings as a soloist ballet dancer under contract are taxed under Schedule D. Why the difference? And why is she allowed professional expenses which are not specifically stated on her contract as being required, while I am not allowed expenses because they are not specifically stated on my contract? (b) When I leave the R.A.F., and if I do not seek a hospital post but employ myself with locums, etc., can I claim assessment under Schedule D? (c) If so, will tax relief be granted on the yearly depreciation of a new car, plus the interest payable on a hire-purchase contract?

A.—(a) The correct basis of assessment of the husband is undoubtedly Schedule E; that Schedule may also be appropriate in the case of the wife, but it is believed that unless engagements in the particular profession concerned are for unusually long periods the liability is dealt with under Schedule D. There is normally a difference in the matter of expenses—possibly only one of degree, but nevertheless a substantial difference. (b) If the work undertaken as a locumtenent involves comparatively short periods and frequent changes, the Revenue authorities usually regard the earnings as falling for assessment under Schedule D. If in fact an employer has deducted tax under the P.A.Y.E. system, this does not prevent assessment under Schedule D; the liability on the total earnings is calculated and the tax paid by deduction set off against the amount so calculated. (c) In those circumstances the total expenses incurred in the carrying on of the profession as a locumtenent can be deducted, including the annual allowance of 25% of the cost of the car and the interest on the hire-purchase contract, but subject to an appropriate restriction for private use of the car. The annual depreciation allowance is due on the full cost of the car less the aggregate amount of the hire-purchase interest.

Correspondence

Colonial Medical Service

SIR.—The progress report on the Colonial Medical Service (*Supplement*, January 31, p. 31) is unnecessarily mild in its reference to Cyprus, where representations by the Association have received cavalier treatment by the Government, which also has refused to recognize the local Branch as a body suitable to negotiate on medical matters. It is now over two years since the Association first broached the question of salaries and conditions in the Cyprus Medical Service. Detailed proposals were submitted, but remained unanswered for almost a year, when it was learned that, without consultation with the medical profession either locally or in London, the Cyprus Government had introduced a new and inadequate salary scale in spite of the fact that boom conditions prevail in the Colony. Another unsatisfactory feature of the Colony's medical service is that the terms of service for individual specialists are far from uniform, some enjoying much more favourable conditions than others. The Association has made every effort to bring about improvements, but has encountered an uncooperative spirit at every stage. It is difficult to believe, but it is a fact that the Chairman of the Representative Body, on his recent visit to Cyprus, was unable to obtain an interview with the Governor or the Colonial Secretary.

However, Sir, the prime object of this letter is not to expose the sins of the Cyprus Government but plainly to set out the broad lines of the Association's policy concerning the vexed question of private practice by medical officers of the Colonial Medical Service. Generally speaking, the Association is against private practice by medical officers (exceptions would be where Colonies are too small or too badly off to pay adequate salaries) except those in districts where no other medical help is available and the medical officer is compelled for humanitarian reasons to attend individuals who would normally consult private medical practitioners. In such cases the medical officer should be allowed to retain the fees. The Association is also against the charging of fees to patients in Government hospitals except to those accommodated in annexes or wards specially set aside for the reception of paying patients: such fees should also be retained by the officer concerned, as should fees for consultations asked for by another medical man. The Association is opposed to the "farming out" in any shape of medical officers or the use of their services for revenue purposes.—I am, etc.,

JOHN L. GILKS,
Chairman,
Overseas Committee.

Petersfield.

Whole-time Consultants and Domiciliary Visits

SIR.—Now that the question of the betterment factor as applied to the salaries of full-time consultants is under consideration, it would be appropriate also to reconsider the question of non-payment to full-time consultants for domiciliary visits. If ever an iniquitous decision was agreed to by our representatives, this was one. The British Medical Association, through its *Journal*, is adept at assuring us that full-time consultants' interests are very much to the fore, and that, though there are few, if any, full-timers on various negotiating committees, their interests are adequately looked after by their part-time colleagues. This simply is not so, and the inept handling of the domiciliary-visit question is an example. Domiciliary visits by full-time consultants should be paid for, and I sincerely hope the present opportunity will be taken to reconsider the matter.

At the same time I would like to add my name to the ever-lengthening list of those who consider that the present representation of full-time consultants on negotiating committees is inadequate. There are many of us, and we control many beds throughout the service. It is high time our voices were heard in committee, along with those of our part-time friends and colleagues.—I am, etc.,

Barnet.

G. RIDDELL ROYSTON.

Betterment for Consultants

SIR,—In view of the vital importance of the discussions which are at the moment taking place between the management and staff sides of the Whitley Committee for consultants, it was felt it would be of value to stress that the consultants in the western area of the region administered by the South-west Metropolitan Regional Hospital Board are solidly united in support of a firm line being taken by our negotiators in the Whitley Committee and the Joint Committee. At a recent meeting of the South-west Metropolitan (Western Area) Regional Consultants and Specialists Committee, fully representative of all the consultants in the area, the following resolution was passed:

The South-west Metropolitan (Western Area) Regional Consultants and Specialists Committee urges the Joint Committee to press for full and retrospective implementation of the Spens Report as regards salaries of hospital medical staff, and only to accept a betterment factor which is comparable to that recently decided by arbitration as applicable to general-practitioner remuneration.

This resolution was passed unanimously at a meeting attended by 25 consultants, representing medical advisory committees throughout the area.—I am, etc.,

H. H. LANGSTON,
Hon. Secretary, South-west Metropolitan
(Western Area) Regional Consultants
and Specialists Committee.

Winchester.

New B.M.A. Subscription Rates

SIR,—The new subscription rates were presumably determined with the object of spreading the necessary increase as fairly as possible. As Dr. James Ackerley (*Supplement*, January 31, p. 33) points out, however, the real cost of membership depends both on the rate paid and whether or not the subscription is allowed as a deduction for income-tax purposes. It is highly undesirable that anomalies should occur which might discourage membership in any branch of the profession, and the question raised by this letter certainly requires careful consideration. It was therefore somewhat surprising to find that although the letter was referred to in a leading article (*Journal*, January 31, p. 262) the point of the letter was completely ignored.—I am, etc.,

Tonbridge.

J. W. CRAWFORD.

SIR,—I read with interest Dr. James Ackerley's letter concerning the new B.M.A. subscription rates (*Supplement*, January 31, p. 33) and the leading article (*Journal*, January 31, p. 262).

I cannot find any suggestion in Dr. Ackerley's letter that the new rates are unreasonable, but he did say that the whole-time doctor had to pay more than a just proportion, and with this I most heartily agree. The B.M.A. is rightly concerned to maintain its finances in a sound state, and if the subscription must be increased no exception can be taken. The B.M.A. also realizes that the contributions of its members should bear a relation to their earnings and conditions of work, and this is done by a graduated subscription rate.

The fact remains that, where two doctors receive approximately the same earnings and one is whole-time and one part-time, the former may have to contribute almost double the subscription of the latter, since a whole-time doctor can claim no tax relief on his subscription. This matter, which was the main theme of Dr. Ackerley's letter, receives no comment in your leading article. I cannot believe that the B.M.A. is not aware of the strong feeling amongst whole-time doctors that they receive less than justice at the hands of many official bodies, and I am confident that the B.M.A. would not wish to perpetuate this inequality. The case for allowing salaried doctors to pay a reduced subscription rate seems a strong one.—I am, etc.,

Birmingham.

IAN S. BUCHANAN.

SIR,—The first two sentences in your leading article (January 31, p. 262) are the ones which show grave misconception. Nowhere in Dr. James Ackerley's letter (*Supple-*

ment, January 31, p. 33), to which you refer, is there any mention of the fact that six guineas is a large subscription. The point which appears obvious from the letter is that the only persons paying the full six guineas annual subscription are full-time medical officers of health with salaries from £1,500 per annum. I do not think that this leading article is fair comment on the letter in question, and is merely a reiteration of the report of the Finance Inquiry Committee to the Annual Representative Meeting in 1952 (*Supplement*, July 12, p. 26), when it was decided to raise the annual subscription.—I am, etc.,

Bedlington.

ALEXANDER DONALDSON.

Plight of Provincial Ophthalmic Surgeons

SIR,—The general practitioners have now received the Dankwerts award, and I believe that negotiations are in progress (or about to be) with regard to the consultants. I feel that the provincial consultants, and particularly so the provincial ophthalmic surgeons, have some very just grievances under the Health Service. Unlike the general practitioners, they have no compensation for their practices, which were a very valuable and saleable capital asset. Owing to the lack of preparation of the Health Service, the permanent eye service was not established at the beginning. Under the supplementary service, which was supposed to be a temporary expedient, the patients are able to go to the ophthalmic surgeon's private consulting-rooms, if he were an established ophthalmic surgeon, for one-third of the pre-war private fee, as a State patient. In these circumstances, it has been impossible for ophthalmic surgeons to retain their private practices, as the spectacles were supplied free to the State patient, whilst the private one had to pay for them. Whilst the general practitioner is assessed for pension on the number of State patients on his list, no pension is payable for these supplementary cases which the ophthalmic surgeon sees under the supplementary scheme. The ophthalmic surgeon, having lost his capital asset, can therefore only look forward to a pension on his hospital clinics, which, for a man in the fifties when the Service started, can only amount to £200 or £300 a year when he attains the age of 65.

I would suggest, therefore, that the provincial consultant should (a) be compensated for the loss of his practice in the same way as the general practitioner has been; (b) that the pension for his hospital clinics should be dated from the first time that he held any official post in a hospital; and (c) that ophthalmic surgeons should receive a pension based on the number of State patients seen under the supplementary scheme in their own consulting-rooms to compensate them for the loss of their private practices.

It is a regrettable fact that the supplementary service has practically put an end to private ophthalmic practice, with the result that a considerable number of ophthalmic surgeons are working in dispensing opticians' shops instead of in their private consulting-rooms. Stern necessity has driven these ophthalmic surgeons to seek free professional accommodation and free clerical assistance owing to the small fee paid for refractions by the State. This is a most unfortunate and retrograde step.—I am, etc.,

Camberley, Surrey.

LESLIE HARTLEY.

Payment of Compensation on Taking a Partner

SIR,—It is surprising that the Ministry cannot be persuaded to take a more realistic attitude towards part payment of compensation in respect of partnerships formed after the inception of the Act. The official attitude appears to be that, unless financial hardship can be proved by existing debt, no valid reason exists. This may seem to be justifiable on paper, but in actual fact is far from the case.

My own experience must be similar to that of many other practitioners. In 1949 I entered into a partnership on a 50/50 basis, and, as it was illegal to sell the whole or a part

of a practice, I had in fact given away half of my anticipated income without immediate capital gain. As I had only recently purchased the goodwill and premises in 1947, it appeared reasonable to expect some financial compensation in respect of the loss of right to sell a share to an incoming partner. All attempts to recover any financial compensation have failed because I am unable to demonstrate any debts in respect of the purchase of the practice, which was purchased out of my own capital. It would appear that this comes very close to denying, on grounds which do not appear to be related, an elementary right of the Act—that is, the payment of compensation for the right to sell goodwill.

I submit that the giving away of half of one's income is equivalent to part retirement, and, as such, qualifies for compensation equal to half of the agreed figure with the Ministry without further financial investigation, if we are not to be denied an agreed principle. I was not forced into a partnership because I had a list too large for one man theoretically to handle but because I felt that the increased work and demands on one's patience did not allow sufficient time to do adequate justice to the really ill patients. I was fortunate in meeting a practitioner who shared my views, but I suggest that my appeal for part payment of compensation should have been met.—I am, etc.,

Shipley.

J. A. FRAIS.

Medical Reports

SIR,—The following anomalies exist in fees for medical reports. A solicitor pays a fee of two guineas for a report on a patient. For a similar report, but on its own form, an insurance company, by recent arrangement with the British Medical Association, pays a fee of 15s. For the same report the Ministry of Pensions pays 5s. Leaving out the solicitor's fee, which may entail a full examination of the patient, I think that the Ministry of Pensions fee should be brought into line with the insurance companies. I continue to send these reports to the Ministry of Pensions, as I feel that it might be detrimental to my patients to refuse to do so.—I am, etc.,

Boreham Wood.

A. DE COURCY-WHEELER.

Radiology on Points

SIR,—I am relieved to note (*Supplement*, January 31, p. 33) that the Faculty of Radiologists has now placed the above-mentioned subject in its correct perspective, and before the correspondence closes I hope I may be permitted to amplify the second paragraph of the Faculty's letter.

In 1951 the Radiologists Group Committee of the B.M.A., at the suggestion of the Medical Committee of the B.I.R., drew up independently a unit scheme. When details of the Nuffield scheme were received the two were found to be so remarkably similar that it was decided to use the Nuffield scheme with a few small modifications which were accepted by the Trust, and those facts were reported and discussed at the annual conference of the Radiologists Group of the Association in 1951 and again in 1952. In the circumstances, and particularly in view of your leading article (January 10, p. 86), I suggest that the following points should be made clear: (1) A number of radiologists themselves asked that a standard system of record-keeping in x-ray departments should be devised, in view of the widely different systems in use throughout the service and the desirability that any uniform system of presenting the data required monthly by the Ministry should be one acceptable to radiologists. (2) The radiologists who collaborated in this matter were given to understand that the system would be tried out in the first place as an experiment for at least one year, and that no step would be taken to introduce it officially until all those concerned in its production and trial had had an opportunity to discuss it in its final state.—I am, etc.,

Worthing.

R. BOULTON MYLES,
Chairman,
Radiologists Group Committee.

H.M. Forces Appointments**ARMY**

Colonel G. Anderton, O.B.E., late R.A.M.C., has retired on retired pay.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel A. J. N. Warrack, M.B.E., has retired with a gratuity.

Majors P. D. Stewart, E. D. H. Williams, S. O. Bramwell, M.B.E., and T. A. Pace, O.B.E., to be Lieutenant-Colonels.

Major E. L. Moore, M.C., has retired with a gratuity, and has been granted the honorary rank of Lieutenant-Colonel.

Major I. W. Caldwell has retired with a gratuity.

Short Service Commissions.—Major L. C. F. Chevens has retired with a gratuity, and has been granted the honorary rank of Lieutenant-Colonel. Major A. H. L. Wilson has retired, having received a gratuity. Captains H. T. Jones and P. A. Trafford have retired with gratuities, and have been granted the honorary rank of Major. Captain K. L. Prendergast to be Major.

REGULAR ARMY RESERVE OF OFFICERS**ROYAL ARMY MEDICAL CORPS**

Major D. P. Kearns has ceased to belong to the Reserve of Officers.

ARMY EMERGENCY RESERVE OF OFFICERS**ROYAL ARMY MEDICAL CORPS**

Major (Honorary Lieutenant-Colonel) A. D. Davidson, from T.A.R.O., to be Major, and has been granted the acting rank of Lieutenant-Colonel.

Majors (Honorary Lieutenant-Colonels) G. F. Edwards and M. Kingsley, from R.A.R.O., to be Majors, and have been granted the acting rank of Lieutenant-Colonel.

Major A. McC. Campbell, D.S.O., O.B.E., T.D., has been granted the acting rank of Lieutenant-Colonel.

Captain A. Murphy has been granted the acting rank of Major.

TERRITORIAL ARMY**ROYAL ARMY MEDICAL CORPS**

Major J. D. Finnegan has been granted the acting rank of Lieutenant-Colonel.

Major L. C. Lade has resigned his commission. Captain (Acting Major) G. Gregg has been granted the acting rank of Lieutenant-Colonel.

Captain D. S. Orr to be Major.

Captains K. Greig and W. Brodie have been granted the acting rank of Major.

Captain S. A. Jenkins (now T.A.R.O.), to be Major.

REGULAR ARMY: EMERGENCY COMMISSIONS**ROYAL ARMY MEDICAL CORPS**

Lieutenant (War Substantive Captain) G. Blaine has relinquished his commission, and has been granted the honorary rank of Major.

ROYAL AIR FORCE

Flight Lieutenant S. Gillis has relinquished his temporary commission, retaining the rank of Squadron Leader.

Flight Lieutenant J. C. Rushton has reverted to the Reserve, retaining the rank of Squadron Leader.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: C. W. Davies, M.R.C.S., L.R.C.P., D.P.H., Assistant Director of Medical Services, Tanganyika; B. J. Green, M.B., Ch.B., D.T.M.&H., and D. W. McLaren, M.B., Ch.B., D.T.M., Senior Medical Officers, Nigeria; L. R. Boulger, M.B., Ch.B., Pathologist, Nigeria; E. Rombejko, Med.Dip.M.(Warsaw), Medical Officer, St. Helena; A. A. Akiwumi, M.B., Ch.B., and E. Trinick, M.B., Ch.B., Medical Officers, Gold Coast; K. M. Gottlieb, M.B., Ch.B., Schools Medical Officer, Northern Rhodesia; J. M. H. R. Hardy, L.R.C.P.&S.Ed., Police Medical Officer, Mauritius; D. D. Hilton, M.B., Ch.B., Temporary Medical Officer, Nigeria; A. E. Ward, M.B., Ch.B., District Medical Officer, Windward Islands; S. E. Onwu, M.B., Ch.B., D.T.M.&H., Deputy Director of Medical Services, Eastern Region, Nigeria; G. C. Dansey-Browning, M.R.C.S., L.R.C.P., D.O.M.S., Ophthalmic Specialist, Hong Kong; P. W. Kent, O.B.E., M.B., B.Ch., D.P.H., D.T.M.&H., Special Grade Medical Officer, Kenya; V. O. G. Smyth, M.R.C.S., L.R.C.P., Medical Officer (Alienist), Federation of Malaya; H. I. Williams, M.B., B.Ch., Bacteriologist, Federation of Malaya; L. E. Dasent, M.B., B.Ch., Medical Officer Grade C (late Student), Trinidad; P. R. Das Gupta, M.B., F.R.C.S., Medical Officer (E.N.T.), British Guiana.

Association Notices

SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

An Ernest Hart Memorial Scholarship, of the value of £250.
A Walter Dixon Scholarship, of the value of £250.
One or more research scholarships, each of the value of £200.

These scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

In addition, applications are invited for the award of the following research scholarship:

The Insole Scholarship, of the value of £250, for research into the causes and cure of venereal disease.

Each scholarship is tenable for one year, commencing on October 1, 1953. A scholar may be reappointed for not more than two additional terms. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships must be made not later than March 31, 1953, on the prescribed form, a copy of which will be supplied on application to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

Diary of Central Meetings

FEBRUARY

- 24 Tues. Building Committee, 2 p.m.
- 25 Wed. Joint Committee of B.M.A. and British Veterinary Association, 11.30 a.m.
- 25 Wed. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 12 noon.
- 25 Wed. Joint Formulary Committee, 2.30 p.m.
- 25 Wed. Joint Conference of Science Committee, Royal College of Nursing, and Pharmaceutical Society, 4 p.m.
- 26 Thurs. Standing Subcommittee, Central Ethical Committee, 12 noon.
- 27 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.
- 27 Fri. Library Subcommittee, Science Committee, 12 noon.
- 27 Fri. Science Committee, 2 p.m.

MARCH

- 2 Mon. Joint Committee of Psychological Medicine Group and R.M.P.A., 11 a.m.
- 2 Mon. Armed Forces Committee, 2 p.m.
- 4 Wed. Private Practice Committee, 11.30 a.m.
- 4 Wed. Joint Conference, Occupational Health and Public Health Committees, and Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
- 5 Thurs. Subcommittee on Constitution and Procedure of Medical Service Committees, G.M.S. Committee, 2 p.m.
- 11 Wed. General Practice Review Committee (adjourned meeting), 11 a.m.
- 13 Fri. Consulting Pathologists Group Committee, 2.30 p.m.
- 18 Wed. Council, 10 a.m.
- 25 Wed. Joint B.M.A. and T.U.C. Committee, 2.30 p.m.

Branch and Division Meetings to be Held

Bournemouth Division.—At Royal Victoria Hospital, Bournemouth, Friday, February 27, 8.15 p.m., meeting. Film: "The Science and Art of Obstetrics—Normal Labour."

Bromley Division.—At Royal Bell Hotel, Bromley, Tuesday, February 24, 8.20 p.m., meeting. Short papers by Dr. E. C. Warner and Dr. A. C. E. Breach: "The Training of the General Practitioner." General discussion to be opened by Dr. A. Talbot Rogers.

Burnley Division.—At Sparrow Hawk Hotel, Burnley, Friday, February 27, 8.30 p.m., annual general meeting.

City Division.—At Royal National Throat, Nose, and Ear Hospital, Gray's Inn Road, London, W.C., Tuesday, February 24, 8 p.m., clinical evening arranged by Mr. C. Gill-Carey.

Finchley Division.—At Finchley Memorial Hospital, London, N., Friday, February 27, 8.45 p.m., meeting. Dr. Michael Kremer: "Pain in the Upper Limb."

Lewisham Division.—At Lewisham Hospital, S.E., Friday, February 27, 8.30 p.m., meeting. Lecture by Dr. Murdoch MacGregor.

Monmouthshire Division.—At St. Mellons County Club, Thursday, February 26, 7.45 p.m. for 8.15 p.m., dinner. Annual B.M.A. Lecture by Mr. A. Dickson Wright: "The Surgery of Hypertension." Members' wives are also invited.

North Bedfordshire Division.—At South Wing, Bedford General Hospital, Thursday, February 26, 8 p.m., meeting. Dr. J. A. Gorsky: "Alcohol and the Motorist."

North-East Suffolk Division.—At Lowestoft and North Suffolk Hospital, Sunday, February 22, 3 p.m., meeting. Sound films: "Some Aspects of Accessible Cancers."

Oxford Division.—At Maternity Department Lecture Theatre, Radcliffe Infirmary, Oxford, Wednesday, February 25, 8.15 p.m., meeting. Address by Mr. J. A. Stallworthy on his recent visit to Australia and New Zealand.

South Bedfordshire Division.—At Luton and Dunstable Hospital, Thursday, February 26, 9 p.m., meeting. Dr. W. S. C. Copeman: "Rheumatoid Arthritis."

Tyneside Division.—At North Eastern Hotel, Nile Street, North Shields, Tuesday, February 24, 8 p.m., A.G.M.

Warrington Division.—At Warrington Infirmary, Friday, February 27, 8.15 p.m., clinical meeting. Dr. F. H. Brisby: "Crimes and Criminals."

Wembley Division.—At Wembley Hospital, Tuesday, February 24, 9 p.m., meeting. Discussion to be introduced by Dr. H. M. Harris: "The Changing Pattern of Medical Practice." All medical practitioners in the area of the Division are invited.

Woolwich Division.—At St. Nicholas' Hospital, Plumstead, S.E., Tuesday, February 24, 8 p.m., clinical meeting. Members of the Greenwich and Deptford Division are invited.

Meetings of Branches and Divisions

DORSET DIVISION

A meeting was held at the Kings Arms Hotel, Dorchester, on November 7. With Dr. H. G. Harvey in the chair, there were 28 members present. A presentation was made to Dr. E. H. Parkinson in recognition of his work as honorary secretary. The meeting closed with a talk by Dr. A. N. Blades on "Iron Metabolism."

HONG KONG BRANCH

The annual general meeting was held on October 20, 1952, at Hong Kong University Alumni Association premises. With Dr. T. J. Hua in the chair, there were 25 members present. The following officers were elected for 1952-3:

President.—Dr. John Gray.
Secretary.—Dr. A. H. R. Coombes.
Treasurer.—Dr. I. Bergius.

SOUTHAMPTON DIVISION

A ladies' night was held at the Civic Centre, Southampton, on January 21. About 130 members and guests listened to an interesting and amusing lecture by Professor W. T. Williams on "Some of the Medical Problems of Sherlock Holmes."

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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THE CONSTITUTION OF THE B.M.A.

I.—THE LOCAL UNIT

The Annual Representative Meeting to be held at Cardiff in 1953 will be the jubilee meeting of the Representative Body, which first met at Swansea in 1903 under the chairmanship of Sir Victor Horsley. It seems fitting, therefore, in a short series of articles, to describe the history and character of the constitution of the Association—the local unit, the representative structure, the executive council, and the principal committees.

The British Medical Association had its origin at Worcester—in the board-room of the Worcester Infirmary in 1832. There is more significance in this than usually attaches to the choice of locality for a meeting to inaugurate a new movement. The B.M.A. was primarily an organization centred on Worcester, or on the Midlands, and for many years it remained provincial. Its founder and the chairman of its council for more than 30 years, Sir Charles Hastings, was a Worcester man; its two secretaries were resident in Worcester, as were many members of its early councils. In the days when the Association was founded railways were still in their early stages of development, and from most places in England it took as long to get to Worcester as it had done in the time when Charles II was brought to bay by Oliver Cromwell at the gates of the city. The remarkable thing is that the Association should have spread so rapidly to every part of the provinces. Within 10 years its annual meetings were held at places as distant as Manchester, Southampton, and York, and its early council included members from Swansea, Norwich, Exeter, and Sunderland. Even the border was being penetrated at Berwick-on-Tweed.

Beginning in the Provinces

It is important to remember that it was a provincial organization. This fact was conveyed by its title—the Provincial Medical and Surgical Association—for the first 23 years of its history. It was provincial, not by accident, but in intention, designed to counterbalance the concentration of medical authority in London, to sustain the tone of provincial practice, to unite all classes of the profession outside the metropolis, and to ensure that the very considerable status and ability of physicians and surgeons in the provincial hospitals did not go unrecognized. Its provincial character attracted some gibes from the *Lancet* of the period—"a provincial council in the far-off city of Worcester," and again, in view of the fact that

the Association met only once a year and in a different place each time, "a migratory provincial medical club."

Moreover, the Association, to begin with, was mainly a scientific body. In the prospectus setting out its objects only one of the five clauses concerned the "maintenance of the honour and respectability of the profession"; the others had to do with scientific activities. Neither in Hastings's foundation address nor in the official programme of the first meeting was there any reference to medico-political matters. The Association came into medical politics tardily and under the compulsion of events.

As a curious footnote to this history it may be said that there was actually a British Medical Association 20 years before the Provincial Medical and Surgical Association adopted the title and made the initials "B.M.A." universally familiar. This earlier association was founded in London in 1836 and survived for about 10 years. It seems to have had a precarious existence. On one occasion it is reported that the association "met in the person of Dr. George Webster" (its president), "that the secretary was absent, and that the resolutions were moved, seconded, put to the meeting, and carried by the president."

The Creation of Branches

The growth of the Association in the provinces proceeded by the creation of branches. In some cases local societies already existing converted themselves into branches of the Association. This was the case with the first branch to be formed—the East Anglian—which arose out of the Eastern Medical and Surgical Association at Bury St. Edmunds in 1835. A branch at Bath was founded in the following year, and a year later the Lancashire and Cheshire Branch was formed out of the Newton Medical and Surgical Association, Newton being a town half-way between Liverpool and Manchester. Within 10 years eight branches had been formed; within 20 years there were 14, and by the time the Association reached its jubilee in 1882 there were 25, including the first overseas branch (Jamaica). London, or the metropolitan counties, a territory which the Association had hitherto skirted, became a branch in 1853, by which time the Association was ready to drop the name "provincial." Rather oddly there was not for 50 years a branch at Worcester, probably because Sir Charles Hastings had thought of his town as the Association headquarters. At the present time the Association has over 50 branches in the United Kingdom and nearly as many overseas.

Quite early in the Association's history the principles to be followed in its management exercised many minds. There

were those who wanted the representative principle more fully applied than was possible in the patchwork arrangement by which the Association had developed. They felt probably that a good constitution was infinitely better than the best despotism. In its early period the Association was really governed by the members who happened to live in or near Worcester. Arrangements which were adequate for a local society no longer availed for a national organization. The annual meeting was the body of ultimate decision, but it had no representative status and was attended by relatively few of the members, who in the middle of the nineteenth century numbered 1,800. A code of laws had been set up requiring that the council should be elected by the branches, one member for every 20 branch members, resulting in a wholly unwieldy body. In 1873 a committee was set up to prepare a memorandum and articles which turned the Association into a limited liability company, with the members of council as directors. The Association was placed under the control of a general meeting to be held in a different part of the country every year, but the quorum was to be only 25.

Search for a Democratic Basis

It became more and more evident that such constitution as there was was not suited to the new democratic age which was already dawning not only in national government but in the government of the professions. A constitutional committee accordingly was set up and submitted a report which was, in the manner of such reports, referred by the council to the branches and then to a reformed constitution committee for reference to the council again. This delayed matters for some time, and the spell of old custom and tradition was at length broken—as it has been in so many other cases—by the emergence of a “ginger group” and the threat of the establishment of a new body. The ginger group was the Medical Guild of Manchester, which in 1899 called a conference of delegates from societies of general practitioners—not necessarily branches of the Association—from all over the country. The Guild itself was one of a number of local medical societies which sprang up towards the end of the nineteenth century, not, like the earlier local or regional associations, with mainly scientific objects, but for the frank discussion of medico-political matters, which were becoming more and more important with the growth of public responsibilities for the profession. For a time there was a danger of a rival organization to the B.M.A., which would voice more emphatically the views of the profession in relation to medical reform, the Poor Law, public health and State medicine, contract practice, and other subjects.

At a conference summoned on the Manchester initiative delegates from 54 bodies assembled, including seven branches of the Association itself, Sir Victor Horsley taking the chair, with Dr. (afterwards Sir) Smith Whitaker, presently to be medical secretary of the Association, at his right hand. A resolution was brought forward that local associations should elect delegates to meet annually at a conference at which only medico-political and ethical aspects of the doctor's work would be discussed, and at which a central executive committee would be set up, one-third of whose members would retire annually.

The case for a separate body from the Association on the one hand, and on the other for the reform of the Association, was effectively argued, and the decision was in favour of a reformed Association. It was felt that the multiplication of associations was to be deprecated, and it was also generally agreed that the British Medical Association, by now a body of established position, was the most suitable organization for the purpose. It was resolved accordingly that all efforts should be directed to the conversion of the B.M.A. into an energetic body really representative of the profession.

Attempts at reform along these lines had to meet a number of obstacles, the importance of which it is not always easy to understand in retrospect. But at the annual meet-

ing at Ipswich in 1900 a committee of 24 was appointed, half elected at that meeting, and the other half to be appointed by the Council, to report on the best means of meeting the situation. Sir Edmund Owen, one of the small group of London surgeons who took an interest in the affairs of the Association from the 'eighties onwards, and afterwards became chairman of its Council, presided over the committee.

The Division

The first thing which exercised the minds of the Association was the primary unit of the Association. The branches at this period numbered about 80 in this country, but they were not of suitable size and shape in most cases for the real work of the Association. Many of them were too large. For example, one branch comprised Lancashire and Cheshire; another the counties of Kent, Surrey, and Sussex; a third the several counties of eastern England, from Lincolnshire to Essex. Thus it was impossible for members to attend branch meetings regularly, and, moreover, the larger the area the more difficult it was to secure useful discussion on matters of local interest, and the more the discussions tended to be scientific in character.

It was agreed, therefore, that the primary unit should be of such a size that a member would have a reasonable opportunity of attending every meeting. The name “divisions” was given to these primary units, which were grouped within the area of branches. There are, for example, 26 divisions in the Metropolitan Counties Branch, 12 in the North of England Branch, 8 in the Midland Branch. On the other hand, some branches, like East Yorkshire, Leicestershire and Rutland, and, in Scotland, Perth and Fife and Stirling, are not divided. The divisions may comprise a large city like Birmingham, or a town of fair size like Grimsby, or a small county like Buckinghamshire, or a part of a county like South-east Essex. The branches still retain some functions, including the election to the Association of members resident in their areas, the ordination of the divisions, and the allocation of divisional grants. But every member of the Association is deemed to be a member of the division in which he lives, and every member of a division is a member of the Association. There are now about 220 divisions in Great Britain, not including a few branches which, being undivided, are themselves in effect divisions. The Association is thus practically a federation of divisions, each division having its own area, local administration, and rules, subject only to such limitations as are deemed needful for the co-operation of all.

Next Article: The Representative Body.

MEDICAL PRACTICES COMMITTEE

AMENDMENT OF CLASSIFICATION OF AREAS

The following amendments to the classification of areas have been issued by the Medical Practices Committee:

ENGLAND: COUNTIES

Bedfordshire.—Harrold, Sharnbrook, Riseley and Turvey, Intermediate from Restricted.

Cheshire.—Hollingworth and Mottram (sub-area of Hyde, Dukinfield and Stalybridge), Restricted from Intermediate.

Essex.—Urban District of Clacton-on-Sea, Intermediate from *Designated; Harlow New Town Development Area, Designated (rest of Epping Rural District to remain Restricted).

Gloucester County and City.—Filton, Little Stoke and Stoke Gifford, Intermediate from *Designated.

Hertfordshire.—Borough of St. Albans, Intermediate from *Designated; Urban District of Letchworth, Intermediate from *Designated.

Huntingdonshire.—Alconbury Weston, Restricted from Intermediate.

Kent and Canterbury.—Rural District of Dartford, Intermediate from *Designated; Rural Districts of Sevenoaks (except Otford

*Areas where the position is finely balanced and the admission of one or two doctors may result in reclassification.

and Shoreham) and of Swale, Restricted from Intermediate; Urban District of Tonbridge, Intermediate from *Designated.

Lancashire.—Accrington, Colne, Heywood District, Walton-le-Dale, Intermediate from *Designated.

Lincolnshire (Holland).—Boston Municipal Borough and Rural District, East Elloe Rural District, Spalding Urban and Rural Districts, Intermediate from *Designated.

Lincolnshire (Lindsey).—Brigg Area (Barton-on-Humber Urban District), *Designated from Intermediate; Caistor Area (Caistor Rural District), Restricted from Intermediate.

Middlesex.—Boroughs of Hornsey and Wood Green and Urban Districts of Enfield and Harrow have been subdivided and classified as follows. The numerals I, II, or III denote whether the district is designated Doubtful, Intermediate, or Restricted. I: Borough of Hornsey (*South Haringey Ward only); Borough of Wood Green (Noel Park and *Town Hall Wards only); Urban District of Enfield (all wards except Cambridge Road, Green Street, and Town Wards); Urban District of Harrow (*Harrow Weald, *Queensbury, *Roxeth and *Wealdstone North Wards only). II: Borough of Hornsey (Central Crouch End, Finsbury Park, North Haringey, and Stroud Green Wards only); Borough of Wood Green (Alexandra—Bowes Ward only); Urban District of Enfield (Cambridge Road, Green Street, and Town Wards only); Urban District of Harrow (Belmont, Headstone, Kenton, Harrow-on-the-Hill, Pinner North and Hatch End, Pinner South, Stanmore North, and South and West Harrow Wards only). III: Borough of Hornsey (Highgate and Muswell Hill Wards only); Urban District of Harrow (Wealdstone South Ward only).

Northumberland.—Rural District of Glendale, Restricted from Intermediate.

Nottingham County and City.—Carlton-in-Lindrick, Kimberley, Intermediate from *Designated.

Salop.—Shifnal, Intermediate from *Designated.

Somerset.—Rural District of Wellington, Intermediate from Restricted.

Staffordshire.—Urban Districts of Aldridge, Coseley, Stone, Intermediate from *Designated; Urban District of Wednesfield, *Designated from Intermediate.

Suffolk West.—Rural District of Mildenhall, Intermediate from *Designated.

Warwickshire.—Borough and Rural District of Warwick, Intermediate from *Designated.

Worcestershire.—Stourport-on-Severn, Intermediate from *Designated.

Yorkshire (West Riding).—Borough and Rural District of Goole, Borough of Morley, Urban District of Rothwell, Intermediate from *Designated; Rural District of Ripon and Pateley Bridge, Restricted from Intermediate.

COUNTY BOROUGHES

Bolton, Intermediate from Designated; Bradford, classified as one area—Designated (previously subdivided); Carlisle, Intermediate from Designated; Newcastle-upon-Tyne (Central Area—Jesmond Ward), Restricted from Intermediate; Salford (Seedley District), Intermediate from *Designated; Stoke-on-Trent (Hanley, Shelton, Bucknall, Abbey Hulton and Milton), Intermediate from *Designated.

WALES: COUNTIES

Carmarthenshire.—Cwmlllynfell and Brynamman (to be excluded from Pontardawe Rural District, Glamorganshire), combined and classified as Restricted; Drefach, Tumble, Cross Hands and Penygroes, combined and classified as Intermediate; Llandilo, Restricted from Intermediate; Llandovery and Llangadock, combined and classified as Intermediate from Restricted; Pontyberem and Pontyates, combined and classified as Intermediate; St. Clears and Llandboidy, to be combined but to remain Intermediate; Whitland, Restricted from Intermediate. Areas immediately adjacent to Henllan and Lampeter in Cardiganshire to be included with Newcastle Emlyn and classified as Intermediate.

Glamorganshire.—Cwmlllynfell and Brynamman, to be excluded from the Pontardawe Rural District and classified as Restricted in the Carmarthenshire Executive Council's area; Urban District of Aberdare, Intermediate from *Designated.

Monmouthshire and Newport.—Urban District of Nantyglo and Blaena, Intermediate from *Designated.

Pembrokeshire.—Haverfordwest, Intermediate from *Designated.

COUNTY BOROUGH

Swansea.—Swansea East Division, Intermediate from *Designated.

THE REPRESENTATIVE BODY

MEMORANDUM BY THE WINCHESTER DIVISION

The following memorandum on the Representative Body is being circulated by the Winchester Division to other divisions of the Association.

Present Constitution

Total membership, 460. Made up as follows: 425 Representatives from Great Britain and Northern Ireland, 31 overseas, 4 public health (and members of Council, who do not vote).

Functions

(i) The Parliament of the Association. *The only Conference of all sections of the profession, and in which all areas of the country are fully represented.* (ii) The final arbiter of policy. (iii) More attention is paid by the Press to the deliberations of the Representative Body than to those of any other medical organization.

Shortcomings

(i) Most important, its present size—governed by by-laws made over 50 years ago.

(ii) There are 460 Representatives, about 70 members of Council, the Secretariat, and members of the Press, requiring a Hall in which 600 people can move about comfortably. Until such time, therefore, as the size of the R.B. can be reduced, the smaller towns cannot hope to entertain it.

(iii) Its very lengthy Agenda. And resulting from (i), (ii), and (iii):

(iv) The lack of balance in the conduct of business, so that some items of no great importance may be the subject of lengthy debate, while other far more important matters are summarily dealt with, and even subject to guillotine through lack of time; the fate of, and attention paid to, any subject thus largely depends on its position in the Agenda (items on the last day of the meeting, for example, cannot be said to receive equal consideration with those debated on the first day). This position is further exaggerated by the following factors, (v) and (vi):

(v) The Representative Body is *not truly representative of the profession* in that the majority of its members are general practitioners, so that the view expressed by the Representative Body on any subject tends to be the general practitioners' view, and is *unfortunately so regarded by other sections of the profession*. Consequently the decisions of the Representative Body are not always implemented by the appropriate Standing Committees of the Association.

(vi) Large sections of the Agenda are allocated to the major Standing Committees, and this results in matters belonging to smaller committees having scant consideration.

Reorganization

If the above criticisms are valid any constructive proposals must involve three major changes: (i) a substantial reduction in membership; (ii) a balanced representation of all sections of the profession; and (iii) the evolution of a system whereby adequate time can be allocated to the discussion of matters of the first importance, irrespective of the committee of origin.

With the above in mind, therefore, the following constructive proposals are set out:

(1) A Parliament of 300 members should be aimed at. This Division is not entirely satisfied with the view that the activity of a Division increases in direct proportion to its membership, and this view must have been in the minds of those who originally planned the Representative Body. For example, it may well be that a Division of, say, 650 members, at present taking up six seats in the R.B., may yet be unrepresented on the Agenda, whereas a smaller active Division may find itself with only one Representative to speak and reply to half a dozen or more Resolutions.

Furthermore, it is suggested that the view of any division, however active and however large, can be adequately presented by five representatives.

It is with the above in mind that we propose the following Amendments to By-law 40: (a) A Division of 50-249 members to have 1 Representative. (b) A Division of 250-449 members to have 2 Representatives. (c) A Division of 450-749 members to have 3 Representatives. (d) A Division of 750-949 members to have 4 Representatives. (e) A Division of 950 or more members to have 5 Representatives. *Making a total of 279 Representatives.*

(2) And, in addition to the above, to ensure that sectional interests are fully represented, a panel of members to be elected by the undermentioned Committees (following the precedent already set by the Public Health Service): (a) Central Consultants and Specialists Committee to elect 4 members. (b) General Medical Services Committee to elect 4 members. (c) Public Health Committee to elect 4 members (as at present, by-law 44 (1)). (d) Private Practices Committee to elect 2 members. (e) Unestablished Practitioners Committee to elect 2 members. (f) The Registrars Council to elect 1 member. (g) The Armed Forces Committee to elect 2 members. *Making a total of 298 members.*

(3) With (1) and (2) above, 31 overseas members to be appointed as at present. *The Representative Body thus to be made up of a total of 329 members.*

(4) An enlarged Agenda Committee (renamed Steering Committee) should be established with greater powers of arrangement and co-ordination of the Agenda, so as to ensure that important subjects have priority over others. In order to secure this the Chairman of the Representative Body, in consultation with the Steering Committee, should have full powers of grouping and guillotine.

Economy

In view of the recent rise in subscription rate the economies resulting from the above proposals should be borne in mind.

The Rights of Divisions

The above proposals will, of necessity, curtail in some measure the present rights of individual Divisions, but in the view of this Division it is only by these means that the decisions of the Representative Body can carry the whole weight and authority of a united profession behind them.

The above represents the thoughts of a small Division on a very important and difficult subject (but one which must be faced at this present time), and this Memorandum is issued to its fellow Divisions as a basis for discussion.

Comments of Divisions would be much appreciated and should be addressed to the Honorary Secretary, Winchester Division, B.M.A., St. Clement's, Winchester.

RONALD GIBSON, *Chairman.*

GEORGE SWIFT, *Hon. Secretary.*

REPORT OF COMPTROLLER AND AUDITOR-GENERAL

PRESCRIPTIONS FOR PROPRIETARY DRUGS

The report of the Comptroller and Auditor-General on the civil appropriation accounts, 1951-2,* shows an increase in the prescribing of proprietary drugs under the N.H.S. In 1950 in England and Wales 18% of the total number of prescriptions (representing 33.5%, or nearly £12,000,000 of the approximate total cost of £35,000,000) were for proprietaries, and in Scotland the percentage was 26%. In 1951 the percentage in England and Wales rose to 23%, and in Scotland to 30%, while a sample analysis in England and Wales for 1952 showed a further rise to 25.6%.

Unnecessary Expense

The cost of prescriptions in 1951 included £400,000 for a proprietary drug. If the standard equivalent had been prescribed instead, the cost would have been £158,000. The Auditor-General considered this to be an unnecessary expense. He asked the Ministry whether it had given doctors any additional information on comparative costs of proprietaries and equivalent standard preparations. Although this had not yet been done, the Ministry stated that it contemplated preparing a price list on these lines for the use of practitioners.

*Civil Appropriation Accounts (Classes I-VIII), 1951-52. H.M. Stationery Office, London.

GENERAL MEDICAL SERVICES COMMITTEE EVIDENCE REGARDING GENERAL PRACTICE

A meeting of the General Medical Services Committee was held on February 19, with Dr. A. TALBOT ROGERS in the chair. The Chairman referred to the death, announced that day, of Sir William Douglas, until lately Permanent Secretary of the Ministry of Health. He said that those of them who had had occasion to meet him held him in high respect as a very able and approachable Civil Servant.

The Committee devoted the whole morning to a consideration, paragraph by paragraph, of the draft memorandum of evidence which the Council of the Association will be invited to submit in due course to the Central Health Services Council's Committee on General Practice, presided over by Sir Henry Cohen. This was a document of some 24 sections and 11 appendices, and the Chairman reminded the Committee that it was based on points of policy already decided by the Conference of Local Medical Committees and the Representative Body. It had been very carefully revised and brought up to date.

In its examination of the draft the Committee made no fundamental alterations, but the phrasing was varied in a number of places. Dr. DAIN drew attention to a statement in the early part of the memorandum to the effect that it was the intention eventually to prepare a still more comprehensive memorandum, embodying the evidence already available and inviting doctors to submit their views on present conditions and future patterns. In his view they had already got together an excellent report, and he hoped they would not recommend the undertaking of any further investigations into general practice for, say, the next four or five years.

After the various revisions had been completed, the Committee adopted a recommendation of the subcommittee which had been preparing the evidence that the Council be invited to appoint not more than seven persons to give oral evidence, the General Medical Services Committee to be represented by four, and the Central Consultants and Specialists Committee, the Public Health Committee, and the General Practice Review Committee by one each.

Applicants for Practices and Surgery Accommodation

Reference was made to what appeared to be a change in policy of the Medical Practices Committee with regard to applicants for inclusion in the medical list. Instead of granting such applications provisionally, subject to confirmation when the actual address of the surgery premises was notified to them, they now returned the application and requested that it be re-submitted when the applicant was in a position to furnish details of his accommodation. Dr. FRANK GRAY said that in the instance cited there might have been a misunderstanding, but it was most important that the Liaison Subcommittee should meet, so that there might be consultation on any changes of policy. Dr. J. A. PRIDHAM, a member of the Medical Practices Committee, said that his committee did not like this procedure with regard to new applicants, but it had arisen owing to the new distribution scheme. A practitioner might wish to start in practice in a designated area, but he had no premises. Afterwards another applicant might appear who had premises, and the classification of the area might be affected. The new procedure had been adopted provisionally. They were going to discuss it with the Executive Councils Association, and they would be very pleased to discuss it with representatives of the Committee.

It was agreed that the Liaison Committee should meet as soon as possible.

Help in the Flood Areas

The Deputy Secretary reported on the inquiries made of Divisions of the Association and local medical committees

in the flood areas, both as to general medical arrangements and as to ways and means by which Headquarters could give assistance. Immediately the flood disaster was reported Headquarters sent out communications to the honorary secretaries of local medical committees in all the areas affected to see whether anything could be done. What they had in mind in particular was that evacuation might place an undue strain upon the reception areas, and it might be possible to enlist the services of additional doctors for those areas. Fortunately, however, the reception areas were able to cope with the situation without extra help. Then an effort was made to discover whether there were individual cases which needed assistance. There were many problems concerned with the effect on the practices of doctors in the flooded districts. There was also the more remote question of the effect on summer resorts and the possible decrease in the number of temporary residents. A certain amount of information had been obtained which showed that, by and large, the immediate problem of coping with the casualties was being overcome. The Secretary of the Association had sent a personal letter to every doctor affected, expressing the Association's concern and inviting them to let the Association know what it could do to help. The Chairman of Council had written a letter in the *Journal* of February 14 (p. 399) asking for donations to the Sir Charles Hastings Fund for this purpose. A number of local medical committees said that they were ready to forward cheques to the General Medical Services Committee or whatever body was organizing funds for this purpose. Already a substantial sum had been received by the Hastings Fund as a result of the Chairman of Council's appeal. Some doctors in the region had been temporarily dispossessed, and there were others whose income would be greatly depreciated this year. The problem divided itself into an immediate one on the lines of the Chairman of Council's letter, and a long-term one, involving possibly compensation for loss of income. Doctors in the reception areas have been reminded that any patients they did accept should not go permanently on their list.

Dr. HUTCHINSON spoke against the setting up of a special fund; he thought it would be better for all subscriptions to go to the Hastings Fund and to be earmarked for flood-relief purposes.

The Chairman agreed that it would be most unwise to have two different funds. The question was whether the Committee as Trustees of the General Medical Services Trust should set aside a sum from that fund to meet the demands.

At a later stage, on the proposal of Dr. KATHERINE HARROWER, it was decided to guarantee a certain amount from the G.M.S. Trust Fund to the Sir Charles Hastings Fund to assist the appeal which the Chairman of Council had launched.

Inflation of Lists

A letter was read from the Ministry regarding persistent inflation of the number of persons on doctors' lists, the areas mainly concerned being Middlesex, London, and Essex. It was stated to be known that in the records of these executive councils some of the medical record cards were without a counterpart in the nominal index. It had been decided that in such cases an inquiry letter should be sent to the person concerned on somewhat similar lines to that sent out during the purge. Under the regulations executive councils must give a practitioner six months' notice of the intention to remove a patient from his list. This would mean that any cases of inflation emerging from the special check could not be removed until October 1, and, because of the new distribution scheme, it was of the utmost importance that the removals should take place by April 1 next. The Committee was asked whether it would agree to giving the practitioner the usual six months' notice, but removing the practitioner the usual six months' notice was issued instead of at the end of the period, the name, of course, being reinstated

and back credit given in any case where the practitioner provided information concerning a person's whereabouts which enabled him to be traced.

Dr. M. SORSBY said that London did not agree that there was any appreciable degree of inflation in 1947, nor did it agree that there were no checks; there were checks all along the line. On January 1 of this year, 97.4% of the population were on doctors' lists. That did not indicate any specific degree of inflation as suggested in this letter. The proportion traced had in fact been 81.7%. He gave reasons indicating the danger of classifying London with Middlesex and Essex. As for the request from the Ministry, London had agreed to accept the principle that the patient's name should be removed from the doctor's list immediately (otherwise there would be some degree of inflation which would not be justified), always provided that the name should be restored in the circumstances stated in the letter. In London they felt it to be of very great importance that either the register should be properly arranged or that there should be a supplementary register to cope with the special difficulties.

The Committee agreed to the suggestion concerned with removal of names as explained in the Ministry's letter.

Other Business

It was agreed to send a message of good will to the newly formed College of General Practitioners, and to invite a delegation from the College to attend a meeting of the Committee at which methods of complementary working might be discussed.

Attention was drawn to the Press statement by the Ministry of National Insurance issued at the peak of the influenza epidemic, reminding patients of the procedure of notification for incapacity for work, having in mind the fact that doctors in affected areas might not be able to see their patients without some delay, and also of the need for making a request for a visit, should this be necessary, if possible before the doctor started his rounds. It was agreed to thank the Ministry for its action in this respect.

The minutes of a meeting of the General Medical Services Subcommittee (Scotland) and of two meetings of the Chairman's Subcommittee were presented, but no matters for discussion arose.

A letter was reported from the Ministry on the formula to be taken for defining the remuneration of general practitioners for superannuation purposes. The formula at present is 50% of mileage payments and 35% of other payments, but in view of the increase in the size of the central pool the formula has to be adjusted to take account of the actual ratio of expenses to earnings. Assuming that the overall figure of 38.7% in 1950-1 was about right, the best estimate that could be made suggested that the present figure might be about 33%. This could be obtained fairly closely by taking 50% of payments for mileage and drugs and 30% of other payments. The Committee's accountants, who had been consulted, considered the formula to be a reasonable one, provided there had been no material increase since 1950-1 in the aggregate value of practice expenses.

On the question of a national code number for all doctors under contract with executive councils, which the Committee had had under discussion with the Ministry, the Society of Clerks of Executive Councils had written that the idea was basically sound, but forty years too late, and gave reasons why any alteration of the present system could not be supported by the Society.

Among the many other matters which came before the Committee were a verbal report by the Deputy Secretary of a meeting with the medical director of the Central Council for Health Education on the Council's pamphlets on diphtheria and measles, an account of discussions with representatives of the Pharmaceutical Society on accidental poisoning of children by medicinal preparations, and various questions relating in particular to prescribing.

Correspondence

Dental Anaesthetics

SIR,—Recently a certain amount of ill-feeling has arisen between myself and doctors in the neighbourhood when patients of theirs have had a general anaesthetic administered to them by a doctor of my own choosing. The executive council, when asked for a ruling, stated that the anaesthetic may be given by any doctor the dentist chooses, which seems rational if one is to regard the routine followed for general surgery in a hospital as a parallel. But the general medical practitioner takes the point of view that the patient is his, that he will be called in if complications occur, and that he is competent to give a dental anaesthetic.

It is this last important point which is questionable. Most practitioners can give a competent intravenous anaesthetic, but from my own experience I believe that very few can administer under all circumstances, as efficiently as is necessary, nitrous oxide and oxygen with or without various adjuncts.

For some years now one doctor has given most of my general anaesthetics. He knows my surgery and staff, we have a mutual knowledge of each other's preferences and habits, and we have achieved the harmony necessary to carry out an efficient and safe operation. Lastly, it is the normal routine in a busy practice to put general anaesthetic cases together in one session in the week. Are we to experience the chaos of having three or four or more doctors, one after the other, giving anaesthetics each in his own way?—I am, etc.,

Leeds.

J. D. MANSON.

* The ethical rules as approved by the Representative Body in 1950 include the following: "Where an anaesthetic is advised by the dentist, it is competent for him to select the anaesthetist, but, if such anaesthetist is not the patient's doctor, no objection should be taken to the patient inviting his doctor to be present. Where the operation proposed is a major one, or if it is known to the dentist that the patient is under medical care, the dentist should consult the patient's doctor upon the operation proposed and should invite him to be present if the patient so desires. Similarly, where the patient is under dental care and the doctor advises operative or other major treatment arising from the patient's dental condition, the dentist should be consulted. On the completion of any dental operation, and especially if there is any reason to think that post-operative complications may ensue, the patient should be advised to consult the dentist immediately if such complications arise, and the dentist should take all reasonable steps to facilitate such consultation."—ED., B.M.J.

Cost of Prescribing

SIR,—May I be allowed as a pharmacist to correct the dispensing charges given by your correspondent Dr. Thomas M. Glaister (*Supplement*, February 14, p. 43)?

For a 6-oz. "benlylin" expectorant or any other proprietary product the dispensing charge is 9d., not 1s. 2d. Aurist. phenol. and lot. calamin. and similar liquid medicaments carry a dispensing fee of 1s., not 2s. 3d. While both tab. ergot. and tab. ergometrin. maleat. have the same action, the latter has a much higher potency and more rapid solubility, which the higher cost may justify according to the physician's preference.—I am, etc.,

Fordingbridge, Hants.

F. E. S. CLARKE.

Whole-time Consultants and Domiciliary Visits

SIR,—Under the present dispensation it would probably be true to say that the majority of general practitioners are loath to call out whole-time hospital staff on domiciliary consultations. The whole-time consultant does undertake,

as part of his duties, the performance of domiciliary consultations—but the fact cannot be altered that his general-practitioner colleagues feel it an imposition to ask him to carry out additional work. In consequence, a useful point of contact between consultant and practitioner is lost. The consultant loses the opportunity of seeing the patient in his home surroundings, which in some specialties at least is a distinct advantage. Quite frequently, in substitution, the patient is admitted to hospital. This often brings psychological upset and, in the case of small children, physical danger. It is also expensive.

The solution to this problem is not necessarily bound up with an increase in the total remuneration of the whole-time consultant. The essence of the problem is that, for reasons beyond his control, the whole-time consultant is frequently debarred from carrying out his work in the most effective manner. Means should be sought for overcoming this impediment.—I am, etc.,

Bebington, Cheshire.

K. R. LLEWELLIN.

Association Notices

Diary of Central Meetings

MARCH

- 2 Mon. Joint Committee of Psychological Medicine Group and R.M.P.A., 11 a.m.
- 2 Mon. Armed Forces Committee, 2 p.m.
- 3 Tues. Finance Advisory Committee, 11 a.m.
- 4 Wed. Private Practice Committee, 11.30 a.m.
- 4 Wed. Joint Conference, Occupational Health and Public Health Committees, and Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
- 5 Thurs. Subcommittee on Constitution and Procedure of Medical Service Committees, G.M.S. Committee, 2 p.m.
- 6 Fri. Anaesthetists Group Committee, 2.30 p.m.
- 11 Wed. General Practice Review Committee (adjourned meeting), 11 a.m.
- 13 Fri. Consulting Pathologists Group Committee, 2.30 p.m.
- 18 Wed. Council, 10 a.m.
- 25 Wed. Joint B.M.A. and T.U.C. Committee, 2.30 p.m.

Branch and Division Meetings to be Held

DARTFORD DIVISION.—At Embassy Ballrooms, Welling, Kent, Wednesday, March 4, 8 for 8.30 p.m., annual dinner.

EAST HERTS DIVISION.—At County Hospital, Hertford, Thursday, March 5, 8.45 p.m., meeting. Lecture by Professor Alan Moncrieff: "Children in Hospital."

EAST NORFOLK DIVISION.—Wednesday, March 4, 2.45 p.m., tour: Caley's Chocolate Factory, Norwich.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, March 5, 8.30 p.m., meeting. Lecture by Dr. W. P. H. Sheldon: "Abdominal Distension in Children."

HAMPSTEAD DIVISION.—At Hampstead Town Hall, Haverstock Hill, N.W., Thursday, March 5, 8.30 p.m., discussion: "The Future of the Professions." Members of professions other than medical are invited to attend the meeting.

LANCASTER DIVISION.—At Grosvenor Hotel, Morecambe, Saturday, March 7, 7.30 for 8 p.m., annual dinner.

MID-HERTS DIVISION.—At Red Lion Hotel, St. Albans, Friday, March 6, 8.45 p.m., meeting. Mr. John O'Connell: "Sub-arachnoid Haemorrhage."

NORTH MIDDLESEX DIVISION.—At Friern (Mental) Hospital, 52, Friern Barnet Road, New Southgate, N., Friday, March 6, 8.30 p.m., second meeting of "Brains Trust" on Psychiatric Problems. Panel: Dr. A. C. Dalzell, Dr. Colman Kenton, and Mr. W. H. A. Weston.

NUNEATON AND TAMWORTH DIVISION.—At Gymnasium, Manor Hospital, Nuneaton, Tuesday, March 3, 8.45 p.m., clinical meeting. General practitioners' evening arranged by Dr. H. J. Wright.

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, March 3, 8.30 p.m., meeting. Sir Arthur Porritt: "Surgery and the Peptic Ulcer."

SOUTH ESSEX DIVISION.—(1) At King's Head Hotel, Romford, Thursday, March 5, 7.30 p.m. until 1 a.m., annual supper dance. (2) At Rush Green Hospital, Romford, Sunday, March 8, 10.30 a.m., clinical meeting.

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, March 6, 8 p.m., clinical demonstration by Dr. V. H. Allan, Mr. M. L. Nairac, and Mr. G. Rhys-Evans.

SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Thursday, March 5, 8.30 p.m., annual general meeting.

WIGAN DIVISION.—At Prince of Wales Hotel, Southport, Wednesday, March 4, annual dinner dance.

SUPPLEMENT TO THE
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OCCASIONAL COMMENT

WINCHESTER ON THE R.B.

That the spirit of reform is still alive in the Winchester Division is evident from the memorandum on the Representative Body of the Association published last week (*Supplement*, February 28, p. 55). This will no doubt revive, as it is intended to revive, discussion of certain problems which have received much careful study in recent years. The latest Winchester proposals relate to the size and composition of the R.B. and to matters of procedure, especially the arrangement of the agenda.

The Problem of Size

The original plan for the Representative Body, drawn up in 1902, provided for one representative to be elected by each constituency, the total number of constituencies not to exceed 300. To-day the relevant By-law, which dates from 1911, entitles a constituency in the United Kingdom with not less than 150 members to elect one additional representative for every 100 members in excess of 50. Of necessity, therefore, the R.B. has grown enormously in size with the ever-increasing membership of the Association. The number of representatives actually appointed by the home constituencies was 210 in 1920, 278 in 1938, 360 in 1947, and 425 in 1951. The possible number in 1953 is 448.

Previous Discussions

In the autumn of 1947 the Organization Committee began to discuss the advisability of a reduction in size, and in April of the following year it advised the Council to recommend that the R.B. should approve a reduction to approximately 300 and should instruct the Council to submit proposals for bringing this about. It was argued in the Council that the governing considerations should be the effectiveness of the R.B. as a working body, and the limitation imposed by the size of the Great Hall at B.M.A. House and the halls in provincial cities. Against this it was maintained that it was "a healthy thing that as many representatives as possible should be appointed, for such people, when they went back to their constituencies, were good disciples of Association policy." The Council's decision was to refer the matter back to the Committee; and later in the same year the R.B. itself rejected a motion from Gloucestershire advocating a decrease in its size.

"A Shambles"

In August, 1948, the Winchester Division produced a comprehensive memorandum on the organization of the

Association in which it described Representative Meetings as "a shambles—too many members discussing too many resolutions," and recommended that the membership should be reduced to 200, "based on Branch representation." This led to further discussions at Headquarters, culminating in a report by the Council to the A.R.M. in 1949. This report, referred to below, discussed the size of the agenda, but made no reference to the size of the meetings. The latter problem was re-examined by the Organization Committee during session 1950-1, but the Committee decided against recommending any change, considering that attendance at the meetings was of "great educational value to the members concerned."

The Financial Aspect

Last session the Council, at the suggestion of its Finance Inquiry Committee, asked the Organization Committee to look at the matter again from the point of view of economy. On this occasion the Committee went so far as to recommend to the Council two alternative methods of reducing the number of representatives by altering the qualification for additional representation of constituencies. The first plan was the one proposed by Gloucestershire in 1948—that a constituency with not less than 200 members should have an additional representative for every 150 in excess of 50. This would have reduced the R.B. to 350. The alternative plan was that a constituency with not less than 250 members should have an additional representative for every 150 in excess of 100. This would have brought about a reduction to 304. The Council rejected both proposals and reported to the R.B. at Dublin last July that it was satisfied that the additional representation afforded under the existing By-law "more than compensates for the expenditure involved." Apparently the same satisfaction was felt by the R.B., which rejected motions from Cornwall and Gloucestershire asking for reconsideration of the matter. And now, nothing daunted, Winchester returns to the attack.

The Problem of Procedure

The congestion of business at the Representative Meetings, and particularly at the special Meetings, became a serious problem in the period of unusual medico-political activity when the proposals for the National Health Service were under discussion. In 1945 the Winchester Division proposed that, as a temporary measure "during the present emergency," the bulk of the agenda should be dealt with by committees constituted *ad hoc*, which would sit simultaneously and report to plenary sessions of the R.B. This proposal did not find favour, but in 1946 a Winchester motion that a committee should be appointed to recommend

"such alterations in procedure as would enable the bulk of the agenda to receive adequate consideration" was referred to the Agenda Committee. This Committee, which had no dictatorial ambitions, advised that it should not be empowered to compile "omnibus" resolutions and to exclude motions covered by such resolutions from the agenda. It discussed, but did not advocate, the plan of resolutions from Divisions being filtered through a body composed of representatives of grouped Branch councils. Its only positive recommendation was that its own membership (consisting of the Chairman and Deputy Chairman of the R.B. and the Chairman of Council, with power to co-opt up to four chairmen of standing committees) should be altered by the addition of two members elected by the R.B. This was approved by the A.R.M. in 1946, and two years later the number of members so elected was increased to four.

"Starred" Motions

The 1948 Winchester memorandum recommended discussion and co-ordination of Divisional resolutions at the Branch level, and further co-ordination by a committee elected by the R.B. or by the Branches before transmission of the resolutions to the Agenda Committee. In the following year the Council reported on the problem to the R.B. Its report discussed, among other matters, the plan of "starring" a selected motion in a group of similar motions on the same subject, the other motions in the group being held to be covered by the one "starred." Certain disadvantages of this plan, which had been tried in 1946, were suggested. A representative, for example, might feel that the "starred" motion did not bring out the precise point made by his constituency in a "covered" motion. The Council made no definite recommendation, but the A.R.M. in 1949 approved a motion from Marylebone that representatives whose motions were "grouped" or "held covered" should be given at least 48 hours' notice in writing and be allowed an opportunity of discussion at the meeting to decide on the proposer of the "starred" motion. It also referred to the Council a motion from Mid-Cheshire calling for the early institution of a "steering committee" for the agenda at Representative Meetings.

Recent Changes

At the Southport meeting in 1950 a number of changes were introduced. First, four complete days—instead of three and a half—were made available for the meeting, which now begins on a Thursday morning and need not conclude before the following Monday afternoon. Secondly, the time allowed to movers of motions and amendments was reduced. Thirdly, the procedure of the grouping and "starring" of certain motions by the Agenda Committee was incorporated in the Standing Orders. Despite these changes, the A.R.M. at Southport, owing to exceptional circumstances, was unable to complete its business, and an adjourned meeting was held in London in September, when it was decided, on the recommendation of the Agenda Committee, that representatives whose motions were grouped should be empowered to select a motion for discussion in place of the "starred" motion, or to agree a common form of motion. Other proposals approved were that the Chairman should be empowered to take such steps as he deems necessary to prevent tedious repetition, and that the Agenda Committee should meet at intervals during the meeting to examine the progress made and to make any necessary recommendations. Whether these various measures to facilitate the conduct of business at Representative Meetings go far enough is no doubt debatable. Winchester thinks they do not.

Representation of Sectional Interests

At the A.R.M. last year Winchester failed to secure acceptance of a motion that in any future reorganization of the constitution of the R.B. consideration should be given to providing for "direct election to the R.B. from the regional consultants and specialists committees—for

example, one representative from each region." The present Winchester memorandum asks for four members of the R.B. to be elected by the Central Consultants and Specialists Committee, and varying numbers by certain other committees representing sectional interests. To judge from the discussion at Dublin, this is likely to prove the most controversial of the new proposals, although there is already provision for four public health service members to be elected—not, as Winchester suggests, by the Public Health Committee, but by the general body of the public health service members of the Association. This is the sole exception to the rule of election by Divisions and Branches. Apart from any possible objection in principle (such as was voiced at Dublin) to an extension of sectional representation, there may perhaps be differing views about the particular sections which might properly be included if any such scheme as is now proposed were to be adopted. And it may perhaps be questioned whether the present proposals would either provide the "balanced representation of all sections of the profession" which Winchester desires, or remove the disadvantage—if, as Winchester suggests, it is a disadvantage—of the majority of the representatives being general practitioners.

Whatever decisions may be taken on these matters, this small Division is to be admired for the ceaseless thought which it gives to the improvement of the Association's organization—and surely also for what is either the engaging modesty or the nice sense of humour displayed in its remark that it is "not entirely satisfied with the view that the activity of a Division increases in direct proportion to its membership."

THE CONSTITUTION OF THE B.M.A.

II.—THE REPRESENTATIVE BODY

The first Annual Representative Meeting was held in 1903 at Swansea during the Annual Meeting of the British Medical Association, and it marked the emergence of the Association from a long period of controversy as a truly democratic body. What constitutes a representative assembly is always difficult to define. The line between a representative and a delegate can never be exactly drawn. The representative comes, as do members of the Representative Body year by year, instructed by his constituency concerning the principal items on the agenda or at least the general line of policy which is proposed; and yet he is at liberty, being a representative and not a delegate, so to interpret his duties that if he finds the arguments on the other side so cogent, or if new aspects of the problem come forward or new facts are revealed, and he feels that his decision would be endorsed by the members of his constituency, he may vote contrary to his original instructions. That principle at least has always obtained in the Association, where, unlike Parliaments, there are no parties with conflicting loyalties. The representative is a trusted man, permitted to exercise his discretion with regard to his instructions, not an automaton registering a vote. Even if he is not sure that his change of attitude on a particular question may be endorsed by his constituents, and follows the line of his own convictions, probably no one will reproach him, and what his constituency may lose in one respect they gain in having a representative of independence of mind and judgment. In any event, as representatives hold office only for one year, a constituency can change its representative in time for another Annual Meeting. Unlike Parliamentary constituencies, it has not to await the lifetime of a Parliament.

The Representative Body is the governing organ of the Association. In this assembly policy is determined. The Council is the central executive, charged with carrying out that policy. Only in certain relatively minor, though not unimportant, fields can the Council act on its own. For example, the general and sectional meetings of the Association and many other internal and domestic matters are in its sole charge.

Composition of the Representative Body

The representatives are elected by the constituencies, which are Divisions or groups of Divisions; members of Council also sit in the Representative Body, although their voting rights, unless they are also elected representatives, are limited. There are 201 constituencies in Great Britain and Northern Ireland for the purpose of election to the Representative Body, and in addition each Division of the Association overseas is an independent constituency and entitled to return one representative. Great pains have been taken to ensure a proper geographical representation.

The number of members of the Representative Body from Great Britain and Northern Ireland is 441; of these, 56 represent Scottish constituencies, 21 Welsh, and 13 Northern Ireland. Most of the constituencies consist of single Divisions, but sometimes two, and in one case (Aberdeen and Kincardine counties and the islands of Orkney and Shetland) three, are grouped together to form a constituency. Each constituency elects one member, with an additional member for every 100 members of the Association in excess of 50. With the continual growth of the membership of the Association the result has been that some constituencies return a phalanx of representatives. One Division (Glasgow) is entitled to 11; three (the cities of Birmingham and Edinburgh and the borough of Marylebone, in London) are entitled to 10. But nearly half the constituencies return only one member, and of the remainder more than half return only two. The Branch area with the largest number of representatives is the Metropolitan Counties, with 73, followed by Yorkshire, with 28, and Glasgow and the West of Scotland, with 25. There are also four representatives specially elected by the public health service members of the Association. This special representation was agreed upon a few years ago in order to ensure that the public health service would have its mouthpiece in these assemblies, which might well not have happened had it been left to the accident of the constituency vote. Overseas Divisions, or Branches without Divisions, may return nearly 70 representatives. Thus the total assembly of the Representative Body may be more than 500, one-half constituting a quorum. This forms a real problem in the matter of accommodation in the halls in which the meeting is held, not excepting the Great Hall of the Association in London, for the volume of documents with which each representative is burdened necessitates a table as well as a chair.

The Representative Body at Work

The Annual Representative Meeting is normally held at the time of or just preceding the Annual Meeting of the Association, but there is provision for calling a Special Representative Meeting, either by the chairman of the Representative Body on the requisition of the Council or on the requisition of not less than 20 constituencies. At times of crisis, such as the introduction of National Health Insurance in 1911-12 or of the National Health Service in 1946-8, several Special Representative Meetings were summoned (each of them, by the way, at the cost of something like £1,000 to the Association, for the first-class return fares of representatives are paid centrally) to make specific decisions on policy.

The Representative Body elects its own chairman and deputy chairman, also, on the recommendation of Council, the president of the Association, and it elects 16 members of Council, 10 of them being ordinary members and three Service members, elected by the representatives voting together as a whole, together with two elected by representatives of constituencies in Scotland, and one by representatives of constituencies in Wales. Both the Representative Body and the Council are carefully adjusted on the geographical model so as to ensure the representation of different types of practice so far as these can be linked with varying localities, and in fact, although apart from the public health service there is no specific provision, every branch of medicine can be sure of having a voice.

The first and principal business of the Annual Representative Meeting is to consider the Annual Report of Council, which is published beforehand in ample time for consideration by the Divisions, while a Supplementary Report covers later events. It considers also the Financial Statement of the Association. At least two months' notice is required from Divisions or Branches of any motion they may desire to bring forward at an Annual Representative Meeting, or 14 days' notice in the case of a Special Representative Meeting. The Annual Report is a comprehensive document, recording the work of the many committees, standing and special, which assist the Council, and, although opportunity is given for motions on matters not covered by the report, these are generally few and minor. A time limit is imposed on speakers, but can be extended.

Fifty Years of History

As already stated, the first Annual Representative Meeting was held at Swansea in 1903. Some of those who attended that meeting are happily still with us, notably Alfred Cox, who on that occasion represented Consett and Gateshead, and who was to be Medical Secretary of the Association for 20 years, and R. Langdon-Down, who put in conspicuous service as chairman of the Central Ethical Committee. Many whose names are still familiar in Association memories attended that first meeting—a future Chairman of Council in J. A. Macdonald, then representative of West Somerset; a future Treasurer in N. Bishop Harman, representative of Hampstead; a future Chairman of the Representative Body in T. W. H. Garstang, of Cheshire. The number of representatives attending was 135, much smaller than the number of constituencies, the reverse of the position obtaining to-day.

The first Chairman of the Representative Body was Sir Victor Horsley, a man who had already achieved world-wide fame as a physiologist, neurologist, and surgeon, and who had plunged into the struggle for the reorganization of the Association and the championship of the general practitioner with all the zeal of a youthful enthusiast. It was he who at the meeting of the Association three years earlier at Ipswich brought forward the motion to appoint a committee to consider the constitution of the Association, and when after long discussions it was hammered out in legal form and adopted at meetings in London in 1902 Sir Victor Horsley was the obvious choice of what has now become a long succession of able chairmen. In spite of his radicalism and his strongly held opinions he had a profound respect for constitutional practice, and this proved to be of the greatest value to the Association in the four critical years in which he presided over the Representative Meetings. One curious circumstance marked his election to the chairmanship. After he had been chosen it was discovered that he was not properly a member of the Representative Body at all, because the secretary of his constituency had inadvertently omitted to inform Headquarters of his election. The technical lapse was soon rectified.

Another little circumstance attending the first Representative Meeting is worth noting. On the second day of the meeting—it lasted a day and a half—a timid knock at the door conveyed a request from the Press—not the national but the local Press—for permission to report some of the proceedings. The meeting discussed this matter at length, and decided that the request could not be granted—a very different attitude from that which obtains to-day, when, thanks to the Public Relations Department, every facility is afforded to the 40 or 50 pressmen who usually attend to report the meeting extensively in all the principal journals of the country. On some occasions the meeting has gone into closed session, but on others it has discussed private matters in the presence of the Press, and a word to them has always secured their loyalty and co-operation.

This short account does not pretend to be a history of the work of the Representative Body over the course of 50 years, a period which has included two world wars and two major revolutions in medical practice in this country. But it can be said that the machine has worked well.

During the few days into which the Annual Meeting has had to be compressed no professional or trade union congress has shown such a capacity for hard work. The standing orders have been framed to secure the utmost fairness to all taking part in the debates. If there have been grievances, these have arisen from the size of the meeting and the multiplicity of motions and amendments. Some effort has been made lately to curb the diffuseness of debate which is likely to follow when large numbers of constituencies send forward amendments of similar intention but slightly different phrasing.

There has been much keen debate at Representative Meetings; oratory has often risen to a high level, the clash of opinion has been expected and welcomed. But the writer of these notes has attended every Annual Meeting for more than 40 years, and, except for one or two instances at the beginning of the National Health Insurance controversy, he cannot recall any disagreeable incidents which have left a mark in the mind. Exchanges on a personal level have been very few. In spite of the enormous volume of business which has had to be carried through in a short time, the Representative Body has proved worthy of the profession it represents, a machine well poised and effective for its purpose, and a model which other professional organizations have envied and sometimes imitated.

FLOODS

Arrangements are being made to ensure that for the time being doctors who have suffered as the result of the recent flood disaster will not suffer any loss of income from capitation payments and temporary-resident payments. The position will be reviewed from time to time.

THE ASSOCIATION AND PUBLIC HEALTH

A meeting of the Public Health Committee of the Association was held on February 20, with Dr. H. K. COWAN in the chair. Dr. C. Metcalfe Brown was warmly welcomed back after his illness, and the Committee also welcomed a new member, Dr. J. S. G. Burnett.

It was reported that, with only five exceptions, where appeals are pending, local authorities had accepted the awards Nos. 2285 and 2321 of the Industrial Court.

Appeals Machinery—Northern Ireland

A report was made on the present position regarding the approach already made to the Northern Ireland Government in connexion with the need for an adequate appeals machinery in Northern Ireland, and particular reference was made to the present disagreement regarding certain divisional medical officers. Mr. LEIGH TAYLOR (of Messrs. Hempsons, solicitors to the Association) attended the Committee and explained the variations in the legal position as between Northern Ireland and the rest of the United Kingdom. It was agreed that a further approach be made to the Northern Ireland Government.

Whitley Council

In the wider field of arbitration it was reported that the General Whitley Council, at a meeting during the following week, would be giving further consideration to the establishment of a court of arbitration within the existing machinery. In the event of the Staff Side failing to reach a satisfactory agreement with the Management Side, alternative action would have to be taken.

Assistant Medical Officer Arbitration

The CHAIRMAN gave a full report of the discussions in connexion with the claim for the revision of the salary scale for assistant medical officers. The Staff and Management Sides had failed to reach agreement and it had been

decided by both sides to refer the matter to arbitration. The necessary action was now being taken to report the matter to the Minister of Labour under the Industrial Courts Act. Further, discussions were now going ahead with Counsel regarding the preparation and presentation of the claim.

"Dual Appointments"

The circulars (RHB (53) 11 and Ministry of Health 3/53) which deal with the recent agreement were received. The membership of the Staff Side of the Advisory Committee, which had been the subject of discussion in the Central Consultants and Specialists Committee, was agreed.

Superannuation

Some comments by the Compensation and Superannuation Committee on the Local Government Superannuation Bill were considered. The Bill itself was considered to be satisfactory, but it was emphasized that it would be important to watch any subsequent regulations. An assurance had been given that the Association would be afforded an opportunity of studying draft regulations before they were laid before Parliament.

A summary of the extent to which local health authorities were exercising their discretionary power under the Local Government Superannuation Act, 1937, whereby part-time service may be superannuable, was received. The discretionary power did not appear to be widely used, and the Committee decided to consider the matter further.

Decentralization of Part III Services

The Committee had on a previous occasion received a document prepared by the Society of Medical Officers of Health regarding the decentralization of Part III Services. It was agreed that this document set out the views of the Committee and should be recommended for acceptance by the Council of the Association.

Therapeutic Abortion

It was reported to the Committee that a private Bill had been introduced into the House of Commons to add a proviso to the appropriate section of the Offences Against the Person Act, 1861 (which makes it a felony to administer drugs or use instruments to procure abortion). The proviso is as follows:

(a) No person shall be found guilty of an offence under this section unless it is proved that the act charged was not done in good faith for the purpose of preserving the life of the mother;

(b) no registered medical practitioner who acts with the concurring opinion of a second registered medical practitioner shall be found guilty of an offence under this section unless it is proved that the act charged was not done in good faith for the purpose of preventing injury to the mother in body or health.

Dr. METCALFE BROWN referred to the statement issued to the Press by the British Medical Association on the subject of therapeutic abortion. With regard to the proviso before the Committee, he spoke of the difficulty of proving "good faith." If subclause (a) were passed it might just as well be said that anybody was entitled to carry out therapeutic abortion.

The CHAIRMAN pointed out that the Act of 1861 referred to unlawful abortion, thereby implying that abortion under given conditions might be carried out lawfully. Dr. METCALFE BROWN moved that the Committee inform the Central Ethical Committee that in its view subclause (a) was objectionable. This was agreed.

After considerable discussion on subclause (b) the Committee agreed that its views were fully expressed in the statement already issued by the Association, which reads as follows: "The general question whether it is right to perform therapeutic abortion (that is, abortion carried out for the purpose of saving the life of a mother or of preventing injury to her health) involves important non-medical considerations outside the province of the Association, and on which, therefore, we are not called to comment.

There is considerable uncertainty, however, regarding the present legal position. If, as is sometimes believed, therapeutic abortion is in fact permissible under the existing law, it is highly desirable that the legal position should be made clear. The question whether or not to perform a therapeutic abortion in any particular case—within the limitations imposed by the law—must be left to the decision of the doctor concerned. The Association would always advise that a doctor proposing to carry out therapeutic abortion should seek a second opinion from a professional colleague."

Other Business

A number of other matters, including Home Office Circular No. 258/52 on child care, the resettlement in industry of tuberculous persons, and the care of mothers and babies during the lying-in period, were considered by the Committee.

PUBLIC HEALTH SERVICE DEFENCE TRUST

Purpose of the Trust Fund

The Committee, sitting as the Trustees of the Public Health Service Defence Trust, considered the question of contributing from the Trust Fund towards the legal costs involved in the presentation of cases for arbitration. These cases might involve a single medical officer, a section, or the whole of the public health service.

The view was expressed that the Trust Fund was originally intended to assist members in difficulties or suffering hardship which resulted from their adhesion to B.M.A. policy. It was agreed, however, that under the constitution of the Trust it was clear that the Trustees had wide powers and it was entirely proper to use the funds available for arbitration purposes.

The present position regarding the other Trusts—General Medical Services Defence Trust and Hospital Medical Staffs Defence Trust—was explained. It was agreed that, without prejudice to the future, the Trust should pay the legal costs of the arbitration on the assistant medical officer claim, and also of a pending case of arbitration under the Industrial Courts Act concerning an individual medical officer regarding whose status there is a difference of view between the two sides of Committee C.

OCCUPATIONAL HEALTH COMMITTEE THE FUTURE OF OCCUPATIONAL HEALTH SERVICES

A meeting of the Occupational Health Committee of the Association was held on February 18, with Dr. J. A. L. VAUGHAN JONES in the chair. It was announced that Dr. J. M. Rogan had accepted the Committee's invitation to serve as a co-opted member, and that the Public Health, Central Consultants and Specialists, and Private Practice Committees, and the Dermatologists Group Committee had appointed representatives for the current session.

The Committee devoted itself to the study of a draft memorandum intended for the Ministry of Labour and National Service on the future of occupational health services. It had been learned that the Social Insurance and Industrial Welfare Committee of the Trades Union Congress was anxious to have informal discussion on the development of a comprehensive occupational health service. A joint meeting had been held at which a preliminary exchange of views had taken place.

After the draft memorandum had been discussed for some time in the Occupational Health Committee, and various amendments in the phraseology had been agreed to, it was found necessary for the memorandum to be referred back to the Planning Subcommittee for reconsideration of certain essential points.

Integration of Training for Diplomats

At a previous meeting the Committee appointed a subcommittee to consider the integration of the training for the diplomas in industrial health and in public health and the possibility of a part-time course spread over two or three years in place of the one-year full-time course for the D.I.H. The conclusion reached was that there was no objection to even more integration of the two courses than exists at present, since a necessary proportion of the knowledge is common to both. It was mentioned that the London School of Hygiene and Tropical Medicine had gone some considerable way towards achieving this integration in a teaching experiment with a selected group of students. The evidence, however, was insufficient at present for the subcommittee to recommend a complete amalgamation of the two courses. It was generally agreed that a part-time course for the D.I.H., spread over a period of two or three years, was both desirable and practicable.

The full Committee agreed to submit these views to the Council.

Medical Examination of Public Transport Drivers

Two members of Council, Mr. D. S. Pracy and Dr. R. Forbes, attended during a discussion in the Committee on the medical examination of public transport drivers. The Committee was concerned with the possibility of drivers suffering from diabetic coma or some other condition which impaired their mental state, imperilling the safety of the travelling public.

Dr. FORBES pointed out that there were two matters involved in this subject. One was the policy with regard to more frequent examination of drivers of transport of any kind, and the other was the ethical question of what the doctor should do when he became aware that his patient, a driver of a vehicle, was suffering from some condition which might be a serious danger to the public. The B.M.A. had said that information gained from the patient in confidence must not be disclosed except by consent or by statutory authority.

A subcommittee was set up to prepare, with all urgency, a report on the whole subject. Included on the subcommittee will be medical officers closely concerned with transport questions. The question of the extent of the reference was considered. It was suggested that it might be extended to drivers of motor-cars in general, but it was agreed to limit it in the first place to drivers of passenger transport.

Ethical Rules for Industrial Medical Officers

A document which had been submitted by the Association of Industrial Medical Officers at an earlier meeting, entitled "Notes for the Guidance of Industrial Medical Officers," had been considered by the Central Ethical Committee, which had expressed anxiety regarding the apparent desire of industrial medical officers to undertake the continued treatment in minor or trivial cases without the consent of the general practitioner. At a later meeting they had considered the view of the Association of Industrial Medical Officers that there was no longer any necessity for them to be singled out as a section of the profession requiring special ethical rules. In reply to this the Central Ethical Committee had said that there was no intention to single them out or to suppose that they were more likely than anyone else to transgress the accepted code of ethics, but there were ethical rules for other sections of the profession, and the rules were of great value when questions were raised or complaints lodged. It regarded the retention of the present rules as highly desirable.

The policy of the Association in this respect was reaffirmed at the Annual Representative Meeting last year: "That it is a practitioner's obligation to observe strictly the rule of professional secrecy by refraining from disclosing voluntarily without the consent of the patient (save with statutory sanction) to any third party information which he has learned in his professional relationship with the patient."

A long discussion took place in the Occupational Health Committee on this subject, and various points were made by representatives of the Association of Industrial Medical Officers. One of them pointed out that whereas under the first of the rules an industrial medical officer giving advice or treatment at the place of employment must inform the employee's doctor of the material facts, yet in an establishment in which there was no medical officer but there was a nurse she might carry out some necessary treatment without being under any compulsion immediately to ring up the patient's doctor. The member who raised this point thought the matter was one to be considered on grounds of common sense and convenient practice. Another argument put forward was that the ethical considerations originally advanced did not carry the weight they formerly did, now that the National Health Service was in being. This argument was answered by a statement that ethical considerations between doctors were unaffected by the existence of a National Health Service. Another point made in the discussion was that there were part-time industrial medical officers who might use their position to attract patients on to their lists, and the ethical rules were essential to prevent this from happening. One member expressed the view that if some instructions were given to general practitioners when they took over an industrial appointment a considerable part of the difficulty would be overcome.

It was agreed that the document under consideration should go back to the Association of Industrial Medical Officers for study and revision in the light of the comments made by the Central Ethical and Occupational Health Committees.

APPOINTMENTS TO SCOTTISH HEALTH SERVICES COUNCIL AND STANDING ADVISORY COMMITTEES

The Secretary of State for Scotland has appointed the following eight new members to the Scottish Health Services Council in place of those who retired on December 31, 1952.

Dr. W. Mackie, Group Medical Superintendent, Perth Royal Infirmary Group, until December 31, 1953; Dr. W. Boyd, Medical Superintendent, Stratheden Mental Hospital; Dr. C. W. Clayton, physician-in-charge, Lochmaben Sanatorium; Dr. J. G. M. Hamilton, physician, Edinburgh; Professor J. L. Henderson, Professor of Paediatrics, St. Andrews University; Councillor Mrs. M. S. Ewart, chairman of the Health Committee of Hamilton Town Council; Mr. J. South, ex-chairman, Northern Regional Hospital Board; and Mr. W. R. Tattersall, dental practitioner, Perth, have been appointed members of the Council until December 31, 1955.

Reappointments

The following members have been reappointed until December 31, 1953: Dr. I. D. Grant, general practitioner, Glasgow; Mr. W. W. Galbraith, surgeon, Glasgow; Miss E. W. Himsforth, County Nursing Superintendent, Midlothian and Peebles; and Dr. David McCall, secretary, Pharmaceutical Society (Scottish Department).

Standing Advisory Committees

The Secretary of State has also appointed the following members to the Standing Advisory Committees.

Standing Medical Advisory Committee: Dr. D. P. Cuthbertson, Director, Rowett Research Institute, Aberdeen, has been reappointed. **Standing Dental Advisory Committee:** Mr. J. F. Henderson, dental practitioner, Motherwell, and Mr. D. MacGregor, chairman, Scottish Committee of the British Dental Association. Mr. G. K. MacLennan, dental practitioner, Edinburgh, has been reappointed. **Standing Nursing and Midwifery Advisory Committee:** Miss M. Fraser, Supervisor of Midwives for Lanarkshire; Miss F. E. Kaye, Matron, Aberdeen Royal Infirmary; and Miss C. Macdonald, Matron, Craig Dunain Mental Hospital, Inverness. Professor W. L. Burgess, Department of Public Health and Social Medicine, St. Andrews University, and Miss M. C. N. Lamb, Education Officer, Royal College of Nursing, have been reappointed. **Standing Pharmaceutical**

Advisory Committee: Mr. J. Hall, Western General Hospital, Edinburgh, Dr. I. M. Macleod, general practitioner, Inverness, and Mr. G. D. Stewart, retail pharmacist, Edinburgh, have been reappointed. **Standing Advisory Committee on Hospital and Specialist Services:** Dr. J. T. Curran, Superintendent, Lennox Castle Mental Deficiency Institution. Mr. J. Mackenzie, male mental nurse, Craig Dunain Mental Hospital, Inverness, has been reappointed. **Standing Advisory Committee on Local Authority Services:** Dr. I. B. K. MacGregor, general practitioner, Kilmarnock, and Mr. W. J. M. Kean, chairman, Public Health Committee, Edinburgh. Mr. R. P. Ligertwood, chairman, Public Health Committee, Aberdeen, has been reappointed. **Standing Advisory Committee on General Practitioner Services:** Mr. G. G. C. Bain, chairman, Aberdeen Executive Council, and Mr. M. B. Jackson, ophthalmic optician, Dunfermline, have been reappointed. **Standing Advisory Committee on Health Services in the Highlands and Islands:** Dr. C. S. Sandeman, general practitioner, Durness. Mr. J. S. Banks, chairman, Caithness Executive Council, and Mr. J. McNaughton, Argyll County Council, have been reappointed.

IRISH HEALTH BILL

CHANGES FROM WHITE PAPER

The Government of Eire has recently published the text of its Health Bill. An explanatory memorandum issued with the Bill says that its main object is to give to local health authorities the power and the duty to provide the improved and extended health services outlined in the White Paper published in July, 1952 (*Supplement*, August 9, 1952, p. 92). The explanatory memorandum also states that suggestions made by several bodies particularly interested in the development of health services for modifications of the White Paper proposals have been taken into consideration in drafting the Bill. The White Paper proposals were rejected by the Irish Medical Association as unacceptable (*Supplement*, November 15, 1952, p. 193).

New Features

Important changes from the White Paper are confined to new definitions of the income groups eligible for free treatment. They affect mostly what was described in the White Paper as the "middle income class." It has been decided that only the lower income group (previously known as the public assistance group) should have free general-practitioner, maternity, hospital, and specialist treatment. This proposal does not alter the existing position. The middle income classes are defined in the Bill as (a) persons insured under the Social Welfare Act, 1952, (b) adult persons whose yearly means (including the means of certain members of the family) are less than £600, (c) adult persons whose yearly means (including those of certain members of the family) are derived wholly or mainly from farming and the valuation of whose farms is £50 or less, together with (d) other persons who, in the opinion of the health authority, would be unable without undue hardship to provide institutional and specialist services for themselves or their dependants. These groups, and their dependants, may have free institutional and specialist services (but not general-practitioner or maternity services) as determined by the local health authorities. At the same time, local authorities will have discretion to impose a charge on groups (a)-(c) not exceeding two guineas a week for institutional services. A higher charge may be made for the persons specified in group (d).

Maternity Services

The White Paper proposed that maternity services should be free to all. In the Bill free services are restricted to the lower income groups and those in the middle income group who are unable to pay. Otherwise maternity services of all kinds—specialist and general practitioner—will be obtained by the middle income groups and above by the payment of £1 per annum. These contributions will be payable to the local health authority, and regulations will govern the conditions of their payment.

Schoolchildren

Special arrangements are made in the Bill for free specialist and institutional treatment for all pupils in national schools in respect of defects found at school health examinations. Arrangements are also made for cripples and mental defectives. A service at child welfare clinics and similar institutions will be available, free, for children up to 6 years of age.

The local health authorities will be responsible for the administration of all services. There is no provision in the Bill for any central medical advisory council.

Correspondence

Mau Mau

SIR,—The annual general meeting of the Kenya Branch of the Association was held in Nairobi on January 30, six days after the murder of Dr. Esme Ruck, whose obituary notice appeared in the *Journal* of February 28, p. 513. The meeting expressed the wish that the profession should be acquainted with the wanton attacks which have been made and of the continuing threat to life in Kenya. Although cognizance had been taken of subversive movements for some years, it was only in September, 1952, that it became clear that a considerable section of the Kikuyu tribe had, perhaps largely by coercion, taken an illegal pagan oath which forced dedication to the perpetration of murder and other felonies with the object of expelling British settlers and those loyal leading Africans who held that the improvement of their lot lay in co-operation with the Government. The movement is openly anti-Christian. The causes and controlling forces behind the movement, known as the Mau Mau, are *sub judice*, but it would appear to have taken root because some African "intelligentsia" have been encouraged to believe that their prosperity lay in expelling the British and seizing political power by force.

The Kenya Branch put forward in 1947-8 the case for a Royal Commission to inquire into the population problem. The Kenya representative at the Annual Meeting at Cambridge in 1948 pleaded for support for the proposal and subsequently the Council of the British Medical Association recommended it to the Colonial Office. The Government then in office, however, declined to recommend the appointment of a Commission. It will thus be seen that the Kenya Branch has been actively concerned with the problem of providing sufficient food for an increasing population. On the human level this is the primary need of the Colony. Many members of the Branch are devoting their professional lives to medical work primarily on behalf of Africans, and the present disturbances are a great disappointment to us all. Casualty figures of those murdered by Mau Mau up to January 31, 1953, are Wa-Kikuyu 134, other Africans 37, Europeans 8, Asians 2. These numbers may appear small, but in the affected areas loyal Africans are on the alert against surprise attacks from their neighbours, whilst the murdered include some of the most loyal and progressive chiefs, headmen, teachers, and pastors. Europeans have been attacked at night, those chosen being the apparently vulnerable from their situation. No discrimination in the choice of victims is made unless it is to choose those who are elderly or who are held in especial esteem by Africans whom they have befriended. Dr. Esme Ruck was not the first member of our profession to be attacked. Commander Meiklejohn and his wife, Dr. Meiklejohn, were similarly attacked by a gang using the usual sharp and heavy knives. Both were left for dead, but, although Commander Meiklejohn subsequently died, Dr. Meiklejohn survives after sustaining severe mutilating wounds. Farmers and others in affected areas have been left with no recourse but to arm against all possible assailants, for those propagating the crimes include trusted servants, so little have we correctly understood African psychology. Great strides have been made in the development of the

medical services in the Colony during the last 25 years, in which activities trained Africans have played an increasingly important part. Whilst casual visitors to the Colony are impressed by the disparity between the productive farm lands of European settlements and the soil-eroded areas of certain native reserves, no competent authority has ever advocated that the solution of the food problems of the Africans lay in interfering with the successful farming of the former. The Kenya Branch is anxious that the profession should become acquainted with these facts, lest in a desire to help the Africans of Kenya some of its members might misinterpret events and hinder a return to orderly progress on which alone the health of all communities, but especially that of the African, depends.

It should be recognized that, with possible rare exceptions, Mau Mau has had no support from members of any tribe in Kenya except the Wa-Kikuyu.—I am, etc.,

Nairobi.

R. HOWITT WISEMAN,
Hon. Secretary, Kenya Branch.

Cost of Prescribing

SIR,—If everyone taking a prescription to the chemist's would bring along a clean medicine bottle, Britain would save £1m. a year. At present National Health Service patients lose roughly one-half of the 100,000,000 handed to them each twelve months; and, as householder, pharmacist, and taxpayer, need I say how much I deplore the loss of the £1m. which this wastage means to all of us?—I am, etc.,

Nottingham.

MARY A. BURR.

Admission of Acutely Ill Patients to Hospital

SIR,—Like Dr. A. Harbour (*Supplement*, February 7, p. 37), I am irritated to read week by week that 80% to 90% of applications to the Emergency Bed Service are admitted to hospital. Also, like Dr. Harbour, I have learned long ago the type of case that it is useless to try to get admitted. I entirely agree with his analysis of the situation. A G.P. has to learn to withstand the reproachful looks of the district nurse as she gallantly struggles to prevent pressure sores developing in some elderly, comatose, bronchopneumonic, doubly incontinent, and with perhaps only a senile husband to tend her. I no longer trouble the E.B.S. with such cases.

Dr. Harbour might well have raised a further question. What kind of case does occupy the beds of medical wards? What principle, if any, is used in the selection of such cases? From my own experience, certainly not that of greatest need. My own feeling—and I should be glad to be proved wrong—is that cases have roughly the following priority. First are those cases of medical or therapeutic interest seen on grounds of urgency in the out-patient department; second are similar cases from general practitioners; third, and very much the last, are those pathetic, desperate, all-too-common cases of serious illness in the elderly with inadequate facilities for home care.—I am, etc.,

London, S.W.14.

J. H. S. HOPKINS.

Position of Registrars

SIR,—I should be grateful if you would allow me to correct a serious error in your report of a statement I made at the Central Consultants Committee on February 12 (*Supplement*, February 21, p. 46).

My figures for senior registrars who are now in their fourth or subsequent years referred only to two metropolitan, two provincial, and one Scottish region. In these five regions alone we are aware of about 110 senior registrars in this unenviable position. We believe that when up-to-date figures from all the regions are known there will be at least 300 senior registrars in the same position. It is difficult to see how the Ministry of Health can remain complacent about the future of such a large group of highly trained men.—I am, etc.,

Manchester.

R. M. FORRESTER,
Late Chairman, Registrars' Group.

Association Notices

ELECTION OF MEMBERS OF COUNCIL

Notice is hereby given that nomination of candidates for election as members of Council, 1953-4, (a) by the following Divisions and Branches, (b) by public health service members, and (c) by women members, must be forwarded in writing so as to reach me not later than Saturday, April 4, 1953.

Forty Members by Branches in Great Britain and Northern Ireland

Group	England and Wales	No. of Members of Council to be Elected by Group
1.	North of England Branch; Tees-side Branch	2
2.	East Yorkshire Branch; Yorkshire Branch	3
3.	North Lancashire and Westmorland Branch	1
4.	Divisions in Cheshire: Birkenhead and Wirral; Chester; Crewe; Hyde; Macclesfield and East Cheshire; Mid-Cheshire; Stockport; Wallasey	1
5.	Lancashire Divisions of Merseyside Branch: Liverpool, St. Helens, Southport, Warrington; Isle of Man Branch	1
6.	Lancashire Divisions of South Lancashire and East Cheshire Branch: Ashton-under-Lyne; Bolton; Bury; Leigh; Manchester; Oldham; Rochdale; Salford; Wigan	1
7.	Derbyshire Branch; Nottinghamshire Branch; Lincolnshire Branch; Leicester and Rutland Branch	2
8.	Midland Branch	1
9.	Staffordshire Branch; Worcester and Hereford Branch	1
10.	Berks, Bucks, and Oxford Branch; Northamptonshire Branch	1
11.	Cambs and Hunts Branch; Norfolk Branch; Suffolk Branch	1
12.	Divisions of Metropolitan Counties Branch in Middlesex	2
13.	Marylebone Division	1
14.	Tower Hamlets Division; City Division; Stratford Division; South-west Essex Division	1
15.	Hampstead Division; St. Pancras Division; Westminster and Holborn Division	1
16.	Kensington and Hammersmith Division; Paddington Division; Chelsea and Fulham Division	1
17.	Camberwell Division; Greenwich and Deptford Division; Lambeth and Southwark Division; Lewisham Division; Woolwich Division; Wandsworth Division	1
18.	Hertfordshire Branch; Essex Branch; Bedfordshire Branch	1
19.	Sursey Branch	2
20.	Kent Branch	1
21.	Sussex Branch	1
22.	Southern Branch; Dorset and West Hants Branch	1
23.	Bath, Bristol, and Somerset Branch; Gloucestershire Branch; Wiltshire Branch	2
24.	South-western Branch	1
25.	North Wales Branch; Shropshire and Mid-Wales Branch	1
26.	South Wales and Monmouthshire Branch	1
Scotland		
27.	Aberdeen Branch; Dundee Branch; Northern Counties of Scotland Branch; Perth Branch	1
28.	Edinburgh and South-east of Scotland Branch; Fife Branch	1
29.	Glasgow and West of Scotland Branch (Glasgow Division)	1
30.	Glasgow and West of Scotland Branch (County Divisions); Border Counties Branch; Stirling Branch	2
Northern Ireland		
31.	Northern Ireland Branch	2

Public Health Service Members

Two members of Council are nominated and elected by members of the Association employed in the public health service as defined in By-law 1 (3). Candidates must be members of the public health service as so defined.

One Woman Member

One woman member of Council is nominated and elected by women members of the Association.

Nominations

The nominations must be on the prescribed forms, copies of which can be obtained on application to me. In the case of the 40 members to be elected by Divisions and Branches, the nomination may be by a Division or Division-Branch as such, or by not fewer than three members of any Branch in the group. A notice will be published by the Council in the *British Medical Journal Supplement* on April 18, 1953, of the candidates nominated. Where contests occur, voting papers containing the names of all duly nominated candidates will be issued on April 25, 1953, from the Head Office, British Medical Association, Tavistock Square, London, W.C.1, to each member in the Group, or to the public health service members, or to women members. A notice will be published by the Council in the *Supplement* of May 16, 1953, giving the results of the elections where there have been contests.

A. MACRAE,
Secretary.

Diary of Central Meetings

MARCH

11 Wed.	General Practice Review Committee (adjourned meeting), 11 a.m.
13 Fri.	Consulting Pathologists Group Committee; 2.30 p.m.
17 Tues.	Subcommittee re Occupational Dermatitis, Occupational Health Committee, 2 p.m.
18 Wed.	Council, 10 a.m.
18 Wed.	Charities Committee, 1.15 p.m.
19 Thurs.	G.M.S. Committee, 10.30 a.m.
19 Thurs.	Radiologists Group Committee, 2 p.m.

Branch and Division Meetings to be Held

ALDERSHOT AND BASINGSTOKE DIVISION.—At Village Hall, Rotherwick, Wednesday, March 11, 9 p.m., meeting to discuss a proposal to alter the area of the Division.

BURTON-ON-TRENT DIVISION.—At Burton Golf Club, Ashby Road, Tuesday, March 10, 7.45 p.m., dinner, followed by lecture by Dr. Melville D. Mackenzie: "International Medical Work."

CROYDON DIVISION.—At 43, Wellesley Road, W. Croydon, Tuesday, March 10, 8.30 p.m., general meeting. Illustrated address by Dr. Philip Ellman: "Cancer of the Lung—Problems in Diagnosis and Differential Diagnosis."

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, March 12, 7.30 p.m., dinner; 8.45 p.m., meeting. Dr. J. M. Lipscomb: "Heart Trouble."

HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, March 10, 8.45 p.m., clinical meeting. Dr. Donald Teare: "Abortion."

KESTEVEN DIVISION.—At White Hart Hotel, Sleaford, Thursday, March 12, 7.15 for 7.30 p.m., dinner; 9 p.m., address by Dr. C. Worster-Drought: "Recognition of Early Organic Disease of the Nervous System."

LEEDS DIVISION.—At Medical School, Leeds, Wednesday, March 11, 8.15 p.m., meeting. Lecture by Dr. Ffrangcon Roberts: "The Impact of Scientific Medicine on the Struggle for Existence."

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Royal Oak Hotel, Alderley Edge, Cheshire, Monday, March 9, 8.30 p.m., meeting. Discussion on Cohen Report, followed by medical films.

MANCHESTER DIVISION.—At Manchester Royal Infirmary, Oxford Road, Manchester, Thursday, March 12, 5.30 p.m., special meeting. Dr. E. E. Claxton (Assistant Secretary, B.M.A.): "Current Problems in the Hospital Field."

ST. PANCRAS DIVISION.—At Old Library, B.M.A. House, Tavistock Square, W.C., Tuesday, March 10, 8.30 p.m., meeting. Lord Amulree: "Geriatrics."

SALISBURY DIVISION.—At Church House, Crane Street, Salisbury, Tuesday, March 10, 8.15 p.m., meeting. B.M.A. Lecture by Mr. T. Holmes Sellors: "Disorders of the Lower End of the Oesophagus" (illustrated with lantern slides).

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, March 12, 8.30 p.m., meeting. Mr. A. J. Wrigley: "Changes that have Occurred in Obstetrics in the Past 25 Years and the Lessons to be Learned from Them."

TUNBRIDGE WELLS DIVISION.—At Pembury Hospital, Wednesday, March 11, 8.30 p.m., clinical meeting.

SUPPLEMENT TO THE
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THE CONSTITUTION OF THE B.M.A.

BY

Sir ZACHARY COPE, M.D., M.S., F.R.C.S.

The brief but interesting account* of the origin and growth of the British Medical Association does not lay special emphasis on that which must colour any attempt to discuss the merits and demerits of its organization and administration—i.e., the fact that it has achieved a remarkable success. It has brought together and amalgamated into one body many thousands of doctors whose habits of thought and action are intensely individualistic, who by instinct and training object to being made to conform to any one pattern, and whose outlooks vary according to the branch of the profession which they have taken for their life-work. Consultants and general practitioners, those without and those within the National Health Service, civilians and Service members, research workers and public administrators, all are to be found in the one large Association. The fact that there still remain some whose sense of the importance of independence is greater than their appreciation of the value of unity in the profession is not surprising. The remarkable fact is that the minority is so small.

The British Medical Association started from a provincial centre and was "designed to counterbalance the concentration of medical authority in London." This aim has succeeded so well that, though the Headquarters of the Association are in London, a considerable if not a preponderating proportion of the principal officers of the Association have for many years been chosen from parts outside the Metropolitan area, and, to judge from my own observations, there is greater keenness and enthusiasm for the Association outside than within London.

The Association's Scientific Activities

When the Association was started there were few opportunities for developing the scientific aspect of medicine, and it was natural that the Association's activities should be mainly scientific. As time went on other opportunities outside the Association of advancing the scientific part of medicine presented themselves, and, with the simultaneous rise into prominence of many medico-social and medico-political questions, it was natural that greater emphasis was laid on these new problems. There was some danger that the scientific side of the Association might be neglected. Never-

*Three general articles under the above title have already appeared (*Supplement*, February 28, March 7, and March 14). Other signed articles will follow.

theless, the scientific value of the papers and discussions at the Annual Meetings remained very great, and the scholarships granted for research gave many distinguished men their first opportunity to show their worth. This aspect of Association affairs should not be lost sight of. The recent institution of prizes for essays written by nurses and medical students is a step in the right direction, but, if and when funds permit, there are other useful projects of a scientific nature which the Association might well undertake.

Branches and Divisions

The organization of the Association into branches and divisions has been carefully thought out, and for the most part seems to function well, but some of the branches are so large as to be almost unwieldy. If it be granted that one of the functions of a branch is to train those of its members who have special aptitude for administrative work, then it is unlikely that a very large branch will provide sufficient scope for training the number of able men who should be available among several thousand doctors. There is some ground for thinking that this last criticism might be fairly applied to the Metropolitan Counties Branch, which comprises 26 divisions and over 7,000 members. Though this branch is well run and well officered, objections against its size can be raised both on principle and as regards practical working. On the practical side it is difficult to get up enthusiasm for such a large unit as London, for the conditions of one part differ so greatly from those of another. There is reasonable ground for discussing whether it might be wise to split the Metropolitan Counties Branch into either two or four smaller branches. Each smaller branch would contain six or seven divisions, and there might be the additional advantage that there would be a greater community of interests as regards hospital matters which might help to make a more compact unit of the divisions in the branch. On special occasions combined meetings of the branches could easily be arranged.

The Representative Body

The Representative Body is a remarkable institution which gets through an amazing amount of work most expeditiously. It is at present quite large enough, and it would be more easily accommodated and perhaps more easily managed if the number of members were reduced to 400. It seems surprising that the representation of Marylebone should be as great as that of Birmingham or of Edinburgh, but that is no doubt due to the extraordinary number of specialists who congregate round the neighbourhood of Harley Street.

The discussions in the Representative Body are often clever and animated, and any speaker, however unpopular his views, will obtain a fair hearing. The many resolutions which are on the agenda paper of the Representative Body are, before the meeting, grouped and classified so as to diminish the number of arguable propositions, but, even with this sifting, there are too many items, and towards the end of the meeting, when the attendance begins to flag, many matters have to be hurried over which deserve a longer discussion.

The Council

The Council consists of a picked body of men who are experienced in the business of the Association and have a high sense of responsibility. Their debates have a statesmanlike quality. It is a pity that the membership has increased beyond the 50 which the Council Chamber was to seat comfortably. Owing to the great distance between some of the overseas branches and the Mother Country it has been customary to elect distinguished men from overseas who are practising in this country to represent those branches from which they originally came. This method of representation has worked very well and has been the means of bringing many very able men into the Council. Now that the means of communication throughout the world have improved beyond what would have been considered possible when the constitution of the Association was devised, there is something to be said, as and when vacancies should occur, for arranging for the overseas members of Council to be chosen from those actually practising in the country they represent. By this means a very close touch would be kept with the distant branches, and what is now almost an academic discussion on their affairs would become more practical and helpful.

The Committees

Few members of the Association have a full realization of the amount and value of the work done so conscientiously by its numerous committees. Though the constitution of the Association may to some appear rather rigid, yet considerable flexibility is shown by the permission given to Council to appoint special *ad hoc* committees to deal with any particular subject which may be in need of thorough investigation. From the reports of some of these committees have come information and recommendations which have led to very great improvements in the practice of medicine. Flexibility is also shown in the formation of the so-called autonomous committees, though here there is a distinct danger that outside influence may sometimes prevent the Association from pursuing the policy decided upon by the Representative Meeting. On the other hand, these autonomous committees are the means of extending the influence of the Association. It is well represented upon them, and by this means is able to make its views known to the whole profession, to interchange views with other medical bodies, and to reach conclusions which, on due confirmation by the bodies represented on the committees, can be regarded as the considered view of the whole profession. In former days, and before the introduction of the National Health Service, it was often said that the Association was mainly interested in the affairs of general practitioners, and there was some force in the remark. The criticism is no longer just, for of late years consultants have seen the importance of united action and have taken an increasing part in the activities of the Association. Undoubtedly the autonomous committees have formed a valuable link between the Association and outside bodies, but there is still need for closer integration of the whole profession, specialists and general practitioners, and the Association is the only body which provides the opportunity and actively encourages this necessary unification.

The Secretariat

It is strange that in the preceding articles the account of the Council should have omitted an important function—that of appointing the secretariat of the Association. The secretariat of any large association can be compared with

the nervous system of the body, for it is in constant contact with the periphery and knows every shade of opinion among the constituent members. The Secretary and his assistants can, and regularly do, furnish information of the greatest importance to the chief officers and the Council. Everyone will agree that the Association has been extremely fortunate in the choice of its secretaries and deputy and assistant secretaries, much of whose work is done behind the scenes where full credit does not always penetrate.

During the last 20 years there has been a great increase in membership of the Association, and any impartial observer will also have noted that its power and authority have also increased. If the Association shows the same flexibility, alertness, and unity that have characterized it during the last decade it should still further enhance its reputation.

MEDICAL PRACTICES COMMITTEE FOR ENGLAND AND WALES

FOURTH REPORT

The Medical Practices Committee for England and Wales has presented its fourth report to the Minister of Health covering the period of eighteen months. The following is a summary of some of its contents.

Analysis of Movement of Medical Manpower

The report contains an analytical survey illustrating the movement of medical manpower throughout the country since July, 1948. The Committee did not consider itself to be in a position to do this before, because so many imponderable and abnormal circumstances of medical practice were in being at the commencement of the National Health Service. To some extent they are still apparent to-day, and for these reasons it would have been preferable, says the report, that a five-year period, at least, should have elapsed before presenting this material. The inferences to be drawn from a survey extending over the longer period would have been more reliable. The Committee thinks, however, that the introduction of the plan proposed by the Working Party is bound to have rapid effects on the distribution of medical manpower, and therefore the period assessed is the longest over which the results of the operation of the Act and its amendments in this respect, as they were originally planned, can be properly assessed.

Some Figures

The report states that the figures given are substantially accurate, but that in a few instances there are inaccuracies. For example, in a few executive council areas the numbers on doctors' lists are still subject to a degree of inflation. In one instance this may amount to about 10% in excess of the true figure. But in the Committee's opinion this factor does not affect the relative changes that have occurred and allows broad inferences to be drawn. The report says that "in July, 1948, the total number of principals on medical lists in England and Wales was 16,864 and the number of registered patients approximately 41,500,000. The numbers at July, 1952, were 17,383 and 42,250,000 respectively. These figures give an average of 2,461 patients to each principal in 1948 and 2,430 in 1952 throughout the whole country. In 1948 variations in the average list in different parts of the country were wide. In Wales, to quote extreme examples, the average list per principal in Radnorshire Executive Council's area was 1,120, while in a part of Glamorgan it was over 8,000 in that year. In 1952, on the other hand, the averages for the same areas are 1,320 and 2,832 respectively."

Average of Lists

In the areas where the earlier reports of executive councils showed the average lists to be high the following figures taken from the report show the alterations in the position. (Assistants and practitioners on the list for limited purposes

have not been included in the following summaries. Principals have been taken into account only for the areas in which the main portion of each practice is situated.)

	No. of Principals	Average Lists
July, 1948	6,648	3,163
January, 1949	6,758	3,049
" 1950	6,783	3,041
" 1951	7,055	3,009
" 1952	7,397	2,869

The total increase of 749 in the number of principals practising in these areas represents an increase of over 11%. The important point, says the report, is that these additional principals are working where their services are most needed. Further, it is known that in these areas of high average lists most of the 1,560 assistants practising in the Service are employed.

In areas where the executive council's reports showed that the average lists were low the position has altered thus:

	No. of Principals	Average Lists
1948	1,176	1,648
1949	1,157	1,674
1950	1,085	1,868
1951	1,075	1,941
1952	1,062	2,010

Fewer Principals in "Overdoctored" Areas

Nearly 10%, or 114, fewer principals are now practising in these "overdoctored" areas than when the Service started. Included in these areas are many rural districts where one doctor is essential however small his list. It is concluded that the reduction of manpower in the urban areas is therefore mainly responsible for the alteration. For example, Bournemouth in 1948 had 97 principals, with average lists of 1,237, and in 1952 only 72 principals, with average lists of 1,827. Southport, Colwyn Bay and the surrounding district of Denbigh and Flint, Hastings, and Harrogate are given as other examples of substantial urban areas where the average lists of patients, well under 1,400 in 1948, have all risen considerably as the number of principals has fallen. In 1948 these principals numbered about one-third more than they do to-day.

"It appears doubtful," the report continues, "whether the number of doctors practising in these areas will or should be much further reduced. A number of these practitioners have held during their more active years busy practices in other areas, and have preferred to take smaller practices later in life rather than carry on work that had become too heavy for them or to retire completely. It is right that they should still be permitted to do this. Since 1948 some executive councils and local medical committees have, not unnaturally, been reluctant to allow this position to continue, and have dispersed practices which such doctors might have taken. Now that there is no longer a question in this type of vacancy of the practitioner being entitled to claim a fixed annual payment at the expense of the other doctors practising locally, it is probable that the attitude of the local bodies will be more tolerant towards the doctor seeking a semi-retired vacancy in their area."

Classification of Areas

Following upon the Danckwerts award and the Working Party's report, the Committee reports that it formulated proposals which were accepted by the Ministry and by the General Medical Services Committee of the British Medical Association. These proposals fixed the figures of 1,500 and 2,500 as flexible limits, so that any area with an average list of patients for each effective unit of medical manpower between these limits would be termed "doubtful" or "intermediate." With an average above the upper limit an area would become "designated," and beneath the lower limit would be classified as "restricted."

The Committee proposes to defer asking for detailed reports from executive councils about the medical manpower position in their areas until later in the year. The Committee thinks that executive councils will at that time have an opportunity of deciding, in the light of some experience of the working of the most recent amendments to the regulations, whether any rearrangement is desirable.

Admissions to Medical List

The Committee reports that the rate of admission of new partners to the list since July has increased considerably, and appears likely to continue to do so. Experience suggests that the stimulus of the Danckwerts award and the Working Party's plan will lead speedily to an improved service where it is most needed.

The report states that there have been 300 applications made by doctors who have themselves chosen a place in which to commence new practices. Of these 290 were granted and 10 refused. One of two appeals against the Committee's decision to refuse an application was allowed by the Minister. A further appeal against a restriction imposed by the Committee was also allowed by the Minister.

The Committee states that executive councils occasionally forward to it applications which have been made by doctors seeking admission to the list who are desirous of knowing in advance of making definite or even provisional arrangements whether their applications will be granted. Until recently the Committee gave the assurance asked for, but now, in view of the introduction of the scheme for designated areas, it has felt obliged to modify its procedure. Now it insists that the candidate should have made at least provisional arrangements for commencing to practise before being admitted to the list. "It would be manifestly unfair," says the report, "that an applicant to practise in an area which was designated, and who had, in fact, made his arrangements, should be deprived of the initial practice allowance because the 'designation' of the area had just been removed by reason of the admission to the list of applicants who had not made any such arrangements, and some of whom might never do so."

Additional Principals as Partners in Established Practices

The Committee reports that the number of admissions to the list under this heading was 781. Of these 44 were replacements for partners who were about to withdraw or had recently withdrawn from the list, and 737 were additional partners at the time of their admission to the list. In 344 of these cases the new partner had served as assistant in the practice before his admission to the partnership. Since the publication of the Danckwerts award and the report of the Working Party the Committee notes that "it appears not only to be financially practicable but also desirable or even necessary that many new partners will be required in existing practices. Indeed, from the numbers of new partnerships of which we have been notified each week since July last we know that the process of assimilating doctors into general practice in this manner has again been restored to a satisfactory level. During the next few months the number is likely to exceed those hitherto admitted during any similar period."

The Committee expresses concern, as it has done before, regarding attempts to nullify the normal procedure of appointing a doctor to succeed one retiring from the list who had hitherto been in single-handed practice. "Such attempts," it says, "are persisting, and consist of the formation of a 'partnership' which cannot in fact have any reality in substance, since the senior partner clearly contemplates almost immediate retirement and the transfer of the practice property to the new practitioner. Executive councils have themselves noted these devices with great concern." The Committee has suggested to executive councils that in these cases it is proper neither for it nor for the executive councils themselves to appear to condone

the procedure which in such cases has been adopted, and that therefore the usual custom of effecting a block transfer of the patients on the list of the retiring "partner" to that of the new "partner" should not be followed. No satisfactory method, the report continues, of preventing this abuse of the privilege which rightly attaches to genuine partnerships has so far been found.

Advertised Vacancies

During the period 208 vacancies were advertised, of which 28 were for the purpose of commencing new practices from premises situated usually on new housing estates. The remainder were for the vacancies in established practices following the death or resignation of single-handed practitioners. Most executive councils dealt initially with the applications received, and after an interview of short-listed candidates have made a definite recommendation to the Committee. These recommendations were accepted in 206 cases, and in only two was it found necessary to disagree with the executive council and to select another candidate. "These figures," states the report, "show how infrequently any real difference arises between the Medical Practices Committee and the local bodies acting in these matters."

In its third report the Committee referred to the average time taken to fill 32 vacancies. A similar number of recent cases have been examined, and analysis in this, its fourth, report shows that the periods have fallen from eight weeks to just under seven weeks in cases in which no appeal was made, and from eleven weeks to just under nine weeks where there were appeals.

Age of Candidates for Vacancies

In its last report the Committee noted that the average age of candidates selected for advertised vacancies was approximately 38. A further study shows that the average has fallen to 36. The proportion of doctors above and below 40 years of age applying for advertised vacancies appears to have remained fairly constant. The Committee gladly notes a tendency on the part of some executive councils to give consideration to older applicants for vacancies, and particularly to those who have retired from other forms of medical practice at a comparatively early age. Generally, however, the Committee finds that it remains extremely difficult for this class of applicant to make a belated entry into general practice.

Assistants

The report states that the number of full-time assistants, other than trainees, employed by principals in general practice in England and Wales, which had been fairly constant, dropped from the figure of 1,724 noted last year to 1,566 on November 1, 1952. As a result of the Working Party's report, an increasing tendency for assistants in the larger practices to be taken into partnership has been noticed, and the Committee has no doubt that because of this the number of permanent assistants will continue to decrease during the next few months. According to the report, there is little evidence to support the contention that the advent of the National Health Service in 1948 produced a very large increase in the numbers of permanent assistants employed in general practice. There are no reliable figures of the number of whole-time assistants in general practice prior to the appointed day, nor until the end of 1949. The number believed to be so engaged prior to July, 1948, was approximately 2,100 for the United Kingdom and Northern Ireland, as stated in the reports made before the plebiscites of the profession held in 1947-8.

Practice Premises

The Committee thinks that in some areas, at least, the problem of doctors obtaining premises from which to commence a practice has been a little easier during the last 12 months. Joint discussions between the Ministry, the General Medical Services Committee of the B.M.A., and

the Medical Practices Committee have resulted in the agreement of the Association to the issue of regulations which in the Committee's view should to some extent avert the position in which a doctor, selected to succeed to a practice vacancy, finds himself when the premises from which the practice has been conducted are already secured by a competing doctor. (See p. 77 of this Supplement.)

The report concludes with a sincere appreciation of the work done by executive councils and local medical committees. A greater difficulty than was in fact experienced had been anticipated in reconciling views regarding the reclassification of areas. Where initial disagreement was encountered, in nearly every case a decision satisfactory to all the statutory bodies concerned had been arrived at, and where disagreement still persists the Committee is confident that this will be amicably resolved.

The report is signed by W. E. Dornan (Chairman), H. Lesser, J. A. Pridham, A. C. Gillie, J. F. Murphy, J. C. Pearce, D. B. Evans, R. O. Wilberforce, and P. V. Anderson.

British Medical Association

EXTRAORDINARY GENERAL MEETING

In pursuance of a requisition made in writing and signed by more than 100 members of the British Medical Association, notice is hereby given that an Extraordinary General Meeting of the members of the Association will be held at B.M.A. House, Tavistock Square, London, W.C.1, at 2.30 p.m. on Tuesday, May 5, 1953, for the purpose of considering and, if thought fit, passing the following Resolution:

That the Association being concerned by the modification of the present method of remuneration by capitation fees agreed in the Working Party's report requires the Council forthwith to approach the Minister of Health with proposals for the better protection (financial and otherwise) of the small-list doctor and of the doctor newly seeking entry into practice, and requests the Minister of Health not to implement the Working Party's report until the scheme for distribution of remuneration has been considered in the light of such proposals, and meanwhile to continue the present method of payment.

By order of the Council,

A. MACRAE,
Secretary.

THE ASSOCIATION OF WHOLE-TIME SALARIED SPECIALISTS

CHANGE OF NAME

The annual general meeting of the Association of Whole-time Salaried Specialists was held at the Royal College of Surgeons of England on February 20, 1953. It was decided to change the name of the Association to "The Whole-time Consultants Association."

The following officers were elected for 1953: *President*, Dr. E. N. Allott; *Hon. Treasurer*, Dr. J. Duncan White; *Hon. Secretary*, Dr. C. Allan Birch.

It was reported that, as a result of representations made by the Association, Committee "B" of the Medical Whitley Council had decided to set up a subcommittee to reconsider problems affecting whole-time consultants. This subcommittee would consist of the whole of both the Management and Staff sides of Committee "B," together with three representatives of the Whole-time Consultants Association. It was felt that a considerable step forward had been taken, and it was hoped that the first meeting of the subcommittee would take place at an early date.

Dangerous Drugs Act: Withdrawal of Authorities

The Home Office announces that Dr. Alex Forbath (London, S.E.9) and Dr. G. O. Grant (Carlisle) are no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

GENERAL MEDICAL SERVICES

PARTNERSHIP PREMISES AND NOTIONAL LISTS

The following is a summary of some of the matters dealt with in a letter from executive councils to all doctors on their lists (E.C.N.114). Further details should be obtained by reference to the original document.

Succession to a Vacant Medical Practice by a Partner

Under this heading attention is called to the fact that partnerships have occasionally been formed between an established single-handed doctor who intends or is expected shortly to retire and another doctor, apparently with the main object of enabling the latter to secure the succession to what is essentially a single-handed practice. It is stated that this action, if allowed to be successful, would defeat the intention of the regulations made under the Act, by which the executive council and the Medical Practices Committee in consultation are required to select doctors for single-handed vacant practices. The Medical Practices Committee, therefore, in agreement with the Ministry of Health and the General Medical Services Committee of the B.M.A., will not accept one partner as a logical successor to another partner who has died or resigned if the partners have not been in active practice together for about a year, unless there are good reasons for an exception being made. When a vacancy occurs in a partnership practice of this kind the Ministry of Health considers that it is particularly desirable that the vacancy should be advertised.

Acquisition of Vacant Practice Premises

A doctor selected for a vacant practice is sometimes faced with competition from another doctor who may have been an unsuccessful applicant for the practice and who has secured the premises from which the practice was previously conducted. In order to help the selected doctor to establish himself in the new practice and to purchase the premises, if he so wishes, a new provision is to be inserted in the terms of service which will prohibit a doctor from practising at premises previously used by another doctor whose practice has been declared vacant unless he has the consent of the executive council or, on appeal, of the Medical Practices Committee. The effect of these provisions is, in short, that the selected successor to a vacant practice will have the first offer of the vacant practice premises and will have a month in which to decide whether to accept the offer. The terms of the offer will have to be approved by the Medical Practices Committee.

Payment of Partners on Notional Lists

In order to qualify for the payment of loading fees which is most advantageous to a partnership (notional lists), all the partners must be principals and each of them entitled to a share of the profits of the partnership which is not less than one-third of the share of any other partner.

If a salaried partner is to be entitled to be regarded as a full partner under the allocation scheme, it will be necessary for the executive council to be satisfied that his guaranteed minimum share in the form of a net salary is at least one-third of the net income of any other partner, and that the share of the partner with a guaranteed minimum must increase—proportionately to his share in the practice—above the minimum when the net earnings of the practice exceed the amount necessary to provide his guaranteed income. Where there is an assistant, or a doctor described as a partner who is paid a fixed salary without any provision for a variable share in the profits, the total list under the allocation scheme may be increased only by an additional 2,000 patients, and this allowance will not attract "loadings" or be included in the calculation of notional lists to attract "loadings."

Paragraph 9 of E.C.N.108

This paragraph stated that executive councils will require at least three months' notice of any change which is desired

by a partnership in the basis of payment on notional lists. This statement was intended to apply to any changes requested by a partnership after notional list arrangements for the partnership had been brought into effect, not to suggest that executive councils will require three months' notice when dealing with original applications by partnerships for payment on notional lists.

Scottish News

SCOTTISH COMMITTEE

The Scottish Committee met at B.M.A. House, Edinburgh, on February 24, with Dr. J. G. M. HAMILTON in the chair. The Committee had before it a recommendation of its Hospitality Subcommittee that it should recommend to Council that the occasion of the Committee's Jubilee Year should be marked by holding a dinner in October to which guests prominent in Scottish public life would be invited. The approximate cost to the Association would be £225. After considerable discussion, and reference to the need for economy in the Association, the Committee resolved that a dinner be arranged, but that the cost be borne by the members of the Committee.

Invitation from Denmark

The Committee welcomed an invitation from the Danish Society (the equivalent in Denmark of the British Council) for a small party of doctors in Scotland to visit Denmark for two weeks in September (see page 78). The Scottish Secretary reported that the number suggested was 20, and that an attractive provisional programme had been drawn up by the Society in conjunction with the Danish Medical Association. The Secretary was instructed to undertake the necessary arrangements, including notices to the *Journal* and to Branch and Division secretaries in Scotland.

Dr. Hamilton informed the meeting that he had been invited, as Chairman of the Scottish Committee, to become a Patron of the Scottish Marriage Guidance Council. The Scottish Committee accepted a letter from the council setting out the aims of the work undertaken, and found no objection to the Chairman accepting the invitation, should he wish to do so.

Glasgow Regional Office

Dr. J. T. McCUTCHEON, Assistant Scottish Secretary, submitted his annual report on the work of the Glasgow Regional Office. The Chairman said he felt sure the Committee would wish to congratulate Dr. McCutcheon on the good work which was being done by himself and his staff in the Glasgow office. Dr. I. D. GRANT said the Glasgow office had given great satisfaction in the West of Scotland. In view of this he felt that the Organization Committee of the Association might usefully begin to consider the establishment of similar regional organizations in other parts of the country. There was no doubt that the Glasgow office had enhanced the value of the Association to members in the area.

Public Relations

A report on the work of the past year was submitted by Mr. GEORGE DONALDSON, Press Officer in Scotland, and the hope was expressed that local medical committees and Divisions would avail themselves of Mr. Donaldson's offer to address them on the special needs of public relations in Scotland. It was felt that, if there was a greater appreciation of this need, more could be achieved to foster understanding and good relations between the public and the profession in Scotland.

Resignations

The Committee received with regret the resignation for health reasons of Dr. W. N. Gray, Helmsdale. The

Caithness and Sutherland Division has elected Dr. J. C. McGregor, Thurso, to succeed him.

It was agreed that no action should be taken to fill the vacancy caused by the resignation from the Committee last month of Dr. T. Simson Hall and that Dr. Hall be thanked for his services.

A Happy Ending

At the conclusion of the meeting a cocktail party was held in honour of Dr. I. D. Grant, immediate past chairman of the Committee. In proposing Dr. Grant's health, the Chairman said that it must have been particularly gratifying to Dr. Grant that the project of the Glasgow Regional Office, of which he had been an untiring advocate for many years, should be realized during his term of office. He felt sure that Dr. Grant, no matter to what further heights he should rise in the Association's hierarchy, would always have closely at heart the interests of the Association in Scotland. Dr. GRANT, in reply, said how proud he was to have been Chairman of the Scottish Committee, and thanked the members for the honour they did him, and for their support during his term of office.

PROPOSED TOUR OF DENMARK BY SCOTTISH DOCTORS

The Scottish Committee has welcomed an invitation received from the Danish Society (the Danish organization corresponding to the British Council) for a party of up to 20 Scottish doctors to tour Denmark in September, 1953.

It is proposed that the tour shall extend from September 1 to 14. Organized visits to Danish hospitals, universities, medical institutes, and other places of interest to members of the medical profession, together with sightseeing excursions, will be arranged. The cost of the tour will be approximately £31, including travel (third class) Newcastle-Copenhagen-Newcastle and the stay in Denmark. First-class travel can be arranged for an extra charge of about £7. All expenses of travelling in Denmark will be met by the Danish Society, who will also make full arrangements for the programme in co-operation with the Danish Medical Association. The provisional programme for the visit is as follows:

Date	Time	
Tuesday, September 1	Noon	Departure from Newcastle
Wednesday " 2	1 p.m.	Arrival Esbjerg
	7 "	Departure from Esbjerg
Thursday " 3		Arrival Aarhus
		Programme in Aarhus arranged by the Danish Medical Association and the Danish Society (including visits to University, Town Hall, Central Hospital, Serum Institute, modern housing)
Saturday " 5	Night	Leave by boat for Copenhagen
Sunday " 6	8 a.m.	Arrival Copenhagen
	10 "	Sightseeing in Copenhagen
	1 p.m.	Meet private hosts
Monday " 7		Programme in Copenhagen arranged by the Danish Medical Association and the Danish Society (including visits to the new university town, reception at Domus Medica, visit to "Rigshospitalet" and the Anatomical Institute, excursion to North Zealand with visits to the Central Hospital in Hillerød and to Frederiksborg and Kronberg Castles, further visits in Copenhagen to the Serum Institute, the central tuberculosis station, a tuberculosis sanatorium, to the new institute for infantile paralysis, to the laboratory of the Sick Benefit Clubs and the Finsen Institute)
Saturday " 12		Free in Copenhagen
Sunday " 13	11.45 a.m.	Leave Copenhagen by train for Esbjerg
	5.45 p.m.	Leave Esbjerg by boat for Newcastle
Monday " 14	6 p.m.	Arrive at Newcastle

Depending to some extent on the number of applicants, it may be possible to arrange to include their wives in the party.

Doctors in Scotland who are interested in this tour of Denmark are asked to communicate with the Scottish Secretary, British Medical Association, 7, Drumsheugh Gardens, Edinburgh, 3, without delay.

HOSPITAL ACCOUNTS FOR 1951-2

AVERAGE COST OF MAINTAINING N.H.S. PATIENT

Detailed costing returns* for the year ending March 31, 1952, covering some 2,750 hospitals in the National Health Service in England and Wales, have been published by the Ministry of Health. Each hospital is classified in the returns according to its primary function, for example, wholly general, mainly chronic, maternity, mental, etc. Then three main sets of figures are worked out—(1) the total inclusive net cost per week of maintaining a patient; (2) the same cost after allowing for out-patient expenditure (this is done by assuming that five out-patient attendances equal for costing purposes one in-patient day); and (3) the same cost further adjusted to allow for the "vacant bed factor"—beds staffed but not occupied. An innovation of the present returns is that non-teaching general hospitals have been classified according to the number of beds.

The following Table shows the regional and national average cost of maintaining an in-patient per week in general hospitals (excluding teaching hospitals) according to bed-size, and in maternity, mental, and tuberculosis hospitals.

Region	Wholly General Hospitals				Maternity	Mental	Tuberculosis
	1-50 Beds	51-100 Beds	101-300 Beds	301-900 Beds			
	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.
Newcastle-upon-Tyne ..	10 15	11 17	12 18	13 0	15 9	3 17	7 9
Leeds ..	14 2	12 9	14 8	13 10	17 1	3 14	9 5
Sheffield ..	12 0	14 10	12 16	14 4	15 9	4 5	7 19
East Anglian ..	13 4	14 3	13 19	14 2	15 16	3 14	9 16
N.W. Metropolitan ..	15 15	15 17	17 0	19 6	18 4	4 9	12 8
N.E. " ..	14 0	15 2	15 16	14 11	20 5	4 10	9 11
S.E. " ..	13 0	15 13	15 10	15 6	18 2	3 18	10 16
S.W. " ..	11 17	14 9	14 19	15 5	15 12	4 4	8 19
Oxford ..	13 13	18 0	18 11	16 13	19 9	4 4	11 2
South-western ..	12 16	14 4	15 18	17 15	15 5	4 0	9 7
Welsh ..	12 15	14 5	14 17	14 2	14 9	4 4	8 17
Birmingham ..	13 17	12 0	15 9	13 10	19 5	3 16	8 15
Manchester ..	11 0	12 6	12 18	12 14	15 4	3 14	8 2
Liverpool ..	12 9	11 2	13 6	13 8	15 16	3 12	8 12
National averages	12 14	14 7	14 13	14 11	16 19	4 1	9 6

The average patient-week cost in England and Wales in 1951-2 for all non-teaching hospitals in the "wholly general" group was £14 5s. 11d. The corresponding average figure in 1950-1 was £13 10s. 3d.

Teaching Hospitals

For teaching hospitals (irrespective of size) classified as wholly general, the average weekly cost per in-patient in 1951-2, again computed on the same basis, was £23 13s. 8d. in London, and £17 15s. 8d. in the provinces. The figures for the previous year were £23 16s. 10d. and £17 5s. 10d. respectively, but the figures before allowing for out-patient expenditure were: London, 1951-2 £33 2s. 4d., 1950-1 £32 18s. 11d.; Provinces, 1951-2 £23 13s. 6d., 1950-1 £22 17s.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

*National Health Service: *Hospital Costing Returns*, year ending March 31, 1952. H.M. Stationery Office.

THE DANCKWERTS AWARD AND THE SMALL-LIST PRACTITIONER

WORKING PARTY TO MEET

As announced in last week's *Supplement* (p. 69), the General Medical Services Committee has decided to undertake, with the help of the Ministry of Health, local executive councils, and local medical committees, an immediate inquiry with a view to obtaining a precise analysis of the number and categories of practitioners who may suffer injustice under the new distribution scheme which starts on April 1.

If the results of an inquiry of this nature are to be accurate, comprehensive, and above criticism all three sources of information must be used and the inquiry carried out on a uniform basis throughout the country. Again, after the results of the inquiry are known, any further steps which the Committee might wish to take to give effect to the rider passed by the Conference of Local Medical Committees must necessarily be taken through the Working Party, as a means of securing the agreement of the Ministry of Health.

First Meeting Soon

It has been agreed, therefore, to call the Working Party together again to investigate the problem and to obtain the fullest possible information about the number of small-list practitioners likely to be concerned. It is anticipated that the first meeting of the Working Party will take place within the next few weeks.

Distribution Scheme

The Regulations embodying the new distribution scheme will include a provision to enable the Minister to evolve a scheme to provide for payment, if this should prove necessary, to certain practitioners who may suffer a fall in remuneration through the introduction of the new methods of payment.

Notes and News

Resolution of Nottingham Consultants.—Sixty members of the Nottingham Area Consultants and Specialists Committee met recently and passed the following resolution: "That this meeting of consultants and specialists of the Nottingham and Nottinghamshire area is of the opinion that an adequate betterment factor should now be accorded to the consultants and specialists in conformity with the intention of the Spens report, accepted by the Government and by the profession, and already implemented in the case of the general practitioners by the Danckwerts award."

Holiday Exchange.—A German doctor would like his son, aged 16, to stay with the family of a doctor in this country from July 20 to September 10. In return, the British doctor's son could spend a similar period in Germany either before July or after September 10. The German family live in a town between the Ruhr and the Rhineland, and, as a car is available, the British boy would be able to see much of the surrounding countryside. Anyone interested should write to Dr. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Telesuggestion.—A patient, referred to a chest physician, took with him a note from his general practitioner: "This man has a television set. He has been worried as to whether he has tuberculosis or cancer. Please x-ray."

Correspondence

The Representative Body

SIR,—It warmed up my old ex-secretarial heart to read Winchester's memorandum (*Supplement*, February 28, p. 55). Although it was the Divisions who were asked for their opinion, I feel sure Winchester will not object to my butting in. Not only because I largely agree with it, and because I think it a lucid and masterly statement and argument, but also because I naturally take a special interest in the status and reputation of the Representative Body, being the only survivor of the Constitution Committee which in 1900 created it as the very core of the new constitution of the Association.

I cannot improve on the Winchester argument in favour of the reduction in size of the R.B., but I wish to emphasize some of its points. That body was always intended to be the *parliament* of the Association and ultimately that of the whole profession. At present it seems more like a public meeting than a legislative body. We are told that it is good to have a large meeting on account of the educative influence it has on its members and, through them, on their colleagues at home. This argument can easily be pushed too far, and I doubt if any Division, however large and important, would suffer if limited to a maximum of, say, five representatives. The present generosity looks to me extravagant, and a body which has had to increase its subscription cannot afford extravagance.

I like the idea of giving representation to the autonomous bodies which have sprung up recently within the Association. The idea of autonomy inside a parliament is unusual and seems to me potentially dangerous. A parliament represents all sections of the community, and in our profession there is no other body than the B.M.A. and its R.B. capable of doing this.

Finally, a recent personal experience of the hypertrophy of the R.B. disturbed me. Since my retirement from office I have attended as a spectator every Representative Meeting held in London. On the last occasion I found great difficulty in inserting myself into the gallery, because for the first, and I hope for the last, time it was almost entirely taken up by representatives who had overflowed the usual accommodation on the floor. I was sorry for them, for they must have felt it difficult to take an active part in what was going on below. But it would be a great pity if the ordinary member were denied the opportunity to see his representative at work. It looks as if our Great Hall is no longer able to accommodate a Representative Meeting and interested onlookers. This difficulty is likely to be even more acutely felt in some of the towns in which the Annual Meeting may be held.

I earnestly hope that the Winchester document will receive the attention it deserves, first from the Divisions and later from the R.B. itself.—I am, etc.,

London, S.W.7.

ALFRED COX.

Cost of Hospital In-patient Maintenance

SIR.—The Ministry of Health publication about hospital costings makes interesting perusal (see page 78). The discrepancy between the costs for dealing with maternity, general, tuberculosis, and mental-hospital patients clearly requires some explanation. Why should the maintenance of a patient in a mental hospital cost so much less—£4 1s. 1d. per week, compared with £9 6s. 7d. in a sanatorium and about £14 10s. in a non-teaching general hospital?

The explanation may lie partly in the fact that mental hospitals, like sanatoria, work almost to capacity, and this must reduce the cost of patient maintenance. On the other hand, admissions to general hospitals are more sporadic and irregular. This implies a certain measure of bed-

wastage which is inevitable in even the most efficiently managed general hospital. Again, it is possible that the shortage of mental nurses and the overcrowding of mental hospitals (11%) help to keep costs *per caput* low. The above reasons may be partly responsible for the lower running charges in mental institutions. Yet these facts cannot account for the very considerable difference in the maintenance costs for sanatorium and mental-hospital patients.

It is well established that there are a considerable number of factors, such as overcrowding, difficulty in hygienic control of mental-hospital patients, etc., responsible for the extremely high tuberculosis morbidity and mortality rates in mental hospitals (2.8% of the national deaths due to tuberculosis occur in mental hospitals, while this community only constitutes 0.35% of the population of England and Wales). A most important factor in the high incidence of pulmonary tuberculosis in mental institutions may prove to be the failure to maintain an adequate nutritional level among mental-hospital patients. It would be reassuring to learn that the feeding costs *per caput* in these various institutions cited by the Ministry are approximately similar, and that the calorie intake in the mental units compares favourably with that to be found in sanatoria, general, and maternity hospitals.—I am, etc.,

Halifax.

BERTRAM MANN.

Association Notices

Diary of Central Meetings

MARCH	
24 Tues.	Remuneration Subcommittee, Occupational Health Committee, 11 a.m.
24 Tues.	Executive Subcommittee, Joint Formulary Committee, 2 p.m. (at Pharmaceutical Society of Great Britain, 17, Bloomsbury Square, London, W.C.).
24 Tues.	Public Transport Drivers Subcommittee, Occupational Health Committee, 2 p.m.
25 Wed.	Planning Subcommittee, Occupational Health Committee, 10 a.m.
25 Wed.	Alcohol and Road Accidents Committee, 11.30 a.m.
25 Wed.	Joint B.M.A. and T.U.C. Committee, 2.30 p.m.
26 Thurs.	Central Consultants and Specialists Committee Executive, 12 noon.
26 Thurs.	Rural Practices Subcommittee, General Medical Services Committee, 2 p.m.
APRIL	
1 Wed.	General Practice Review Committee, 11 a.m.
1 Wed.	Joint Committee of the B.M.A. and the Royal College of Nursing, 2 p.m.
9 Thurs.	Central Consultants and Specialists Committee, 1.30 p.m.
14 Tues.	Registrars Executive Committee, 2 p.m.
15 Wed.	Occupational Health Committee, 11 a.m.
20 Mon.	Armed Forces Committee, 2 p.m.
MAY	
1 Fri.	Registrars Group Council, 2 p.m.
20 Wed.	Conference of Honorary Secretaries, 10.45 a.m.

Branch and Division Meetings to be Held

BRIGHTON DIVISION.—At Hotel Metropole, Brighton, Thursday, March 26, 8.30 p.m. Joint meeting with Brighton and Hove Association of Pharmacy.

CHESTERFIELD DIVISION.—At Walton Sanatorium, Chesterfield, Friday, March 27, 8.45 p.m., meeting. Lecture by Dr. R. T. Gaunt: "Some Recent Advances in Medicine." (Date changed from March 20.)

CITY DIVISION.—At Finsbury Health Centre, Pine Street, London, E.C., Tuesday, March 24, 8.30 p.m., meeting. Lantern demonstration by Dr. R. M. B. MacKenna: "Common Problems in Dermatology."

DEWSBURY DIVISION.—At Dewsbury General Infirmary, Friday, March 27, 8.30 p.m., meeting. Annual B.M.A. Lecture by Mr. A. Dickson Wright: "Ulcerative Colitis" (illustrated by lantern slides).

EAST SOMERSET DIVISION.—At The Small Hall, Wells, Sunday, March 22, 3 p.m., general meeting.

FURNESS DIVISION.—At Duke of Edinburgh Hotel, Abbey Road, Barrow-in-Furness, Friday, March 27, 7.15 for 7.45 p.m., annual dinner.

ISLE OF WIGHT DIVISION.—At St. Mary's Hospital, Newport, Sunday, March 29, 2.30 p.m., meeting. Combined lecture-demonstration by Dr. Aitken Ross: "Treatment of Chronic Leg Ulceration." All island medical practitioners and district nurses are invited.

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Mary Abbots Hospital, Marloes Road, Kensington, W., Tuesday, March 24, 8.30 p.m., meeting. B.M.A. Lecture by Dr. Eustace Chesser: "Psychological Factors in the Termination of Pregnancy." Members of the Chelsea and Fulham and the West Middlesex Divisions are invited.

LEWISHAM DIVISION.—At Lewisham Hospital, S.E., Friday, March 27, 8.30 p.m., meeting. Mr. J. V. Broad: "The Discharging Ear. Some Comments on Migraine and Sinus Headaches."

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, March 24, 8.45 p.m., annual general meeting. Film: "Anaesthesia in the Dental Chair."

OXFORD DIVISION.—At Maternity Department Lecture Theatre, Radcliffe Infirmary, Oxford, Wednesday, March 25, 8.15 p.m., meeting. Dr. W. D. W. Brooks: "Recent Advances in the Treatment of Pulmonary Tuberculosis."

ROCHESTER, CHATHAM AND GILLINGHAM DIVISION.—At St. Bartholomew's Hospital, Rochester, Thursday, March 26, 8.30 p.m., meeting. Lecture by Dr. William Tegner: "Rehabilitation." All medical practitioners in the area of the Division are invited.

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, March 26, 8.30 p.m., annual general meeting. Colour and sound film: "Senile Obliterative Arteritis of the Legs."

SHEFFIELD DIVISION.—At University Medical Library, Sheffield, Friday, March 27, 8.30 p.m., annual general meeting.

SOUTH BEDFORDSHIRE DIVISION.—At Luton and Dunstable Hospital, Friday, March 27, 9 p.m., meeting. Dr. Robert Forbes: "The Legal Hazards of Medical Practice."

SOUTH SHIELDS DIVISION.—At Ingham Infirmary, Friday, March 27, clinical meeting. Address by Dr. W. G. A. Swan: "Mitral Valvotomy."

SOUTH-WEST ESSEX DIVISION.—At Whipps Cross Hospital, Leytonstone, E., Wednesday, March 25, 8.30 p.m., meeting. Address by Dr. M. Gilchrist: "Handicapped Children." All members of Leyton Head Teachers' Association are invited.

SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Tuesday, March 24, 9.30 p.m., meeting. Paper by Mr. A. L. d'Abreu: "The Selection of Patients for Thoracic Surgery." To be followed by annual general meeting.

WANDSWORTH DIVISION.—At St. James' Hospital, Ouseley Road, Balham, S.W., Tuesday, March 24, 8.30 p.m., meeting. Lecture by Mrs. Collis and Dr. W. F. Dunham: "The Neurological Disorders of Infancy."

WARRINGTON DIVISION.—At Warrington Infirmary, Friday, March 27, 8.15 p.m., clinical meeting. Professor Robert Platt: "Hypertension."

WEST NORFOLK DIVISION.—At West Norfolk and King's Lynn Hospital, Thursday, March 26, 3 p.m., meeting. Annual B.M.A. Lecture by Dr. P. M. F. Bishop: "Endocrine Disorders in General Practice."

WEST SUSSEX DIVISION.—At Burlington Hotel, Worthing, Wednesday, March 25, 8.30 p.m. Dr. N. Lloyd Rusby: "Domiciliary Management of Pulmonary Tuberculosis."

WILLESDEN DIVISION.—At Willesden General Hospital, Harlesden Road, N.W., Friday, March 27, 9 p.m., clinical meeting. Address by Dr. J. H. Gould: "The Approach to Psychological Problems in General Practice."

Meetings of Branches and Divisions

GUILDFORD DIVISION

A meeting was held at the Royal Surrey County Hospital on March 5, 1953. With Dr. Gerald Cranston in the chair, there were 30 members present. The following resolution was passed: "The Guildford Division of the British Medical Association is profoundly shocked by the judgment given in the case of *Payne v. St. Helier Group Hospital Management Committee* and *Another*. The Division asks the Council of the Association to examine the implications of the judgment and to include a memorandum on the matter in either the Annual or Supplementary Report of Council."

MOMBASA DIVISION

The annual general meeting was held at the Pandya Memorial Clinic on January 29, 1953. With Dr. S. D. Karve in the chair, there were 10 members present. The following officers were elected for 1953:

President.—Dr. Cochrane.

Vice-president.—Dr. S. D. Karve.

Hon. Secretary and Treasurer.—Dr. A. U. Sheth.

SOUTH STAFFORDSHIRE DIVISION

A meeting was held at the Rendezvous Café, Wolverhampton, on January 28, 1953. With Dr. Eva Pringle in the chair, there were 26 members present, a further 15 attending after supper. Dr. Philip H. Addison gave a lecture on "Legal Pitfalls in Medical Practice," which was followed by a discussion on medico-legal problems.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 28 1953

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THE CONSTITUTION OF THE B.M.A.*

BY

C. METCALFE BROWN, M.D., D.P.H.

Barrister-at-Law

"By constitution we mean," wrote Bolingbroke in 1735, "whenever we speak with propriety and exactness, that assemblage of laws, institutions and customs derived from certain fix'd principles of reason . . . that compose the general system, according to which the community hath agreed to be govern'd." What Bolingbroke wrote about the national constitution so long ago applies with equal force to the constitution of the British Medical Association—the community of practitioners of medicine.

A constitution may be autocratic, oligarchical, or democratic. The first and short-lived British Medical Association was an excellent example of autocracy, particularly so when the President, being the only member present, contrived to move, second, and approve the business of the day. In the present century, the work of the Association has been conducted on a basis sometimes oligarchical, sometimes democratic—depending on whether or not a handful of strong men exercised sway. To-day we are truly democratic—there are strong men in leading places, but their strength is directed by the Representative Body.

Earlier articles have shown how the constitution has been constructed and how it has evolved to meet the ever-changing needs of a profession that is making progress with increasing acceleration. Evolution goes on and will go on, and we can only speculate what the effects will be. One thing, however, is clear—it is vital that all the decisions of the Association be measured against the essential and unchanging standard: "The primary objects for which the Association is established are to promote the medical and allied sciences, and to maintain the honour and interests of the medical profession."

The constitution of the Association, like a well-found ship, creaks and groans on occasion in face of stress and strain. But this is a sign of strength and elasticity and purposeful movement. There is nothing quieter than a vessel rotting on the harbour mud. There is no stasis in Tavistock Square. The constitution of the Association has had to be adjusted from time to time to meet its difficulties and, indeed, its

*Articles under this title have appeared in the four preceding issues of the Supplement.

dangers—recent changes and new problems will need further adjustments and most probably an approach different from that of the past.

The prestige of the Association is high and must be maintained and fostered. It is dependent on the prestige of the profession, and that in turn must rest on the unity of the profession—not merely a veneer of unity but rather a stable solidarity. There are unlimited opportunities for discussion, agreement, and disagreement within the Association. There is no room in a healthy co-partnership for subterranean clashes which have a disastrous effect on personal relations and general morale. There is no room either for differences between members of the Association outside the Association on Association business—the Representative Body and the Council have long been generously considerate of the minority view—a civility which I have needed and gratefully received on more than one occasion.

The main potential difficulties of the Association may appear to arise from autonomy, schism, aberration in the medico-political field, and financial interests.

Autonomy

Reference has been made in earlier articles to the autonomous bodies within the Association—namely, the General Medical Services Committee and the Central Consultants and Specialists Committee. Both report to the Representative Body through the Council, yet both have some independence. Autonomy is indeed difficult to define, but it can be defined as Cockram did in 1623—"liberty to live after ones owne law." By that definition the two bodies are not truly autonomous, and neither would claim that they are.

Theoretically, autonomy, utter or mitigated, within the Association is illogical and might be productive of disunity and therefore bad. But in practice few difficulties have so far arisen, and for a very simple reason. Comparison of the lists of members of the Council of the Association, the General Medical Services Committee, and the Central Consultants and Specialists Committee shows how exceedingly well each body is represented on the other. This state of affairs is a reflection of the position in the constituencies—most of the members of a local medical committee, for example, have a remarkable physical resemblance to most of the members of the corresponding Division executive committee of the Association. Danger from autonomy is therefore much less than might appear, but any kind of

autonomy is incompatible with true unity, and therefore autonomy should cease. But any revolutionary attempt to abolish autonomy would almost certainly cause more disunity than autonomy itself. Autonomy should be abolished in time by evolution and by agreement.

"All those autonomies wherewith the world was filled . . . one after another stoop and disappear."

Schism

Schism is a division into mutually opposing factions of a body of persons who have previously acted in concert. As we have seen, the autonomous bodies are clearly not schismatic, but some fear that fission may appear sooner or later. These fears appear to be groundless, and patience, good will, common sense, and mutual forbearance will ensure that they will continue to be so.

Some apprehensions have been expressed about the relations between the Association and the Fellowship for Freedom in Medicine. Most of the members of the latter would probably agree that there are other fellowships for freedom in medicine, not the least of which is the Association itself. Is the Fellowship schismatic? We must judge by what is said by or for the Fellowship and a consideration of what are its objects. The Chairman, Lord Horder, has said, "The B.M.A. is no longer the mouthpiece of the profession." Also: "If, and when, we are confident that the B.M.A. accepts, and carries out, the obligations to the public for which we ourselves stand, we can dissolve into thin air." He added, "But that time is not yet." Lord Horder also said, "The F.F.M. is the B.M.A.'s one eye. It behoves us to keep that eye open." That suggests rather a sleepless vigilance, a declaration of adherence to the body politic and a promise of ocular co-ordination subject to the B.M.A.'s other eye remaining open too—and no doubt it will.

Most of the members of the Fellowship are practitioners with high ideals who feel strongly about the inroads of the State into the practice of medicine and are striving to amend the National Health Service Act with the object of preserving the highest standards of practice and of achieving a reasonable measure of professional freedom. If that be a fair interpretation of the main aims of the Fellowship, it must be remembered that that, too, is the policy of the Association.

May we hope that the Fellowship will continue to stimulate and criticize—within the Fellowship and within the Association. May we hope, too, that they will continue to assist in the education of the public about the defects in the medical service. We also hope that in medico-political matters they will strive for unity within the profession so that we can speak with one voice.

A recent development of much interest is the provisional formation of the College of General Practitioners. Its aims are to supplement the work of the medical educational institutions and to complement the scientific and educational functions of the British Medical Association. One of its functions is "to ensure that the best achievements and traditions of general practice are preserved and that the best of future developments are encouraged." It will not have a political function. There is clearly no schism here.

Medical Politics

No divine right or any right has been conferred on the Association to possess a monopoly in medical politics. But with a membership of some 67,000 the Association does represent the vast majority of doctors—general practitioners, consultants and specialists, public health medical officers, and many others. It is the only medical society that can properly claim to represent the views of the profession as a whole, a claim which has been accepted in practice by a succession of Governments over a long period of years. This unchallenged leadership means that the Association speaks for the profession with power and authority. Power is a great privilege and carries with it great responsibilities. In the exercise of that power the Association does well to give careful attention and every consideration to the opinions

expressed by other medical bodies—some of them small, and some representative of sectional interests only. Their points of view are important. In this respect, an agreement of many years' standing between the Association and the Society of Medical Officers of Health may be regarded as worthy of consideration in that it has helped in the establishment and maintenance of cordial relations and mutual help and has set up a valuable precedent.

The agreement was made between the Association and the Society in 1923 and modified in 1939. Section II of this agreement is as follows:

II (a) If the Society of Medical Officers of Health propose to formulate and urge any medico-political policy which, by reason of affecting the interests of public or private practice, is of mutual concern to both the Society and the Association, the Society shall communicate its opinions or proposals with regard thereto to the Association and shall refrain from taking any further action on such policy. In the event of the Association approving such policy or proposals through its Representative Body or (if within the already declared policy of the Association) through the appropriate machinery of the Association all action consequent thereon shall be taken by the B.M.A.

(b) Where the Association is consulted by a Government Department or by another association on questions of public health or preventive medicine, and where the Society is consulted by a Government Department or another association on a matter which is held to be medico-political—that is, likely to affect the interests of public or private medical practice—the Association and the Society shall forthwith consult together by communication between the offices and if necessary by the calling of a joint standing committee appointed for the purpose. In the event of the Association raising no objection to the proposed reply of the Society, the Society shall be free to express its opinion to the Body by which it has been consulted.

(c) In the event of dissent being expressed by the Association, either under subsection (a) or subsection (b), the Society shall refrain from taking any action in support of a divergent policy or from making any divergent reply to a Government Department or association consulting it until the joint standing committee has reported to the two Councils concerned, and those Councils have had an opportunity of considering the report or, at the request of either Council, conferring together.

Matters of Finance

"The world is too much with us; late and soon,
Getting and spending, we lay waste our powers."

To some extent that is true for many of us. Even so, we are entitled to a just reward for the services we give. But it has been felt by many in recent years that the financial interests of the profession have been too much to the fore. The Association must look after the status and appropriate remuneration of all doctors in all sections of the profession, but it would be most unwise for this to take priority over everything else. The setting up of Whitley machinery has partly dealt with these matters, but this does not mean that the Whitley committees have taken the full responsibility out of the hands of the Association. The Whitley committees have full powers to act according to their own judgment, but are advised in the first place by the appropriate committee of the Association and by Council and must keep in mind the rulings of the Representative Body. The position is still in a state of evolution and should be carefully watched.

Co-ordination of Medical Sections

In the past the various sections and branches of the profession have been inclined to live and think in watertight compartments. It is the duty of the Association to counteract this tendency, and indeed this has been done to a considerable extent. The setting up of joint committees within the Association is an excellent method of achieving co-ordination. A good example of this at the present time is the Joint Committee of representatives of the Public Health, Occupational Health, and Tuberculosis Group Committees dealing with the urgent social problems of the resettlement of tuberculous persons in industry. This is a matter of great importance to the medical profession and even more so to the community.

Inter-professional Relationships

Here is great scope for co-operation between the Association and the allied professions. There is a very large number of subjects of mutual interest, and an example of this co-operation comes readily to mind in the Joint Committee of the B.M.A. and the British Veterinary Association, which has had joint discussions on the question of meat inspection and the Penicillin Bill. A further example is the Joint Committee of the B.M.A. and the Magistrates' Association. This Committee has produced a series of interesting and helpful reports and is now discussing the question of cruelty to children. There are other committees where joint discussions take place, such as the B.M.A. and the Pharmaceutical Society and the B.M.A. and the Royal College of Nursing. These and similar committees should be encouraged to undertake more work in wide fields, bearing in mind that the fact that the two professions are working together will not only enhance the status of both, but, more important, render the work of great value to the community.

Anatomy of the Representative Body

The timely memorandum (*Supplement*, February 28, p. 55) on the Representative Body circulated by the Winchester Division merits close study. Winchester's criticisms of the size of the Representative Body, the very lengthy agenda, and the lack of balance in the conduct of business are well founded, and their proposal to reduce the number of representatives is conservative rather than radical. The Representative Body as at present constituted is so unwieldy that proper consideration of all the business before it is well-nigh impossible. The Division's proposal to ensure that sectional interests are well represented is in line with the existing policy of the Association of freedom of discussion and full facilities for presenting the minority viewpoint.

The suggestions for an enlarged Agenda Committee to ensure priority for important subjects are soundly based.

Less sound, however, is the statement that "the Representative Body is not truly representative of the profession in that the majority of its members are general practitioners." The largest group of members of the Association are the general practitioners, and in any case, if the electorate chooses a majority of representatives whatever they may be, then the result must be true representation.

PRIVATE PRACTICE COMMITTEE

ALL-DAY MEETING

An agenda of more than 60 items awaited the Private Practice Committee of the Association at a meeting on March 4. Dr. I. D. GRANT was in the chair. Dr. T. W. MORGAN was appointed vice-chairman in view of the Chairman's forthcoming temporary absence abroad. Dr. J. H. HUNT, honorary secretary of the College of General Practitioners, had been invited to attend the meeting to discuss possible matters of common interest to the College and the Committee. The good wishes already expressed by Council were endorsed.

Prison Medical Officers

Mr. B. M. TRACEY, of Norwich, had also been invited to attend during a discussion on the salaries of part-time prison medical officers in England and Wales. The Prison Commissioners are proposing to introduce a similar scheme of payment to that which obtains in the Scottish prison service, and which had been accepted by the Scottish Committee and approved by Council in November, 1952.

After discussion the Committee expressed itself satisfied with the scale subject to the approval of Council. It was stated that the revised salaries for part-time medical officers in the Scottish prison and Borstal service were proving satisfactory.

Cremation Certificates

A letter from the Home Office had invited the Association to recommend to its members that £2 2s. would be a suitable maximum for completion of either certificate B or C. It was agreed that, although this fee was suitable, a maximum fee could not be recommended.

Fees for Services to the Coroner

Dr. ROBERT FORBES presented the views of the Coroners Subcommittee on fees payable to medical practitioners under the Coroners Acts. It was noted that the Subcommittee's representations had been sent to the Home Office, and an assurance had been received that the Association would be informed as soon as there was any possibility of introducing necessary amending legislation.

It was reported that the Coroners Society had agreed that the proper salary for a full-time coroner was £2,750 per annum.

Dr. Forbes also reported for the Medical Witnesses Subcommittee. The fees payable to medical witnesses at the Central Criminal Courts were set out, and it was agreed that an endeavour should be made to arrange a meeting with the Home Secretary to secure the adoption of this scale at all criminal courts. In view of certain difficulties experienced by medical witnesses in courts of law, it is to be recommended to Council that it should obtain counsel's opinion on whether a medical witness to fact can refuse to express an opinion on the facts. If he does express such an opinion it is also to be inquired whether he should accordingly be regarded as an expert witness.

Examination of Recruits to the Regular Army

In at least one Command it appears that an anomaly has arisen in the method of payment of civilian medical practitioners examining recruits. The fee is £1 1s. for each man examined; for Territorials this is subject to a weekly maximum of 25 men, but in the case of volunteers for the Regular Army a daily maximum payment of £3 10s. is in operation. It was stated that in one Command it appeared to be the practice to require civilian medical practitioners to examine a relatively large number of recruits on one day of the week, thus reducing the average fee very appreciably. It was decided to press for the application of a weekly maximum for examination of both Regular and Territorial Army recruits.

Mineworkers and Bonus Shift Medical Certificates

A matter of some importance arose on the report of a joint committee (with the Occupational Health Committee) on the National Coal Board Medical Service. In order to stimulate regular attendance a system of payment for miners has been instituted whereby a man is paid for six shifts provided he works five (work on Saturday being voluntary and outside the scope of the agreement), but he is allowed payment for the bonus shift if he is absent for one or more days owing to illness or to certain domestic causes. In sickness a medical certificate or other evidence must be produced during absence or immediately on return. The consequence of this has been that the miner absent even for one day must produce a doctor's certificate, and often the doctor is asked to issue a certificate which can only be a record of the man's statement that he has been ill.

It was decided to seek a meeting with representatives of the National Coal Board to discuss the problems arising from the requirement of such certificates.

It was agreed to recommend to Council that £1 1s. was an appropriate fee for the "counter" medical certificate required by certain areas of the National Union of Mine-workers.

Miscellaneous Business

Advice was asked by a member about the proper fee for a report of inspection of men for a gas board in order to prevent skin complaints due to contact with tar or pitch.

It was considered that an appropriate fee would be 7s. 6d. for each man examined at the works, or 5s. if examined at the surgery.

It was reported that agreement had been reached with the Ministry of Civil Aviation on the fees for attendance at civil airfields.

The question of the unattended telephone again came forward, and particulars were given of a trade device approved by the G.P.O. This records telephone messages in the absence of the subscriber, and plays the messages back to him on his return or on ringing his own number from some other telephone and using a private code.

For the information of the Committee it was stated that all life assurance offices using a short form of medical examination report had now agreed to increase the fee to 15s.

Reference was made to the complicated legal position of utility vehicles used for professional purposes. Attempts have been made and will continue to be made to remove the anomalies affecting doctors.

CARE OF MOTHERS AND BABIES

RESPONSIBILITY OF LOCAL HEALTH AUTHORITIES

The Ministry of Health has sent a memorandum to regional hospital boards, hospital medical committees, and boards of governors (R.H.B. (53) 19, H.M.C. (53) 18, B.G. (53) 20) and circular 5/53 to local hospital authorities, drawing attention to the need for continuity in the care of mothers and babies.

Duties Under the Act

The memorandum points out that the major responsibility for securing adequate postnatal attention for women who have been confined in hospital rests with the local health authority. Under the National Health Service Act, 1946, under Section 23, it has the duty to secure the provision in its area of sufficient certified midwives for "attendance on women in their homes as midwives, or as maternity nurses during childbirth and from time to time thereafter during a period not less than the lying-in period"; under Section 22, to make "arrangements for the care . . . of expectant and nursing mothers and of children who have not attained the age of 5 years and are not attending primary schools"; and under Section 24, to "make provision . . . for the visiting of persons in their homes by . . . health visitors for the purpose of giving advice as to the care of young children . . . and expectant or nursing mothers."

The duty to provide the requisite continuity of care is subject to the clinical responsibility of the family doctor in attendance on the mother or child, and to the general responsibility of the hospital authority for care when the mother or child is a hospital in-patient or attending hospital clinics.

The Lying-in Period

The memorandum calls attention to the definition by the rules of the Central Midwives Board of the lying-in period as "a period being not less than 14 days nor more than 28 days after the end of labour during which the continued attendance of the midwife on the mother and child is requisite." It is clear, the memorandum states, that the lying-in period will vary between 14 and 28 days, and that it is not limited to the time during which the mother needs to remain in bed or indoors, nor necessarily coextensive with the time during which a mother confined in hospital needs to remain an in-patient.

The period during which a mother and child should be kept as in-patients in a hospital or maternity home depends mainly on clinical considerations. In the Minister's view it should not be less than 10 days after the confinement unless there are special reasons for earlier discharge. It will be for the local health authority to decide what, if any,

form of care is necessary after discharge, and at what stage the attendance of a midwife should cease and visiting by a health visitor begin.

Continuity of Care

The memorandum points out that continuity of care depends upon notification (with the knowledge and agreement of the patient) by hospital authorities to the family doctor and the medical officer of health of the local health authority of all impending discharges of maternity patients, if possible not less than 24 hours beforehand; upon visiting of mother and child by the appropriate local authority officer as soon as possible after discharge; upon notification by the hospital to the doctor and, where appropriate, the medical officer of health of any special attention required; and upon consultation between the appropriate authorities and the family doctor where there is any doubt about the advisability of discharge, having regard to home conditions.

The memorandum stresses the importance of ensuring that the nursing, midwifery, and health visiting services of local health authorities work in close collaboration with the family doctors.

TREATMENT OF TEMPORARY RESIDENTS ON BOARD SHIP

The General Medical Services Committee has recently discussed with the Ministry of Health the terms of a new distribution scheme which will give effect to the recommendations of the Working Party on the future distribution of the pool. Advance copies of this scheme have already been sent to executive councils, and it is apparent that some confusion exists about the section dealing with fees for the treatment of temporary residents. This section reads as follows:

"Payment shall be at the rate of 17s. for treatment given to a temporary resident, or 5s. if the temporary resident is residing at a place which the executive council in consultation with the local medical committee has classified as a convalescent home or other institution, being a place at which ten or more persons reside temporarily and where the council concerned is satisfied that the practitioner is in regular attendance. The council may also at its discretion, in consultation with the local medical committee, pay at the lower rate in other cases where a practitioner is known to give treatment to temporary residents who are living temporarily in groups of ten or more, on a ship or at any other place within the council's area."

Discretion Given

It will be seen that this paragraph gives discretion to executive councils in consultation with local medical committees to pay at the lower rate in cases where a practitioner is known to give treatment to temporary residents who are living in groups of ten or more on a ship.

It was in the Committee's mind when this matter was discussed with the Ministry that where a practitioner visits a ship and treats a large number of seamen on the one occasion it would clearly be inappropriate for him to claim the higher temporary-resident payment. On the other hand, a visit paid to a ship where only a few patients are treated should warrant the higher rate. The matter is left entirely to the discretion of the local executive council in consultation with the local medical committee, and it is assumed that applications for payment will be dealt with on general principles outlined above.

REGISTRARS' GROUP—SCOTTISH WESTERN REGION

The annual general meeting of the above group will be held in the Lister Theatre of the Glasgow Royal Infirmary on Monday, March 30, 1953, at 7.30 p.m.

British Medical Association

PROCEEDINGS OF COUNCIL

A meeting of the Council of the British Medical Association was held at Headquarters on March 18, Dr. E. A. GREGG, Chairman of Council, presiding. The Chairman welcomed the return of Dr. John Cottrell, Mr. Logan Dahne, and Dr. T. Rowland Hill after their absences through illness. The Chairman also welcomed Dr. T. C. Routley. He reminded the Council that Dr. Routley had been for many years General Secretary of the Canadian Medical Association. They were also delighted to see with him Dr. Arthur Kelly, deputy General Secretary of that body, who would shortly succeed Dr. Routley as Secretary.

Dr. ROUTLEY said that they were deeply grateful for the warmth and cordiality with which they had been welcomed. They as Canadians did not feel themselves to be strangers in their midst. He was also very grateful to those who had proposed his name for the presidency of the Joint Annual Meeting at Toronto in 1955. He assured members who came to Canada two years hence that the most cordial welcome awaited them.

The Council received a report that the Canadian Medical Association had nominated Dr. Routley for election as President of the British Medical Association for the session 1955-6, and unanimously passed on a recommendation to the Representative Body to that effect.

A letter was also received from the Canadian Medical Association regarding the proposal to hold a joint Annual Meeting of the two Associations in Great Britain at a date after 1955. Dr. Routley said that they would be very happy to come back to this country, not later, he hoped, than five years after the Toronto meeting.

The Council deferred for further consultation the question of the exact year in which the meeting should be held.

The death was reported of Dr. Alfred Tennyson Smith, of Bournemouth, a former member of Council. The Chairman also referred to the death of Mr. A. Twelftree, for many years a very faithful servant of the Association and at the time of his death Chief Clerk.

The members of the Council stood in silence as a tribute. The SECRETARY reported that in accordance with a previous decision of Council a communication had been sent, through the Soviet Embassy, to the President of the Academy of Sciences of the U.S.S.R., inviting the Academy to send six Russian doctors on a friendly visit to Great Britain for a few days as guests of the Association. He had received a reply stating that the Soviet Medical Associations thanked the B.M.A. for its kind invitation and informed it that unfortunately they were unable to send a delegation to this country at the moment.

The Duke of Edinburgh, Honorary Member

The PRESIDENT-ELECT (Mr. Tudor Thomas) proposed that it be a recommendation of the Council to the Representative Body that H.R.H. the Duke of Edinburgh be elected as an Honorary Member of the Association. He said that at the present time they had one Honorary Member in the person of Lord Nuffield. There were two precedents early in this century for royal personages being honorary members of the Association—namely, the future King Edward VII and the future King George V, both of whom laid down their Honorary Membership on ascending the Throne, when they became Patrons of the Association. The interest that the Duke of Edinburgh took in the advancement of science, including medicine, was well known.

The recommendation was approved with acclamation.

Requisition for Extraordinary General Meeting

The SECRETARY stated that a requisition had been received signed by 141 members, and some signatures additional to those in the agenda had also been received, requiring the

Council to convene an Extraordinary General Meeting of the members of the Association for the purpose of considering and, if thought fit, passing the following resolution:

That the Association being concerned by the modification of the present method of remuneration by capitation fees agreed in the Working Party's report requires the Council forthwith to approach the Minister of Health with proposals for the better protection (financial and otherwise) of the small-list doctor and of the doctor newly seeking entry into practice, and requests the Minister of Health not to implement the Working Party's report until the scheme for distribution of remuneration has been considered in the light of such proposals, and meanwhile to continue the present method of payment.

The Secretary reported that he had referred certain questions of procedure to the Solicitor of the Association, and the Solicitor had advised that Counsel's opinion should be taken whether, in view of the terms of Article 37, it was really competent for a General Meeting to pass a resolution on a medico-political matter of this kind and whether the matter was not exclusively one for the Representative Body.

The SOLICITOR, Mr. Leigh Taylor, who attended the meeting, said that the position was that the meeting must be held, but the opinion of Counsel was that the resolution if passed at that meeting would be ineffective. The Representative Body had reserved to it the rights and powers of decision in a matter of this nature.

The CHAIRMAN said the constitutional point was that, if the Council did not carry out the wishes of the requisitionists, then the requisitionists themselves were at liberty within three months to call a meeting.

Constitutional Difficulty

Dr. J. A. GORSKY said that there was obviously some constitutional difficulty here. This requisition might cause a considerable expense to the Association. At the same time the Council must not allow it to be thought that it was trying in any way to override the grievance of a minority. He suggested that it might be possible to ask Mr. Justice Danckwerts for a declaration judgment as to whether his decision and the decision of the Working Party were consistent with one another.

Mr. LEIGH TAYLOR replied that there were two objections to referring the matter to Mr. Justice Danckwerts, one of them the time factor and the other procedural. Before they could go back to Mr. Justice Danckwerts they would have to come to an agreement with the other party to the adjudication and in addition to get the Lord Chancellor's agreement to the proposed reference. Mr. Justice Danckwerts at the inquiry had been concerned with the total sum to be awarded, and he did not think he had applied his mind to the question of distribution at all, which was the task of the Working Party. He was not saying that he would not be competent to do so, but it would be an elaborate procedure, involving another hearing of some kind.

Dr. GORSKY said that this was a requisition asking the Association, under Company Law, to do a certain thing which concerned not only the Working Party but also the Ministry of Health. Supposing they did call this meeting, could the Ministry at any time on behalf of its own membership in the Working Party issue a writ of prohibition?

On the proposition of Mr. H. H. Langston, seconded by Dr. A. V. Russell, it was agreed to call the Extraordinary General Meeting for Tuesday, May 5, at 2.30 p.m., the day preceding the next Council Meeting.

Discussion then turned on the question of whether, and, if so, when, a Special Meeting of the Representative Body should be called.

A report by the Organization Committee presented by Dr. PRIDHAM recommended that, to conform with the system of budgetary control approved by the Council, the financial

year of Divisions and Branches should in future terminate on June 30 instead of on December 31. It was stated that only in this way would it be possible to determine the grants to Branches in time for inclusion in the budget which must be drawn up at the beginning of the session. This recommendation was passed on to the Representative Body, and, if agreed to, will take effect as from next year.

Dr. PRIDHAM reported that the membership of the Association was now 66,823.

Dr. DORNAN reminded the Council that it decided at its last meeting that further consideration should be given to those medical students who had been receiving grants and on taking pre-registration appointments were considerably worse off than before. They had in mind particularly ex-Service students who were married. It was reported that the Ministry had answered promptly, and in many respects adequately, to the representations which had been made on behalf of these men.

Association Finance

The TREASURER (Mr. A. M. A. Moore) presented a detailed financial statement concerning the position of the Association. He said that the position had greatly improved during the year, though he must impress on the Council the importance of stringent economy during the coming year. It was essential to consider very carefully any steps which involved fresh or added expenditure. In going through the various sections of the statement he drew special attention to the considerable improvement in the position of the *British Medical Journal*. When they compared the present position with the state of affairs at this time last year there was occasion for great satisfaction. The financial position of *Family Doctor* was also greatly improved.

The draft Financial Statement for the year ending December 31, 1952, which was submitted subject to audit, was received and approved, and the Treasurer was congratulated upon the great improvement of the position.

The Treasurer then went on to present the draft Revenue and Capital Budgets for the twelve months ending December 31, 1953. These had been prepared in a form which incorporated the recommendations of the firm of management consultants whose services had been retained to advise on the system of budgetary control adopted by the Council. Provision had been made for loan redemption and reserve for contingencies amounting altogether to £50,000. He hoped it would be noted that the instruction of the Representative Body with regard to earmarking for loan redemption at least half of the revenue accruing from the increase in subscription had been more than met.

Dr. CARTER, Chairman of the Journal Committee, said that some fear had been previously expressed that the advertisement revenue from the *Journal* might fall, but in actual fact the advertisement revenue was now higher than at the corresponding period of last year.

The Revenue and Capital Budgets for the year ending December 31 next were approved.

Dr. FRANK GRAY wished it to be referred to the Finance Committee to consider the remuneration appropriate to the chief officers of the Association. Everybody realized, he said, the burden falling upon the Chairman of Council, the Chairman of the Representative Body, and the Treasurer, and it was quite time that this position was looked into, irrespective of the persons who held these offices. This burden was heavy and might very well become heavier, and he hoped that the Council would not continue to rely on members of the Association doing an extraordinary job of work and making them no recompense whatever.

Dr. R. P. LISTON and other members supported this view. The CHAIRMAN OF COUNCIL said that at the present moment the Association was only just getting out of its "financial wood." He begged that this matter might be adjourned to some future occasion. (Cries of "No.") Then he ruled it out of order.

Dr. CARTER gave a brief report on *Family Doctor*, and spoke of progress in the matter of distribution and in other respects. Financially *Family Doctor* was "breaking even."

Public Health

Dr. H. K. COWAN presented the report of the Public Health Committee. He said that the Committee had considered a statement on decentralization by county councils of Part III services under the National Health Service Act, and he moved that the policy already endorsed by the Society of Medical Officers of Health favouring decentralization of such services be accepted.

This was agreed to.

A further recommendation was agreed to defining the term "public health service member" in the By-laws of the Association.

Dr. COWAN also brought forward the report of a Joint Committee of the B.M.A. and the British Veterinary Association (see *Supplement*, March 14, p. 71) which had been considering the Therapeutic Substances (Prevention of Misuse) Bill. This dealt with the relaxation of certain of the restrictions on the sale of penicillin. It was proposed to make representations to the Ministry of Health that any regulations for the preparation of diluted penicillin in the form of a supplement for addition to livestock feeding-stuffs should be confined to such firms as were able adequately to protect their employees from the hazards of penicillin, and that investigations should be carried out in order to determine whether there was a need for precautions to be taken, and, if so, what precautions, by persons who in the course of their employment handled livestock feeding-stuffs supplement containing penicillin.

This recommendation was agreed to.

Dr. Cowan also submitted the report of a conference of representatives of the Occupational Health, Public Health, and Tuberculosis and Diseases of the Chest Group Committees on the resettlement of tuberculous persons. The conference, after detailed consideration of the problems, had decided to ask the Ministry to discuss the matter with a deputation consisting of Dr. Peter Edwards, Dr. J. A. L. Vaughan Jones, and himself.

Miscellaneous

Dr. J. A. MOODY presented a report of the Building Committee concerning certain work at B.M.A. House.

Mr. NICHOLSON-LAILEY brought forward on behalf of the Science Committee a recommendation that the annual grant to the Library for the purchase of books and periodicals and the binding of journals be increased from £2,000 to £2,500, and this was agreed to. He also submitted a number of recommendations concerning the award of B.M.A. prizes.

General J. C. A. DOWSE brought forward a report of the Overseas Committee which dealt with a number of matters concerning overseas branches, and this was approved. He also submitted a report on behalf of the Armed Forces Committee concerning Service pay, and said that he hoped that at the next meeting of Council his committee would have something satisfactory to report.

Dr. VAUGHAN JONES presented the report of the Occupational Health Committee, and the Council agreed to its recommendation that it saw no objection to even more integration of the two courses for the D.P.H. and the D.I.H. than existed at present, since a necessary proportion of the knowledge was common to both. The Council was generally agreed that a part-time course for the D.I.H. spread over a period of two or three years was both desirable and practicable, and recommended that such courses should be arranged.

Dr. PRIDHAM, who was shortly going to Lisbon to attend the Council of the World Medical Association, asked for guidance concerning a question which would arise at those proceedings—namely, the call from the Medical Association of Israel for the denunciation of the trial of the doctors recently arrested in Moscow. After discussion the Chairman of Council said that they could trust Dr. Pridham to handle the matter in a proper way.

The Council rose at 6.45 p.m., after sitting with two short intervals, from 10 a.m.

British Medical Association

ANNUAL MEETING—CARDIFF, JULY 9-17, 1953

President-Elect: J. W. TUDOR THOMAS, D.Sc., M.D., M.S., F.R.C.S.

Local General Secretary: JOHN D. SPILLANE, M.D., F.R.C.P.

Science Secretary: PROFESSOR GILBERT I. STRACHAN, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G.

Executive Officer: G. A. PECK, B.Sc., B.M.A. House, 195, Newport Road, Cardiff.

PROVISIONAL PROGRAMME

SCIENTIFIC MEETING

PLENARY SESSIONS

Tuesday, July 14, 10 a.m.: "Coronary Disease"

Chairman: Professor H. SCARBOROUGH (Cardiff).
Speakers: Dr. D. EVAN BEDFORD (London), Dr. WILLIAM PHILLIPS (Cardiff), Professor G. W. PICKERING (London), Dr. CLIFFORD G. PARSONS (Birmingham), Dr. A. RAE GILCHRIST (Edinburgh), Dr. JOHN H. HUNT (London).

Thursday, July 16, 10 a.m.: "Fibrositis"

Chairman: Mr. A. LAWRENCE ABEL (London).
Speakers: Dr. A. TALBOT ROGERS (Bromley), Dr. A. H. DOUTHWAITE (London), Dr. J. P. SPILLANE (Cardiff), Orthopaedic Surgeon (name to be announced later), Mr. LESLIE H. W. WILLIAMS (London), Dr. J. H. CYRIAX (London), Dr. G. D. KERSLEY (Bath).

Friday, July 17, 2.15 p.m.: "Overweight"

Chairman: Right Hon. LORD HORDER (London).
Speakers: Dr. J. H. SHELDON (Wolverhampton), Professor R. A. McCANCE, F.R.S. (Cambridge), Dr. ARNOLD P. MEIKLEJOHN (Edinburgh), Dr. H. M. SINCLAIR (Oxford), Dr. LEONARD H. HOWELLS (Cardiff), Dr. EMRYS WILLIAMS (Cardiff).

SCIENTIFIC SECTIONS

MEDICINE

President: Professor A. M. KENNEDY, M.D., F.R.C.P. (Cardiff).

Vice-Presidents: Professor W. MELVILLE ARNOTT, B.Sc., M.D., F.R.C.P. (Birmingham); Sir DANIEL DAVIES, M.D., F.R.C.P. (London); LEONARD H. HOWELLS, K.C.V.O., M.D., F.R.C.P. (London); and Professor W. J. E. JESSOP, M.D., F.R.C.P. (Cardiff); and Professor W. J. E. JESSOP, M.Sc., M.D., F.R.C.P.I., D.P.H., F.R.I.C. (Dublin).

Hon. Secretaries: BYRON EVANS, M.D., M.R.C.P., 59, Cathedral Road, Cardiff; JOHN RICHARDSON, M.V.O., M.D., F.R.C.P., 33, Devonshire Place, London, W.1.

The following programme has been arranged:

Wednesday, July 15—morning and afternoon. A.m., Subject: The Use and Abuse of Antibiotics. (The names of the openers and the invited speakers will be announced later.) P.m., Subject: The Early Diagnosis of Intrathoracic New Growths. To be opened by Sir GEOFFREY MARSHALL (London), Mr. VERNON THOMPSON (London), and Dr. PETER KERLEY (London), followed by Dr. BRIAN TAYLOR (Birmingham) and Mr. DILLWYN THOMAS (Cardiff).

SURGERY

President: Professor LAMBERT C. ROGERS, V.R.D., M.Sc., M.D., F.R.C.S., F.A.C.S., F.R.A.C.S. (Cardiff).
Vice-Presidents: D. J. HARRIES, M.D., F.R.C.S. (Cardiff); J. B. HAYCRAFT, M.C., M.B., F.R.C.S. (Cardiff); D. IOAN JONES, M.B., F.R.C.S. (Cardiff); C. JENNINGS MARSHALL, M.D., M.S., F.R.C.S. (London); A. DICKSON WRIGHT, M.S., F.R.C.S. (London).

Hon. Secretaries: STANLEY AYLETT, M.B.E., M.B., F.R.C.S., 114, Harley Street, London, W.1; D. B. E. FOSTER, M.B., F.R.C.S.Ed., Hillboro, Llandough, Penarth, Glamorgan.

The following programme has been arranged.

Wednesday, July 15—morning and afternoon. A.m., Subjects: The Relief of Pain of Vascular Disease in the Lower Limb. To be opened by Sir JAMES PATERSON ROSS (London) and Mr. J. B. OLDHAM (Liverpool), followed by Mr. HAROLD DODD (London) and Professor C. G. ROB (London). P.m., Subject: (1) The Treatment and Diagnosis of Toxic Goitre. To be opened by Mr. R. V. COOKE (Bristol). (2) The Treatment of Diseases of the Gall-bladder and Bile Ducts. To be opened by Mr. McNEILL LOVE (London).

OBSTETRICS AND GYNAECOLOGY

President: Professor G. I. STRACHAN, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G. (Cardiff).

Vice-Presidents: M. D. ARWYN EVANS, M.D., F.R.C.S.Ed., F.R.C.O.G. (Cardiff); Professor H. HARVEY EVERS, M.B., M.S., F.R.C.S., F.R.C.O.G. (Newcastle-upon-Tyne); R. G. MALIPHANT, M.D., M.R.C.P., F.R.C.S., F.R.C.O.G. (Cardiff); H. K. PACEY, M.D., F.R.C.S., F.R.A.C.S., F.R.C.O.G. (Wellington, New Zealand); LESLIE H. W. WILLIAMS, M.D., M.S., F.R.C.S., F.R.C.O.G. (London).

Hon. Secretaries: J. M. BOWEN, M.B., M.R.C.O.G., 9, Edward VII Avenue, Newport, Mon; ALISTAIR L. GUNN, M.D., F.R.C.S.Ed., F.R.C.O.G., 51, Harley Street, London, W.1.

The following programme has been arranged:

Wednesday, July 15—morning and afternoon. A.m., Subjects: The Place of the Forceps in Present-day Obstetrics. To be opened by Professor T. N. A. JEFFCOATE (Liverpool), followed by Mr. GAVIN BOYD (Belfast), Mr. WILLIAM HUNTER (Newcastle-upon-Tyne), and Mr. E. PARRY JONES (St. Asaph, Flint). Short Paper: Professor J. C. McCLURE BROWNE (London), Placental Circulation in Pre-eclamptic Toxaemia. P.m., Subjects: The Climacteric. To be opened by Mr. ALECK W. BOURNE (London), followed by Mr. T. N. MACGREGOR (Edinburgh), Professor H. C. McLAREN (Birmingham), and Mr. M. D. ARWYN EVANS (Cardiff). Short Paper: Dr. D. McKAY HART (Glasgow), Dysmenorrhoea.

ANAESTHETICS

President: C. LANGTON HEWER, M.B., B.S., M.R.C.P., D.A., F.F.A.R.C.S. (London).

Vice-Presidents: RONALD JARMAN, D.S.C., M.R.C.S., L.R.C.P., D.A., F.F.A.R.C.S. (London); A. HUGH MUSGROVE, M.R.C.S., L.R.C.P., D.A., F.F.A.R.C.S. (Cardiff); WILLIAM W. MUSHIN, M.A., M.B., B.S., D.A., F.F.A.R.C.S. (Cardiff).

Hon. Secretaries: J. G. BOURNE, M.B., B.Ch., D.A., 37, Marsham Court, Westminster, S.W.1; I. RHYS JONES, M.R.C.S., L.R.C.P., D.A., Cliff Cottage, Radyr, Glamorgan.

The following programme has been arranged:

Wednesday, July 15—morning and afternoon. A.m., Subject: A Return to Simplicity. To be opened by Dr. M. D. NOSWORTHY (London), followed by Dr. W. W. MUSHIN (Cardiff). P.m., Subjects and speakers will be announced later.

CARDIOLOGY

President: MAURICE CAMPBELL, O.B.E., D.M., F.R.C.P. (London).

Vice-Presidents: A. RAE GILCHRIST, M.D., F.R.C.P. (Edinburgh); Professor C. BRUCE PERRY, M.D., F.R.C.P. (Bristol); WILLIAM PHILLIPS, M.D., F.R.C.P. (Cardiff).

Hon. Secretaries: SHEILA HOWARTH, M.B., B.S., Institute of Cardiology, 35, Wimpole Street, London, W.1; ARTHUR J. THOMAS, M.D., M.R.C.P., D.P.H., Tanooma, Llandough, near Penarth, Glamorgan.

The following programme has been arranged:

Wednesday, July 15—afternoon. Subject: Pulmonary Heart Disease. To be opened by Dr. A. J. THOMAS (Cardiff) and Professor JETHRO GOUGH (Cardiff), followed by Dr. WILLIAM EVANS (London).

DISEASES OF THE CHEST

President: SIR CLEMENT PRICE THOMAS, K.C.V.O., F.R.C.S. (London).

Vice-Presidents: A. L. D'ABREU, O.B.E., M.D., Ch.M., F.R.C.S. (Birmingham); Professor FREDERICK HEAF, M.D., F.R.C.P. (Cardiff); DILLWYN M. E. THOMAS, M.R.C.S., L.R.C.P. (Sully, Glam).

Hon. Secretaries: H. R. S. HARLEY, M.S., F.R.C.S., 93, Station Road, Llanishen, Cardiff; M. MEREDITH BROWN, B.M., F.R.C.S.Ed., 17, Priory Mansions, Drayton Gardens, London, S.W.10.

The following programme has been arranged:

Friday, July 17—morning. Subjects: The Value of Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis. To be opened by Dr. HOWARD NICHOLSON (London) and Dr. C. H. C. TOUSSAINT (London), followed by Mr. R. S. BARCLAY (Newton Mearns, Renfrewshire), Dr. C. S. DARKE (Sheffield), and Dr. PETER EDWARDS (Cheshire Joint Sanatorium). *Short Papers:* (1) Mr. O. S. TUBBS (London), Constrictive Pericarditis. (2) Mr. R. H. FRANKLIN (London), Congenital Atresia of the Oesophagus. (3) Dr. ARCHIE COCHRANE (Cardiff), Radiological Diagnosis of Pneumoconiosis.

CHILD HEALTH

President: Professor A. G. WATKINS, M.D., F.R.C.P. (Cardiff).

Vice-Presidents: V. MARY CROSSE, O.B.E., M.D., D.P.H., D.R.C.O.G. (Birmingham); Professor A. V. NEALE, M.D., F.R.C.P., D.P.H. (Bristol); J. N. O'REILLY, D.M., M.R.C.P. (London).

Hon. Secretaries: P. T. BRAY, M.R.C.P., D.C.H., 28, Park Place, Cardiff; I. A. B. CATHIE, M.D., M.R.C.P., Pathological Department, The Hospital for Sick Children, Great Ormond Street, W.C.1.

The following programme has been arranged:

Wednesday, July 15—afternoon. Subject: Care of the Newborn. To be conducted on a basis of "Any Questions?" The names of the panel will be announced later. Poisoning in Childhood. To be opened by Dr. D. SWINSCOW (London) and Dr. J. O. CRAIG (Edinburgh).

DERMATOLOGY

President: R. M. B. MACKENNA, M.D., F.R.C.P. (London).

Vice-Presidents: LOUIS FORMAN, M.D., F.R.C.P. (London); GEOFFREY HODGSON, M.B.E., D.M. (Cardiff); BERNARD A. THOMAS, M.D., D.P.H. (Newport, Mon).

Hon. Secretaries: A. J. ROOK, M.D., M.R.C.P., 23, Park Place, Cardiff; D. S. WILKINSON, M.D., M.R.C.P., Whitecroft, Hervines Road, Amersham, Bucks.

The following programme has been arranged:

Wednesday, July 15—morning. Subject: Symposium on Practical Problems in the Management of Disorders of the Skin in General Practice. (1) Dr. LOUIS FORMAN (London), The Management of Pruritus. (2) Professor ARTHUR W. GRACE (New York), The Differential Diagnosis and the Treatment of Ringworm of the Feet. (3) Dr. C. H. WHITTLE

(Cambridge), The Problem of Nummular Eczema. (4) Dr. C. S. NICOL (London), Difficulties in the Interpretation of the Serological Tests for Syphilis. (5) Dr. MARTIN BEARE (Belfast), Difficulties in the Diagnosis and Treatment of Scalp Ringworm. (6) Dr. D. S. WILKINSON (Amersham), Management of Hypostatic Conditions of the Lower Leg. (7) Dr. IAN SNEDDON (Sheffield), Overtreatment. (8) Dr. GEOFFREY HODGSON (Cardiff), The Influence of Home Conditions on Skin Diseases.

In connexion with this Section a clinical demonstration will be held on the afternoon of Wednesday, July 15, in Cardiff Royal Infirmary. Further details of this will be available at a later date.

NEUROLOGY

President: W. RITCHIE RUSSELL, C.B.E., M.D., F.R.C.P. (Oxford).

Vice-Presidents: Professor PHILIP C. P. CLOAKE, M.D., F.R.C.P., D.P.M. (Birmingham); T. ROWLAND HILL, M.D., F.R.C.P. (London); W. ESMOND REES, M.D., F.R.C.P. (Swansea).

Hon. Secretaries: CHARLES LANGMAID, M.B., F.R.C.S., 174, Lake Road East, Roath Park, Cardiff; C. W. M. WHITTY, D.M., M.R.C.P., Department of Neurology, The Radcliffe Infirmary, Oxford.

The following programme has been arranged:

Friday, July 17—morning. Short Papers: (1) Dr. HONOR SMITH (Oxford), Diagnosis and Treatment of Meningitis. (2) Dr. A. B. KINNIER WILSON (Oxford), Dangers of Bulbar Poliomyelitis. (3) Dr. RICHARD JOHNSON (Manchester), Surgical Treatment of Intracranial Haemorrhage. (4) Dr. MURRAY FALCONER (London), New Trends in the Diagnosis of Spastic Paraplegia.

OCCUPATIONAL HEALTH

President: J. A. L. VAUGHAN JONES, M.B., Ch.B. (Leeds).

Vice-Presidents: Professor R. C. BROWNE, M.A., D.M., M.R.C.P. (Newcastle-upon-Tyne); ANDREW MEIKLEJOHN, M.D., M.R.C.P., F.R.F.P.S. (Glasgow); J. M. ROGAN, M.D., F.R.C.P.Ed., D.P.H. (London); J. S. SPICKETT, M.R.C.S., L.R.C.P. (Bridgend, Glam).

Hon. Secretaries: J. G. BILLINGTON, M.R.C.S., L.R.C.P., 7, Westfield Hall, Hagley Road, Edgbaston, Birmingham, 16; H. L. COULTHARD, M.D., M.R.C.P., D.P.H., 149, Heathwood Road, Cardiff.

The following programme has been arranged:

Friday, July 17—morning. Symposium: Work and Age. Dr. N. T. WELFORD (Cambridge), Dr. W. P. D. LOGAN (London), Dr. D. D. REID (London), and Dr. I. M. RICHARDSON (Aberdeen). *Film:* Date of Birth. *Occasional Papers:* (1) Carcinoma of the Lung Associated with Certain Industries, Dr. J. GWYNNE MORGAN (Clydach). (2) Method of Demonstrating Porphyrin in the Urine of Lead Workers, Dr. J. GWYNNE MORGAN (Clydach).

OPHTHALMOLOGY

President: J. H. DOGGART, M.D., F.R.C.S. (London).

Vice-Presidents: RUPERT J. PARRY, M.B., F.R.C.S.Ed. (Cardiff); ROY THOMAS, M.B., F.R.C.S.Ed., D.O.M.S. (Swansea); EUGENE WOLFF, M.B., F.R.C.S. (London).

Hon. Secretaries: BERNARD GLUCK, M.Ch., F.R.C.S.Ed., D.O.M.S., 76, Cathedral Road, Cardiff; A. J. B. GOLDSMITH, M.B., F.R.C.S., 63, Harley Street, London, W.1.

The following programme has been arranged:

Friday, July 17—morning. Subject: (1) The Ocular Complications of Diabetes. To be opened by Mr. G. I. SCOTT (Edinburgh) and Dr. LEONARD HOWELLS (Cardiff), followed by Mr. A. B. NUTT (Sheffield). (2) The Scope of Corneal Graft Surgery. To be opened by Mr. B. W. RYCROFT (London) and Mr. E. C. ZORAB (Southampton), followed by Mr. J. AYUB (London) and Mr. A. G. LEIGH (London).

ORTHOPAEDICS

President: A. O. PARKER, M.D., C.M., M.C.P.S., F.R.C.S. (Monmouth).

Vice-Presidents: IAN LAWSON DICK, M.D., Ch.M., F.R.C.S.Ed. (Edinburgh); A. M. HENDRY, M.B., F.R.C.S.Ed. (Birmingham); D. N. ROCYN-JONES, M.D., F.R.C.S.Ed. (Cardiff).

Hon. Secretaries: J. M. P. CLARK, M.B.E., M.B., F.R.C.S., 29, Park Square, Leeds, 1; DILLWYN EVANS, M.B., F.R.C.S.Ed., 25, Cathedral Road, Cardiff.

The following programme has been arranged:

Friday, July 17—morning. Subject: The Injured Hand. *Opening Speakers:* Mr. WILLIAM GISSANE (Birmingham) Major Injuries of the Hand. Mr. R. J. FURLONG (London), The Cut Tendon. Mr. EMLYN LEWIS (Cardiff), Major Skin Loss and the Vascular Effect of Crush Injuries of the Hand. Mr. L. W. PLEWES (Luton), The Rehabilitation of the Hand.

OTO-RHINO-LARYNGOLOGY

President: R. D. OWEN, F.R.C.S. (Cardiff).

Vice-Presidents: C. GILL-CAREY, F.R.C.S. (London); R. R. SIMPSON, M.B., F.R.C.S.Ed. (Hull); HECTOR A. THOMAS, M.B., F.R.C.S.Ed. (Cardiff).

Hon. Secretaries: ALUN BEYNON THOMAS, M.B., F.R.C.S., D.L.O., 23, Park Place, Cardiff; JOAN WADGE, M.B., F.R.C.S., 15, Devonshire Place, London, W.1.

The following programme has been arranged:

Friday, July 17—morning. Subject: (1) The Diagnosis and Treatment of Upper Respiratory Tract Infections in Allergic Children. To be opened by Mr. ANGELL JAMES (Bristol), followed by Dr. JOSEPH JACOBS (Cardiff) and Dr. J. PEPYS (London). (2) The Management of Otitis Media. (The speakers on this subject will be announced later.)

PATHOLOGY

President: Professor J. B. DUGUID, M.D. (Newcastle-upon-Tyne).

Vice-Presidents: E. N. ALLOTT, D.M., F.R.C.P. (Beckenham); Professor J. GOUGH, M.D. (Cardiff); Professor R. A. Q. O'MEARA, D.Sc., M.D., D.P.H., F.R.C.P.I., F.T.C.D. (Dublin).

Hon. Secretaries: I. H. O. EARLE, M.D., 12, Hillside, Wimbledon, London, S.W.19; SCOTT THOMSON, M.D., M.R.C.P.Ed., D.P.H., Public Health Laboratory Service, Institute of Pathology, Third Floor, Royal Infirmary, Cardiff.

The following programme has been arranged:

Wednesday, July 15—morning. Subject: Gastro-enteritis in Babies. To be opened by Professor ROBERT CRUICKSHANK (London), followed by Dr. M. T. PARKER (Manchester), Dr. K. B. ROGERS (Birmingham), and Dr. JOAN TAYLOR (London).

PREVENTIVE MEDICINE

President: J. GREENWOOD WILSON, M.D., F.R.C.P., D.P.H. (Cardiff).

Vice-Presidents: A. R. CULLEY, M.D., D.P.H. (Cardiff); Professor I. G. DAVIES, M.D., M.R.C.P., D.P.H. (Leeds); Professor T. FERGUSON, D.Sc., M.D., F.R.C.P.Ed., F.R.F.P.S., D.P.H. (Glasgow).

Hon. Secretaries: R. T. BEVAN, M.B., Ch.B., D.P.H., West Winds, 14, Rhiwbina Hill, Rhiwbina, Cardiff; J. A. STIRLING, D.S.C., M.B., Ch.B., D.P.H., Public Health Department, Town Hall, Chesterfield.

The following programme has been arranged:

Wednesday, July 15—morning and afternoon. A.m., Subject: The Health Visitor and the Family Doctor. To be opened by Dr. LLYWELYN ROBERTS (Sheffield) and Dr. STANLEY THOMAS (London). *P.m., Subject:* Cancer and the Community. To be opened by Dr. PERCY STOCKS (Rhodes-on-Sea) and Mr. RONALD W. RAVEN (London), followed by Dr. E. K. MACDONALD (Leicester).

PSYCHIATRY

President: T. J. HENNELLY, M.D., D.P.M. (Cardiff).

Vice-Presidents: Professor D. R. MACCALMAN M.D., M.R.C.P.Ed. (Leeds); DORIS M. ODLUM, M.R.C.S., L.R.C.P.

D.P.M. (London); HENRY V. DICKS, M.A., M.D., F.R.C.P. (London).

Hon. Secretaries: KENNETH SODDY, M.D., D.P.M., World Federation for Mental Health, 19, Manchester Street, London, W.1; JOSEPH P. SPILLANE, M.D., D.P.M., Whitchurch Hospital, Cardiff, Glam.

The following programme has been arranged:

Wednesday, July 15—afternoon. Subject: Interpersonal Relationships and Stresses within the Family. To be opened by Dr. H. V. DICKS (London) and Dr. W. S. MACDONALD (Leeds).

RADIOLOGY

President: PETER KERLEY, C.V.O., C.B.E., M.D., F.R.C.P., D.M.R.E., F.F.R. (London).

Vice-Presidents: J. A. C. FLEMING, M.B., F.R.C.S.Ed., D.M.R.E., F.F.R. (London); ERNEST HANSON, M.B., B.S., D.M.R. (Cardiff); E. ROHAN WILLIAMS, M.D., F.R.C.P., D.M.R.E., F.F.R. (London).

Hon. Secretaries: MARGARET D. SNELLING, M.B., M.R.C.P., F.R.C.S., D.M.R., Meyerstein Institute of Radiotherapy, The Middlesex Hospital, London, W.1; BRYAN WILLIAMS, M.R.C.P., D.M.R.D., 119, Cathedral Road, Cardiff.

The following programme has been arranged:

Wednesday, July 15—morning. Subject: Radiology of Congenital Heart Disease. To be opened by Dr. THOMAS LODGE (Sheffield), Dr. ROBERT STEINER (London), and Dr. THOMAS HILLS (London). (Names of any other speakers to be announced later.)

SCIENTIFIC EXHIBITION

All the stands (32) have now been allocated, and details will be given in a later issue of the *Journal*.

TIME-TABLE AND HOTEL ACCOMMODATION

An up-to-date time-table giving details of the social functions and excursions arranged during the Annual Meeting, and a further list of hotel accommodation available in and around Cardiff, will be published shortly (see *Supplement*, February 14, p. 39, and 21, p. 48, for previous notices).

IRISH HEALTH BILL REJECTED

I.M.A. SPECIAL GENERAL MEETING

The Irish Medical Association on March 18 unanimously rejected the Health Bill now before the Dail. The association would refuse to co-operate if it became law, and a defence committee was set up to devise ways and means of defeating the Government's proposals. The decision was announced after a special general meeting, at the opening of which Dr. A. McCarthy, chairman of the central council, said that reports from branches and groups were unanimously against the Bill.

Declaring that the association had a membership of 2,200, representing over 90% of the doctors of Ireland, he said that whatever scheme was brought in would have to be worked by the doctors. They had the power in their hands, and what was needed was the determination and courage to use it.

Objections Summarized

The I.M.A. summarized the objections to the Bill under five points: (1) that it contained in essence State control of the medical profession; (2) that under it the State must enter unduly and very intimately into the lives of patients and of doctors; (3) that to implement it the whole community must be heavily taxed independently of the necessity or desire of the citizens to use the facilities that might be provided; (4) that its implementation by taxation direct or indirect would morally compel the citizens to avail themselves of the services; and (5) that under it, the State must have recourse in great part to ministerial regulations as distinct from enactments of Parliament.

British Medical Association

EXTRAORDINARY GENERAL MEETING,
MAY 5, 1953

The names of the signatories to the requisition for an Extraordinary General Meeting which the Council has convened for Tuesday, May 5, 1953, at 2.30 p.m. (see *Supplement*, March 21, p. 70), are as follows:

Alken, C. F. S., Padstow
Allison, S., Liverpool
Andrew, Katharine M., Parkstone
Arazi, E. C., Mitcham
Armstrong, T. V., Manchester
Barber, C. H., Thame
Beattie, T. M., Manchester
Bellgard, S. J., Cardiff
Bellingham, R. C., Stockport
Benson, J. M., Great Ouseburn
Bergenthal, M., London, N.W.11
Bethune, A. D., Newcastle
Billings, B. R., Potts Wood
Boyers, L., Liverpool
Burney, W. H. S., Shrewsbury
Byworth, H. A., Stanmore
Carter, C. L., London, W.8
Chand, F., Sedgley
Charlton, Jean E. H., Grange-over-Sands
Chomet, I., London, N.16
Chomet, Zuzanna, London, N.16
Chromwell, J., Manchester
Clarke, D. D., Shrewsbury
Coleman, D., Liverpool
Coleman, R., Liverpool
Colville, W. C., Worthington
Conroy, J. I., Radcliffe
Constad, V., London, S.W.3
Cook, W. H. R., Liverpool
Coope, G. M., Prestwich
Cree, Alice, Edgware
Crook, G. T., Liverpool
Crookes, E. G., Liverpool
Devlin, H. F., London, S.E.15
Devlin, J., London, S.E.15
Dixon, P. A., Liverpool
Duncan, A. G. B., Kelso
Ellis, R., Manchester
Elson, C. W., Worthing
Fawcett, R. S., Gerrards Cross
Fine, W., Liverpool
Freeman, S., Manchester
Friis, W., Chislehurst
Gardner, H., Southport
Gibson, A. B. F., Oxford
Gilbert, S. F., Manchester
Gill, K. H., Eastbourne
Gladstone, F. C., Cirencester
Glendonning, A. V., Liverpool
Gordon, S., London, N.W.8
Grant, B. S., East Horsley
Grant, W. J., Shrewsbury
Gray, D. P., Cirencester
Grove-White, J. H., Cirencester
Hall, J. R., Wingate
Hamilton, J. J., Derby
Harvey, P. W., Manchester
Hirsh, B., Manchester
Hodge, H., London, W.9
Hughes, C. A., Willerby
Huston, J. A. F., Liverpool
Irwin, E. V., Wellingborough
Jaffe, E., Manchester
Joels, I., Manchester
John, R., London, W.6
Johnson, F. E., Stanmore
Johnston, L. M., Wallasey
Kagan, G., Leek
Kemp Horne, Winifred K. N., Burgess Hill
King, W., Manchester
Kohn, B., Salford
Koretz, H. A., Manchester
Kup, R. P. W., Gainford
Lambert, W., Keighley
Latham, J., Stockport
Launer, Annie, Prestwich
Launer, N., Prestwich
Lawrence, R. A. R., Derby
Lay, E. T., Camborne
Lee, R., Warrington
Leigh, D., Wantage
Lemerle, M. E., Tunbridge Wells
Lemerle, Muriel O., Tunbridge Wells
Lewis, A. C., Liverpool
Lichtenstein, L., London, W.8
Litherland, Doris G., Bourne-mouth
Long, Mary E., Tunbridge Wells
Lurie, M., Manchester
McCann, J. A., Liverpool
Macdonald, C. B., Liverpool
McEvedy, B. V., Knutsford
Mackenzie, J. L., Harrogate
McLeish, D. G. G., Liverpool
McMullan, W., Birmingham
McNamara, L., Mitcham
Mahony-Jones, Alice, Tunbridge Wells
Makos, K. A., Weybridge
Manning, A. D., Edgware
Marriner, K. D., Tunbridge Wells
Mart, Doris L., Stanmore
Master, J. A., London, E.2
Maxwell, M. J., Salford
Merzer-Szeinhau, Roza, Kenton
Miller, A., Trimdon Station
Newell, Grace H., Harrow
Odam, C. L., London, S.E.4
O'Donnell, P., Manchester
Ormerod, R., Blackburn
O'Sullivan, D. G., Stockport
Patrick, J. F., Manchester
Peach, F. P., Crewe
Pines, N., London, E.1
Primmer, J. B., Aberdour
Rall, J. A. A., London, S.W.19
Ramsay, Marianne O., Bourne-mouth
Rees, J. O. M., Guildford
Reid, J. J. G., Liverpool
Reid, Rhona A., Liverpool
Renton, H. B., Devizes
Robin, G. C., Shrewsbury
Robinson, K. V., Liverpool
Rosen, I., St. Helens
Rosenthal, L., Manchester
Ross, K. A., Tunbridge Wells
Ryan, Joan S., Liverpool
Salmon, N. G. H., Constantine Bay
Samson, H. P., Manchester
Savataud, G. W., Timperley
Scharfe, Frieda, Northampton
Schiff, C. I., London, E.8
Shah, J., Edgware
Sharpe, H. A., Liverpool
Sheldon, J. W. V., Padstow
Shiffman, Ellen M., Liverpool
Shirvell, E. A., Padstow
Simpson, R. E. H., Cirencester
Soloman, M., Liverpool
Soltau, D. H. K., Bristol
Stein, B. S., London, N.1
Steinberg, P., London, E.1
Stevenson, F. H., Stanmore
Stewart, J. B., Swindon
Stirling, J. M., Brighton
Stubbs, J. W. C., Shrewsbury
Styles, W. F., Liverpool
Taylor, C., Liverpool
Tillyard, F. E., Worthing
Tobias, L., Manchester
Varian, S. N., Devizes
Vickers, H. A., Wirral
Wallace, C. P., West Clandon
Waltho, Margaret L., Gomshall
Wasserstein, J., London, N.16
Watchman, I. G., Liverpool
West, Joyce H. W., Tewkesbury
Wilkinson, Dorothy M., Tewkesbury
Williams, W. B., Portslade
Woodhouse, H. Barbara, Stanmore
Wyburn-Mason, C. G., Wantage

GENERAL MEDICAL SERVICES
COMMITTEE

THE FATE OF THE DISTRIBUTION SCHEME

An all-day meeting of the General Medical Services Committee was held at Headquarters on March 19, with Dr. A. TALBOT ROGERS in the chair. Dr. A. Kelly, Deputy General Secretary of the Canadian Medical Association, attended the meeting and was given a hearty welcome.

It was reported that the evidence on general practice proposed to be given to the Cohen Committee had been approved by the Council at its meeting on the previous day, subject to certain suggested revisions made in the course of the debate.

College of General Practitioners

In response to an invitation given at the previous meeting, Dr. G. F. Abercrombie, Chairman of Council of the College of General Practitioners, and Dr. J. H. Hunt, Honorary Secretary, attended the meeting to discuss matters of mutual interest. The Chairman welcomed the visitors and said that in the General Medical Services Committee they were, of course, concerned with the affairs of general practitioners, and it was desired to make certain that the work of the two organizations would be complementary.

Dr. ABERCROMBIE said that he could speak for the whole of his council when he stated that they were not interested as a College in medical politics. Their sole object was the education of the general practitioner and the improvement of general practice.

Dr. HUNT thanked the Committee for the congratulations which it had extended to the College and which had been very encouraging and helpful. He repeated also that they were interested only in the academic side of general practice. In order to underline this, they felt that their regional faculties should be situated in universities which had medical schools. He himself had feared there might be a certain overlapping between the work of the British Medical Association and the College, but in his view there was plenty of room for both. He asked whether the Committee discussed subjects of academic interest and what liaison it might have with the Postgraduate Medical Federation of the University of London and with the 19 universities in Great Britain and Eire which had medical schools.

Postgraduate Training

Dr. TALBOT ROGERS said that they were concerned with the postgraduate training of the general practitioner and had looked into that matter very carefully. He referred to one of the aims of the College—namely, an open door for the general practitioner to the pathological and x-ray and like facilities in hospitals—and inquired how this objective could be achieved outside medical politics.

Dr. HUNT said that they had collected a great deal of evidence on this and similar matters which would be at the Committee's disposal if it wished. It would be their aim to refer all matters to do with medical politics to the B.M.A.

Dr. BEAUCHAMP asked what would be the relationship between the regional faculties and the kindred organizations already existing in the area.

Dr. HUNT replied that it would be the same as the arrangements already existing in London. His College and the General Practitioner Section of the Royal Society of Medicine and other like bodies would be complementary.

The CHAIRMAN pointed out that they had in the Association a Central Consultants and Specialists Committee which dealt with the Ministry through a Joint Committee with the Royal Colleges. In the General Medical Services Committee they would not be in favour of such a joint arrangement with the College of General Practitioners.

Dr. FRANK GRAY said that, while accepting the view that the spheres of the Committee and the College would in general be separate, he wondered whether their visitors had any ideas as to how the problem of overlapping when it occurred could be solved.

Close Liaison

Dr. HUNT said that what he would like to see was a very close liaison between the two bodies, and he hoped that a member or more than one member of the Committee might be on his College council.

Dr. H. G. DAIN said that they were all convinced of the sincerity of the present representatives of the College in saying that there was no intention on the part of the College to enter the medico-political field. But there could be no assurance that their successors would be of a like mind. He was very anxious that nothing should happen to destroy or harm the work of the committee of the British Medical Association in its approach to the Ministry. The General Medical Services Committee could claim to go to the Ministry as representative of the whole body of general practitioners. It would be seen, therefore, that he regarded the starting of the College of General Practitioners with some misgiving.

Dr. F. M. ROSE said that it all depended on the College and the methods by which it was run.

Dr. W. WOOLLEY said that in his view the College would be up against medical politics right from the beginning if they wanted to do anything with hospitals. He admired their intention to keep out of medical politics, but he was not at all sure how they were going to do it.

Dr. ABERCROMBIE said that he thought that if the College found itself faced with a problem the solution of which was not its business it would transfer the whole matter to the proper quarter.

Dr. Abercrombie and Dr. Hunt were thanked for their attendance and then retired.

Dr. FRANK GRAY said that it was important to have a co-operative basis from the beginning. In his view a Liaison Committee would not be adequate as a permanent arrangement.

It was agreed that a small number from the College and the General Medical Services Committee should continue the discussions and report back in due course.

The Conference Rider

A report by the Working Party Subcommittee was submitted and led to long discussions. Dr. TALBOT ROGERS, who had been in the chair of the subcommittee, said that it had been proposed to take immediate steps, in view of the Conference rider, to find out the number of groups of general practitioners who might be adversely affected by the new distribution scheme. The subcommittee felt that inquiries must be carried out on a uniform basis throughout the country, and information sought from the Ministry, executive councils, and local medical committees. It had been decided, in view of the sense of urgency, to invite the Ministry to call the full Working Party together again to investigate the problem. An official inquiry would safeguard both the accuracy of the information sought and the form in which it was given. He proposed that the action of the subcommittee in taking steps to call the Working Party together again for the investigation of the problem of the future remuneration of the small-list practitioner be approved.

This was agreed to.

Requisition for Extraordinary Meeting

The Committee then turned to the requisition signed by more than 100 members for an Extraordinary General Meeting to be convened to consider a resolution which was set out in the notice of the meeting, published in the *Journal* of March 21, and in the report of the proceedings of Council (see p. 85 of this *Supplement*).

Dr. MACRAE (Secretary of the Association's Solicitor at the legal position as stated by the Association's Solicitor at the Council on the previous day.

Dr. KNOX, Chairman of the Conference, proposed the acceptance of a recommendation of the Working Party Subcommittee that a Special Conference of Representatives of Local Medical Committees be convened on the issue

which had been raised, and to decide what action was necessary in view of the resolution to be brought forward at the Extraordinary General Meeting.

Dr. HOWIE WOOD seconded, and other members supported the calling of a Special Conference.

Dr. BRUCE CARDEW said that his organization, the Medical Practitioners Union, had had, of course, no opportunity of expressing its opinion on this matter, but he had little doubt about the view they would hold when they learnt of the new position. He was one who had moved certain modifications in the Working Party's proposals, but in no sense of the word was his organization behind this move on the part of the requisitionists to delay the implementation of the report of the Working Party, nor, he thought, would his council be likely to be in sympathy with it. After the acceptance of the Working Party's proposals he had always said that he believed the scheme should go forward. Certain modifications had been made, and he was entirely satisfied with the undertaking by the Committee to ask the Working Party to investigate further the problem of the future remuneration of the small-list practitioner. When his Union met to consider this matter he was convinced that it would disapprove of any attempt whatsoever to upset the scheme in the way proposed, though they would continue to seek certain modifications through the proper channels. Dr. MACALISTER, the President of the M.P.U. (a member of the Committee), indicated his assent.

Dr. F. M. ROSE thought it essential that the Conference should again in present circumstances reaffirm its decision taken in the early part of last year.

A motion to hold a Special Conference before the Extraordinary General Meeting was agreed to with two dissentients, and discussion then turned upon the appropriate date. Dr. DAIN suggested that the Conference be held on the morning of the day fixed for the Extraordinary General Meeting—namely, May 5.

Dr. HOWIE WOOD seconded Dr. Dain's proposal. Dr. CARDEW moved as an amendment that the Special Conference take place at a date well in advance of the Extraordinary General Meeting. This would give an opportunity for a full report of the Conference in the *Journal* and a better understanding of the issues by all concerned before the Extraordinary General Meeting took place. Dr. FRANK GRAY seconded.

A proposal to hold the meeting at an earlier date was lost, and the motion that the Special Conference be held on the morning of May 5 was carried.

The Committee then turned to the consideration of a draft report to the Special Conference and approved it subject to certain alterations. It also approved a letter, to be signed by the Chairman of the Conference, to go out to chairmen of local medical committees.

Flood Relief

Sitting as trustees of the General Medical Services Defence Trust, the members of the Committee received a statement from Dr. KELYNACK (Assistant Secretary) on the measures taken to assist doctors who had suffered as a result of the recent flood disaster. She said that there had been an extraordinarily good response to the appeal, and altogether some £3,670 had been received, including £1,500 (out of £5,000 set aside for the purpose) from Trust funds. Twenty-one doctors had already received help from the fund.

It was agreed by the Trustees that inquiries should be made as to whether there were any means of giving help to doctors in the Netherlands and that a report on this subject be made at the next meeting.

Provisional Inclusion in Medical List

The CHAIRMAN reported that a meeting of the Liaison Subcommittee with the Medical Practices Committee had been held to discuss the position arising from the decision of the Medical Practices Committee to discontinue the granting of applications for inclusion in the medical list provisionally. The reason for this change was that it did not seem

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

justifiable to alter the classification of an area as a result of a provisional application which might not mature. It was pointed out in discussion that whatever course was taken difficulties were bound to arise. The representatives of the General Medical Services Committee suggested that the position could best be met by enforcing safeguards that in such cases provisional admission should be granted only for a short period and only in one area at a time. The Medical Practices Committee had agreed that this appeared to be an equitable solution and undertook to discuss it with the Executive Councils Association. Dr. ROGERS said that what it came to was that where a practitioner applied to go provisionally on the list his application would be granted for at least one month, but if at the end of that time there was another practitioner who was in possession of premises and waiting to go on the list the period would not be extended.

Various

The Committee had spent a very large part of its session in discussing the requisition for an Extraordinary General Meeting in connexion with the Working Party's report, and other items on what had appeared to be a light agenda had to be dealt with quickly or in some cases held over until the next meeting on April 16. Dr. J. D. R. MURRAY reported on his discussion with the Central Ethical Committee on the circumstances in which patients of vacant practices should be accepted by other doctors in the vicinity. Certain suggestions were put forward by the Central Ethical Committee, but Dr. ROGERS from the Chair said that in his view the suggestions were too far-reaching, and might make it difficult to obtain locums. It was agreed to consult further with the Central Ethical Committee.

The Committee also considered, among other documents, a draft E.C.L. on "hardship payments" to elderly doctors, the last of the documents in the present series required to give effect to the recommendations of the Working Party.

It was also reported that local medical committees had been asked for their observations on the relationship between the general practitioner and the school medical service in the light of the agreement reached between the Association and the Society of Medical Officers of Health in 1950. Seven out of eight replies received reported good liaison.

The Assistants and Young Practitioners Subcommittee submitted to the Committee a procedure for compiling electoral rolls and the criteria for inclusion in the rolls. The subcommittee had also under consideration the compilation of a register of unestablished practitioners. Its proposal was that in future principals, including partners, predominantly engaged in general practice, whose lists do not exceed 1,500, should be eligible for inclusion on the roll of unestablished principals. This proposal was referred back to the subcommittee.

On the question of the possibility of issuing national code numbers to doctors instead of the present numbers on a local basis, which the Committee had requested the Ministry of Health to examine, the Ministry stated that it had looked into the matter, but thought that the balance of advantage was in favour of maintaining the present arrangements.

ABERDEEN APPRENTICE SCHEME FOR MEDICAL STUDENTS

The Aberdeen Executive Council has approved a scheme for practical instruction in general practice for medical students put forward by the City of Aberdeen Division of the B.M.A. Under the scheme students in their fifth or final year can be apprenticed to a general practitioner for about a month during vacation.

A circular sent by the Division to general practitioners in Banff, Moray, Nairn, Aberdeenshire, Kincardineshire, and the City of Aberdeen has brought an extremely favourable response. Nearly 90% of the general practitioners have expressed their willingness to participate. The scheme is a voluntary one for both practitioners and students.

SENIOR REGISTRARS

The Joint Consultants Committee has made fresh representations to the Ministry of Health on behalf of those senior registrars whose appointments are being terminated and for whom suitable opportunities are not available in the hospital services or elsewhere. The Ministry is collecting figures from the regions with a view to ascertaining the exact extent of the problem, but the information received is not yet complete. The Joint Consultants Committee has protested at the delay and has received an assurance that the figures will be passed on to it as soon as they are available. It is hoped that the Committee will be in a position to resume the discussions with the Ministry in the near future.

PRIVATE HOSPITAL TREATMENT

NEW PAY-BED REGULATIONS

The Minister of Health has now laid before Parliament new Pay-bed Regulations—the National Health Service (Pay-bed Accommodation in Hospitals, etc.) Regulations, 1953—under Sections 4 and 5 of the National Health Service Act, 1946. These regulations are designed to come into operation on April 1 next, when they will supersede the existing regulations.

The new regulations, which have been the subject of lengthy discussions between the Joint Consultants Committee and the Ministry (and with the Minister himself), deal broadly with two matters: (a) the manner in which the charges for private hospital beds shall be assessed, and (b) the maximum professional fees to be charged to patients desiring private treatment in hospital.

Private-bed Charges

Under Section 5 of the 1946 Act, patients seeking treatment in private hospital beds are required to pay the whole cost of the accommodation and services provided. Since 1948 the charges for private beds have risen to an alarming degree—in some hospitals being more than £25 per week—and during the discussions on the new regulations the Joint Committee sought a personal interview with the Minister of Health and impressed upon him that unless some action was taken to reduce the charges private practice would steadily diminish. The Committee reminded the Minister of the promises of previous Governments that facilities for private practice would be retained under the new Service. It pointed out that it was the experience of consultants in many parts of the country that there was a falling off in demand for private treatment—due largely in their opinion to the high maintenance charges—and that this was bound also to affect hospital revenue. The Committee therefore urged the reintroduction of a moderately priced private bed.

New Legislation Unlikely

In reply the Minister stated that he thought the possibility of introducing the necessary legislation during the next two or three years was extremely remote in view of the heavy parliamentary programme. The Minister added that, while he was anxious not to place any obstacle in the way of private practice, he doubted whether the falling-off in private hospital treatment was primarily due to the high charges. He agreed, however, that if this could be substantiated the position would warrant further consideration, because the provisions of Section 5 were intended to implement the promise given that private practice facilities should continue.

Calculation of Charges

The new regulations are still designed to secure that the charges for private beds shall represent the whole cost, but there are certain changes in the method of calculating the charges that will in many cases result in a reduction of the charge. Thus in hospitals where the total cost of the pay

block cannot be determined separately from the cost of the public wards, the percentage increases which are added to the average daily in-patient cost to arrive at the private-bed charge are reduced from 25% (single room), 15% (double room), or 5% (multiple-bedded room) to 15%, 10%, and 5% respectively. Furthermore, these percentage increases are to be added to the net daily in-patient cost before the addition of the salaries of medical and dental staff instead of after the addition of these salaries as hitherto; and the cost of any service from which the private patient receives no benefit—such as the almoner's and medical records departments—is excluded from the maintenance charge.

Maximum Professional Charges

The main criticism which is likely to be levelled by the profession against the new regulations so far as they concern the professional fees to be charged to private hospital patients is that the detailed classification of operations is retained.

The Joint Committee made strenuous efforts to persuade the Ministry—and even the Minister himself—that the attempt arbitrarily to divide operations into categories of major, intermediate, and minor without reference to the condition of the individual patient was unrealistic and unlikely to work satisfactorily. Unfortunately the Minister has adhered to the view that the classification is necessary as a protection to the patient, despite the repeatedly expressed view of the Committee that the classification affords no protection at all and that on the contrary the maximum fee for each category of operation was likely to become the standard charge, whereas in the past consultants normally related their fee to the particular requirements of the case and to the patient's circumstances.

The Ministry sought the assistance of the Joint Committee in improving the detailed classification of operations, but, because of its view that any classification was impracticable, the Committee declined to accept any responsibility for it.

Some Increase in Professional Fees

Apart from this point of major principle on which the Ministry and the Joint Committee were unable to reach any agreement there are certain improvements in the 2nd Schedule, setting out the maximum professional fees. The maximum fee that may be charged by a physician is increased from 25 to 40 guineas, with a similar increase for a surgeon in cases not involving an operation. There are also changes in the maximum fees in other specialties and the scale for radiotherapists has been completely revised. The maximum fee payable to a general practitioner attending a patient privately in hospital has been increased from 15 to 20 guineas.

The overall fee of 75 guineas to be charged by all the practitioners concerned in the patient's treatment is retained as the normal maximum, but provision is now made for this maximum to be increased to not more than 125 guineas (at the discretion of the hospital board or committee) in the following circumstances.

(a) When the treatment of the patient in accommodation provided under Section 5 of the Act has lasted four months; or
(b) when the patient needs at least two major operations or at least three major or intermediate operations as part of the same course of treatment during the same stay in such accommodation as aforesaid; or

(c) when the patient requires excision of lung, an operation on the heart or oesophagus, or the excision of a tumour of the brain or spinal cord, or otherwise requires specialized operative techniques involving complicated team-work.

Provision is retained for the maximum charges laid down in the regulations to be exceeded in cases where the patient so agrees, provided not more than 15% of the pay-beds are occupied at any one time by patients who have made such an agreement with their doctors.

In a circular to hospital authorities (R.H.B. (53) 26) the Minister of Health has given guidance on the new regulations. He states that the majority of complaints by patients

about pay-bed questions have been caused by lack of explanation before admission, and "many members of the public have . . . been left with a feeling that they have been unfairly treated." Though such complaints have become less the Minister asks hospitals to make sure that patients know (a) about amenity beds as well as about pay-beds; (b) about their right to be admitted as general patients on urgent medical grounds; and (c) about the nature and amount of the medical fees which their doctors may charge.

Notes and News

Holiday Exchanges.—A few French doctors would like to arrange holiday exchanges for their sons with the children of doctors in this country. A French business man with whose family a British doctor's daughter stayed last summer would like to make an *au pair* arrangement for one of his daughters with a family in this country. Anyone interested should communicate with Dr. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Correspondence

The Trainee Assistant Scheme

SIR,—Perusing your vacancy advertisements, I note a disquieting number of vacancies for "assistant or trainee assistant." This type of advertisement suggests a fundamental misunderstanding of the theoretically admirable trainee assistant scheme. The advertiser implies that assistant and trainee assistant are synonymous as regards the duties they are supposed to do. Surely the positions are no more synonymous than assistant surgeon and house-surgeon? A trainee assistant should be a recently qualified practitioner, taken on as a supernumerary to the practice staff, a bounty of £100 per annum being payable to the principal concerned for the trouble taken in training the young man who is not yet ready for the full responsibilities of practice.

In practice, however, some trainer principals seem to see in the trainee scheme an endless procession of not only cheap, but actually profitable, assistants, upon whom (in the name of giving experience) is thrust all the midwifery, most of the night work, and most of the chronic sick, the responsibility for whom the principal is paid to accept. The trainee is also called upon to replace the rather expensive holiday locum—an advantage to the principal which far overshadows the loss of the few-score disgruntled patients who do not like the constant change. I have computed that it would require the loss of over a thousand such patients to equal the financial loss of swapping a succession of trainees for a permanent assistant or, even less likely, a partner. Only too often the trainee scheme furnishes an excuse for the principal concerned to concentrate in his pocket the whole of the profits from a practice which it requires two to run.

The trainee cannot effectively object to this state of affairs. The threat of an unsatisfactory testimonial at the end of the trainee period is a nasty sword of Damocles hanging over a young doctor about to embark upon the search for a practice. He cannot afford to complain until he is himself established, by which time he has usually forgotten the abuses of the system. A simple and effective remedy for this state of affairs would be to limit each trainer principal to one trainee per five years. This would not be contrary either to the spirit or to the letter of the Spens report (an argument used previously for the retention of the trainee scheme as it is), and would have the advantage of multiplying by five the number of principals given the opportunity of training young practitioners.—I am, etc.,

Hayes, Middx.

TOM RUSSELL.

The General Practitioner and Midwifery

SIR,—I have recently had returned by the executive council some midwifery forms (E.C.24) for patients who have had their babies in hospital, on the grounds that the hospital would take full responsibility for the patient during pregnancy and labour. This appears the thin edge of the wedge to exclude the G.P. from midwifery. The next move could be that patients who have their babies at home will be the sole responsibility of the antenatal clinics. The reason given would be to avoid duplication in the midwifery services. The duplication is very evident, but this is not the solution.

The G.P. bears full clinical responsibility for all pregnant women until they enter hospital. In any emergency patients will always send for their own doctor. According to the above ideas, he would not even know if they were pregnant.

Why not follow normal medical practice? The G.P. should do all routine antenatal and postnatal work, and the hospital should hold a consultant clinic to which patients can be referred by their own doctors when necessary. The hospital could also see their own booked patients once or twice as required. There seems now no place for the local authority antenatal clinic.

I feel that the profession should act very sharply to stop this tendency. If it is allowed to pass by default, general practice will lose its midwifery, and medicine will degenerate one step further.—I am, etc.,

Kisca, Mon.

P. M. VASEY.

E.C.N. 113

SIR,—In 1948 we entered the N.H.S. lured on by various specious promises, amongst them the promise of secretarial help. Although that came to nothing, general practitioners have kept their records, nor am I aware that there have been any grounds for complaint—on the contrary. In any case, the Ministry knows well enough that we cannot conduct our practices without constant use of records.

None the less, a circular directive (E.C.N. 113) is sent out to tell us that "clinical records should contain all information that would normally be considered by general practitioners as necessary . . ." and so on. That is silly enough, but I am amazed to find the G.M.S. Committee a party to the business, and I hasten to assure the G.M.S. Committee that in this matter it represents only itself. It certainly does not represent me. On whose side is it battling?—I am, etc.,

Gateshead.

K. T. BROWN.

Memorandum on General Practice

SIR,—I would strongly suggest that the final draft memorandum on general practice which is to be submitted to the Central Health Service Council's Committee, presided over by Sir Henry Cohen, appears before all Divisions and general practitioners for discussion prior to its submission to the above-mentioned committee. Members will bear in mind that on more than one occasion evidence which was not representative of the medical profession as a whole has been submitted to outside bodies by the Association.—I am, etc.,

Meols, Cheshire.

E. S. A. ASHE.

Dental Anaesthetics

SIR,—In answer to the letter by Mr. J. D. Manson (*Supplement*, February 28, p. 58), I am afraid that neither the ethical rules quoted by the Editor nor the specious arguments of the dental surgeon enter into it. The only thing that matters here is that if the doctor concerned persists in giving dental anaesthetics to patients other than his own, and he knows that the doctors of those patients are willing to give the anaesthetic, then he is reducing medical ethics to a new low level. Having behaved in this rather cut-throat manner, he cannot then be surprised if there is ill feeling between him and his colleagues.

The ethical rules state, "No objection should be taken to the patient inviting his doctor to be present." This is surely one of the most ludicrous things ever written. I cannot imagine any doctor standing by and watching a colleague,

whether he be a specialist anaesthetist or a general practitioner, giving someone gas to have a few teeth extracted when, in spite of what the dentist says, he could do the job equally well himself. There must be many other very busy dentists in the district who get along quite well with the patients having gas from their own doctors.—I am, etc.,

Littlehampton.

HUGH STEWART.

S.H.M.O. Groups

SIR,—The S.H.M.O.s of the Leicester area have formed a Group for the following purposes: (1) Ensuring that full justice be done in the interests of its members; (2) representation of S.H.M.O.s on various committees; (3) assisting, wherever possible, the smooth running and efficiency of the Health Service.

In view of the extreme dissatisfaction expressed by S.H.M.O.s in many letters from various regions, it is hoped that groups will be started in other areas, and eventually an organization formed to cover the whole country. This Committee will willingly help in any way, either to assist individuals or to help with the formation of other groups. Correspondence will therefore be welcomed from anyone interested.—I am, etc.,

53, Stoneygate Road,
Leicester.

G. WARING ROBINSON.

Association Notices**Diary of Central Meetings****APRIL**

- 1 Wed. General Practice Review Committee, 11 a.m.
- 1 Wed. Joint Committee of the B.M.A. and the Royal College of Nursing, 2 p.m.
- 9 Thurs. Central Consultants and Specialists Committee, 1.30 p.m.
- 14 Tues. Registrars Executive Committee, 2 p.m.
- 15 Wed. Occupational Health Committee, 11 a.m.
- 17 Fri. Public Health Committee, 2 p.m.
- 20 Mon. Armed Forces Committee, 2 p.m.

MAY

- 1 Fri. Registrars Group Council, 2 p.m.
- 5 Tues. Extraordinary General Meeting, 2.30 p.m.
- 20 Wed. Conference of Honorary Secretaries, 10.45 a.m.

Branch and Division Meetings to be Held

BROMLEY DIVISION.—At Royal Bell Hotel, Bromley, Tuesday, March 31, 8.20 for 8.45 p.m., meeting. Cinematograph films of medical and scientific interest.

CORNWALL DIVISION.—At Royal Cornwall Infirmary, Truro, Tuesday, March 31, 8.30 p.m., clinical meeting. Address by Professor W. Melville Arnott: "The Changing Aetiology of Heart Disease."

DONCASTER DIVISION.—At Messrs. Parkinson's Café, High Street, Doncaster, Tuesday, March 31, 7.30 p.m., meeting. Annual B.M.A. Lecture by Mr. H. S. Shucksmith: "A General Surgical Ramble."

DORSET DIVISION.—At the Clinic, Glyde Path Road, Dorchester, Friday, April 10, 8.30 p.m., meeting. Consideration of Cohen Report: "General Practice and the Training of the General Practitioner." Lecture by Dr. Vera B. Walker: "Allergy in General Medicine."

GLASGOW DIVISION.—At B.M.A. Glasgow Regional Office, 234, St. Vincent Street, Glasgow, Thursday, April 2, 8.30 p.m., A.G.M.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, April 2, 8.30 p.m., meeting. Address by Dr. W. J. O'Donovan: "Drug Eruptions, New and Old."

HAMPSTEAD DIVISION.—At New End Hospital, Hampstead, N.W., Wednesday, April 1, 8.30 p.m., meeting. Talk by Mr. J. E. Piercy: "Recent Advances in the Treatment of Thyroid Disease."

MONMOUTHSHIRE DIVISION.—At St. Mellons County Club, Tuesday, March 31, 7.45 for 8.15 p.m., dinner. Address by Mr. G. M. Schwartz (Kemsley Newspapers, Ltd.): "We Can't Afford It." Members, their wives, and friends are invited.

NORTH BEDFORDSHIRE DIVISION.—At Bedford General Hospital, South Wing, Tuesday, March 31, 8.30 p.m., joint clinical meeting with Bedford Medical Society.

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, March 31, 8.30 p.m., meeting. Dr. J. Franklin: "The Modern Approach to Some Dermatological Problems."

WEMBLEY DIVISION.—At Wembley Hospital, Fairview Avenue, High Road, Wembley, Tuesday, March 31, 9 p.m., clinical meeting. Address by Dr. O. L. S. Scott: "Dermatology with Special Reference to the Problems Encountered in General Practice" (illustrated by lantern slides).

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 4 1953

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British Medical Association**ANNUAL REPORT OF COUNCIL, 1952-3**

Every member is asked to keep this Supplement, which contains matters referred to Divisions, until the subjects have been discussed by his Division.

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PRELIMINARY**The Queen's Patronage**

1. It is with the greatest pleasure that the Council records the fact that Her Majesty the Queen has been graciously pleased to grant Her Patronage to the Association.

Election of Honorary Member

2. On more than one occasion in the past a member of the Royal Family has honoured the Association by accepting Honorary Membership. In the year 1900 His Royal Highness the Prince of Wales (later His Majesty King Edward VII) was elected as an Honorary Member, and His Majesty King George V also had been an Honorary Member before his accession to the Throne.

The interest taken by His Royal Highness the Duke of Edinburgh in scientific advances, including those in the medical field, is well known, and the Council is sure that the Representative Body will give enthusiastic approval to the following recommendation:

Recommendation: That His Royal Highness the Duke of Edinburgh be elected, as an Honorary Member of the Association.

Election of a Vice-President

3. The Council has much pleasure in recommending:

Recommendation: That Professor Sir Henry Cohen, J.P., LL.D., M.D., F.R.C.P., F.F.R., be elected a Vice-President of the Association in recognition of his outstanding services to the Association.

Annual Meeting, 1953

4. The Annual Meeting of the Association will be held in Cardiff from July 9 to 17, 1953. The Adjourned Annual General Meeting, at which the President's Address is delivered, will be held on the evening of Monday, July 13.

As in 1952, there will be two types of scientific meetings: (i) Plenary Sessions, (ii) Meetings of Scientific Sections. The plenary sessions will be on "Coronary Disease," "Fibrosis," and "Overweight." The Popular Lecture on Friday, July 17, will be given by Sir Russell Brain, P.R.C.P.

There will also be a Scientific Exhibition covering a wide field of medical interests. Provisional programmes of the Meeting appeared in the *Supplement to the British Medical Journal* of February 14 and of March 28, and further details will be published when available.

Annual Meeting, Glasgow, 1954

5. The Annual Meeting at Glasgow will be held from July 1 to 9, both dates inclusive.

The Council recommends:

Recommendation: That Professor Sir John McNee, D.S.O., D.Sc., M.D., F.R.C.P., Glasgow, be elected as President of the Association for 1954-5.

Joint Annual Meeting, Toronto, 1955

6. A Joint Annual Meeting of the British Medical Association and the Canadian Medical Association will be held in Toronto in 1955, beginning on June 20.

The Council recommends:

Recommendation: That Thomas Clarence Routley, C.B.E., LL.D., M.D., F.R.C.P.(C.), Toronto, be elected as President of the Association for 1955-6.

Arrangements for Future Annual Meetings

7. The Council has accepted an invitation from the Brighton Division to hold the Annual Meeting in Brighton in 1956 from July 5 to 13.

The Canadian Medical Association has accepted the Council's invitation to hold a joint meeting of the two Associations in the British Isles at a date after 1955. The precise date has not yet been determined.

The Annual Representative Meeting, 1952, decided that the election of the President of the Association should in future be on a national basis except when the Annual Meeting is held overseas, when the selection would be a matter for consultation with the "host organization." The Council has decided to bring the new procedure into operation in 1956, when the President for 1957-8 will be elected.

The Council has arranged for a member of the central secretariat of the Association to take a special interest in the details of procedure of the Annual Scientific Meeting in order that he may advise science secretaries and officers of Sections in the light of past experience.

The Council has decided to pay the travelling expenses within the United Kingdom of non-members, including foreign speakers, invited to speak at the Annual Scientific Meeting.

A lantern projector with portable screen has been purchased for use at Annual and other meetings.

The Council has decided to provide overseas representatives, delegates, and speakers, and ladies accompanying them, with free tickets for all functions at the Annual Meeting.

Extraordinary General Meeting

8. A requisition, signed by more than 100 members of the Association, has been addressed to the Council in the following terms:

Pursuant to Articles 24 and 25 of the Articles of Association of the British Medical Association the undersigned members of the Association require the Council to convene an Extraordinary General meeting of the members of the Association in accordance with Article 27 of the said Articles of Association for the purpose of considering, and if thought fit passing, the following Resolution:

That the Association, being concerned by the modification of the present method of remuneration by capitation fees agreed in the Working Party's report, requires the Council forthwith to approach the Minister of Health with proposals for the better protection (financial and otherwise) of the small-list doctor and of the doctor newly seeking entry into practice, and requests the Minister of Health not to implement the Working Party's report until the scheme for distribution of remuneration has been considered in the light of such proposals, and meanwhile to continue the present method of payment.

The Council has convened an Extraordinary General Meeting, to be held on May 5, for consideration of the above resolution, but it is advised that the resolution, if passed, will not be effective, since "the general control and direction of the policy and affairs of the Association" are vested in the Representative Body by Article 37. (See also paragraph 27 of this Report.)

Representative of the Medical Branch of the Royal Navy on the Council

9. In 1951 the Representative Body elected Surgeon Rear-Admiral O. D. Brownfield to represent the Medical Branch of the Royal Navy on the Council for the remainder of the period of office of his predecessor—that is, until the A.R.M., 1952. Owing to an oversight, the expiry of Admiral Brownfield's term of office was not reported to the Council, and consequently no recommendation was made to the Representative Body in 1952 for the filling of the vacancy.

On behalf of the Council the Chairman nominated Admiral Brownfield for re-election for the period 1952-5, and the Chairman of the Representative Body accepted the nomination on behalf of the Representative Body, which is now asked to confirm the decision of its Chairman.

The Council recommends:

Recommendation: That Surgeon Rear-Admiral O. D. Brownfield, C.B., O.B.E., be elected as the representative of the Medical Branch, Royal Navy, on the Council for the period 1952-5.

Representatives at Conferences of Other Bodies

10. The Council appointed the following to represent the Association at the Conferences named:

West German Medical Association, Annual Meeting, Berlin, September, 1952	Dr. S. Wand
New Zealand Branch Biennial Conference, February, 1953	Dr. Denis H. Brinton
British Council for Rehabilitation Conference, London, February, 1953	Dr. J. A. L. Vaughan Jones Mr. H. H. Langston
The Pedestrians' Association—Conference on the safety of old people on the roads, March 7, 1953	Dr. E. B. Brooke
Eighth International Hospital Congress, London, May, 1953	Dr. J. M. Gibson Dr. T. Rowland Hill
National Association for Maternity and Child Welfare—Annual Conference, London, June, 1953	Mary Esslemont Annis Gillie
American Medical Association Annual Meeting, New York, June, 1953	Mr. Albert Sharman
Annual Conference of the Cremation Society, Llandudno, June 29 to July 1, 1953	Lord Horder
Seventh International Congress of Radiology, Copenhagen, July, 1953	Professor B. W. Windeyer
First World Conference on Medical Education, London, August, 1953	The Chairman of Council Sir Henry Cohen Dr. R. P. Liston Mr. J. R. Nicholson-Lailey Dr. A. T. Rogers Dr. F. M. Rose

Centenary of the Metropolitan Counties Branch

11. The Council has sent congratulations to the Metropolitan Counties Branch on attaining its Centenary. To mark the occasion the Branch organized a very successful ball in aid of medical charities.

Gifts to the Association

12. The Council has pleasure in reporting the following gifts to the Association:

- (1) Mounted head of a waterbuck, presented by Mr. N. E. Waterfield, a member of Council from 1934 to 1950.
- (2) Large walnut table, presented by Mrs. Radcliffe, in memory of the late Dr. Frank Radcliffe, a member of Council from 1920 to 1934.
- (3) Original manuscript of a letter written to a patient in 1817 by Dr. J. Gregory, presented by Captain Sir James Paget, Bt. R.N.

War Memorial

13. A further application was made recently for a licence to proceed with the erection of the Association's war memorial. The application was supported by influential members of the Association, and it was pointed out that many of the older subscribers to the memorial would wish to see it completed in their lifetime. A reply was received that a licence for the erection of the memorial itself could not be granted, but permission has since been given to proceed with repair and drainage work on the courtyard, which will be a necessary preliminary to the erection of the memorial.

An unforeseen effect of the delay in securing a licence to proceed with the memorial itself is that a rise in the cost of materials, wage rates, and transport charges will increase the cost of the memorial.

The Flood Disaster

14. In response to an appeal by the Chairman of Council, published in the *British Medical Journal* of February 14, many contributions from local medical committees and from individual members of the profession have been received by the Sir Charles Hastings Fund for the assistance of the doctors who suffered in the recent flood disaster. The Canadian Medical Association sent a most kind donation of a thousand dollars, and the General Medical Services Defence Trust generously guaranteed moneys for immediate assistance up to £5,000. The Council is grateful for the kindness of all concerned, and is glad to report that it has been possible to provide substantial relief in all the known cases of hardship. (See also paragraph 38 of this Report.)

Co-opted Member of Council of Royal College of Surgeons of England

15. The Council of the Royal College of Surgeons of England, after considering nominations which it had invited from the Council of the Association, has co-opted Dr. O. C. Carter (Bournemouth) to its membership for 1952-3.

College of General Practitioners

16. The Council has conveyed to the founders of the College of General Practitioners its best wishes for the success of the College.

The University of Southampton

17. The Association has been invited to appoint two representatives on the Court of the newly established University of Southampton, one nominated by the local Division and one by the Central Council. The Southampton Division has nominated Dr. J. G. McDowell and the Council has nominated Mr. H. H. Langston (Winchester).

Centenary of the Royal Photographic Society

18. The Council, on behalf of the Association, sent an Address to the Royal Photographic Society on the occasion of its Centenary on January 20.

Deaths

19. The Council regrets to record the death of 597 members during the year 1952.

Staff

20. The adoption of proposals made by the management consultants whose advice was sought in regard to the Association's financial structure and organization has involved changes in the designation and responsibilities of certain officials. The Finance and Business Officer (Mr. W. S. Giles) has been given the title of "Financial Comptroller," and Mr. D. C. Turnbull is now designated "Accountant and Assistant to the Financial Comptroller."

On the advice of the management consultants, a Business Manager to the *British Medical Journal* (Mr. M. W. Webb) has been appointed.

A vacancy on the editorial staff has been filled by the appointment of Dr. J. G. Thwaites as Assistant Editor.

Dr. Cormac Swan has resigned his appointment as Assistant Medical Editor of *Family Doctor*.

GENERAL MEDICAL SERVICES**Remuneration**

21. During the earlier part of the session a good deal of the General Medical Services Committee's time was taken up with discussions with the Ministry on the detailed application of the Danckwerts award and the recommendations of the Working Party on the future distribution of the Pool.

Payment of Arrears

22. The Committee, in consultation with its accountants, was able to reach agreement with the Ministry on the detailed calculation of the arrears due under the Danckwerts award and to secure their prompt distribution to the profession. This task was completed by November 28, 1952.

Income Tax

23. The Committee, assisted by Counsel, had discussions with the Board of Inland Revenue on the assessment of income tax and surtax on the arrears paid to general practitioners. The Committee wishes to acknowledge the co-operation of the Board and to report that the discussions enabled agreement to be reached on an equitable method of assessment.

Size of the Pool

24. It will be remembered that the size of the Pool each year depends upon a number of variable factors, in particular the number of doctors in the Service and the amount of practice expenses. At the Committee's request, Messrs. Price, Waterhouse & Co., the Association's auditors, carried out a detailed check of the Ministry's records and of the records maintained by a number of executive councils, and have been able to agree upon the precise number of doctors in the Service and thus to calculate the exact size of the Pool.

The Committee is in consultation with the Ministry about a further inquiry into practice expenses which will in future be undertaken at regular intervals.

The New Distribution

25. The new distribution scheme commenced on April 1, and, after consultation with the Committee, the Ministry issued detailed instructions in advance to executive councils outlining the arrangements to be made for the reduction of lists to the new maxima, the payment of partners on the basis of notional lists, and the procedure to be adopted in dealing with applications for initial practice allowance.

Reclassification of Areas

26. The revised report of the Medical Practices Committee, setting out the classification of areas throughout the country in accordance with the Working Party's proposals, was published in good time before the new distribution scheme started.

The report and subsequent amendments were published in the *British Medical Journal* (Supplement, October 18, 1952).

The Danckwerts Award and the Small-list Practitioner

27. Shortly after the Special Conference of Local Medical Committees, 1952, the Committee set up a special sub-committee to consider a rider passed by the Conference to the effect that if, in the light of experience of the new distribution scheme, it was found that certain groups of practitioners had not benefited to the extent which might have been expected, it should be left to the Working Party provisionally to allocate an appropriate proportion of the final settlement moneys for the purpose of remedying any obvious defects in the scheme.

The Committee has given very careful consideration to the report of its subcommittee and agrees with the view expressed that it would not be possible in the time available before April 1 to obtain information sufficiently exact for the Committee to be able to formulate any reliable estimate either of the extent of the problem or of the funds likely to be available for its solution.

It has therefore decided to undertake an immediate inquiry, with the help of the Ministry of Health, local executive councils, and local medical committees, with a view to obtaining a precise analysis of the number and categories of practitioners who might suffer injustice under the new distribution scheme which started on April 1. If the results of an inquiry of this nature are to be accurate, comprehensive, and above criticism, all three sources of information must be used and the inquiry carried out on a uniform basis throughout the country. Again, after the results of the inquiry are known, any further steps which the Committee might wish to take to give effect to the rider passed by the Conference must necessarily be taken through the Working Party as a means of securing the agreement of the Ministry of Health. It has been agreed, therefore, that the Working Party should be called together again to investigate the problem and to obtain the fullest possible information about the number of small-list practitioners likely to be concerned, and arrangements have been made for an early meeting.

The Ministry, at the Committee's request, has included in the regulations embodying the new distribution scheme a provision to enable the Ministry to evolve a scheme to provide for payment if this should prove necessary in the light of the results of the inquiry. In this way the final settlement fund can be used to adjust retrospectively the remuneration of any small-list practitioner who can show that his financial position has been prejudiced by the new distribution scheme.

Assistance for Elderly Practitioners

28. Paragraph 19 of the Working Party's Report provides that a small sum of money should be set aside from the Central Pool to deal with cases of hardship which might arise, particularly where under the new arrangements an elderly practitioner might lose his fixed annual payment and after receiving the initial practice allowance for a year find himself less well off than he was before the new scheme of distribution came into operation. Discussions are now being held with the Ministry as to the detailed arrangements to be made for implementing this recommendation.

Payments from the Inducement Fund

29. The Ministry has agreed that the percentage increase in the size of the Central Pool made under the Danckwerts award shall be applied to payments which have been made in the past from the Inducement Fund to assist doctors in "inducement areas." Percentage additions ranging from 11% to 22% are accordingly being made in respect of the years 1948-9 to 1952-3.

Group Practice

30. It will be remembered that the Report of the Working Party (paragraph 29) provisionally allocated the sum of £100,000 to encourage the formation of partnerships working as a group practice. The Committee has been informed that the Committee on General Practice of the Central Health Services Council has been asked by the Minister to define "group practice," and when this definition is available discussions will be held with the Ministry to consider both the advice tendered by Sir Henry Cohen's Committee and the measures necessary to give effect to paragraph 29 of the Working Party's Report.

Provisional Applications for Inclusion in the Medical List

31. It has been the practice of the Medical Practices Committee in the past to permit the provisional inclusion of a practitioner in the medical list on the understanding

that the application would require confirmation when satisfactory practice premises had been obtained. The Medical Practices Committee has discontinued this practice on the ground that the addition of one more doctor to the list might result in the reclassification of the area and in the exclusion of another practitioner who had earmarked suitable practice premises.

The Committee appreciates the intention of the Medical Practices Committee, but feels that some hardship may be caused by the new arrangement. It is proposing to hold an early meeting with members of the Medical Practices Committee to discuss the matter more fully.

Filling of Vacancies

32. (a) The Committee has reviewed the present arrangements for filling practice vacancies and has sought the views of local medical committees on this important subject. Replies received show that there is a good deal of dissatisfaction with the arrangements in England and Wales, and a preference has been expressed for the methods already in force in Scotland.

The Committee considers that the problem could best be met by combining the most satisfactory features of the English and Scottish systems, and is recommending to the Annual Conference of Local Medical Committees that:

- (i) the executive council should be responsible for appointing a successor;
- (ii) the decision as to whether a practice is to be dispersed or a vacancy is to be declared and advertised should rest with the executive council;
- (iii) the Medical Practices Committee should act as an appeals body, and in hearing an appeal should be required to review all the applications originally submitted and not merely that of the appellant.

(b) Proposals were approved by the last Annual Conference of Local Medical Committees for the amendment of the terms of service to protect the position of a successful applicant to a practice vacancy who finds that the practice premises have been secured by another doctor. Following discussions with the Ministry, the necessary amendment to the regulations and a circular letter to executive councils have been drafted, and will shortly be issued.

(c) The Committee's attention has been particularly drawn to partnerships which have been formed between an established single-handed doctor who intends shortly to retire and a doctor who is new both to the practice and to the district, the intention being to enable the latter to secure the succession to what is essentially a single-handed practice. The Committee feels that this practice is against the best interests of the Service and has therefore agreed with the Ministry that in future the Medical Practices Committee will not, unless there are special circumstances, accept one partner as a logical successor to another partner who has died or resigned unless the partners have been in active practice together for about a year. The Medical Practices Committee will retain full discretion if the circumstances of any particular case merit special consideration.

Committee on General Practice of the Central Health Services Council

33. At the invitation of the Council, the Committee has prepared a memorandum of evidence for submission to the Committee on General Practice of the Central Health Services Council. The evidence to be submitted is confined to recommendations and observations of a general character based upon policy which has already been determined by the Representative Body and the Conference of Local Medical Committees.

The Committee was assisted in its task by representatives of the Central Consultants and Specialists, Public Health, and General Practice Review Committees, whose experience and viewpoints in their own fields were of the greatest value in compiling the memorandum.

Mileage

34. The Interdepartmental Mileage Committee, which is examining the whole question of the distribution of the mileage fund and upon which the Committee is represented, has continued its work. The Committee's task was at first hampered by lack of information about the net earnings of rural practitioners, but, as a result of the evidence collected in connexion with the Danckwerts award, full information is now available and it should soon be possible for the Committee to formulate its views. Apart from the Committee's direct representation on the Interdepartmental Committee, a very close liaison has been established between the two bodies.

Inflation of Lists

35. The virtual completion of the "purge" of doctors' lists has on the whole produced satisfactory results, and a substantial amount of inflation has been eliminated. In view of the guaranteed capitation fee which will be paid from April, 1953, it is more than ever essential that lists should be accurate, and the Ministry has launched a further campaign to keep inflation at a low level, based on sustained local publicity through executive councils and various social organizations. It is hoped that in this way the resistance to the use of a numbering system which followed the abolition of national registration will be reduced, and that the public will appreciate that the continued use of national registration numbers purely for the purpose of identifying individuals using the National Health Service is essential to the proper administration of the Service. The Committee concurs in the arrangements which the Ministry has made, although it feels that further steps may be required at a later stage.

The Ministry has also decided to undertake a further "purge" in a few remaining counties where there is still a substantial degree of inflation. In view of the urgency of the task, the Committee has agreed that where under the regulations six months' notice is normally given to a practitioner of intention to remove a patient from his list, in these particular cases the removals should be effective as from the date of service of the notice. It is anticipated that this further check in these areas will be completed by April 1, and that any necessary adjustments in the lists of the doctors concerned will be effected on that date. Should the practitioner subsequently provide information which enables the patient's whereabouts to be traced, the patient would be reinstated and a back credit given.

Limited Lists

36. The Committee has discussed with the Ministry the procedure to be followed when the inmate of an institution, such as a residential day nursery, who during his or her period of residence has been transferred to the list of the medical officer in charge, leaves the institution. There are practical difficulties in the way of applying any standard procedure for automatic reinstatement on the list of the patient's own family doctor. The Ministry and the Home Office, who are responsible for the majority of these institutions, have, however, agreed to prepare a standard letter which will be sent to the children's parents, and this should go a long way towards overcoming the problem.

Allocation of Patients to General Practitioners

37. Further discussions have taken place on the powers which the Act vests in the Ministry, acting through an executive council, to compel a practitioner providing general medical services to take on his list as a patient a person who is already receiving treatment from an unqualified practitioner. It appears that the only completely satisfactory solution lies in an amendment of the National Health Service Act, 1946, and unfortunately there is little hope of early amending legislation in the health field. As a temporary measure, the Ministry has agreed to include in its *Notes for Service Committees* a reference which will ensure that if a doctor is alleged to have broken his terms

of service by refusing to take on his list a patient who at the same time is receiving treatment from an unregistered practitioner, the attitude of the General Medical Council regarding "covering" should be fully taken into account by the Service Committee.

Flood Areas

38. Immediately news was received of the serious floods along the East Coast, telegrams were sent on behalf of the Committee to the secretaries of local medical committees in the areas affected expressing the Committee's sympathy and seeking information as to how best assistance might be given. It was anticipated originally that additional doctors might be required in the reception areas to cope with the sudden influx of population, but reports received subsequently indicated that in general the normal medical services were able to meet the demands placed upon them.

The Committee has given careful consideration to the steps which might be necessary to prevent hardship among individual practitioners whose practices were in the flood areas. It was felt that the problem would best be met by:

- (a) providing immediate financial assistance to doctors whose property had been lost or damaged, and
- (b) the introduction of long-term measures to protect the practices of doctors in the flood areas and to compensate them for any loss of income.

It has welcomed, therefore, the appeal made by the Chairman of Council for contributions to the Sir Charles Hastings Fund which would be earmarked for the relief of doctors in the flood areas, and has decided to recommend to the Trustees of the General Medical Services Defence Trust that a sum of money should be guaranteed to the Hastings Fund in the event of heavy demands exhausting the resources available to that Fund. This recommendation has been accepted by the Trustees.

The Committee has discussed with the Ministry the steps to be taken to compensate doctors for loss of income due to the evacuation of many of the coastal areas and the likelihood that many seaside resorts will not this year receive their usual number of holiday visitors. It has been agreed that this may most appropriately be done by guaranteeing the doctor (from the final settlement) a minimum income based on the number of patients on his list as at January 1, 1953, together with a payment by way of temporary resident fees equivalent to the amount which he received from that source during the previous year.

It is hoped that by the end of the year conditions will have returned to normal, but, if it appears necessary, further discussions will then be held so that these emergency arrangements may be extended for a longer period.

Fees for Temporary Residents

39. The Ministry, after consultation with the Committee, has raised the maximum standard fee for the treatment of a temporary resident from 15s. to 17s. The lower rate of payment has also been raised from 2s. 6d. to 5s. The new lower rate will be applied not only to convalescent homes but other institutions—for example, holiday camps—where special arrangements for medical services are made. For this purpose an institution has been defined as "a place of residence at which 10 or more persons reside temporarily, and where a surgery is held at which a practitioner regularly attends." It does not include hotels or boarding-houses. Lists of such institutions are being kept locally by executive councils in consultation with local medical committees. The new rates will be paid to practitioners on June 30, 1953, in respect of cases treated in the quarter ending on March 31.

Treatment of Services Personnel on Leave

40. Although the Committee was in general agreement with a proposal made by the Ministry that Services personnel on leave should be treated as temporary residents under the National Health Service, the arrangements which

the Ministry suggested carry with them certain implications which are not altogether acceptable to the Committee. In particular, the Committee is concerned to protect the positions of private practitioners, who appear to be excluded by the Ministry's proposals. Similarly, the position of Admiralty surgeons, whose responsibilities go beyond those of a practitioner providing temporary resident treatment under the N.H.S., requires careful consideration.

The Committee has therefore discussed these questions with the Ministry of Health, and its observations have been forwarded to the Service departments.

Treatment of Merchant Seamen

41. The Shipping Federation has sought from the Ministry of Health an increase, as from April 1, 1951, in the annual payment made to the Federation from the Pool for the services of their whole-time medical officers. The Committee has informed the Ministry that it raises no objection to the small increase proposed.

Emergency Fees—Anaesthetics

42. The Committee has agreed with the Ministry that emergency and anaesthetic fees shall be a first charge on the local final settlement money, and funds will be made available for the distribution of fees quarter by quarter. Where there is a local arrangement that no emergency fees are claimed, that amount of money will be used to supplement the final settlement for the area.

Medical Service Committee Procedure

43. The special subcommittee which was appointed to carry out a full investigation of the status, composition, procedure, and functioning of the Tribunal and Medical Service Committees has now completed its task and a detailed report is being prepared for submission to the Annual Conference. The report will be issued as an appendix to the Supplementary Annual Report of Council.

Representation of General Practitioners in Hospital Administration

44. The Ministry's attention has been drawn on a number of occasions to the importance which the Annual Conference and the Representative Body attach to the adequate representation of general practitioners at all levels of hospital administration.

The Committee is happy to report that some progress has been made in this matter, and it will continue to press for greater representation whenever the opportunity occurs.

Sale of Goodwill

45. The A.R.M. last year referred to the Council a motion that the Council be instructed to examine and report upon ways and means of procuring the restoration of goodwill to those who wish to reacquire it.

As indicated in paragraph 88 of this Report, the Amending Acts Committee has prepared a memorandum on the optional return of goodwill which has as its object the repeal of section 35 of the National Health Service Act, 1946. This memorandum, together with the comments of the Compensation and Superannuation Committee, has been considered by the Committee, and representatives of the Amending Acts Committee took part in the discussions on the optional restoration of goodwill.

After most careful consideration the Committee has reached the conclusion that the proposals put forward by the Amending Acts Committee in regard to goodwill are impracticable, but, bearing in mind the very strong views expressed by the profession on the subject before the "appointed day," has decided that a full report setting out the arguments for and against the proposal should be included in the Committee's Annual Report to the Conference of Local Medical Committees in June.

Employment of General Practitioners in Hospitals

46. The Committee was asked to consider the draft of a circular letter which the Ministry proposed to issue to hospital authorities giving guidance on the employment of general practitioners in hospitals. The terms of the circular were not entirely satisfactory, and the Committee has put forward to the Joint Consultants Committee certain amendments which it feels should be made. The Committee's objections are at present under discussion between the Joint Committee and the Ministry, and a representative of the Committee has been invited to be present and to take part in the discussion.

Dispensing Capitation Fee

47. Following representations by the Committee, the Ministry accepted a proposal that an increase of 50% should be made in the dispensing capitation fee as from April 1, 1952. Payment was made when the Danckwerts award was implemented, and the Committee has good reason to believe that the revised figure is equitable, having regard to the heavy increase which has taken place in the cost of drugs.

Charges for Prescriptions

48. Following the decision of the Government to introduce charges for prescriptions issued under the National Health Service, the Committee asked the Ministry to discuss not only the detailed application of the scheme but also the measures it proposed to adopt to safeguard the interests of the dispensing doctor.

As a result of the Committee's intervention, the original proposal that an arbitrary deduction should be made from the dispensing capitation fee was replaced by the present system whereby a dispensing doctor is called upon to account for only the number of shillings which he is actually able to collect. In order to safeguard the Ministry's position, draft regulations have been prepared which extend the existing disciplinary machinery to cover possible cases of abuse of the arrangements made for collecting the charges. These regulations have been approved by the Committee and will shortly be issued by the Department.

Economy in Prescribing

49. The Committee has considered whether it is practicable or desirable to impose by regulation a requirement that the dispensing costs of proprietary articles should be shown in the advertising material issued by pharmaceutical firms.

A meeting was held with representatives of the Association of British Pharmaceutical Industry, when a most helpful exchange of views took place. It was agreed on both sides that it was desirable that doctors should know the costs of the articles which they were prescribing, and that anything which could be done to achieve this should be encouraged. There are, however, many technical difficulties in printing prices on promotion material which has to cater for different markets at varying prices, and the Committee has recommended the Conference of Local Medical Committees not to press at this juncture for the introduction of any measure of compulsion.

The Committee has also discussed a motion proposed at the Annual Representative Meeting in 1952 to the effect that in the interests of national economy patients who are attending hospital regularly should have their medicines dispensed by the hospital and not by the family doctor. In the Committee's view, the sole criterion should be the interests of the patient, and the Committee is in agreement with the proposal in those cases where it is in the interests of the patient that the hospital should do the dispensing.

Investigation of Prescribing

50. The attention of the Committee has been drawn to cases in which charges of over-prescribing brought against general practitioners were not finally resolved until many months after the issue of the prescription in question. This

is obviously an unsatisfactory state of affairs from the point of view both of the efficient working of the Service and of the individual doctor concerned. The Committee has discussed with the Ministry ways and means by which this procedure might be speeded up without infringing the doctor's legal rights. The main difficulty has been the time lag between the issue of a prescription and its pricing by the Pricing Bureau, but the Committee understands that Pricing Bureaux are working through these arrears at a steady rate and that it should shortly be possible for an investigation to be completed within three months from the issue of the prescription.

Medicines and Appliances for Doctors' Surgeries

51. The Committee has again discussed with the Ministry the urgent necessity for introducing arrangements for stock orders for doctors' surgeries. The Ministry is in favour of such a scheme on the grounds of both convenience and economy, but, unfortunately, the pharmacists have declined to proceed any further at the present time. The Committee appreciates that the pharmacists cannot be compelled to take part in the proposed arrangements, but every effort will be made to reach agreement on this important aspect of the pharmaceutical service.

Maternity Medical Services

52. The National Health Service (General Medical and Pharmaceutical Services) Regulations lay down that a doctor providing maternity services shall carry out a post-natal examination of the mother at or about six weeks after pregnancy. In the past, the Ministry has advised executive councils that a doctor may be held to have complied with his obligations if the examination is undertaken within 10 weeks. Following discussions with the Committee's representatives, the Ministry has now agreed to extend this period to twelve weeks from the date of confinement.

The Ministry has also agreed to bring to the notice of local authorities the desirability of supplying self-contained maternity outfits so that general practitioners do not receive requests from patients for additional supplies. It has been pointed out that antiseptics and surgical spirit not normally included in the maternity pack should, if required, be supplied by the midwife, and that where crêpe bandages are considered necessary these should be obtained from the local health authority and not prescribed on Form E.C.10.

Arrangements were made by the Committee for a copy of the Ministry's letter to be sent to all local medical committees with a suggestion that if adequate provision was not made in any particular area the local medical committee should approach the local authority on the subject.

Criteria for Admission to the Obstetric List

53. Discussions have taken place with the Ministry of Health concerning the publication of advice which the Minister received from the Central Health Services Council about the procedure for the admission of doctors to the special obstetric list.

In the Committee's view, it was undesirable that a circular embodying any advice on this subject should be sent to executive councils at the present time when the whole question is under review in the light of the decisions taken by the Representative Body and when another committee of the Central Council, that on general practice, will also have the matter under consideration.

The Ministry has pointed out that the Minister has an obligation to publish advice which he receives from the Central Health Services Council. It has been agreed, however, that, instead of an official letter being sent to executive councils, the advice shall be transmitted only to the chairmen of these councils by means of a personal letter, which will include a paragraph making it clear that the Minister has no wish to disturb existing arrangements by laying down any rigid criteria to be applied to applications for admission to the special obstetric list.

Liaison between the General Medical Services and Public Health Committees

54. It has been the practice for the representative of the public health service on the General Medical Services Committee to be appointed by the Society of Medical Officers of Health. There has been no direct representative of the General Medical Services Committee appointed to the Public Health Committee.

The Council has considered a proposal that the public health service representative should be jointly nominated by the Public Health Committee and the Society, with a view to establishing a closer liaison between the two committees. This proposal has been accepted by the Society, and it has been agreed that the representative appointed should be a medical officer of a local health authority who is a member both of the Public Health Committee and of the Council of the Society.

The Council is also of opinion that there should be a direct representative of the General Medical Services Committee on the Public Health Committee. The recommendation for amendment of the Schedule to the Bylaws to cover these decisions is contained in Appendix III.

Admission of Students to Medical Schools

55. From time to time the Council has received requests for information about the number of students admitted to medical schools in relation to the probable future need for doctors. The Committee considers that an early inquiry should be made into this important problem, and, as a start, proposes to investigate:

- The number of students in medical schools;
- the number qualifying from the schools; and
- the number of newly registered practitioners absorbed into the various branches of the medical profession.

The inquiry will, inevitably, take some time, but a full report will be made as soon as possible.

Medical Records

56. Under the National Health Insurance Scheme a fairly elaborate memorandum of guidance was issued to medical practitioners as to the form in which their medical records should be kept. The Ministry of Health has drawn attention to the fact that nothing comparable has been issued under the National Health Service, and that difficulties are arising in determining whether particular practitioners have complied with their obligations under their terms of service. The Ministry has accordingly prepared for issue to general practitioners a short note of guidance in general terms which has, with minor alterations, been agreed by the Committee.

Certification for Surgical Corsets

57. The Committee has long held the view that the practice of requiring a medical certificate for the remission of tax on a made-to-measure corset of the non-surgical type should be abolished. The Ministry has been reluctant to withdraw this form of certification in case it should increase the call for free corsets from the hospitals. The Board of Customs and Excise has, however, amended the list of conditions in respect of which a certificate from a doctor entitles the patient to a tax-free appliance. It is hoped that this will have the effect of reducing the demand made upon the doctor for certificates, but at the same time the Committee feels that the complete abolition of the concession is the only satisfactory method of solving the problem. It will keep the problem under review.

COMPENSATION AND SUPERANNUATION

Assignment of Compensation

58. The Council, in collaboration with the Medical Insurance Agency, investigated ways of assisting, by means of loans on security of compensation, practitioners suffer-

ing financial hardship who were unable to obtain an advance payment of compensation. The results were successful and it is now possible for a practitioner to secure an advance of a proportion of the capital eventually payable by assigning the compensation and interest thereon to the lender under a form of mortgage.

Payment of Compensation

59. The Council has considered Minutes 243 and 244 of the A.R.M., 1952, and has reconsidered Minutes 165 and 167 of the A.R.M., 1951, on which action had previously been deferred pending the outcome of the arbitration on remuneration. The Council thinks that the time is now opportune to reopen the question of the payment of the whole or part of the compensation due in the following circumstances:

- (a) When a partner is taken into a practice.
- (b) When a doctor moves from one area to another.
- (c) Where hardship arises because of a debt on a practice house.

Representations have been made to the Ministry on these points and the Council will also endeavour to reach agreement as to the circumstances which constitute "hardship" within the meaning of the Compensation Regulations.

Superannuation

60. The Council regrets to report that the decision of the Income Tax Commissioners, that tax is payable under Case III of Schedule D on the 8% contribution paid by the Minister to those practitioners who opted out under Regulation 38 (3) (m), was upheld when an appeal was heard in the High Court. Counsel has advised against any further appeal.

REVIEW OF GENERAL PRACTICE

61. The General Practice Review Committee, appointed by the Council in 1950, has completed its report, which contains an illuminating account of general practice in the early years of the National Health Service, based partly on systematic personal observation of a random sample of practitioners at work and partly on replies to a postal inquiry. The Council has decided to publish the report in the *British Medical Journal*, and the document is now being edited by the Committee for publication.

"GENERAL PRACTICE AND THE TRAINING OF THE GENERAL PRACTITIONER"

62. The Council summarized in its last Annual and Supplementary Reports the replies of 39 Divisions to its request for observations on the report on *General Practice and the Training of the General Practitioner* prepared by a special committee under the chairmanship of Sir Henry Cohen. Soon after the issue of the Supplementary Report six more replies were received. The Representative Body (A.R.M., 1952) "deplored the apparent apathy of the Divisions in that few of them had submitted a considered opinion of the important Cohen Report, and urged all Divisions to give this subject adequate and urgent consideration so that an agreed Association policy on general practice and the training of the general practitioner might be formulated." The Council, accordingly, circulated a further request to the remaining 175 Divisions for a definite statement of what action, if any, had been taken in their areas to study the Report. As a result, 15 more Divisions have sent comments or recommendations and 28 have stated that they have considered the Report and have no observations to make. Of the remainder, 36 Divisions are to consider it at future meetings.

The Council is grateful to the Divisions and study groups which have submitted their views. Many of them have obviously given much time and thought to the subject. All their observations will be collated and carefully studied by the Council.

HOSPITAL AND CONSULTANT SERVICES

63. During the past year the Central Consultants and Specialists Committee has maintained its contact with hospital staffs throughout the country through its regional organization; and at the same time has taken an active part in the work of the Joint Consultants Committee and the Staff Side of Committee "B" of the Medical Whitley Council. It has also had the benefit of the advice of the special groups of the Association, including the Registrars Group, and has thus secured that the views of consultants and specialists generally, and those with special problems, have been fully represented in discussions with the Ministry and in the Whitley Council.

The guiding principle of the Committee has been that there should be regular joint consultation with the Ministry in the shaping of the service so that the profession may take its full part in providing the type of service that it knows from its own experience is likely to prove successful. For this reason it has consistently urged that the professional advisory machinery should be overhauled to provide at all levels of the service democratically elected committees representative of the profession. It has been a disappointment to the Committee to find a tendency on the part of the Ministry to reach somewhat hasty decisions without consultation with the profession.

Hospital Medical Staffing

64. Some two years ago the Ministry appointed a number of inspecting teams to carry out a survey of hospital medical staffing, and in June, 1951, the Joint Committee obtained from the Ministry an undertaking that it would discuss the results of the survey in general terms with the Committee before any final decisions were taken. The Committee was therefore extremely disturbed in November last to find that the recommendations of the inspecting teams regarding alterations in medical staffing had been sent by the Ministry to boards of governors without prior consultation with, or indeed the knowledge of, the Joint Committee.

At about the same time instructions were issued to all hospital authorities calling for a 5% reduction in certain categories of hospital staff over the next twelve months, and "freezing" medical staffs at their present level.

The Joint Committee immediately sought an opportunity of discussing with the Permanent Secretary of the Ministry the apparent unwillingness of the Department to take the profession's representatives into its confidence and to discuss with them matters affecting medical staffs in hospitals before issuing instructions to the hospital authorities. The Permanent Secretary freely admitted that on occasions the Ministry had omitted to consult the Joint Committee—as for instance in the matter of the staffing survey—but he assured the Committee that for the most part these were unintentional rather than deliberate lapses and that his Department wished to have the benefit of the Committee's advice on all appropriate subjects. He hoped the Committee would recognize, however, that there must be occasions when it was impracticable to consult with the profession before announcing decisions involving Government policy.

The Joint Committee is continuing to discuss the question of medical staffing with the Ministry in the light of the staffing survey and the instructions on economy measures.

Review of Remuneration of Hospital Medical Staff

65. In June, 1952, the Staff Side of Committee "B" of the Medical Whitley Council notified the Management Side of its intention to submit a claim for a review of the remuneration of hospital medical staff in order that the intention of the Consultant Spens Committee might be fulfilled that the salary scales recommended by the Committee and based on the 1939 value of money should be adjusted to meet post-war conditions.

After the advice of leading counsel had been taken the claim was duly submitted in the autumn and is now under discussion with the Management Side.

Security of Tenure

66. The Committee has had before it the following resolution adopted by the Representative Body in 1952:

That this meeting considers that when a permanent contract has been issued no revision of that contract should take place within a period of three years, unless the work should substantially alter.

The Committee shares the anxiety of the Representative Body at the lack of security of senior members of hospital medical staffs, and particularly of part-time consultants and S.H.M.O.s, in view of recent instructions of the Ministry that part-time contracts should be kept under "continuing" review. The Committee agrees that a permanent contract once entered into should not be lightly set aside or altered, though it feels that the possibility of adjustment either way in an individual officer's contract must be accepted. Nevertheless, the Committee is strongly of the opinion that part-time consultants and S.H.M.O.s should be reasonably protected against sudden and unjustified reductions of sessions, since with the falling off in private practice they are becoming dependent to an increasing degree upon the income from their hospital appointments. The Committee feels that the absence of such safeguards will create a preference for whole-time appointments and encourage the development of a whole-time hospital service.

In recent discussions on the subject the Ministry suggested to the Joint Committee that the appeal machinery provided under paragraph 16 of the Terms and Conditions of Service did not apply in a case where a consultant's (or S.H.M.O.'s) contract was being altered or determined as a result of redundancy or hospital reorganization. The Ministry's attitude was the more disturbing because, if there were any widespread attempt to reduce consultants' sessions as a result of the hospital medical staffing survey, the "moral obligation" placed upon boards to try to find alternative employment would be virtually impossible to discharge. The Central Consultants and Specialists Committee and the Joint Committee did not, however, accept the Ministry's view, and they were firm in their opinion that the wording of paragraph 16 of the Terms and Conditions of Service clearly gave a consultant or S.H.M.O. the right to appeal to a professional committee against the termination of his employment wherever he considered the Board's action to be unfair. Moreover, the Committee was advised that this right extended to consultants and S.H.M.O.s who were threatened with a reduction of sessions, since the reduction could only be effected—apart from agreement—by the termination of the existing contract and the offer of a new one. The Ministry has now accepted this view. Discussions on the subject are continuing with the Ministry, with particular reference to the manner of reviewing part-time contracts.

Reduction in Senior Registrar Establishment

67. In November, 1950, the Ministry issued instructions for a reduction in the number of registrar and senior registrar appointments from approximately 1,400 in each grade to 1,100 and 600 respectively. The Joint Committee, with the support of the Central Consultants and Specialists Committee, at once protested against the Ministry's proposals, and after lengthy discussions it was agreed in the summer of 1951 that the future establishment of senior registrars should be 960 instead of the 600 previously proposed, and that there should be no fixed establishment of registrars, the posts in this grade to be determined by the needs of the service.

The number of medical staff who were likely to be dismissed from the hospital service as a result of the Ministry's action had thus been substantially reduced. Nevertheless it still seemed inevitable that a considerable number of practitioners who had been attracted to the hospital service by the prospect of a consultant career, and had spent many years in training for the practice of a specialty, would be dismissed without any real prospect of obtaining consultant posts, and at a time when entry into general practice had

become difficult. The anxiety of the profession regarding the hardship in which senior registrars were likely to be involved was expressed in the following resolution adopted by the Representative Body in 1952:

That this Representative Body considers that the impending dismissal of senior registrars is unjust, and that, in view of the grave difficulties most of these registrars will have in finding alternative employment, this meeting considers it is the responsibility of the Ministry of Health to provide suitable alternative employment for these doctors in view of their age and experience.

The Central Consultants and Specialists Committee and the Joint Committee were fully alive to the problem. They calculated that, even after allowance was made for those senior registrars who might be expected to obtain consultant posts and for those temporarily retained for the needs of the service, a rapid reduction to the agreed establishment of 960 posts would involve the displacement of some 300 senior registrars before or after completion of their training. The Joint Committee continued to impress upon the Ministry the urgency of taking appropriate action to prevent hardship falling upon these senior registrars, and to secure that they were not lost to the hospital service.

In the latter half of 1952 the Joint Committee learnt that the number of actual consultant vacancies had for some time substantially exceeded the estimated number of vacancies on which the senior registrar establishment had been based. Although it was not known whether, or for how long, this trend would continue, the Ministry thought it likely that as a result the number of senior registrars who at the end of their training would find difficulty in obtaining consultant posts would not be nearly so high as was at one time feared. The Ministry asked to be informed if future events proved this assumption to be false. The Joint Committee accepted the Ministry's contention with some reserve because it thought it likely that the bulk of the displaced senior registrars would be general physicians or surgeons, whereas most of the consultant vacancies would probably be in other specialties. It was still discussing the problem with the Ministry when instructions were issued "freezing" hospital medical establishments at their present level, and virtually putting an end to any consultant expansion (see paragraph 64).

There is little doubt that the efforts of the Joint Committee have been seriously undermined by these instructions, but the Committee is still pursuing the matter vigorously with the Ministry. It is clear that the present situation has arisen from the Government's policy of hospital expansion at the end of the war and the promise of an expansion in the consultant service which it has been unable to fulfil. The Committee strongly feels, therefore, that the Ministry has a definite responsibility towards the present body of senior registrars.

The Central Consultants and Specialists Committee has also noted the following resolution of the Representative Body:

That as far as possible there should be an interchange of senior registrars and registrars between teaching and non-teaching hospitals.

The principle that there should be an interchange of senior registrars between teaching and non-teaching hospitals has already been accepted by the Ministry, and regional boards and boards of governors are putting it into effect.

The Committee has considered the desirability of urging that the principle should be extended to registrars, but feels that this would be impracticable within the short period of a registrar appointment.

Junior Hospital Staffing Difficulties

68. Reports received from various parts of the country during the year indicate that the shortage of junior hospital staff is creating increasing difficulty, particularly in some

of the non-teaching hospitals. It is hoped that the provisions of the Medical Act, 1950, requiring practitioners qualifying after January 1, 1953, to undertake a period of 12 months' pre-registration service in approved hospital posts, will go a long way towards meeting the difficulty at house-officer level. Unfortunately, however, the problem is no less acute at registrar level, and there is little doubt that the recruitment difficulties at this level are related to promotion prospects and facilities for entry into general practice.

The Committee is giving the matter its urgent consideration.

Employment of General Practitioners in Hospitals

69. The Joint Committee, in consultation with representatives of the General Medical Services Committee, is now discussing with the Ministry the question of the employment of general practitioners in hospitals in the light of the resolutions adopted by the Representative Body in 1952.

It is hoped that it will be possible to make a further report in the Supplementary Annual Report of Council.

Medical Advisory Machinery

70. Discussions have taken place during the past year on the question of the establishment of satisfactory medical advisory machinery at all levels in the hospital service, and a large measure of agreement has been reached on the constitution and functions of advisory committees to boards of governors and hospital management committees. The Ministry has accepted the principle that the composition of the advisory committee should be left to the medical staff to decide according to the needs of the hospital or hospital group. It is envisaged that in some hospitals (or hospital groups) the whole of the consultant staff might constitute the advisory committee, meeting regularly to discuss matters of policy, and that in other cases it might be more appropriate for the staff to elect a representative committee. It is anticipated that a circular for the guidance of boards of governors and hospital management committees will be issued shortly.

So far the Ministry has been reluctant to discuss advisory machinery at regional board level, being of the opinion that the boards should be left to seek advice where they think fit. The Ministry has been informed, however, that the profession is extremely disturbed at the way in which some boards are obtaining professional advice, and that it considers it to be fundamental to the development of the service, and to the development of a spirit of co-operation between the profession and the boards, that the advisory machinery at regional board level should be placed on a satisfactory basis. Discussions on this aspect of the matter are being continued.

Review of S.H.M.O.s

71. The Committee has had before it the following resolutions adopted by the Representative Body in 1952:

1(a). That this meeting deplores the fact that the constitution of the Grading Committee was not as recommended in the A.R.M. of 1951, namely:

"That immediate arrangements be made for reviewing the grading of S.H.M.O., J.H.M.O., and others in the 10B group, and that, as many of these are working as part-time general practitioners, the reviewing committee should contain not less than 20% of general practitioners." (Minute 36, A.R.M., 1951.)

1(b). That this meeting deplores the fact that the Grading Committee in the South-west Region, in reviewing the status of individual practitioners, took into consideration whether or not the person under review was in general practice.

1(c). That this meeting considers that there should be a periodic review of the grading of specialists not graded as consultants.

2. That as distinct from the grading of the holder of a post, the grading of all hospital posts be reviewed and published.

3. That this meeting considers that all senior hospital medical officer posts in the hospital establishment should be reviewed as a matter of urgency.

4. That there should be the right of appeal from the decision of the review committees to some suitable central body.

As reported last year, the composition of the professional grading committees appointed to carry out a review of S.H.M.O.s at the end of 1951 had largely been determined by the Ministry at the time when the Representative Body's resolution on the subject was adopted. The Central Consultants and Specialists Committee and Joint Committee went as far as they could in obtaining the inclusion in the review committee of outside assessors nominated by the Royal Colleges (in consultation with the chairman of the Central Consultants and Specialists Committee).

The implication of the second resolution of the Representative Body is that the professional review committee in the South-western Region was biased, in reaching a decision as to grading, in cases where the practitioner under review was also engaged in general practice. The Committee doubts whether it would be possible to obtain sufficient evidence to make it practicable to pursue the matter.

Although the Committee recognizes that there are a number of practitioners who are still dissatisfied with their grading after the last review, it feels that it is impracticable to press for a right of appeal to a central review committee or for further reviews at periodic intervals. A right of appeal to a central body has already been refused by the Government and the Committee does not consider that any useful purpose would be served by pursuing the matter. In the future practitioners will acquire the status of the appointments they obtain in open competition, as they did before 1948, and it is preferable to revert to this principle rather than to perpetuate a system of grading by review committees.

So far as any injustices still exist, the Committee feels that the only course is to raise them on an individual basis direct with the Ministry. The Committee is therefore exploring the position of those S.H.M.O.s who have expressed their dissatisfaction with their grading with a view to raising appropriate cases with the Ministry.

In some cases it is alleged that an S.H.M.O. post is wrongly designated, and presumably the Representative Body had this in mind when it proposed that all S.H.M.O. posts should be reviewed. The Ministry has assured the Joint Committee, however, that hospital boards have been advised that S.H.M.O. posts should only be so designated in accordance with the terms of the agreement reached between the Ministry and the Joint Committee, and set out in Circular RHB (50) 96. The Committee does not consider that there is any evidence that would justify a demand for a general review of S.H.M.O. posts, though it recognizes that there may be individual cases where a post has been wrongly graded. The Committee would be quite prepared, however, where this can be substantiated, to take the matter up through the regional Whitley appeals machinery.

Those S.H.M.O.s holding consultant posts who were upgraded to consultant status as a result of the last review have been placed at the minimum point in the consultant salary scale, despite the fact that a number of them are practitioners of upwards of 40 years of age who have held the same appointment for many years. Hospital boards have declined to exercise their discretionary power to advance the starting salary because the Ministry has advised them that it would be "inappropriate" to do so. The matter has been raised with the Ministry.

Whole-time Officers

72. During the year there has been growing pressure from whole-time officers for direct representation upon the Committee, and upon the Joint Committee and the Staff Side of Committee "B" of the Medical Whitley Council.

It is true that at the present time the number of whole-time consultants on the Central Consultants and Specialists Committee is very small, and that there is only one whole-time member (a university professor) on the Joint Committee and the Staff Side of Committee "B." Nevertheless, there is little doubt that one of the real causes of the unrest among whole-time officers is a lack of information regarding the efforts made on their behalf, particularly by the Staff Side. This, coupled with the fact that there has been no improvement but rather a deterioration in the conditions of service of whole-time officers during the year, has not unnaturally given rise to a growing feeling that they would be better served if directly represented in the negotiating machinery. The Committee is confident, however, that an examination of the work of the Staff Side would show conclusively that nothing more could have been done in negotiation to advance the interests of whole-time officers, and that failure to achieve any material improvements in the conditions of whole-time employment is not due to any lack of sympathy or knowledge on the part of the Staff Side.

At the same time the most careful consideration has been given to the claim for direct representation. So far as the Central Consultants and Specialists Committee is concerned, its membership derives largely from the Regional Consultants and Specialists Committees, which in turn are representative of consultants and specialists (whole- as well as part-time) throughout the country. In some areas whole-time consultants outnumber part-time consultants, but at the moment part-time representatives are often appointed to the Central Committee even in these areas. Nevertheless, there would appear to be adequate opportunity already available for whole-time consultants to find their way to the central committee. Moreover the Committee is composed of some 70-80 members, and it feels that there is room in a body of this size for all sectional interests to be represented without difficulty. In the case of the Joint Committee and the Staff Side of Committee "B," which are much smaller bodies, the Committee considers that it would be impracticable to place representation on the basis of sectional interest, and that it is much more in the interests of all sections of hospital medical staff that the profession's negotiators should be chosen for their personal merits.

The Committee is, however, seeking the views of consultants and specialists generally on the matter through its regional organization, and will be guided as to its future policy by them.

In the meantime, in order to deal with the immediate grievances of whole-time officers over the matter of their professional expenses, the Staff Side of Committee "B" has sought and obtained the agreement of the Management Side to reopen the discussions on the subject, which reached a deadlock last year, and to invite representatives of whole-time officers to take part in the negotiations.

Private Hospital Beds

73. In July, 1952, the Joint Committee sought a personal interview with the Minister of Health, and impressed upon him that, unless some action was taken to reduce the maintenance charges for private hospital beds, private practice would steadily diminish. The Committee reminded the Minister of the promises of previous Governments that facilities for private practice would be retained under the new service. It drew his attention to the reduction since 1948 in the number of hospital beds set aside for private patients, and to the substantial increases which in the same period had taken place in the hospital charges for private beds. The Committee stated that it was the experience of consultants in many parts of the country that the demand for private hospital treatment was falling off, largely owing to the high maintenance priced private bed. In reply, the Minister stated that any such modification would require amending legislation in view of the fact that Section 5 of the 1946 Act required private hospital patients

to pay the whole cost of maintenance. He thought that the possibility of introducing such legislation during the next two or three years was extremely remote, having regard to the heavy Parliamentary programme. The Minister added that, while he was anxious not to put any obstacle in the way of private practice, he thought it was open to argument whether the falling off in private hospital treatment was primarily due to the high charges. He agreed, however, that if this could be substantiated, the position would warrant further consideration, because the provisions of Section 5 were intended to implement the promise given that private practice facilities would continue.

The Committee is now endeavouring to obtain evidence to put before the Minister.

Pay-bed Regulations

74. Discussions have continued during the past year between the Joint Committee and the Ministry upon the question of the revision of the pay-bed regulations, which prescribe the maximum professional fees chargeable to private hospital patients and the method of calculating the maintenance charges.

The Minister has refused to abolish the detailed classification of operations upon which surgeons' professional charges are based, but the new regulations which the Minister has laid before Parliament are, in many respects, an improvement on the existing regulations. Thus provision has been made for the overall maximum of 75 guineas for all professional charges to be increased up to 125 guineas in certain circumstances, and in some specialties the maximum professional fees have also been increased. Moreover the method of calculating the private-bed charges has been amended and should lead to a reduction in the charges.

The new regulations came into operation on April 1, 1953.

Legal Actions Involving Hospital Staffs

75. During recent years there have been an increasing number of actions for alleged negligence brought by patients against hospital authorities and members of their medical staffs. In addition to the general uneasiness caused by this tendency, it is damaging to the spirit of co-operation which has existed hitherto between medical staffs and their employing authorities. The authority is not helped at the moment by the policy of the Ministry that, where it is sought to make a hospital board or committee liable for the alleged negligence of a member of its medical staff, it should endeavour to obtain a contribution from the practitioner concerned in respect of any damages awarded. This makes it difficult for hospital medical staffs to co-operate with their authorities as fully as they would wish, since by so doing they may furnish the authority with information that will subsequently be used against them in pursuance of the Ministry's policy.

Discussions are now proceeding with the Ministry in an endeavour to meet the difficulties both of hospital authorities and of their medical staffs, and it is hoped that a satisfactory arrangement will soon be reached.

The Committee is examining the implications of the judgment given in the recent case of *Payne v. St. Helier Group Hospital Management Committee and Another*. It is hoped to include a statement on this subject in the Supplementary Annual Report of Council.

Mileage Allowances for Hospital Medical Staff

76. The Management Side of Committee "B" of the Medical Whitley Council has consistently taken the view that mileage allowances are a matter of general application to all sections of hospital staff, and for this reason it has proved impracticable to reach separate arrangements for medical staff.

Early in 1952 the General Whitley Council introduced the following revised rates of mileage payments:

New Rates	Old Rates
<i>Cars up to and including 10 h.p.</i>	<i>Regular User*</i>
7½d. per mile for the first 2,000 miles per year.	Annual allowance of £52 per annum, plus 3½d. per mile (irrespective of horse-power)
5½d. per mile from 2,001 to 7,000 miles per year.	*A regular user was one whose annual mileage was estimated to exceed 2,000 miles per annum.
4½d. per mile thereafter.	
<i>Cars over 10 h.p.</i>	<i>Casual User</i>
9d. per mile for the first 2,000 miles per year.	7½d. per mile for the first 3,120 miles and thereafter 3½d. per mile (irrespective of horse-power).
7½d. per mile from 2,001 to 7,000 miles per year.	
6d. per mile thereafter.	

When these new rates were referred in due course to Committee "B" of the Medical Whitley Council for consideration of their adoption for hospital medical staff, the Staff Side was particularly concerned to note that acceptance of the new rates was subject to a proviso that the payment of mileage in respect of the home-hospital part of the journey to a whole-time officer using his car in the performance of his duties would be discontinued in cases where the officer normally travelled between his home and main hospital by car on the days when he did not require it for his official duties.

The Staff Side recognized that this proviso would probably mean that the revised rates would bring little improvement to whole-time officers, and that some of them might even be worse off under the new rates than under the old. It also felt that it was inequitable that a whole-time officer who might require to have his car available at all times should be penalized in this way. The Staff Side, therefore, vigorously resisted the application of the condition to medical staff, but the Management Side was not prepared to vary the terms of the General Council agreement for medical staff alone. The Staff Side was accordingly faced with the choice of accepting the revised rates and conditions *in toto* or of retaining the existing rates. It did not feel that any advantage would be gained for those officers adversely affected by the home-hospital mileage condition by denying hospital medical staffs generally the benefit of the new mileage rates. The Staff Side therefore accepted the revised rates under protest, at the same time making it clear that the question of home-hospital mileage would be taken up in the General Whitley Council.

Objections to the new restriction were also raised in the General Whitley Council by other sections of hospital staff, and after further discussions the following agreement was reached and accepted on behalf of hospital medical staff:

An officer whose normal practice is to travel to his headquarters by car but who satisfies both of the following requirements may, if the employing authority by resolution so decide, be paid mileage allowance in respect of the home-hospital journey calculated in accordance with the terms of service as hitherto in respect of the days on which he actually uses the car to make an official journey which attracts mileage allowance at other than the public transport rate. The officer to whom this arrangement applies is one who has a claim to special consideration because:

(i) He has a definite commitment to make an official journey every day for which the use of his car is justified, or alternatively his duties are such that he is liable to be called upon to make official journeys by car which cannot be arranged in advance, and that liability is so extensive and the journeys in practice so frequent as to make it desirable that his car should always be available at his headquarters.

(ii) He would not otherwise require to travel to his headquarters by car.

If the officer is unable to satisfy these conditions and it is his normal practice to travel to his headquarters by car, then on the days when he uses it for an official journey he will be paid mileage allowance by reference to the excess, if any, of the total distance travelled over his normal return journey between home and headquarters.

If, on the other hand, the officer only travels by car on the days when he requires it for an official journey, mileage will be paid as hitherto in accordance with the terms of service.

The revised mileage rates apply to hospital medical staff with effect from April 1, 1952, with a further increase of ½d. per mile as from October 1, 1952.

Practitioners in Whole-time Salaried Employment: Income Tax

77. The Committee has given consideration to the following resolution adopted by the Representative Body in July, 1952:

That pressure be brought to bear on the Treasury to allow rebate of income tax on the annual subscription to practitioners paid by annual salary.

The rules governing the assessment of income tax under Schedule E allow tax relief only in respect of expenses which the taxpayer is necessarily obliged to incur and defray out of the emoluments of the employment, being money expended "wholly, exclusively, and necessarily" in the performance of the duties of the appointment. Thus income-tax relief in respect of the payment of membership subscriptions to the Association could only be allowed to a practitioner in whole-time salaried employment if membership of the Association were a condition of his employment. To press that membership of the Association should be made a condition of employment would be inconsistent with its policy on the "closed shop" question.

Provision of Diagnostic and Ancillary Facilities

78. The Committee has had before it the following resolutions of the Representative Body:

That this meeting, while appreciating the increasing provision of diagnostic and ancillary services, feels that the present difficulties are as much due to the shortage of staff as to the restriction of capital development, and calls on the Ministry to take steps to overcome this shortage.

That the Ministry be pressed to insist via regional hospital boards and hospital management committees that local hospitals make greater efforts to furnish facilities for pathological investigations for general practitioners in their areas.

That it be an instruction to the Council to make all possible efforts to achieve direct access to pathology and x-ray departments for all general practitioners.

The Central Consultants and Specialists Committee and the Joint Committee both support the principle that wherever practicable general practitioners should have direct access to hospital ancillary departments. The principle is also accepted by the Ministry, and is being implemented as conditions allow.

As the Representative Body itself suggests, the application of the principle is dependent upon the provision of adequate hospital staff as well as apparatus and other facilities, and during the past year a great deal of attention has been devoted in the discussions between the Joint Committee and the Ministry to staffing problems.

Admission of Urgent Cases to Hospital

79. The Committee has noted the resolution of the Representative Body to the effect that hospitals should make the arrangements for an ambulance in emergency cases if so requested by the general practitioner.

The Committee does not consider that this should present any difficulty, but feels that it is essentially a matter for local arrangement.

Early Discharge of Patients from Hospital

80. The Committee endorses the view expressed by the Representative Body in the following resolution, and, as opportunity occurs, will discuss the matter with the Ministry:

That in the view of this Representative Body the early discharge of patients from hospital should be encouraged to enable a quicker turnover of waiting-list.

Fees for Lectures to Nurses

81. The following resolutions of the Representative Body were referred to the Committee for its consideration:

That this A.R.M. deplores the attitude of the Management Side of the Whitley Council in maintaining differentiation in the fees payable for lectures to nurses, and is of the opinion that a uniform fee for all should be the accepted principle.

That the apparently agreed fees for lectures to nurses be restricted to new appointments; the holders of pre-existing appointments to be awarded a fee of two guineas per lecture.

The fees recently agreed for lectures given by members of hospital medical staff to student nurses and midwives were the result of prolonged negotiation in Committee "B" of the Medical Whitley Council. Both the Central Consultants and Specialists Committee and the Staff Side would have preferred a single fee, but the agreed rates represent the best compromise that could be reached.

The Committee feels that the second resolution of the Representative Body on this subject is impracticable. It should be appreciated that in some cases the new rates are an improvement on the pre-existing rates, and it would be impossible to secure the benefit of the new rates for some hospital staff without accepting the reverse for others.

The Committee considers that the best course is to leave matters where they are until experience can be gained of the operation of the new area nurse-training arrangements.

Retiring Age

82. The Committee has considered the following resolution of the Representative Body:

That this Representative Body considers that the difference between the retiring age of consultants and general practitioners is contrary to national policy, which maintains that those over 65 should remain at work as long as they continue to carry out their duties efficiently.

The present policy that members of hospital medical staff should normally retire from their appointments at 65 does not represent any change in the practice which obtained generally in the hospital service before the inception of the National Health Service. The Committee suggests that different considerations may well apply in general practice and in the hospital service, and it would point out that any general departure from the present agreed policy would be bound to have serious repercussions upon the prospects of promotion for junior members of hospital staffs, and in particular for the present body of senior registrars.

Domiciliary Consultation Arrangements

83. The Committee has noted the objection raised by the Representative Body to the inclusion of the diagnosis in the model form of domiciliary consultation certificate agreed between the Joint Committee and the Ministry.

This point was thoroughly discussed with the Ministry, but the Department was strongly of the opinion that the information would be of value for the purpose of hospital statistics. The Ministry agreed, however, to review the model form in consultation with the Joint Committee in 12 months' time and the Committee will bear the Representative Body's view in mind when the matter is reopened.

Deductions for Board and Lodging During Leave

84. Following representations by the Staff Side of Committee "B" of the Medical Whitley Council, the Management Side has agreed that hospital authorities should be

advised that, except in the case of house officers, the charge for board and lodging should not be made in respect of periods when a resident officer is absent from the hospital on annual leave. If the leave entitlement is taken into account in assessing the annual charge, no actual deduction would be made during absence on annual leave, but where the charge is assessed on the full cost of 52 weeks' board and lodging the charge should not be deducted from the officer's remuneration when absent on holiday.

Hospital Capital Expenditure

85. The Committee has noted the following motion, referred by the Representative Body to Council:

That the British Medical Association through its appropriate Committee brings pressure to bear on the Ministry of Health to ensure that, in areas where hospitals are not yet fully developed, central funds on a priority basis will be available for hospital capital expenditure.

The Committee has already recommended, in the evidence submitted to the Select Committee on Estimates, that a block grant system of hospital finance should be introduced. This would go some way towards meeting the difficulties of hospital development to which the Representative Body's resolution draws attention.

The Committee will bear the matter in mind for further discussion with the Ministry at the appropriate time.

Appointment of Members of Regional Hospital Boards

86. The term of office of one-third of the members of regional hospital boards expired in March, 1953, and, as in previous years, the Association received an invitation from the Minister to submit names for his consideration in filling the resultant vacancies. Regional consultants and specialists committees, local medical committees, and Branches and Divisions of the Association, were accordingly asked to consider the matter and to recommend the names of consultants and general practitioners respectively, and the nominations received were transmitted to the Minister at the beginning of the year.

Subsistence Allowances

87. The following new rates of subsistence allowance were introduced by the General Whitley Council in November, 1952, and accepted for application to hospital medical staff:

Night subsistence:

	£810 per annum or over			
	From	To	s. d.	s. d.
(a) Officers in receipt of salary of				
First seven nights	30	0	37	6
From 8-28 nights	25	6	30	0
(b) Officers in receipt of salary of less than £810 per annum				
First seven nights	24	0	30	0
From 8-28 nights	18	0	24	0

Day subsistence:

	£810 or over			
	From	To	s. d.	s. d.
(a) Officers in receipt of salary of				
5-8 hours	3	6	4	0
Over 8 hours	8	4	9	6
(b) Officers in receipt of salary of less than £810 per annum				
5-8 hours	2	6	3	0
Over 8 hours	6	0	7	6

Provided that, where an officer has lunch and/or dinner on a train or boat during the absence, the following allowances shall be substituted for those above:

	s. d.
5-8 hours	6 6
Over 8 hours	
Lunch or dinner	12 0
Lunch and dinner	13 0

(Junior staff 10s. 6d.)

REFORM OF THE NATIONAL HEALTH SERVICE

88. It had been the intention of the Council to present to the A.R.M., 1953, its second report to cover the following items:

- (1) The principle of "contracting out" of the Service;
- (2) the restoration of the optional ownership of goodwill; and
- (3) the structure and functions of regional hospital boards and hospital management committees.

In view of the Government's heavy legislative programme, any amending legislation in the health field seems unlikely in the immediate future. The Council intends in the interval to complete the consideration of the items named, which are still the subject of discussion by the various Association committees concerned, and thereafter to determine the further programme. Further developments in respect of the item on the restoration of goodwill are reported in para. 45 of this report.

The Scottish and Northern Ireland Acts are at the present time under review by committees in those two countries.

Arbitration

89. The question of establishing a Whitley court of arbitration for the National Health Service has been the subject of discussion in the General Whitley Council for the Health Services, but at the present time no final agreement has been concluded. The Staff Side of the General Whitley Council is pressing urgently for further consideration of this matter.

OCCUPATIONAL HEALTH**Future of Occupational Health Services**

90. The Council has continued to consider plans for the future of occupational health services. Discussions with representatives of the Society of Medical Officers of Health have resulted in surveys being undertaken by medical officers of health in different types of area: (a) part of a big city, (b) part of a medium-sized town containing mixed industries, (c) a rural area, and (d) a port. The purpose of these surveys is to ascertain the kind of occupational health services, if any, at present available and to determine future requirements. It is hoped that these surveys will be completed this summer. In addition, surveys are being carried out in two specific industries in a large city, and also in a large industrial organization covering many types of factories and industrial establishments.

An informal discussion has taken place with the Social Insurance and Industrial Welfare Committee of the T.U.C., at which there was a preliminary exchange of views on future occupational health services. A further discussion on this subject will take place when the results of the above-mentioned surveys are available.

Training for the Occupational Health Field

91. In order to ascertain the opportunities for occupational health training at present available, information has been sought from the deans of medical schools on the amount and type of occupational health training given to undergraduate students, and facilities available for postgraduate students.

Although it is appreciated that some training in this subject may be given even where there is no set course in the undergraduate curriculum, the results of the investigation show that the position is not very satisfactory. With few exceptions only a very limited amount of training appears to be given. A greater emphasis on the principles underlying a man's relation to his working environment and his occupation is required. Assessment of a man's fitness for a particular job and for work in general is an important function of a general practitioner, and it is important that medical students should be taught how to undertake such

assessments. In addition, the final examinations might well include a proportion of questions with an occupational health bias.

In so far as postgraduate training is concerned, the number of students undertaking courses for the Diploma in Industrial Health has gradually decreased during the past few years, and at some universities courses are no longer held. As a possible solution of this difficulty, the Council has considered whether integration of the courses of training for the Diploma in Industrial Health and the Diploma in Public Health would be possible. Part I of the course is already common to both. The London School of Hygiene and Tropical Medicine has a D.P.H. elective course, and in the industrial elective course a teaching experiment with a selected group of students has been carried out by which it has been possible to achieve some integration of the D.I.H. and D.P.H. courses. There is not, however, sufficient evidence available at present to show that there could be complete amalgamation of the two courses, leading to either diploma or both diplomas. It has been suggested that a part-time course for the D.I.H. spread over a period of two or three years in place of the present full-time course would be practicable and might well increase the number of postgraduate students wishing to take the D.I.H.

The Council has brought this suggestion to the notice of all teaching authorities in Great Britain.

Occupational Dermatitis

92. Representations have been made to the Ministry of National Insurance that, in all cases of occupational dermatitis where benefit is claimed under the National Insurance (Industrial Injuries) Act and the claimant has been referred to a dermatologist, a copy of the dermatologist's report should be sent to the examining medical practitioner. The Ministry is not prepared to agree to this arrangement, but is willing to provide copies of the dermatologist's report in individual cases where a specific request is received from the examining medical practitioner. The Council has been asked to advise the Ministry on the best method of bringing this decision to the notice of examining medical practitioners, and this matter is now under consideration.

Duties of and Ethical Rules for Industrial Medical Officers

93. The Association of Industrial Medical Officers submitted a document entitled "Notes for the Guidance of Industrial Medical Officers" which it recommended should replace the "Duties of and Ethical Rules for Industrial Medical Officers" approved by the Representative Body in 1949. The Association of Industrial Medical Officers was of the opinion that it was no longer necessary to single out industrial medical officers by the continued use of special ethical rules for this section of the profession. In addition, the Association of Industrial Medical Officers sought to secure that industrial medical officers may undertake continued treatment in connexion with minor or trivial conditions without consultation with the employee's family doctor. The Council is not prepared to agree to abolition of the present ethical rules nor can it accept the view that continued treatment, even for minor or trivial conditions, should be permitted without consultation with the family doctor. The rules act as a guide to new entrants to the occupational health field, particularly to part-time industrial medical officers who may also be general practitioners in the same area. They also assist the Association in advising individual medical practitioners or in dealing with rare complaints which may be lodged. The document has been referred back to the Association of Industrial Medical Officers.

PUBLIC HEALTH**Salaries in the Public Health Service**

94. All authorities, with the exception of six, have now accepted and implemented the awards of the Industrial Court for public health medical officers. The scale

awarded for assistant medical officers has caused considerable anxiety, and negotiations on a revision of the scale have taken place in Committee "C" of the Medical Whitley Council. Following the breakdown of these negotiations, steps have been taken to report the matter to the Minister of Labour for settlement under the Industrial Courts Act.

The Council has under consideration the conditions of service of medical officers employed by local authorities on a part-time basis, including both those remunerated by means of an annual salary and those receiving sessional payment.

Appeals Machinery

95. The Whitley appeals machinery is functioning satisfactorily apart from the failure to establish a Whitley court of arbitration.

Forty-one local authorities have been involved in appeals and in fifteen cases regional appeals were notified by the Association, acting on behalf of the individual medical officers, after failure to secure a settlement at the local level. With one exception, which is now to be the subject of arbitration, the rulings of the regional appeals committees were in favour of the Association. Only in one case has the local authority refused to accept the agreed ruling, and representations on this matter have been made to the Ministry of Health.

Three appeals against non-implementation of the awards are pending, and in another case the status of the medical officers concerned is being taken up with the appropriate Government department. Advice has been given to certain medical officers of health with regard to the manner in which the employing authority had exercised its discretion in selecting the scale of remuneration.

Representations have been made to the Minister of Health and Local Government in Northern Ireland with a view to the establishment of appropriate appeals machinery for all medical officers employed in the National Health Service in Northern Ireland.

Arbitration Machinery

96. The absence of a Whitley court of arbitration gives rise to difficulties when a regional appeals committee fails to reach an agreed decision or when an employing authority does not accept the decision of a regional appeals committee.

The Council is strongly in favour of the establishment of such a court of arbitration and is fully supporting the Staff Side of the General Whitley Council on this matter. The decision to participate in the Medical Whitley Council and to be associated with the General Whitley Council was taken on the understanding that there would be adequate provision for arbitration. The Council is also pressing for the amendment of the Industrial Disputes Order to enable disputes such as those which have not been settled through the present incomplete Whitley machinery to be reported by the Association to the Minister of Labour under that Order.

"Dual Appointments"

97. The protracted negotiations on matters affecting medical officers employed by both hospital authorities and local authorities have been concluded. Details of the agreement are set out in Ministry of Health Circular 3/53 (issued to local health authorities) and RHB (53) 11. The suggestions contained in Ministry of Health Circular 118/47 and RHB (48) 15 for the employment of such officers on an agreed part-time basis by both authorities has now been withdrawn in view of the practical difficulties which had arisen. Under the new arrangements the medical officer will have a full-time contract with the body which requires the greater use of his services, and will receive a full-time salary appropriate to that employment. Provision has been made to safeguard, as far as possible, the position of existing officers. The agreement provides for the establishment of a joint advisory committee which will give advice to officers and employing authorities in cases of doubt. The Staff Side of the advisory committee is composed of representatives nominated by the Association.

Superannuation

98. The Council has examined the Local Government Superannuation Bill, the main purpose of which is to bring the superannuation benefits payable by local authorities into line with those provided by the National Health Service superannuation scheme. The major changes will be embodied in regulations made by the Minister of Housing and Local Government, and these will receive careful consideration by the Council whilst still in draft form. The Council has welcomed the clause under which provision may be made to enable a contributing employee possessing special qualifications to be allowed to reckon additional service on payment of appropriate contributions.

Definition of "Public Health Service Member"

99. The Council has reviewed the current definition of the expression "Public Health Service Member" in By-law 1 (3) of the Association, and is of the opinion that the definition requires amendment as a result of recent enactments and agreements. The Council's proposal for a new definition is given in Appendix III.

"Closed Shop"

100. The "closed shop" dispute with the Durham County Council has been successfully concluded. The board of arbitration, appointed by the Minister of Labour to determine the difference which had arisen in regard to applications for extended sick pay, made an award in favour of the Joint Emergency Committee of the Professions, which was the party in dispute with the county council.

The requirement of certain authorities that their staff, as a condition of employment, should be members of a trade union or professional organization is now virtually nonexistent so far as the medical profession is concerned. Four authorities are still believed to require such membership in accordance with a resolution passed several years ago, but it is known that no pressure has been brought to bear on the medical officers concerned with a view to enforcing this requirement.

Decentralization by County Councils of Part III Services

101. The Council is in agreement with the policy of the Society of Medical Officers of Health favouring, wherever practicable, decentralization by county councils of Part III services under the National Health Service Act. The Council concurs in the view of the Society that there is much to be gained by fostering local interest in child welfare and other Part III services, all of which are of a personal nature and are most appropriately handled by the authorities in closest touch with the persons who are to benefit from the services provided. It is envisaged that the decentralization to subcommittees of the functions of the county health committee would relate to the day-to-day administration of the services in question, matters such as policy and finance being retained by the Central Committee.

Child Care

102. General approval has been given by the Council to the memorandum of guidance prepared by the Ministry of Health on the subject of the responsibilities of hospital authorities, local health authorities, and executive councils for the care of women who are confined in hospital and for their babies during the lying-in period. This general approval has been given subject to the acceptance by the Ministry of the views of the Council regarding the need for adequate administrative procedure within the hospital to ensure the prompt sending of the requisite information to medical officers of health and general practitioners.

The Council is anxious to secure the widest possible co-operation between school medical officers and general practitioners, and is keeping under review the operation of the agreement reached between the Association and the Society

of Medical Officers of Health in 1950 relating to the principles governing the reference of children to specialists.

The attendance at school medical inspections of ophthalmic opticians to undertake sight-testing is regarded by the Council as not being in the public interest. The Council is of the opinion that children whose visual acuity is below normal should in all cases be referred to the school eye clinic for a full ophthalmic examination.

Detailed consideration has been given to draft regulations which the Ministry of Education proposes to introduce to replace the Handicapped Pupils and School Health Regulations, 1945. The comments of the Council have been submitted to the Ministry.

The Council has received with interest Home Office Circular No. 258/52, which deals, among other matters, with the need for foster homes, the desirability of boarding-out children in the care of local authorities, and consultation with the local authority associations about the organization of regular exchanges of information between areas where boarding-out is difficult and the more fortunately placed areas.

Tuberculosis

103. As a result of an approach by the Council to the Ministers of Housing and Local Government and Health, stressing the need for priority in the rehousing of persons suffering from active pulmonary tuberculosis, it has been ascertained that most local authorities take steps to ensure early rehousing in cases where pulmonary tuberculosis occurs in a family which is overcrowded or has no separate home. In these circumstances the Ministries concerned felt that no useful purpose would be served by issuing a further circular on this subject at the present time.

Discussions are proceeding on the general question of the occupational resettlement of tuberculous persons with particular regard to the effect of the new arrangements contained in Ministry of Health Circular 7/52. The problems of placing positive sputum cases in industry, the risks involved, the necessary safeguards which should be taken, and the extent of the responsibility of the various authorities who would be concerned with the operation of the proposed arrangements are matters of the greatest concern both to the individual patient and to the community. Any agreement reached will be dealt with in the Council's Supplementary Report.

Infectious Diseases

104. It is believed that in certain areas there has been an increase in the number of primary vaccinations of infants, and current trends are being kept under review. The Council adheres to its view regarding the desirability of increased propaganda for infant vaccination.

MEDICAL ETHICS

Indirect Methods of Advertising

105. Numerous requests for advice have been submitted by members in regard to such matters as undesirable publicity arising out of the publication of articles, the delivery of lectures, or the granting of press interviews, and the practical application of the Association's policy of anonymity for medical practitioners in sound broadcasting and television. The Council considers that it is desirable for the Association to publish an up-to-date pronouncement on the subject of indirect methods of advertising, the original statement on this matter having been approved by the Representative Body in 1925. The Council submits in Appendix II a revised version of this statement.

Recommendation: That the revised statement on indirect methods of advertising be approved.

Loan of Hospital Records to Government Departments

106. Following a request made by the Representative Body last year, the Council has examined further the possibility of introducing additional safeguards into the procedure for the loan of case papers by hospitals to the Ministry of

Pensions and the Ministry of National Insurance. The Council has proposed a general statement on the question of the loan of hospital records to Government departments and recommends:

Recommendation: That the following amplified statement on the loan of hospital records to Government departments be approved:

(a) Medical records may be lent to Government departments only when written consent has been given by or on behalf of the patient. (b) The form of consent signed by or on behalf of the patient should include a statement that the disclosure of the information contained in the records will not necessarily be to the advantage of the claimant. (c) Wherever practicable, and particularly where disclosure of information may have an adverse psychological effect upon the patient, the practitioner who compiled the record, or, if he is not available, one nominated by the hospital authority for the purpose, should be consulted on the wisdom of disclosing to the patient all of the confidential information contained therein.

Use of Reminders by Ophthalmic Medical Practitioners

107. The Council has considered the propriety of the issue by ophthalmic medical practitioners of reminder letters to patients, inviting them to attend for re-examination. The Council has expressed the opinion, which has been conveyed to the Ministry of Health, that such reminders should not be issued by ophthalmic medical practitioners or ophthalmic opticians.

Work of the Central Ethical Committee

108. Apart from the investigation of complaints regarding professional conduct, the Central Ethical Committee has given advice on many problems relating to professional secrecy, intraprofessional relationships, and other ethical matters.

PRIVATE PRACTICE

Fees for Police Calls

109. The revised scale of fees for payment to practitioners called in by the police, which was approved by the A.R.M., 1951, has been adopted by many police authorities throughout England and Wales. In some areas, however, other methods of payment exist, many of which are considered to be satisfactory by the profession locally. Where this is not the case, it has been suggested to the Division concerned that suitable representations be made to the police authority, the full support of the central organization being available if any difficulty is met.

Hire Purchase: Doctors' Cars

110. The Council has continued to support applications made to the Board of Trade for licences under the Hire Purchase Control Order whereby the period of repayment of the purchase price of a car may be extended over a period of three years. Until December, 1952, the Board of Trade was prepared to issue licences only to general practitioners, or to those about to enter general practice. Since January, however, the Board has agreed to consider similar applications from doctors in the hospital, consultant, or public health services who are able to show that relief from the standard maximum period of 18 months is necessary on financial grounds and also that there is professional need, comparable with that of the general practitioner, for a car in the interest of service to the public.

Mortuary Accommodation

111. Discussions have taken place with the Ministry of Housing and Local Government with a view to the implementation of the recommendations on mortuary accommodation contained in the 1949 report by Council on the working of the Coroners Acts. Further meetings are being arranged which, it is hoped, will enable the Ministry to prepare a scheme for the improvement of mortuary accommodation generally.

The Unattended Telephone

112. The Council has considered the following Minute 254 of the A.R.M., 1952, together with a memorandum from the General Post Office detailing the various methods of dealing with this problem.

Resolved: That this meeting regrets that no progress has been made in meeting the difficulty of the unattended telephone, and urges the Council to press at the highest level for a satisfactory solution.

It is apparent from the memorandum that the G.P.O. is fully aware of the difficulties of the profession and that it is doing all it can to provide a satisfactory solution, having regard to the acute shortage of equipment and the Government's policy of restricting capital outlay. Facilities for the transfer of telephone calls to other numbers are available to a certain extent, and it is the policy of the Post Office to increase these facilities whenever conditions allow. In the meantime the Post Office is prepared to publish in the telephone directories an alternative number which can be used by a patient when the doctor's telephone is unattended. Telephone message centres and agencies, another means of overcoming the problem, have been established in London and in certain provincial centres.

The Post Office has approved, for use in connexion with its lines, a device manufactured commercially which will record a telephone message received in the absence of the subscriber. The recorded message can be played back to the subscriber either on his return or from some other telephone by using a private code.

Remuneration of Part-time Medical Officers at Civil Airfields

113. Discussions have taken place with the Ministry of Civil Aviation on the remuneration of part-time medical officers of civil airfields, and the Council regards as satisfactory the fees now offered.

Remuneration of Medical Witnesses under the Coroners Acts

114. The A.R.M., 1952, deplored the failure of the present and past Governments to give consideration to the implementation of the recommendations of the Representative Body with regard to the working of the Coroners Acts, and called upon the Secretary of State for Home Affairs to introduce an Amending Bill. The Council has since been informed that while the Secretary of State sympathizes with the suggestion that the existing scale of allowances to medical witnesses at coroners' courts should be improved, he is not yet in a position to say when it will be possible to introduce the amending legislation required. The Council will continue to press for action in this matter.

Appointment of Medical Practitioners as Coroners

115. The A.R.M., 1952, reaffirmed a previous decision that the most suitable persons for appointment to coronerships are registered medical practitioners who possess, in addition, a legal qualification. The Council will take appropriate action whenever a local authority seeks to avoid or exclude the appointment of medical men as coroners.

The A.R.M., 1952, also approved the Report by Council that £2,750 per annum, exclusive of expenses, should be the minimum salary of a coroner employed on a full-time basis. The Council has considered what action should be taken in the event of an advertisement being submitted for publication in the *British Medical Journal* which offers a salary of less than £2,750. Bearing in mind the fact that if such an advertisement is refused the effect may be to restrict, or even exclude, the appointment of a qualified medical practitioner, the Council has decided that an advertisement of this nature, if otherwise acceptable, will be accepted for publication.

Life Assurance Short Forms

116. Following representations made by the Council to the Life Offices Association, the fee for the short form of medical report was increased from 10s. 6d. to 15s. as from November 1, 1952.

A similar increase has been agreed by the Co-operative Wholesale Society in the fee for the examination of prospective employees and for a report on the approved short form.

Furnishing Copy of Medical Report to the Defence

117. A suggestion was made by the Law Society that a copy of a police doctor's report should, on application, be made available to the defence. The chief constables, while in favour of a short report being handed to the defence, considered that this procedure might make it more difficult for the police to obtain the services of doctors. The Council, which was asked for its observations by the Home Office, has replied as follows:

(a) that objection would not be raised to a brief report of the doctor's findings being made available to the defence, but that the Council does not favour the issue of a detailed report;

(b) that the difficulties described by the chief constable might be circumvented by other methods, such as the payment of adequate fees, and saving of the doctor's time when he is required to attend court to give evidence on behalf of the police.

Hearts of Oak Benefit Society

118. The Hearts of Oak Benefit Society has agreed that, where its members are of pensionable age and are certified as permanently incapacitated, medical certificates will be required only at yearly intervals.

Car Priorities

119. Up to the late summer of 1952 the delay in obtaining new cars on priority was still causing great anxiety. A pilot survey showed that there were about 1,000 doctors who had not received their first post-war model and whose orders had been outstanding for more than six months. Hitherto, the trade had been unwilling to repeat the emergency measures taken in 1949, but following a renewed appeal agreed to a second special clearance, which, it was hoped, would be completed by the end of the year.

It had been apparent for some time that second-hand prices were falling and that once the price of used post-war cars (of reasonably low mileage) was equal to or fell below the list price of the equivalent new model, the whole position would change. What was not foreseen was the speed at which the final stages of this gradual decline in prices took place. The result was dramatic; the whole situation changing, as it were, overnight, and the special lists prepared for the manufacturers were largely out of date before they were submitted.

Correspondence on car problems is now negligible compared with the volume at which it was maintained during the past five years. This reached its peak in 1950, when 25,000 letters were received, nearly 80 daily, and 6,000 recommendations for priority issued. The Association's Car Department, which employed a whole-time clerical staff of four, has been virtually closed, but the priority scheme remains in being. The Council will continue to watch the position.

Salaries of Part-time Medical Officers of Prisons and Borstal Institutions in England and Wales

120. Proposals for the remuneration of part-time prison and borstal medical officers in England and Wales, submitted by the Prison Commission, have been approved by Council. In future, these medical officers will be paid a salary based on the number of hours spent at the prison during each week, with additional allowances based on the annual turnover of prisoners and the varying responsibilities of the different posts.

National Union of Mineworkers

121. The attention of Council has been drawn to the "counter" certificates required by some branches of the National Union of Mineworkers in cases where the percent-

age disability sustained by a miner has been assessed by an industrial injuries tribunal. The "counter" certificate is a medical report, usually obtained from the patient's family doctor, on which the Union decides whether it should contest the decision of the tribunal. The Union has declined to enter into a national agreement on the ground that these reports are required only in certain areas. Therefore it will be necessary to make arrangements locally for the payment of an adequate fee. In the opinion of the Council a fee of not less than one guinea should be paid for each report.

Cremation

122. The Secretary of State has decided not to make any substantial alterations in the existing procedure for medical certification for cremation when revised regulations are issued under the Cremation Act, 1902, as amended by the Act of 1952. There will, however, be certain alterations in the form of Certificate C, designed to emphasize its importance, and the Council has approved a draft of the revised certificate.

The Cremation Act, 1952, gives the Secretary of State the power to make regulations prescribing the fees which may be charged for Certificates B and C. It was announced in the House of Commons, however, that the Secretary of State would prefer to settle the matter by agreement with the profession without the exercise of his statutory power.

In reply to an official request the Council has informed the Home Office that, although it would be prepared to recommend that two guineas is a suitable fee for the completion of Certificate B or C, it is not prepared to recommend that the fee should not exceed two guineas.

Bonus Shift Certificates

123. In order to stimulate regular attendance at work the National Coal Board, in agreement with the National Union of Mineworkers, instituted a system of payment whereby a man is paid for six shifts provided he works five. Payment for the bonus shift may also be made if the miner is absent on one or more days owing to injury received in the course of his work. In November, 1952, however, the agreement was extended to allow the payment of proportionate bonus in the case of absence due to certified sickness and absence due to the death or sudden illness of a near relative or another person upon whom the worker relies for the management of his home.

In the case of sickness a medical certificate must be produced either during the absence from work or immediately on return to work, unless evidence is produced to show that the worker concerned was in receipt of National Insurance sickness benefit while absent. This has resulted in a considerable increase in the demand for medical certificates for a period of absence of one or two days, and often the certificate can only be based on the miner's own statements.

The Board has been asked to discuss with the Association the problems arising from the need for these bonus shift certificates.

Allowances at Criminal Courts

124. The Council regards as satisfactory the following scale of allowances to medical witnesses to fact which is now in operation at the Central Criminal Court:

	Minimum		
	£	s.	d.
Hospital doctor paid by salary only	1	11	6 a day
Same if coming from over 10 miles away	2	2	0, " "
Doctor in private practice under 10 miles away	3	3	0, " "
Same over 10 miles away	4	4	0, " "
Doctor in private practice coming from long distance—e.g., Reading	5	0	0, " "

The Council proposes to press for the adoption of this scale by all criminal courts in England and Wales.

The Council is also making further inquiries into the position of the medical practitioner who attends court as a witness to fact and who is then asked for his opinion on the

matters in issue. It is the view of the Council that in such circumstances the practitioner should be granted an allowance as an expert witness. The opinion of Counsel is being sought.

"BRITISH MEDICAL JOURNAL"

125. In the report to Council last year reference was made to the high cost of paper and its effect upon the financial position of the *Journal* and other publications. It was stated that "a fall in the cost of paper would go a long way to ease the anxieties of those responsible for the Association's publications." During the past year the price has fallen and the financial position is correspondingly better than it was. At the end of 1951 the Council appointed a firm of business consultants, Messrs. Harold Whitehead and Partners, to investigate the organization of the *Journal* department, with a view to improving efficiency and effecting economy. The consultants made a thorough investigation of the activities of the staff and of the methods employed, and set forth the results of this in a document presented to the Council early in 1952. Among other things, they recommended the Council to appoint a business manager, a recommendation acted on at the end of the year. A number of economies were brought into force, the major one being the purchase of a cheaper type of paper found to be satisfactory for the *B.M.J.*

One of the economies was brought in at the beginning of 1952, when the Council instructed the Editor to reduce the number of literary pages in 1952 by an average of 4 a week, or 208 a year, as compared with 1951. Unfortunately in 1952 the *Journal* received for publication a record number of original articles, with less space in which to print them than formerly. This meant that many more authors than usual had to be disappointed, and, along with other factors operating caused a regrettable delay in publication of papers and in the return of those rejected. The fact that a growing number of members of the Association are seeking to publish their articles in the *B.M.J.* may be taken as an encouraging sign, and as a recognition of the value of publication in the *Journal*. With the increase in the membership of the B.M.A. pressure on space in all parts of the *Journal* increases, especially in the correspondence columns. The imposed restriction on space leads to delay in publication of letters, and at times makes it difficult to preserve a balanced journal.

The "Any Questions?" section and the "Refresher Course" series continue to be popular with general practitioners. About 10,000 copies of the book containing a first selection of questions and answers have been sold, and about 5,000 copies of the *Refresher Course* book, these sales making a useful contribution to the *Journal's* balance sheet. Between 30 and 40 questions are received each week, most of these being answered from the stock-pot of answers to previous questions.

An attempt is being made to produce a more informative *Supplement*, though here again limitation of space is a drawback.

The quarterly journals as a group continue to show satisfactory progress in circulation, and the cost to the Association of these was much less in 1952 than in 1951. The editors of these journals have co-operated to the full in easing the financial situation. But most of them are sharing the same experience as the *B.M.J.* in receiving far more papers than they can find space for. It seems clear that the quantity of work being done by British doctors is increasing, and that this is being accompanied by no falling off in quality. The reputation of the special journals stands high both in this country and abroad, and their publication enhances the prestige both of British medicine and of the B.M.A.

Abstracts of World Surgery ceased publication last June, and *Abstracts of World Medicine* now contains abstracts of surgical as well as of medical literature. Its publication is a service to medicine and represents another attempt to

fulfil the first object of association of the B.M.A.—"to promote the medical and allied sciences." An abstracting service is all the more needed at a time when such rapid advances are being made in the science and so in the practice of medicine, and in financing such a service the B.M.A. shows its awareness of this. The abstracting department receives some 1,500 periodicals a year, and they are eventually made available to members in the library of the B.M.A.

"FAMILY DOCTOR"

126. It should be recalled that *Family Doctor* was launched in April, 1951. By the end of the year, ten monthly issues had appeared, and there had been considerable financial and other difficulties. In order to grapple with these problems the Council appointed a special *Family Doctor* Committee with wide powers; separated *Family Doctor* from the other B.M.A. publications; and accepted and approved a number of staffing changes and a complete plan for reorganization.

At the Annual Representative Meeting in Dublin, 1952, the Chairman of the *Family Doctor* Committee gave an estimate of its likely loss on the year's working, which he hoped would be not more than £6,500. The Committee has been able to keep to this. The trading loss on the eleven issues for which the Committee was responsible (the February issue was in the process of publication before the Committee took over, and appeared on January 28, 1952) is below this figure, and is of the order of £6,200.

For the year 1953 it is the Committee's aim to conduct the affairs of *Family Doctor* at no cost to the general funds of the Association. Already it can be reported that this aim has been achieved on the first three issues of this year, on each of which there is a small surplus. During the whole of the year *Family Doctor* will have a minimum circulation of 100,000 copies per issue, and an advertising revenue which it is estimated will be half as much again as that achieved in 1952. Targets have been set for each month, and money spent on development and promotion will come out of *Family Doctor's* earnings. The standing of *Family Doctor* has been consolidated in the course of the year, and its financial position has been greatly improved.

Obviously the financing of *Family Doctor*, which is being sold from the bookstalls in a highly competitive market, has remained the consideration governing all policies and proposals for 1953. At the end of the year *Family Doctor* should "break even," or perhaps even show a small surplus.

FINANCE

(As the auditing of the Association's accounts has not yet been completed, the Annual Financial Statement will be published with the Council's Supplementary Report.)

127. Throughout the past year the financial position of the Association has been under constant review by the Council. The aim has been to effect an early redemption of the indebtedness which resulted from the losses of the previous year, and to introduce methods which will ensure a more efficient financial control.

Income

128. The income in 1952 from subscriptions, rents, and investments amounted to £239,000, which exceeded the budget figure. In addition, the Association received £20,000, largely in the form of income-tax recoveries in respect of the previous year's losses. The payment by H.M. Government in respect of expenses of the Central and Area Recruitment Committees was increased from £7,000 to £13,000 in accordance with the arrangement that the Association recovers 75% of the total costs incurred in this work.

Expenditure

129. When the budget for 1952 was prepared it was anticipated that the expenditure for the year, excluding the publications, would reach a level of £240,000, and that there would be a small surplus of £3,000 on the general Association account to offset the anticipated deficit of £30,000 on the publications account. That the decisions of Council in regard to economies were effective to a marked degree is shown by the accounts for the past year; for not only was this deficit avoided, but a surplus on both the publications account and the general account, amounting in all to £18,000, was realized. This credit balance, together with the surplus which has accrued from the tax recoveries, has reduced the Association's indebtedness by over £30,000. Against this indebtedness the Association still holds investments in Government and other first-class securities, the market value of which at December 31, 1952, was £133,000.

The economy measures introduced by the Council during the year have had a marked effect on many of the items of Association expenditure. In the case of central meetings the net cost fell from £22,400 to £17,300. Most of the committees were asked at the beginning of the new session to reduce their meetings to two a year unless circumstances warranted additional meetings. Documents were stencilled wherever possible instead of being produced in the more expensive printed form. The stencilling of the Council documents resulted in a saving of £1,300 in the 12 months. The Council gratefully acknowledges the help given by the trustees of the National Insurance Defence Trust, who considerably increased their contribution towards the expenses of the General Medical Services Committee.

The cost of operating the bank overdraft was less than had been anticipated, as the overdraft at its highest figure did not exceed £156,000 in 1952. The Association has been able to make arrangements with the bank for 1953 on the same favourable terms as those for last year's accommodation.

Expenditure on the Empire Medical Advisory Bureau and the International Medical Visitors' Bureau was well inside the amount set aside by the Council for this purpose. Although the anticipated cost of the Bureaux for 1953 is slightly higher than in 1952 the committee of management has accepted a budget which provides for a saving of £500 on the figure originally earmarked.

Economy has been exercised in regard to the premises, and there has been little capital expenditure on alterations or on repairs and redecorations. It will, however, be necessary to meet increased expenditure during 1953 in order to maintain the buildings in a good state of repair, and provision for this has been made in the budget.

The amount paid as capitation grants to Branches and Divisions is considerably less than was provided in the 1952 estimates. By ensuring that all unused balances in the hands of Branches and Divisions were withdrawn it was possible to effect a substantial scaling down of the normal grants, and the Council acknowledges the co-operation given by Branch officers in making this economy possible.

In the case of the library expenses the Council's decision to ask borrowers of library books to pay the postage incurred reduced the cost of this service by over £600. On printings, postage, and stationery there has been an overall reduction in cost of nearly £5,000. This substantial reduction resulted partly from the receipt of certain non-recurring credits and from a fall in the price of paper, and partly from the steps taken in all departments of the Association to effect economies wherever possible.

Publications Account

130. From an estimate prepared in the early months of 1952 the Council had been led to anticipate an adverse balance of £20,000 on the accounts of the *British Medical Journal*, special journals, and abstracts. Two main factors

have contributed to the highly satisfactory position disclosed by the accounts for the past year. First, the adoption of recommendations made by the firm of management consultants retained to investigate the Association's organization and methods resulted in reductions in the cost of paper, wrappers, and reprints. During the period in which these economies operated in 1952 the saving effected was approximately £6,850, or £11,500 when calculated at an annual rate. Secondly, paper prices commenced to fall in May, 1952, and this trend has continued. The result of these and other factors has been that the cost of production of the *British Medical Journal* fell by over £20,000.

"Family Doctor"

131. In the early months of 1952 the Council allowed for a maximum deficit of £10,000 on the working of *Family Doctor*. The results of the year's trading are well within this figure. The present financial position of *Family Doctor* is regarded as satisfactory. On each of the first few issues published in this year (1953) a small surplus is being shown. The aim for the year is that *Family Doctor* will "break even," and will involve no charge upon the funds of the Association.

Trust Funds

132. Although the market value of investments held by the Trust Funds was still relatively low at the close of 1952, they are in a sound position, and in the case of the Prize Funds the income has been sufficient to meet the cost of the normal awards. The Council is pleased to report an increase in the support given to the Medical Charities.

Revenue Budget for Twelve Months ending December 31, 1953

133. A summary of the Budget for the year to December 31, 1953, is set out below. It makes provision for all normal expenditure and for increases which will be met during the year as a result of recent decisions of Council. It is prepared in a form recommended by the firm of management consultants retained by the Council.

Hitherto the budget has shown the total expenditure anticipated under headings such as, for example, salaries and wages, printings and stationery, etc. In future the budget will be set out so as to show the estimated cost during the coming year of each major service or department for which a Committee is responsible. These committees will prepare their internal budgets and submit them for incorporation in the master budget.

The Council has appointed a small Financial Advisory Committee, which will not only scrutinize the annual budget before its submission to the Finance Committee and the Council but will also hold regular monthly meetings to keep a constant watch on expenditure. Any major deviation from the budgeted expenditure of any department will come promptly to the notice of this committee, which will consider how increased costs, if necessary in one department, may be balanced by reduced costs in another. The Council is confident that this new system will provide more effective co-ordination and control of the Association's finances than have existed in the past. The members of the Financial Advisory Committee are the Chairman of Council, the Chairman of the Representative Body, the Treasurer, the Deputy Chairman of the Representative Body, and Dr. H. Guy Dain, and the terms of reference of the Committee are "to review monthly budget and other statements showing the financial position of the Association and to co-ordinate for the Treasurer information and advice on all the Association's financial affairs."

The Committee has no authority to make executive decisions, but its close and constant scrutiny of income and expenditure in all departments will make it possible for timely warning to be given to the Finance Committee of the need for executive decisions.

Summary of Budget for 1953

INCOME		£	£
Membership subscriptions	.. .. .	244,485*	
Rents	.. .. .	33,970	
Investments and sundries	.. .. .	19,819	
Total income			298,274
* The additional revenue from subscriptions as a result of the increased rates which operated from January 1, 1953, is expected to be approximately £49,500, and the greater part of this sum has been earmarked for loan redemption.			
EXPENDITURE		£	£
Secretary's budget	.. .. .	81,106	110,675
Medical Practices Advisory Bureau	.. .. .	6,994	10,594
Regional offices	.. .. .	—	9,840
Central and representative meetings	.. .. .	—	18,600
Scottish offices	.. .. .	—	14,558
Empire Medical Advisory Bureau and International Medical Visitors, Bureau	.. .. .	—	6,074
Organization Committee (grants, etc.)	.. .. .	—	16,895
Science Committee (including library)	.. .. .	5,633	6,483
Public relations (net cost)	.. .. .	4,086	1,551
Film Committee	.. .. .	701	251
Financial charges (including building)	.. .. .	—	41,668
International Relations and Overseas Committees	.. .. .	—	2,220
General services (including catering)	.. .. .	—	6,150
Total secretarial expenses			255,979
Secretarial budget—surplus	.. .. .		42,295
British Medical Journal, medical abstracts, and special journals—surplus	.. .. .		11,594
Family Doctor—estimated to "break even"	.. .. .		—
Total estimated surplus			53,889
Less: Amount appropriated for loan redemption	.. .. .		35,000
Reserve against contingencies	.. .. .		15,000
			50,000
Estimated net surplus to be transferred to Accumulated Fund			£3,889

Membership Subscription

134. The Representative Body authorized the Council "to investigate the position of whole-time salaried members of the B.M.A. in the lower-income group" and, at its discretion, to introduce lower subscription rates for these members.

After reviewing the position of these members, the Council finally decided that a reduced subscription of four guineas for those in receipt of a whole-time salary of not more than £1,500 per annum would be equitable. The new rate of subscription has been applied as from January 1, 1953.

It is considered that the salary limit used to define "lower-income group" should be capable of variation by the Council in the light of experience, and the proposed addition to the by-law makes provision for this.

The recommendation of the Council for amendment of By-law 16(1)B is contained in Appendix III.

Subscription Payable by Associates

135. The annual subscription of £1 5s. paid by associates of overseas Branches has been varied to £1 15s., in order to relate it to the increase in subscription paid by overseas members as from January 1, 1953. No increase has been made in the subscription of £4 4s. paid by associates of home Branches. These latter are a small and diminishing group, comprised mainly of mid-European practitioners engaged in prolonged postgraduate courses.

Income-tax Rebate on Annual Subscription of Salaried Practitioners

136. When asking the Council to review the subscription of whole-time salaried members in the lower-income group, the Representative Body was influenced to some extent by the anomaly which exists in the charging for income-tax purposes of subscriptions to professional bodies.

The A.R.M., 1952, asked that pressure be brought to bear on the Treasury to allow rebate of tax on the subscriptions of practitioners paid by annual salary. The Council has considered this very carefully, but has decided that it would

be impolitic to take the action suggested. The question is closely linked with the "closed shop" issue, as it would be necessary to show that membership of the Association was a condition of employment.

BUILDING

137. Although capital expenditure has been reduced to a minimum, the Council has continued its efforts to improve the amenities at B.M.A. House. In early January, the new Hastings Room was opened to members and their guests. The furnishing of this room has been carried out in a scheme which provides adequate and comfortable seating, and visitors to Tavistock Square now have available a lounge which is in keeping with the dignity and character of the Association's headquarters. The portrait of Sir Charles Hastings, the Founder of the Association, which was painted by a member of his family from the original by Faulkner, and that of Dr. Guy Dain, by David Jagger, are hung in the Hastings Room.

A licence has now been granted by the Ministry of Works for the repaving of the Court of Honour and fountain, and it is hoped that this work will be completed before the summer recess. The licensing officer has not given his approval to the completion of the memorial itself, but it is hoped that by the time the sculptor is ready to prepare the symbolic figures which form a part of the memorial the necessary licence will have been secured. It is interesting to note that Mr. James Woodford, R.A., who was selected by the Council to execute the war memorial, has been commissioned to design and execute the "Queen's Beasts," the heraldic animals which will ornament the Coronation pavilion in Westminster Abbey.

The Council has also directed its attention to the probable future needs of the various departments and services, and in particular the library, by accepting the opportunity which was presented of securing a lease of land and property in Burton Street at the rear of B.M.A. House. Agreement has now been reached with the Bedford Estate Office on the question of ground rent, and negotiations are proceeding in regard to the terms of a lease which will secure the site for the Association until the year 2125, when the existing lease terminates. By the acquisition of this new site, the Association in its own time will be able to extend the building by some 5,000-6,000 square feet, and also improve the facilities available to members for garaging and servicing their cars.

The Association continues to enjoy a rental income of approximately £34,000 from the accommodation occupied by the medical and professional organizations in Tavistock House North and South. All the available space is let on leases with a seven-year term, with the exception of two which are for a longer period.

SCIENCE

Association Prizes

Sir Charles Hastings and Charles Oliver Hawthorne Clinical Prizes, 1953

138. The Sir Charles Hastings Clinical Prize, established to stimulate observation, research, and record in general practice, has been awarded for 1953 to M. I. Cookson, of Gloucester, for his essay on "A Survey and a Commentary on Certain Aspects of Obstetrics of Importance to the General-practitioner Obstetrician." The award consists of a certificate and a cheque for 50 guineas.

The Charles Oliver Hawthorne Clinical Prize, awarded to the writer of the essay ranking second best in the Sir Charles Hastings Clinical Prize Competition, has been awarded for 1953 to G. A. Ballance, of Oxford, for his essay on "An Epidemic of Infective Hepatitis in an Oxford College, 1950." The award consists of a certificate and a cheque for 40 guineas.

Katherine Bishop Harman Prize

139. The Katherine Bishop Harman Prize, established for the encouragement of study and research connected with the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing, has been awarded for 1953 to T. G. E. White, of Croydon, for his essay on "Deflexion Attitudes of the Foetus *in utero*, with special reference to the Aetiology and Diagnosis of Face and Brow Presentation." This prize consists of a certificate and a cheque for £75.

Occupational Health Prize

140. The Occupational Health Prize, established for the purpose of encouraging interest and research in the field of occupational health, has been awarded for 1953 to R. McL. Archibald, of Northwich, Cheshire, for his essay on "Perforation of the Nasal Septum due to Soda Ash." The award consists of a certificate and a cheque for £50.

Prizes for Medical Students

141. The Students' Prize Essay Competition has again been held. The subject set for the 1953 competition was "A Good General Education is a Necessary Preliminary to a Medical Career." A list of the prizewinners will be published in the Supplementary Annual Report of Council.

Prizes for Nurses

142. A number of entries have been received in connexion with the 1953 Nurses' Prize Essay Competition, which has again been organized in four classes. The subjects set were:

- Student Nurses*.—"Is Nursing a Vocation?"
- State Registered Nurses working in a hospital*.—"The Role of the Married Nurse in the Hospital Service."
- State Registered Nurses not working in a hospital, i.e., District Nurses, Private Nurses, etc.*.—"The Psychological Approach to the Patient."
- State-enrolled Assistant Nurses*.—"The Nursing Care of the Paralytic Patient."

A list of the prizewinners will be published in the Supplementary Annual Report of Council.

B.M.A. Lectures

143. At the invitation of the Council, experts in various fields of medicine have continued to give "B.M.A. Lectures" to Branches and Divisions. The number of lectures arranged during the year was 73. The Council wishes to record its appreciation of the services of the lecturers.

The Library

144. The number of individual members using the Library during the past year has increased, although the number of books borrowed is slightly less than in 1951. Over 200 books and journals have been presented to the Library by members of the Association. In order to meet the heavy demand for periodicals from all parts of the British Isles, a number of journals have been added to the Library to make up previously incomplete sets.

Since November, 1951, the cost of postage has been borne by individual borrowers, and this has resulted in a saving to the Association of approximately £900.

The Council has decided not to renew its membership of the National Central Library Inter-Library Loan Scheme. The demands made upon the Association by this Library have been steadily increasing, whereas the Association borrows only a very limited number of books from this source. By virtue of the Association's mutual loan arrangements established with all the main medical and scientific libraries, the loss of the facilities of the National Central Library can be replaced.

Research Scholarships

145. The following Research Scholarships, ténable for 12 months from October 1, 1952, have been awarded:

Ernest Hart Memorial Scholarship (£250).—F. Prime, B.A. (Hon.), M.B., B.Ch.—for research on the therapy of CO₂ narcosis in emphysema.

Walter Dixon Memorial Scholarship (£250).—J. D. K. North, M.B., Ch.B.(N.Z.)—for research into the experimental production of polyneuropathy in the rat.

Ordinary Research Scholarships (£200 each).—(i) I. S. Hodgson-Jones, M.A., M.B., M.R.C.P. (renewal)—for research into the physiological and pathological variations of sebaceous activity. (ii) J. G. P. Hutchison, M.B., B.S.—for research on the nasal carriage of staphylococci. (iii) A. F. Ross, M.B., Ch.B., B.Sc.—for research into the cavernous tissue associated with the posterior parts of the superior sagittal sinus. (iv) P. Macdonald Tow, Ph.D., M.B., B.S.—for research into a severe psychoneurosis.

The Council wishes to thank those who visited and reported on the work of the 1951-2 scholars.

Children's Sand-pits

146. The National Playing Fields Association sought the advice of the Association on the possible danger to the health of the community, and, in particular, to children, arising from the provision of sand-pits. Information was obtained from a number of experts on the subject, including detailed recommendations for the construction and maintenance of sand-pits in operation at day nurseries with sand-pits in the London County Council area, and these have been conveyed to the National Playing Fields Association.

PUBLIC RELATIONS

147. The Public Relations Committee, reconstituted in accordance with the decision of last year's Annual Representative Meeting, now includes representatives of the Central Consultants and Specialists, Public Health, and Journal Committees. At its first meeting it decided to co-opt to its membership someone representing industrial medicine, and the Occupational Health Committee was asked to nominate a representative.

Hitherto the expenses of the Association's Public Relations activity have been borne in equal parts by the Council of the Association and by the National Insurance Defence Trust. In view of its altered constitution, the Committee has suggested that the Central Consultants and Specialists and Public Health Committees might consider making a contribution towards the cost. The Central Consultants and Specialists Committee has agreed to contribute £500 for the current year. The Trustees of the Public Health Services Defence Trust have decided that, in view of the present calls on their Trust Fund, they are unable to contribute at the present time, but will consider the matter again during next session.

Information Service

148. The Public Relations Department has continued and extended its many-sided activities for the profession. The close and friendly relations built up between the Department and the Press have been further strengthened. The Information Service in particular is now widely used not only by the Press but also by many public bodies. During the year there has been an increase of nearly 40% in the number of telephone inquiries—many of them involving considerable research—dealt with by the service. The number of personal visitors, chiefly journalists, has also shown a steady increase. For their willing co-operation the Department is much indebted to the B.M.A. Librarian and his staff.

Central Register of Medical Conferences

149. The Department has steadily built up a Register of Conferences in the medical and allied fields, which is now recognized to be the most comprehensive calendar of its kind maintained anywhere in the country. A selected list

of conferences—national and international—is regularly issued by the Department to the Press and other interested organizations. This is a service which is widely appreciated and has helped to strengthen the good will felt for the Association. During the year certain medical societies pressed the Department to extend this service within the medical field itself, and to set up a Central Register of Conference Dates which would prevent the clashing of conference dates, which in the past has frequently occurred. With the approval of the Council, such a Central Register has now been established. Every participating society has agreed to keep the Register informed of forthcoming conferences and to consult with it before finally fixing a date. The establishment of the Register has been warmly welcomed.

ARMED FORCES**Service Pay**

150. At the request of the Ministry of Defence the Council has submitted a memorandum to a Working Party set up to consider all aspects of the Service medical officer's career, including remuneration. This memorandum covered a number of factors likely to affect recruitment of medical officers to the Armed Forces, including clinical opportunities, postgraduate study, employment in civil or Service life after retirement, widows' pensions, and the prestige of the medical branches of the Armed Forces. Its main emphasis, however, was on remuneration, particularly the necessity for Service pay of medical officers to be comparable with that of civilian practitioners. The views of the Ministry of Defence are now awaited.

Entertainment Allowances

151. Each Service has its own criteria governing the payment of entertainment allowances, but in regard to all three Services the Council considered that the entitlement to payment of entertainment allowances required investigation, and representations were accordingly made to the Ministry of Defence. Individual medical officers are permitted to submit complaints through Service channels, but the Council feels that in many instances they are reluctant to take such action.

Rank and Pay

152. It was reported to the Council that isolated cases have occurred where Service medical officers had been forced to seek legal aid before attaining the rank and pay attached to the appointment they held. Although these cases had been settled successfully it was decided to draw the attention of the Service department to the need for safeguarding the rights of medical officers as laid down in the regulations. Assurances that such action is taken have been received.

Forces Family Pensions

153. The recent increases granted in ordinary pensions payable to widows and children of Service personnel, and the amendment of the conditions attached to the payment of these pensions, have been noted with interest. The inadequacy of widows' pensions was a point dealt with in the Association's Memorandum to the Working Party of the Ministry of Defence.

Retired Service Specialists

154. In order to assist specialists on retirement from the Services to obtain civilian appointments, it has been suggested that Service medical officers should on retirement inform the Medical Practices Advisory Bureau of their availability for civilian appointments, and that regional hospital boards and hospital management committees should be encouraged to communicate with the Bureau when they are in need of a specialist locum. It is considered that this interchange of information may result in more Service medical officers securing adequate civilian appointments.

ORGANIZATION**Association Membership**

155. The Council submits the following report upon the membership of the Association for 1952:

New members	4,050	
Resignations withdrawn	104	4,160
Reinstated	6	
Removed in arrears	2,105	
Less paid arrears	1,193	912
Deaths		597
Resignations		809
Erased from Register		1
		2,319
		Increase 1,841
Membership, December 31, 1951	66,064	
Membership, December 31, 1952	67,905	

The membership of the Association in the United Kingdom represents 74% of the total profession and 84% of the working profession. The membership on March 17, 1953, was 65,823.

Although it is not possible at this stage to make an accurate forecast, the indications are that, notwithstanding the increase in the Association subscription as from January 1, 1953, the membership position will remain satisfactory. An analysis of resignations received up to January 31, 1953, shows that a great many of these are due to lack of knowledge of the Association's activities. In order to meet the criticisms disclosed, arrangements are being made for greater publicity in the *B.M.J. Supplement* for Headquarters activities, with particular reference to the meetings of sub-committees which are not ordinarily reported. Articles have also appeared in the *Supplement* on the constitution of the Association and the work of the Council and its Committees.

The Council is pleased to report that in a large number of Divisions steps have been taken to implement Minute 33 of the A.R.M., 1952, which expressed the view that the Danckwerts award provided an ideal opportunity for a concerted drive for new members.

Honorary Secretaries

156. The Council, on behalf of the general body of members of the Association, desires to express its grateful thanks to Honorary Secretaries of the Divisions and Branches, without whose loyal co-operation the Association could not function as an efficient organization.

Annual Conference of Secretaries

157. The Secretaries Conference at its 1952 meeting in Dublin discussed the place and duration of future annual Conferences, and the majority view was in favour of a whole-day session during the Annual Meeting of the Association. Unfortunately, the programme of the Annual Meeting at Cardiff will not permit of this without conflict with other important functions. The Conference will therefore be held at B.M.A. House, London, on Wednesday, May 20, 1953, commencing at 10.45 a.m. The Conference will be followed by a dinner in the evening, to which ladies are invited.

Financial Year of Divisions and Branches

158. Under the system of budgetary control approved by the Council, each of the "spending committees" of the Association has the duty, at the beginning of the session in the autumn, of drawing up its annual budget for the following calendar year. The expenditure on capitation grants to Branches forms one of the main items of the Organization Committee's budget. The new procedure necessitates a change in the financial year of the Divisions and Branches, which at present ends on December 31. To ensure a correct estimate for expenditure on capitation grants, the Branch and Division financial year in future must be related to the

Association session instead of the calendar year. Only in this way will it be possible to determine the grants to Branches in time for inclusion in the budget.

The Recommendation of the Council for the necessary amendment of By-law 36 is contained in Appendix III.

Financial Position of Home Divisions and Branches

159. In its Supplementary Annual Report for 1952 the Council reported that considerable economy had been effected in the allocation of grants to home Branches for 1952, and that it was hoped by this means to utilize substantial balances which had accumulated in the funds of some home Divisions and Branches. It was also hoped that it might be possible for a number of Branches to return to central funds a portion of the balances in their local accounts. The Council is pleased to report that the Branches concerned have responded generously to its appeal, with the result that approximately 80% of the amount asked for has been refunded.

Areas of Branches and Divisions

160. Approval has been given, after due notice in the *British Medical Journal Supplement*, to the formation of a new Midlands Branch in Southern Rhodesia. Other changes in home Division areas are under consideration.

Resolutions of Representative Body requiring Two Months' Notice

161. The Council has considered Minute 316 of the A.R.M., 1952, namely:

316. **Resolved:** That the Representative Body instructs the Council to examine Article 39(2) with a view to recommending to the 1953 Annual Representative Meeting amendment of the Article to provide that the words "two months" and "one month" shall be changed to "six weeks" and "three weeks" respectively.

Article 39 (2) provides that "no resolution of the Representative Body to make any addition to or any amendment, alteration, or repeal of any Regulation or By-law, or to make any new Regulation or By-law, shall have any operation unless a proposal to make the same shall have been previously approved and submitted to the Representative Body, either by the Council, or by a Branch, or by a Division, and shall have been published in the *Journal* not less than two months before the Annual Representative Meeting, or one month before the Special Representative Meeting at which such resolution is passed."

By-law 47 provides that any resolution submitted by a Division or Branch to the Representative Body which "proposes material alteration of, or addition to, the constitution or policy of the Association" shall receive two months' notice in the *Journal*.

Article 39 came into operation in 1910, when new Articles and By-laws of the Association were adopted. Conditions have changed considerably in the 40 years which have since elapsed, and little time is allowed under present arrangements for Divisions to consider the Annual Report of Council and to submit any Motions requiring notice under the Article or the By-law. The Council accordingly supports the proposal made in Minute 316 of the A.R.M., and its recommendation for amendment of the Article and the consequential amendment of By-law 47 is contained in Appendix III.

Overseas Representation in the Representative Body

162. At present each Division of the Association outside Great Britain and Northern Ireland is an independent constituency in the Representative Body and is entitled to elect one Representative. With few exceptions, the essential unit of organization overseas, in contrast to the United Kingdom, is the Branch and not the Division. The present system of representation, therefore, gives rise to anomalies in that a Branch composed of several Divisions may have a corresponding number of Representatives—for example, the

New Zealand Branch (16)—while another large and important Branch—for example, New South Wales (1)—may send only one Representative to the Annual Representative Meeting. In order to remedy this situation, it is proposed, in the case of the overseas Branches, that the Branch should form the constituency, and that the representation should be on the numerical basis which applies to the United Kingdom constituencies, subject to a maximum of three Representatives for any one Branch. The overseas Branches have been consulted and those who have replied, including the Branch most affected by the change—namely, New Zealand—unanimously approve the proposal. This proposal would not apply to the group of Branches in the Republic of Ireland, which at present forms one constituency.

Provision for the appointment of Deputy Representatives by overseas Branches is not appropriate, as their invariable practice is to appoint as Representative a member who proposes to attend the Annual Meeting of the Association.

The Council recommends:

Recommendation: That the representation of the overseas Branches in the Representative Body be modified to provide:

(a) That every Branch not in Great Britain or Northern Ireland shall form a constituency, except that the Branches in the Republic of Ireland shall together form one constituency.

(b) That each constituency thus formed shall be entitled to elect one Representative, together with an additional Representative for each complete number of 100 members in excess of 50 members, subject to a maximum of three Representatives.

(c) That provision be not made for the appointment of Deputy Representatives.

The amendments to the By-laws entailed by this recommendation are contained in Appendix III.

Amendments of Articles and By-laws

163. Proposals are made in various paragraphs of this report which necessitate alteration of the Articles and By-laws. Amendments of the Schedule to the By-laws in respect of certain Standing Committees are also necessary to give effect to decisions of the Council relating to the constitution of these Committees. The object of these amendments of the Schedule is to improve liaison with other Committees of the Council or to provide for the filling of vacancies for which no provision is at present made.

The Council recommends:

Recommendation: That the Articles and By-laws of the Association be altered in the manner shown in Appendix III and that the Council be instructed to submit the amendment of Article 39 (2) to an Extraordinary General Meeting of the Association.

Autonomous Bodies

164. Under Minute 27 of the A.R.M., 1950, the autonomous powers of the General Medical Services and Central Consultants and Specialists Committees, "in so far as they derive from the Representative Body," require to be specifically renewed by successive Annual Representative Meetings.

The Council recommends:

Recommendation: That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1953-4.

That the Representative Body looks to these Committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not to delay the work of the Association.

Resolutions on Policy

165. The A.R.M., 1952, passed the following resolution:

267.—**Resolved:** That this meeting calls upon Council to state whether in its opinion all resolutions on policy passed by the Representative Body before July 5, 1948, and never rescinded still represent the policy of the Association.

In consultation with the Solicitor, a scrutiny has been made of the resolutions referred to in the above minute, together with the resolutions of the S.R.M. of May, 1948, which relate to the acceptance of service under the National Health Service.

In the view of the Council the decision as to those resolutions of the Representative Body adopted before July 5, 1948, which still represent the policy of the Association is governed by Minute 28 of the S.R.M. of May, 1948—namely:

That, despite the insufficiency of the safeguards to the profession's freedoms and the misgivings of a substantial section of the profession, the Representative Body, anxious as ever that in the public interest a comprehensive health service should be made available to the community, is prepared to advise the profession to co-operate in the new service on the understanding that the Minister will continue negotiations on outstanding matters, including terms and conditions of service for consultants and specialists, general practitioners, public health medical officers, and others.

This minute provides for the profession joining the National Health Service on the understanding that the Minister will continue negotiations on outstanding matters. The resolutions in question fall into four main groups:

(a) Those which express policy in general terms without reference to particular sections of the National Health Service Acts. These resolutions clearly remain operative.

(b) Those which express opinions or policy contrary to definite provisions of the Act (or of regulations made at a later date in agreement with the profession) and which were not "outstanding" at the time of acceptance of service. This group (which includes the various resolutions on goodwill and contracting out) must be regarded as covered by Minute 28 of the S.R.M. of 1948, and therefore as no longer operative.

(c) Those relating to matters of policy under discussion with the Government at the time of acceptance of service—e.g., terms and conditions of service—or matters which could only be assessed subsequently in the light of experience. This group remain operative.

(d) Resolutions which have been superseded by subsequent resolutions of the Representative Body but the underlying principle of which still remains—e.g., those relating to arbitration, the power of the Minister in respect of changes in conditions of service, and appointment in agreement with the profession of medical representatives on administrative bodies.

Medical Act, 1950, in its Relation to Provisionally Registered Practitioners

166. Allowances to married ex-Service men holding hospital appointments during the pre-registration year.—Sections 1 and 2 of the Medical Act, 1950, make compulsory a period of employment in a resident medical capacity in an approved hospital or institution before full registration in the Medical Register can be obtained. Regulations made under the Act specify this employment as a period of 12 months as a house-officer. After consultation with the Association and other professional organizations, a memorandum has been issued by the Ministry of Health to hospital authorities explaining the implications of these provisions, and announcing the "appointed day"—namely, January 1, 1953. The Council raised no objection to the date fixed for the appointed day. It recommended to the Ministry of Health, however, that special provision should be made to relieve the hardships which would be experienced by married ex-Service men, and the Ministry replied that such provision was being made for those formerly in receipt of grants from the Ministry of Education under the Further Education and Training Scheme. Representations have recently been made by the British Medical Students Association to the effect that the financial assistance which a provisionally registered practitioner may so receive during the pre-registration year may leave him with an income considerably less than he received as a student in receipt of F.E.T.S. or other grant.

The Council was satisfied as to the justice of the case presented by the B.M.S.A., and considered that immediate action was called for if the severe hardship which a number

of ex-Service provisionally registered practitioners are suffering was to be relieved. Accordingly, negotiations have been proceeding with the Ministry of Health, and substantial improvement has been made in the original proposals. The provement has been accepted by the Council subject to further discussion on a number of administrative matters and without prejudice to the right of the Council to re-examine the position in the light of experience.

Right of appeal by the provisionally registered practitioner.—Full registration in the Medical Register is dependent upon a certificate of sufficient and satisfactory service during the pre-registration year. This certificate is furnished by the licensing body after receipt of reports from the hospital authorities that the practitioner has completed such service. As the Act contains no specific appeal provision, steps have been taken to clarify the position. The Council is advised that no such provision is necessary. The licensing body is not bound by the report from the hospital authority, and it would be open to the house-officer, where a certificate of satisfactory service was not forthcoming from the hospital authority, to make representations to the licensing body; similarly, the licensing body could hear the practitioner and arrive, on the evidence before it, at a decision regarding the nature of the certificate provided and its attitude thereto.

Employment in general practice during period of provisional registration.—The Council has considered the following Minute 24 of the A.R.M., 1952:

Resolved: That the following Motion be referred to the Council:

That in view of the fact that the majority of newly qualified practitioners will be entering general practice and will be rendering general medical services under the N.H.S. Acts, this Representative Body strongly recommends that it would be in the interests of both the public and the profession that a period of employment of six months in general practice shall be considered as one of the required appointments needed to qualify for full registration.

The Council does not consider that the proposal made in the motion is in keeping with the spirit or purpose of the Act, which is to secure a period of post-qualification experience in hospitals under supervision. The pre-registration year is essentially part of the training of the young practitioner, and in hospital the close supervision of senior members of the staff can be ensured. The organization and administration of present-day general practice do not permit of this close supervision, and difficulties might arise with regard to the signing of death certificates, etc.

It is not clear whether the motion contemplates that the six months' period in general practice would be in addition to or in substitution for part of the 12 months' hospital experience. If the former, the Council feels that it would be undesirable to add to the burden of the practitioner during the pre-registration period. Moreover, the trainee-practitioner scheme would appear to meet the purpose of the motion.

Recognition of Provisionally Registered Appointments for Higher Qualifications

167. Inquiries made of the licensing bodies indicate that the majority of these bodies are prepared to recognize for the purpose of their higher degrees and diplomas pre-registration hospital appointments under the Medical Act, 1950, which conform to their requirements.

Group of Medical Hypnotists

168. The Council has received, over the signature of 15 members engaged in the practice of hypnotherapy, a petition for the formation of a group of medical hypnotists, the group to include medical practitioners who use hypnosis for medical purposes.

Opportunity is already provided to members making use of this form of treatment in their medical practices to express

their opinions through the medium of existing groups. The petition for the formation of a special group has therefore been rejected.

SCOTLAND

Chairman and Deputy Chairman of Scottish Committee

169. Dr. J. G. M. Hamilton and Dr. W. M. Knox were appointed Chairman and Deputy Chairman respectively of the Scottish Committee for the session 1952-3.

Jubilee Year

170. This is the Jubilee Year of the Scottish Committee, which intends to mark the occasion by holding a formal dinner in the autumn.

Glasgow Regional Office

171. The facilities available at the Glasgow Regional Office are being increasingly used by the profession in the West of Scotland.

Salaries of Part-time Medical Officers for Prisons and Borstals in Scotland

172. The Scottish Committee has recently negotiated with the Scottish Home Department the following scale of salaries for part-time medical officers of prisons and borstals in Scotland:

A. Up to 3 hours per week	£75-155 per annum
B. 3 " 5 " " "	155-235 " "
C. 5 " 8 " " "	235-355 " "
D. 8 " 11 " " "	355-475 " "
E. 11 " 14 " " "	475-595 " "
F. Above 14 " " "	By calculation in individual cases

with additional weighting as follows:

(a) Part-time doctors in medical charge of an institution to receive "charge pay" fixed on a U.K. basis on the annual turnover of inmates, as follows:

Annual Turnover	Charge Pay
50-150	£ 50
150-350	75
350-750	100
over 750	125

(b) A further flat rate allowance of £50 to be paid if the prison is one which deals with a large number of trial and remand cases. (This is only likely to apply in one case at the moment.)

(c) An allowance of £100 per annum where the doctor is liable to perform court work regularly.

Press Officer to the Scottish Office

173. Mr. George Donaldson has been reappointed part-time Press Officer to the Scottish Office for a further period of one year ending June, 1953. Steps are being taken to publicize to a greater extent the type of service which Mr. Donaldson can offer to the profession in Scotland.

General Medical Council

174. The Association in Scotland was asked by the General Medical Council to nominate a candidate to fill the vacancy caused by the death of Dr. R. W. Craig. The procedure for direct elections to the General Medical Council was carried out and Dr. G. W. Ireland was nominated as the candidate to be supported by the Association and has now been appointed to the General Medical Council.

Reconstitution of Central Midwives Board for Scotland

175. As a result of further negotiations with the Department of Health for Scotland provision has now been made under the Central Midwives Board for Scotland (Reconstitution) Order, 1952, for the appointment of a deputy to the "1 duly qualified medical practitioner" appointed by the Scottish Committee on the Board.

Training of Health Visitors in Scotland

176. The Scottish Committee has accepted an invitation from a Joint Committee of the Standing Nursing and Midwifery Advisory Committee and the Standing Advisory Committee on Local Authority Services of the Scottish Health Services Council to submit views on the training of the health visitor and to submit proposals for the revision of the present training syllabus in the light of the requirements of the present-day health visitor service. The Scottish Committee accordingly appointed a subcommittee to draw up a report on the training of health visitors. This report has been approved by the Scottish Committee and has been submitted to a special joint committee of the Scottish Health Services Council. The Scottish Committee has also been invited to give oral evidence before the special subcommittee.

Visit to Denmark

177. The Scottish Committee has accepted an invitation from the Danish society for a small group of Scottish doctors to visit Denmark during September, 1953. The tour, which will last for 14 days, will include visits to Danish hospitals, universities, and medical institutions, together with sight-seeing excursions. Hospitality will be extended to the visitors by the medical profession in Denmark.

Scottish Marriage Guidance Council

178. The Scottish Committee has agreed that the Chairman should accept an invitation from the Scottish Marriage Guidance Council to become one of its patrons.

Maternity Services Subcommittee

179. Action has been taken by the Subcommittee in connexion with various administrative matters concerning the maternity services in Scotland under the National Health Service. The Subcommittee intends to discuss with the Department of Health for Scotland the possibility of arranging for maternity record cards, in respect of patients confined in hospital, to be completed by the hospital authorities, the cards being returned to the patients' own doctors on the completion of hospital attendance.

Public Health Subcommittee

180. The Public Health Subcommittee has under consideration the problem of remuneration of medical officers of health holding "dual appointments." The question of car allowances for public health medical officers in Scotland is also being investigated.

Partnership Advisory Committee

181. The Partnership Advisory Committee is receiving an increasing number of requests for advice on proposed partnership agreements.

Committees which Report to the Scottish Committee

182. (a) *General Medical Services Subcommittee (Scotland)*.—In order to maintain liaison between the British Dental Association and the B.M.A., cross representation on the Scottish General Dental Services Committee and the G.M.S. Subcommittee (Scotland) has been established.

As an interim measure, pending the result of the United Kingdom inquiry into the drug costs of dispensing doctors paid on the capitation fee basis, the dispensing capitation fee in Scotland has been increased from 6s. 6d. to 9s. 9d. per annum as from April 1, 1952.

The criteria to be adopted in dealing with applications for initial practice allowances have been approved by the Subcommittee and the Subcommittee has made suggestions for securing adequate means of consultation between the various bodies concerned.

The Subcommittee has recommended, and it has been agreed, that the Interdepartmental Mileage Committee in London and the Mileage Subcommittee of the Scottish

Advisory Distribution Committee should continue independently to consider the mileage distribution scheme. Joint meetings will be held at a later date to consider the inter-national division of the Fund.

As a result of negotiations with the Department of Health for Scotland the figure taken as a guide to the level of net professional income in cases in which inducement payment are made has been raised to £1,400 as from April 1. The percentage increases applied to capitation fee payment under the Danckwerts award will be added retrospectively to inducement payments.

(b) *Central Consultants and Specialists Committee (Scotland)*.—A questionnaire was issued to all consultants S.H.M.O.s, and senior registrars in Scotland in order to ascertain their views on proposals put forward by the Department of Health for alteration of the structure of hospital medical staffing in Scottish hospitals. The number of questionnaires issued was 1,278, and of the 838 replies received 315 were in favour and 523 were against the proposals. In view of this result further consideration is being given to the problem of medical staffing in Scottish hospitals. At the same time, the Scottish Joint Committee, at the instigation of the Central Consultants and Specialists Committee (Scotland), has asked the Department of Health to carry out an immediate review of S.H.M.O.s in Scotland.

Following representations from the Ophthalmic Services Subcommittee, the Department of Health has instructed the clerks of joint ophthalmic services committees that hospital ophthalmic prescriptions about which there may be some doubt should not be scrutinized by the joint ophthalmic services committees, but referred back to the hospital or consultant concerned.

The Committee has accepted a proposal from the Department of Health that mileage allowances might be commuted, provided that (a) commutation is optional, and (b) the commutation excludes domiciliary and emergency consultations.

The Committee's third annual report (1951-2) has now been issued to all consultants, S.H.M.O.s, and senior registrars in Scotland.

WALES

183. The Welsh Committee, which includes representatives of all the Divisions and Branches in Wales and Monmouthshire, has met in Shrewsbury under the chairmanship of Dr. Graham P. Williams. It provides opportunities for discussion of all matters affecting Welsh members.

The Committee is making a presentation to Dr. H. R. Frederick in appreciation of his services as chairman of the Committee for the past seven years.

The Annual Welsh Dinner is to be held in Cardiff on Saturday, July 11.

OVERSEAS**Cyprus**

184. The Council regrets that it is unable to report any settlement of the protracted dispute with the Government of Cyprus over the remuneration of Government medical officers, although some progress has been made on the question of the position of the Cyprus Branch as a negotiating body, which was also in dispute. Meetings have been held on two occasions with officials of the Colonial Office, and local representations have also been made.

New salary scales were introduced in June, 1952, which were considered unsatisfactory, particularly in the senior specialist grade, and it was decided that no advertisements issued by the Cyprus Government could be accepted for publication in the *Journal*.

The Chief Medical Officer to the Colonial Office has recently visited Cyprus. The Council is anxious not to prejudice any chance of reaching an amicable agreement, but it is strongly of opinion that negotiations have already dragged on too long and that they cannot continue indefinitely without any prospect of a settlement of the dispute. It has therefore informed the Colonial Office that unless

evidence of a desire on the part of the Cyprus Government to reach a settlement on the lines of the proposals made by the Association in August, 1951, is received within three months (from February, 1953) it will have no alternative but to include all medical appointments under the Government of Cyprus in the "Important Notice."

Jamaica

185. The Council is pleased to learn that the Government of Jamaica has officially recognized the Jamaica Branch as the proper negotiating body for salaries and conditions of service of Government medical officers.

Gold Coast

186. The Council has considered the report of a Commission on the Civil Service of the Gold Coast, 1950-1 (the Lidbury Commission), and the report of the Commission of Inquiry into the Health Needs of the Gold Coast, 1952 (the Maude Commission), in relation to the medical services of the Gold Coast. The first of these Commissions reported critically upon certain aspects of the administration of the medical department. The second recommended a reorganization of the department, which has now been carried out by the Gold Coast Government.

Recent events in the Gold Coast, such as the publication of the Lidbury and Maude reports, and the rapid constitutional developments in the territory, have emphasized the need for a strong local representative organization for the medical profession. A number of members of the Association accordingly met in January, 1953, in Accra, for the purpose of forming a Gold Coast Branch, and appointed a Steering Committee to arrange a further meeting on February 26 at which rules were adopted and officers elected. Further arrangements were made for Mr. Ian Fraser, a member of the B.M.A. Council and President-elect of the Royal College of Surgeons in Ireland, to visit the Gold Coast from March 4 to 21, 1953, on behalf of the Council.

East Africa—Royal Commission

187. The Council has noted with pleasure the appointment of a Royal Commission to inquire into the wider aspects of land utilization in relation to the economic, industrial, social, and demographic problems of the East African region as a whole. It regrets, however, that there is no medical member of the Commission. The appointment of a Royal Commission on Health and Population was suggested by the Kenya Branch of the Association as long ago as March, 1947, when a detailed memorandum by the Branch on the subject was sent to a number of members of both Houses of Parliament and to the Secretary of State for the Colonies. Copies of a précis of this memorandum have been sent to members of the Royal Commission.

Colonial Medical Service

188. The Council has continued to negotiate with the Colonial Office on salary scales. New scales have been introduced in Nigeria, and senior specialist posts have now been established in Tanganyika and Northern Rhodesia. Salaries in British Borneo and the Seychelles are still under discussion, particularly in relation to the position regarding private practice.

The Council has taken note of the agreed scheme for the unification of the health services in the Federation of Malaya and in Singapore.

The Council has received with satisfaction the announcement by the Ministry of Health that consultants or S.H.M.O.s in the National Health Service can be granted leave without pay in order to take up overseas appointments for a period not exceeding three years, with automatic reinstatement on returning to this country. This will go some way towards removing one of the major obstacles to short-term recruitment from the United Kingdom for overseas appointments.

EMPIRE MEDICAL ADVISORY BUREAU

189. The Empire Medical Advisory Bureau was opened in July, 1948, to welcome and provide a personal advisory service to medical practitioners visiting this country, particularly from the Dominions and Colonies.

The Committee of Management has met regularly during 1952 and the Advisory Committee held its fifth annual meeting on May 29, 1952. The attendance of members and their help throughout the year in the solution of individual problems of visitors is much appreciated.

The Bureau is now well established and becoming more well known abroad, and the number of new inquirers seeking the aid of the Bureau during 1952 shows an increase over last year of nearly 30%. In addition to new inquirers, many overseas doctors keep in touch with the Bureau during their stay in the country and are encouraged to turn to the Bureau for any help needed.

More than half the inquirers sought information about the various aspects of postgraduate education and experience, including information on courses of instruction, examinations, appointments in and visits to hospitals, and medical registration.

The *Summary of Regulations for Postgraduate Diplomas and of Courses of Instruction in Postgraduate Medicine* compiled and published by the Bureau has been revised, reprinted, and dispatched overseas to all Branches of the Association, affiliated associations, deans of medical faculties, postgraduate committees, and editors of medical journals. Many tributes to its usefulness for reference purposes have been received.

More than 200 doctors requested help in obtaining or advice about hospital appointments, and a "follow-up" of visitors who called at the Bureau during the first half of the year showed that the majority obtained the appointments desired within a reasonable period.

The Medical Practices Advisory Bureau has most helpfully co-operated with the Empire Medical Advisory Bureau by finding locum appointments for those overseas visitors desiring such appointments.

Many of the more senior visitors, who may combine a holiday visit to this country with an intention to see something of the latest techniques in various fields of medicine, have requested the Bureau to arrange such visits for them. Through the kindly co-operation of hospital authorities and consultants all such requests have been met.

Port health medical officers throughout the country have kindly continued to help the Bureau by meeting in person, where possible, overseas visitors on their first arrival in the country. Where a visitor cannot be met personally a letter of welcome from the Bureau is sent to him, and such letters have been much appreciated.

The Bureau has found accommodation for visitors in readiness for their arrival, and all requests for this have been met. In addition, many have been found furnished flats and houses after arrival in the country. Nearly 300 doctors and families have been assisted with the difficult problem of accommodation—the satisfactory solution of which is essential to a successful visit.

Social functions arranged by the Bureau, at which overseas visitors have the opportunity of meeting fellow practitioners from all parts of the Commonwealth, including senior members of the profession in this country, have continued to be held and are much appreciated. "At Homes" were arranged during the year in London, Edinburgh, and Cardiff, and nearly 1,100 overseas doctors and wives attended these social functions.

Inquiries coming under the heading of "General Information" were very numerous during the year, and nearly all inquirers had some query in this wide field.

Expressions of appreciation were received from many overseas visitors for the help given by the Bureau, and the demand on its services is a reflection of the needs of the newcomer, his wife, and family, especially when visiting Great Britain for the first time.

The Council is glad to feel that our overseas medical visitors from other parts of the British Commonwealth can obtain the assistance they need to make the most of their visits to this country.

International Medical Visitors Bureau

190. The International Medical Visitors Bureau was opened in January, 1950, to provide a personal advisory service for medical practitioners desiring to visit the United Kingdom from countries outside the British Commonwealth.

The Committee of Management has met four times during 1952.

Inquirers and visitors from 38 countries consulted the Bureau, and the number of inquiries was about one-sixth more than in 1951. Many inquirers required information about postgraduate courses of instruction, diplomas and examinations, and facilities for visits to hospitals, clinics, and other centres during their stay in the country. Inquiries were also received about temporary hospital appointments for the purpose of acquiring further experience, and information was given in all cases with the result that in a few cases such appointments were secured.

The arrangements for visits to hospitals and clinics often involve a good deal of planning, and in some cases where time is short many telephone calls are required. All this is very worth while, however, and visitors have been very appreciative of the arrangements made. The Bureau is much indebted for the whole-hearted co-operation received from consultants and hospital authorities in this connexion. Suitable accommodation has been found for all visitors requesting this, and help has been given to visitors to London and other centres.

Inquiries in the field of "General Information" have been dealt with, and visitors are encouraged to make requests with a view to making their stay pleasant and profitable.

With the co-operation of overseas medical associations, the Bureau has continued to facilitate holiday exchanges of United Kingdom doctors' children with children of doctors in Europe, and several exchanges have been arranged.

Visitors have been very appreciative of the help they have received, and the Council is glad to know that international medical relations are being strengthened by the services given by the Bureau.

MEDICAL FILMS

191. The Council is glad to report that increasing use has been made of the Association's Film Library during the past year. Thirteen films have been added to the Library. A page of addenda to the film catalogue has been issued.

Appraisal panels have met from time to time to view medical films which have been brought to the notice of the Association, and the Council wishes to express its thanks to the members of the profession who have served on these panels.

The Council is greatly indebted to the following, who have kindly presented films to the Association in the past year or have placed copies of their films in the Library on indefinite loan: American Medical Association, Imperial Chemical Industries Ltd., Ortho Pharmaceutical Ltd., Roche Products Ltd., Royal National Hospital for Rheumatic Diseases, Bath, Dr. J. G. Billington, and May and Baker Ltd.

WORLD RELATIONS

First World Conference on Medical Education

192. Preparations are being made for the First World Conference on Medical Education, which is to be held in London on August 24-29, 1953, under the joint auspices of the World Medical Association and the World Health Organization, with the collaboration of the Council of International Organizations of the Medical Sciences and the International Association of Universities, and under the patronage of the Secretary of State for Scotland, the Ministers of Education and Health, and the Chancellor of the University

of London. The President will be Sir Lionel Whitby and the Deputy President Professor W. Melville Arnott. The local arrangements are in the charge of a committee under the chairmanship of Dr. T. Rowland Hill, and the Council is giving a reception to inaugurate the Conference.

A leaflet of information about the Conference may be obtained on application to the Local Arrangements Secretary at B.M.A. House.

World Medical Association

193. The Sixth General Assembly of the World Medical Association took place in Athens in October, 1952, the British delegates being the Chairman of Council and Dr. T. Rowland Hill, with Dr. S. Wand and the Secretary as alternate delegates. The subjects discussed included the arrangements for the Conference on Medical Education, the medical aspects of social security, a report on social security schemes in Europe, and the principles of medical certification. The next General Assembly will be held in September, 1953, at The Hague, under the Presidency of Dr. A. L. Hulst, and the British delegates will be those who attended the meeting in Athens. Dr. J. A. Pridham has been re-elected to the Council of the W.M.A.

During the past year the Council has sent factual replies to questionnaires circulated to member-associations by the W.M.A. on the liaison between national medical associations and medical student organizations, subscriptions and benefits of membership of the B.M.A., co-operation between doctors and clergy, the provision of medical aid for foreign visitors, and practice by immigrant displaced doctors.

Anglo-American and Anglo-Canadian Exchange Scheme

194. The scheme for the exchange of members of the American, British, and Canadian Medical Associations, which was inaugurated in 1951 with the approval of the Bank of England, has been continued. During 1952-3 five British doctors have visited Canada and the U.S.A. under the scheme.

Fourth International Congress of Haematology

195. The Council co-operated with certain pharmaceutical firms in enabling two British haematologists to attend the Fourth International Congress of Haematology in Argentina in September, 1952.

Invitation to Soviet Doctors

196. The Council in September, 1952, sent an invitation to the President of the Academy of Sciences of the U.S.S.R. for six Soviet doctors to pay a good-will visit to Great Britain. The reply received expresses thanks for the invitation and states that unfortunately it is not possible to send a delegation to this country at the present time.

OTHER ASSOCIATION ACTIVITIES

Alcohol and Road Accidents

197. The Committee appointed by the Council in June, 1951, to revise the Association's two publications *Tests for Drunkenness* (1927) and *Alcohol in Relation to Road Accidents* (1935) has continued its work. A revised edition of the first-named publication is likely to be completed before the end of the year, but the revision of the second has been deferred until the results of certain current research are available.

Joint Committee of B.M.A. and the Magistrates' Association

198. The problem of cruelty to children is now being studied by this Committee with a view to the preparation and publication of a report. A considerable amount of information and many varied opinions on the methods of dealing with this problem are under discussion.

National Formulary

199. The revision of the *National Formulary* is a time-consuming task. Although a new edition came into operation as recently as June 1, 1952, the committee responsible for it is already engaged in the work of revision, which will result in a further edition in 1954.

Medical Practices Advisory Bureau

200. The agency work of the Medical Practices Advisory Bureau continues to increase, and there is evidence that its services are widely used and appreciated by members. In 1952, nearly 2,400 locums were arranged. Advice continues to be sought on a wide variety of problems associated with entry into and conduct of medical practice, including contracts and agreements between practitioners and problems arising from the relations between partners, principals, and assistants.

Control of Therapeutic Substances

201. The Penicillin Act, 1947, places restrictions on penicillin, and such other antimicrobial organic substances produced by living organisms as may be prescribed in regulations, by specifying the classes of persons who may supply them.

A Bill has recently been introduced—the Therapeutic Substances (Prevention of Misuse) Bill—which seeks (a) by regulation to add to the substances referred to in the Penicillin Act any therapeutic agent which appears to be capable of causing danger to the health of the community if used without proper safeguards; and (b) to relax, again by regulation, the restrictions imposed by the Act. The immediate object of such relaxation would be to enable penicillin to be added in small quantities to animal feeding-stuffs, the evidence being that such an addition accelerates the fattening of livestock. The Medical Research Council and the Agricultural Research Council have advised the Minister of Health that there would be little risk to the consumer.

The Council, in co-operation with the British Veterinary Association, has considered the Bill, and an outline of the regulations which it is proposed to make once the Bill has passed into law. It has recommended, as a safeguard against penicillin falling into the hands of members of the public and being wrongly used, that the regulations should restrict the preparation of the penicillin addition (which is to be penicillin mixed in a suitable proportion with a diluent from which it will be impossible to extract it) to such firms as are able to protect their employees adequately against the hazards of penicillin.

The Council has also drawn the attention of the appropriate Government departments to possible dangers to those who handle the diluted penicillin for the purpose of mixing it with feeding-stuffs, and has recommended that steps be taken to investigate whether safeguards are necessary.

The Council is taking the opportunity of considering with the British Veterinary Association and the Pharmaceutical Society the need for some form of control for sexual hormones. Such control could be brought within the scope of the regulations foreshadowed in the Therapeutic Substances (Prevention of Misuse) Bill.

Control of Medical Manpower

202. The new committees set up by the Government in consultation with the medical profession for the control of medical manpower in peace and war have come into operation during the past year. The Council has continued to provide the secretarial and clerical staff and other facilities for these committees and to assist the local, regional, and area medical recruitment committees which have been set up throughout the country. The expenses of all these committees for the control of medical manpower are borne by the British Medical Association, which then recovers three-quarters of the cost from H.M. Government. Steady progress has been made with the compilation of the Emergency Register of the medical profession.

The Council cannot allow the Central Medical War Committee and the Scottish Central Medical War Committee to

pass away without some mention of their history and of their magnificent service to the country in two world wars. In August, 1914, the British Medical Association placed its whole machinery at the disposal of the Government for the war effort. The Scottish War Emergency Committee was established in 1914 and the Irish Medical War Committee in 1915. By 1915 it was clear that the national emergency called for something more than adaptation of the Association's normal organization to the requirements of war, and the Representative Body established the first Central Medical War Committee. It was a committee of the Association with co-opted representatives from other bodies such as the Royal Colleges. The Military Service Act of 1916 gave statutory recognition to the Central Medical War Committee and to its functions, which came to an end in 1919, when the Committee was dissolved.

Between the two wars the Council maintained a shadow organization for the control of medical manpower in war. In November, 1938, alarmed by the deteriorating international situation, the Council reconstituted the Central Medical War Committee under the title "Central Emergency Committee." It was again a committee of the Association with co-opted representatives from other bodies, but the committee was larger than its predecessor and representation was made wider in scope. In September, 1939, the Central Emergency Committee became the second Central Medical War Committee, and both this Committee and the Scottish Central Medical War Committee functioned without interruption until 1952. The Northern Ireland Medical War Committee functioned throughout the second world war and gave most valuable service.

The Central Medical War Committee, the Scottish Central and Northern Ireland Medical War Committees, and all the Local Medical War Committees (which were established in both wars in the areas of B.M.A. Divisions) shouldered an enormous burden of voluntary work, to which the Council takes this opportunity of paying a final tribute.

Remuneration of Civil Service Medical Officers

203. The 1952 A.R.M. passed a resolution (Minute 283) supporting the action of the Council in connexion with the dispute between the Treasury and the Civil Service Medical Officers' Joint Committee about the salaries of Civil Service medical officers. Briefly, the position at that time was that the Treasury was asked either to reopen negotiations on the recommendations of the Howitt Committee in the light of the Danckwerts award, and other relevant factors, or to refer the whole matter to arbitration. The Treasury declined arbitration and was willing to review the existing scale of salaries only after they had been given a trial. The Council therefore decided not to accept further advertisements in the *British Medical Journal* for medical officer appointments in the Civil Service until such time as the matter was referred to arbitration or until further discussions resulted in better opportunities for Civil Service medical officers.

After further correspondence the Financial Secretary to the Treasury offered to invite such members of the Howitt Committee as were still available to review their recommendations. The Joint Committee did not feel able to accept this suggestion, though they indicated their willingness to have the existing scales reviewed by a new committee or arbitrating body whose composition and terms of reference could be agreed between the Treasury and the Joint Committee.

The Financial Secretary stated his willingness to agree to the reviewing body being asked to "have regard to any changes since August 31, 1951, in medical remuneration and to any other relevant circumstances" (including the level of remuneration amongst general practitioners resulting from the Danckwerts award). He was not, however, prepared to accede to the original request for arbitration, and was unwilling to invite any body except the Howitt Committee to undertake a further review of Civil Service medical officers' salaries.

A deputation from the Joint Committee is having further discussions with the Financial Secretary to the Treasury.

The Law in Relation to the Adoption of Children

204. The Home Secretary and the Secretary of State for Scotland have appointed a Committee under the chairmanship of His Honour Sir Gerald Hurst, Q.C., "to consider the present law relating to the adoption of children and to report whether any and, if so, what changes in policy of procedure are desirable in the interests of the welfare of children." The Association having been invited to submit evidence, the Council has formed a small Committee to prepare a memorandum for submission to the Interdepartmental Committee.

E. A. GREGG,
Chairman of Council.

APPENDIX I
RETURN OF ATTENDANCES OF COUNCIL

Name	Attendances	
	Actual	Possible
E. A. Gregg, London (Chairman of Council)	5	5
P. T. O'Farrell, Dublin (President)	4	5
S. Wand, Birmingham (Chairman of Representative Body)	5	5
A. M. A. Moore, London (Treasurer)	4	5
A. W. S. Sichel, Capetown (Immediate Past President)	1	1
J. W. Tudor Thomas, Cardiff (President-Elect)	5	5
Ian D. Grant, Glasgow (Deputy Chairman of Representative Body)	4	5
Abel, A. Lawrence, London	5	5
Alexander, H., London	5	5
Arthur, J. C., Gateshead	4	5
Barker, Alan, Whitstable	5	5
Britton, C. J. C., London	5	5
Brown, Alexander, Linton	5	5
Brown, David, Liverpool	5	5
Brownfield, O. D., Petersfield	5	5
Callander, L. Dougal, Doncaster	5	5
Carter, O. C., Bournemouth	5	5
Cottrell, J., Grimsby	4	5
Cowan, K., Chelmsford	5	5
Dahne, S. F. L., Caversham	1	5
Dain, H. Guy, Birmingham	5	5
Dawson, E. C., Derby	5	5
Dickson, N. S., Templepatrick	2	5
Digby, Kenelm H., Bromley	5	5
Dornan, W. E., Sheffield	5	5
Dowse, J. C. A., London	4	5
Esslemont, Mary, Aberdeen	5	5
Forbes, R., London	5	5
Formby, Myles L., London	2	5
Fraser, Ian J., Belfast	5	5
Frederick, H. R., Port Talbot	5	5
Garnham, P. C. C., London	2	5
Gibbons, L. A., Reigate	5	5
Gibson, J. M., Huddersfield	5	5
Gibson, R., Winchester	4	5
Gillie, Annis, London	5	5
Golding, H. M., Bristol	5	5
Gorsky, J. A., London	5	5
Gough, A. Staveley, Watford	4	5
Gray, F., London	4	5
Hale-White, R., London	4	5
Hamilton, J. G. M., Edinburgh	4	5
Heywood-Waddington, W. B., Littlehampton	5	5
Hill, T. Rowland, London	5	5
Hutchinson, D. F., London	5	5
Innes, I. G., Hull	5	5
Ireland, G. W., Ford, Midlothian	5	5
Jones, Isaac, London	2	5
Jones, J. A. L. Vaughan, Leeds	5	5
Jones, Leslie W., Anglesey	5	5
Jope, W., Blantyre	0	5
Knox, W. M., Glasgow	4	5
Langston, H. H., Winchester	5	5
Leacock, A. G., London	5	5
Liston, R. P., Tunbridge Wells	3	5
Macarthur, J. C., Carlisle	5	5
Milne, J. I., Manchester	4	5
Moody, J. A., Ilford	5	5
Morgan, T. W., Kingston-on-Thames	5	5
Nicholson-Lalley, J. R., Taunton	5	5
Owen, D. R., Chester	3	5
Pracy, D. S., Atherstone	5	5
Pridham, J. A., Weymouth	5	5
Rogers, A. Talbot, Bromley	5	5
Rook, Sir Alan F., Cambridge	3	5
Rose, F. M., Preston	5	5
Russell, A. V., Wolverhampton	4	5
Scott, Alexander, Ayr	5	5
Scott, S. Noy, Plympton	5	5
Sutherland, H. H. D., London	5	5
Watts, Weldon P. T., Newcastle-upon-Tyne	3	5
Weston, Angus, Greenford	5	5
Woolley, W., Bristol	5	5

APPENDIX II

REPORT OF COUNCIL ON INDIRECT METHODS
OF ADVERTISING

N.B.—Final decision in all these matters must rest with the individual concerned, but practitioners finding themselves in any difficulty in deciding upon their course of action or in doubt as to the safeguards necessary are advised to seek guidance from the Secretary of the Association.

1. Paragraph 6 of the Warning Notice of the Medical Disciplinary Committee of the General Medical Council reads as follows:

Advertising and Canvassing

The practices by a registered medical practitioner

(a) Of advertising whether directly or indirectly for the purpose of obtaining patients or promoting his own professional advantage; or, for any such purpose, of procuring or sanctioning or acquiescing in, the publication of notices commending or directing attention to the practitioner's professional skill, knowledge, services, or qualifications, or depreciating those of others; or of being associated with, or employed by, those who procure or sanction such advertising or publication; and

(b) Of canvassing or employing any agent or canvasser for the purpose of obtaining patients; or of sanctioning, or of being associated with or employed by those who sanction, such employment,

are in the opinion of the Committee contrary to the public interest and discreditable to the profession of medicine, and any registered medical practitioner who resorts to any such practice renders himself liable, on proof of the facts to the satisfaction of the Committee, to have his name erased from the Medical Register.

2. *Definition of Advertising.*—In the opinion of the Council of the Association the word "advertising" in connexion with the medical profession must be taken in its broadest sense, to include all those ways by which a person is made publicly known, either by himself or by others without objection on his part, in a manner which can fairly be regarded as for the purpose of obtaining patients or promoting his own professional advantage, or as appearing to be for these purposes.

3. *Accepted Customs.*—It is generally accepted by the profession that certain customs are so universally practised that it cannot be said that they are for the person's own advantage, as, for instance, a door plate with the simple announcement of the doctor's name and qualifications. Even this, however, may be abused by undue particularity or elaboration.

4. *Public Health Medical Officers.*—Publicity is necessary in carrying out the duties of medical officers of health and other medical men who hold posts in the public health or other public services. Provided that this is not used for the individual's advancement in his profession, this may be rightly allowed.

5. *Holding of Public Office.*—It is the recognized duty of a medical man to take his share as a citizen in public life and his right to hold public office should be so desired, but it is essential that the holding of public office is not used as a means of advertising himself as a doctor.

6. *Statements and Publications.*—Members of the profession are advised to exercise the greatest care with regard to public utterances and writings. There are many things innocent in themselves which may, by the manner or frequency of their doing, gravely contravene the principle that medical practitioners should not advertise.

7. *Public Activities.*—Practitioners may speak or write on topics which are of general public interest and which require medical knowledge for their proper presentation. Such activities when undertaken with propriety are recognized as legitimate and indeed form a useful public service, but, if abused, may be an avenue for promoting professional advantage. Such activities as lectures and discussions, writing in books and magazines and the like

and appearances in radio and television are those in which medical men are most commonly asked to take part.

8. *Dangers.*—The particular dangers in each of these fields of activity are referred to in the succeeding paragraphs. But, in every case, the guiding principles should be those of the Warning Notice of the General Medical Council which lays down that a practitioner should not sanction or acquiesce in anything which commends or directs attention to his professional skill, knowledge, services, or qualifications or depreciates those of others, or be associated with those who procure or sanction such advertising or publicity.

9. *Books, Articles, and Lectures.*—The publication of books and articles and the delivery of lectures on medical or semi-medical topics which are of general public interest and require medical knowledge for their proper presentation are recognized as legitimate, subject to the avoidance of methods which tend to promote the professional advantage of their authors. It is a wise precaution for a practitioner who proposes to deliver a lecture to request the chairman beforehand to be circumspect in any introductory remarks concerning his status as a speaker. Special precautions are necessary when it is known in advance that a press reporter will be present.

10. *Discussions in Lay Press.*—From time to time there are discussions in the lay press topics which have relation both to medical science and policy and to the health and welfare of the public, and it may be legitimate or even advisable that medical practitioners who can speak with authority on the question at issue should contribute to such discussions. But practitioners who take this action must make it a condition of publication that laudatory editorial comments or headlines relating to the contributor's professional status or experience shall not appear. Discussions in the lay press on controversial points of medical science and treatment should be avoided by practitioners; such matters are more appropriate to medical journals and discussion in professional societies. In particular, medical contributors to the lay press should avoid all references to the diagnosis and treatment of illness which may have the effect of embarrassing their colleagues in the field of active practice and which may lead the public to expect or demand a specific line of treatment.

11. *Press Interviews.*—A practitioner should exercise the greatest caution in granting interviews to the press, and the same conditions as are applicable to the publication of written articles should be scrupulously observed. A seemingly innocuous remark or casual aside is always open to misinterpretation and may easily form the subject of a damaging headline. This may place the practitioner in a position of embarrassment and danger. It is a wise precaution for a practitioner to insist upon seeing a draft of any material prior to publication.

12. *Photographs.*—A practitioner's photograph appearing in connexion with an interview or an article published in the lay press is a most undesirable form of publicity, and every reasonable precaution should be taken to ensure that, wherever practicable, such photographs are not published.

13. *Broadcasting and Television.*

(i) The Association accepts the view held by many in the profession that medical practitioners who possess the necessary knowledge and talent should be permitted to participate in radio and television programmes, provided they ensure the observance of appropriate ethical safeguards.

(ii) To an increasing extent in recent years, medical themes have been included in the programmes broadcast by the British Broadcasting Corporation (including television); for example, such subjects as diabetes, tuberculosis, peptic ulcers, cancer, deafness, diseases of the eye, heart diseases, and alcoholism.

(iii) The public has a legitimate interest in the advances made in the science and art of medicine, and it is of advantage that medical information, discreetly presented, should reach the public through the medium of broadcasting, both for the general instruction of the inquiring layman and for the particular purpose of "health education."

(iv) In November, 1934, the General Medical Council adopted the following resolutions:

1. That the British Broadcasting Corporation be informed that the Council can take no responsibility for the policy of the British Broadcasting Corporation with regard to broadcasting on medical or public health subjects, or broadcasting by registered medical practitioners, but are of the opinion that it is desirable, in the public interest, that registered medical practitioners should broadcast anonymously.

2. That the British Broadcasting Corporation be informed that the Council approved the suggestions numbered 2 and 3 in the letter of June 22, 1934, from the Director-General of the Corporation—namely, that correspondence addressed to broadcasters who are medical practitioners should not be forwarded to them, and that the anonymity of speakers should be strictly observed in connexion with any inquiries relevant to them or to their broadcast talks.

(v) The following resolution was adopted by the Representative Body of the British Medical Association in June, 1951:

That while recognizing that public education on selected health matters is eminently desirable, this meeting is of opinion that a close liaison should be established between the B.M.A. and the B.B.C. to control the selection of subjects and the scope of material presented to the public, and that practitioners approached to appear in such programmes, whether for "sound" or "visual" broadcasting, should insist on anonymity as part of the contract.

(vi) Anonymity may be defined for this purpose as withholding the publication or announcement of the practitioner's name, or any information, such as particulars of the appointments he holds, which might enable the public to identify him. Identification cannot be completely excluded, but it is incumbent upon medical practitioners who take part in sound or television programmes to ensure that the possibility of identification and publicity is reduced to a minimum. Unless a practitioner insists on anonymity he is not only offending against the ethical principles of the profession but is placing himself in danger of being accused of violating the Warning Notice of the General Medical Council. Should a practitioner, while carefully observing these precautions, be recognized by a section of the public, that fact should not of itself be regarded as evidence of an infringement of the rule of anonymity.

(vii) In 1937 the Central Ethical Committee passed the following resolution regarding the association of medical practitioners with commercial enterprises:

The Central Ethical Committee disapproves of the direct association of a medical practitioner with any commercial enterprise engaged in the manufacture or sale of any substance which is claimed to be of value in the prevention or treatment of disease and which is recommended to the public in such a fashion as to be calculated to encourage the practice of self-diagnosis and of self-medication or is of undisclosed nature or composition.

The Central Ethical Committee takes a similar view of the association of a medical practitioner with any system or method of treatment which is not under medical control and which is advertised in the public press.

In neither of the above findings does the Central Ethical Committee pretend to interfere with the right of a medical practitioner to be associated (save as above) with any legitimate business enterprise, but if such enterprise concerns the sale of a medicine or food the practitioner should not allow his professional status or qualifications to be used for advertising purposes outside the medical press.

This remains the policy of the Association; consequently it is unethical for a practitioner to participate in sound or television programmes which are being presented for, or on behalf of, firms using sponsored radio as a means of advertising.

(viii) There is a wide range of subjects unrelated, or only remotely related, to the practice of medicine where there may well be no objection to the announcement of the name and usual designation of a doctor who is an authority on the particular subject. There should be nothing in the announcement or presentation of the subject which could be regarded as promoting his professional advantage.

14. There is a special duty upon practitioners of established position and authority to observe these conditions, for their example must necessarily influence the action of their less-recognized colleagues.

15. After making all allowances for all those modes of publicity for which there may be some justification, there remain many instances which can be regarded as contravening the spirit of the Warning Notice of the General Medical Council. The Association is convinced that in taking up the attitude of determined opposition to undesirable methods of publicity it is acting in the best interests of the public as well as of the medical profession. Advertising by the profession in general would certainly destroy those traditions of dignity and self-respect which have helped to give the British medical profession its high status. The Association therefore draws the attention of the profession to the danger of these objectionable methods, and stresses the urgent need that every member of the profession should offer a firm resistance to them.

APPENDIX III

AMENDMENT OF ARTICLES AND BY-LAWS

Amendment of Article

1. By altering Article 39(2) as follows: By the substitution of "six weeks" for "two months" in line 8, and "three weeks" for "one month" in line 9.

Amendment of By-laws

1. By deleting By-law 1(3) and substituting therefor the following:

(3) The expression "Public Health Service Member" means a Member of the Association who is wholly or mainly employed in the medical service of the Council or Education Authority of any County, County of City, County Borough, Municipal Borough, Metropolitan Borough, Burgh, Urban District, Rural District, or Port Health Authority in Great Britain or Northern Ireland, or a combination of such authorities, or who has been for a period of not less than 10 years so employed and is a whole-time teacher of public health at a University or Medical School in Great Britain or Northern Ireland and whose name is in either case distinguished in the Register of Members of the Association as a Public Health Service Member.

2. By inserting in By-law 16(1)B the following new subparagraph:

(viii) Any Member who is engaged in full-time salaried employment the salary of which is not more than £1,500 per annum (or such other sum as the Council may from time to time determine) and who has signed and transmitted to the Treasurer a declaration in specified form that he comes within this group in relation to the year for which the subscription is due.

Four guineas

The Council have the power to decide in case of doubt whether the Member comes within the group.

3. By substituting in By-law 36 for the words "During the month of January" the words "Not later than the 22nd July"; for the words "during the previous year" the words "during the year ended on the previous 30th day of June"; and for the word "March" the word "August."

4. By inserting in By-law 38 after the word "Divisions" in line 4 the words "or Branches."

5. (i) By inserting in para. (2) of By-law 39 after the words "Any Division" the words "in Great Britain and Northern Ireland."

(ii) By inserting in para. (3) after the word "Division" the words "in Great Britain and Northern Ireland."

(iii) By inserting a new para. (4) reading as follows:

"(4) Every Branch not in Great Britain and Northern Ireland may form a Constituency provided that the Branches in the Republic of Ireland may be grouped together to form one Constituency."

(iv) By altering the number of the existing paras. (4) and (5) to (5) and (6) respectively.

6. By deleting in By-law 40 from para. (2) the words "in Great Britain and Northern Ireland" and by adding at the end of this para. the words "Provided always that no Constituency not in Great Britain or Ireland shall be entitled to elect more than 3 Representatives in all."

7. (i) By adding in para. (2) of By-law 42 after the word "Division" the words "or Branch" and after the word "Divisions" the words "or Branches."

(ii) By making the like alteration in para. (3) of the By-law.

8. By adding in By-law 43 after the word "Constituency" where it first appears in para. (1) the words "in Great Britain and Northern Ireland."

9. By substituting in the last line but one of By-law 47 "six weeks" for "two months."

Amendment of Schedule to By-laws

1. In the Schedule to the By-laws relating to the Amending Acts Committee insert at the end of the present words in the second column ("Additional Members *ex officio*") the words "or at the discretion of each such Committee one other Member appointed by such Committee."

2. In the Schedule to the By-laws relating to the General Medical Services Committee substitute in the fifth column ("Otherwise Appointed") the words "one to be nominated by the Public Health Committee in consultation with the Society of Medical Officers of Health" for the words "one Health."

3. In the Schedule to the By-laws relating to the Public Health Committee add in the fifth column ("Otherwise Appointed") the words "one to be appointed by the General Medical Services Committee."

4. In the Schedule to the By-laws relating to the Armed Forces Committee insert at the end of the existing entry in the sixth column the words "and to appoint one member arising from the failure by members of the Association on the active list of the medical branch of any of the Armed Forces to elect a member of the Committee."

5. Add as a footnote to the By-laws:

Standing Committees appointing representatives on other Committees are entitled to appoint a deputy to attend meetings in the event of the appointed representative being unable to do so.

GENERAL MEDICAL SERVICES COMMITTEE REPORT TO SPECIAL CONFERENCE OF LOCAL MEDICAL COMMITTEES

A special Conference of Local Medical Committees has been called for May 5, 1953, at 10.30 a.m. at B.M.A. House, Services Committee.

1. The Committee has learned that, following a requisition by some 159 members of the British Medical Association, an Extraordinary General Meeting of the British Medical Association will be held on May 5, 1953, "for the purpose of considering and, if thought fit, passing the following resolution":

"That the Association, being concerned by the modification of the present method of remuneration by capitation fees agreed in the Working Party's Report, requires the Council forthwith to approach the Minister of Health with proposals for protection (financial and otherwise) of the small-list doctor and the Minister of Health not to implement the Working Party's Report until the new scheme for distribution of remuneration has been considered in the light of such proposals, and meanwhile to continue the present method of payment."

2. The Committee can only interpret the requisitioning of this Extraordinary General Meeting as an attempt by a small minority group of the profession to overturn the decisions

overwhelmingly approving the Working Party scheme taken by a Special Conference of Local Medical Committees in June, 1952, and by the Representative Body of the British Medical Association in July, 1952.

3. Under Article 37 of the Articles of Association of the B.M.A. the general control and direction of the policy and affairs of the Association are vested in the Representative Body, and it is disturbing to think that it could be open to any small group of practitioners to attempt by the device of an Extraordinary General Meeting to impose their will against the declared wishes of the majority of the profession. It understands that learned Counsel has given his opinion that a resolution on a major medico-political issue, if carried at such a meeting, would have no effect. Notwithstanding this opinion the Committee believes that local medical committees should be made fully aware of the situation and of the steps that have been taken by the Committee since the Special Conference in June, 1952, to give effect to the Conference wishes. It considers it essential that before the Extraordinary General Meeting it shall know the current views of local medical committees on these important matters.

4. The Committee wishes to remind local medical committees that the implementation of the Danckwerts award and the subsequent increases which have been made in the Central Pool, retrospectively to July, 1948, were dependent upon agreement being reached in the Working Party (composed equally of members of the G.M.S. Committee and the Ministry of Health) on a new method of distribution. Every N.H.S. general practitioner was sent a copy of the Working Party's Report, and the recommendations were discussed by local medical committees and at open meetings of the profession held throughout the country. Only after this were the recommendations submitted to and approved with almost complete unanimity by the Conference of Local Medical Committees and the Representative Body of the Association.

5. During the discussions that took place before the approval of the scheme it was suggested that there might be certain groups of practitioners for whom the new distribution might not make adequate provision. To safeguard these practitioners the following rider was put on behalf of the G.M.S. Committee to the Special Conference, by whom it was approved:

Resolved: That if, when the new scheme of distribution has been endorsed by both parties, it is found in the light of experience that certain groups of practitioners who under the terms of reference of the Working Party might have expected to have benefited have, in fact, not done so, it be left to the Working Party provisionally to allocate an appropriate proportion of the final settlement moneys for the purpose of remedying any obvious defects in the distribution scheme, such allocation to be subject to confirmation by the next Conference before it becomes a permanent feature of the scheme.

6. The Committee is satisfied that every doctor concerned, be he a member of the B.M.A. or not, has had an opportunity of making his views known before and since July, 1952, through the democratic machinery open to him. During the months that have elapsed since the Special Conference the Committee has heard of no new arguments against the scheme such as might have influenced the Conference to make any different recommendation. It has received no communication from any local medical committee indicating dissatisfaction with the decisions taken by the Conference. Nor has any such indication been received by the Council of the British Medical Association from any Division of the Association. The Committee is therefore surprised that, at this late hour, an attempt should be made to prevent the introduction of the new distribution scheme due to come into effect on April 1.

7. The sponsors of the resolution to be considered by the Extraordinary General Meeting propose the rejection of the whole of the Working Party's Report and claim to do so in the interests of the small-list practitioner and of the doctor newly seeking entry into practice. The Com-

mittee is convinced, however, that any delay in introducing the new scheme of distribution cannot ultimately be in the best interests of these practitioners.

8. The Working Party in framing its recommendations had many points in mind, but not least among its objectives was to help the new entrant to general practice and the general practitioner in full active N.H.S. practice who had only a small list. Delay in introducing the Working Party scheme would mean denying to these practitioners the benefits of the initial practice allowances, the special provisions made for elderly practitioners, the notional-list arrangements to encourage partnerships, and redistribution of patients expected from the reduction in the size of maximum permitted lists. Some practitioners may believe that the scheme does not offer them, as individuals, the help that they expected to receive, but this is hardly a good reason for vetoing the whole scheme, particularly as it has been agreed by the Conference and by the Working Party that, if experience shows that their fears are justified, an appropriate proportion of the final settlement moneys can be used for the purpose of remedying any obvious defects in the new scheme.

9. Immediately following the Special Conference the Committee set up an *ad hoc* subcommittee, consisting of the medical members of the Working Party and also members of the Assistants and Young Practitioners Subcommittee, the Medical Practitioners' Union, and the Amending Acts Committee of the Association, to examine possible ways and means of giving effect to the wishes of the Conference as set out in the rider quoted above. The Subcommittee held several meetings, but its preliminary work was hampered by lack of reliable information as to the extent of the problem. Although figures are known of the number of doctors whose present lists of patients are small, it is not possible to tell from these figures alone how the introduction of the reduced maxima of lists will affect the situation and whether there will be a proportion of those doctors who can genuinely claim to be in active general practice who will suffer injustice under the new arrangements. Many of the small-list doctors are, or will become, junior partners taking advantage of notional lists for loading; others will be eligible for I.P.A. or for the year's "buffer" allowance: some rely, and will continue to rely, on earnings from sources other than capitation fees for the major proportion of their incomes. There is no case for altering the scheme to give additional help to these groups, but there may remain a proportion of small-list practitioners devoting their whole professional time and ability to the running and the building up of their practices for whom modifications may need to be sought. So far the Committee has not been able to make any reliable estimate of the likely numbers of this last group. Indeed, to do so with any pretence of accuracy would entail the preparation of a nominal roll of all small-list practitioners and a precise prediction of their position after April 1, 1953, on which date the new arrangements came into force. This is obviously impossible at present.

10. The Committee has considered how best this essential information may be obtained. As a first step, it will be necessary to prepare a precise analysis of the number and categories of practitioners concerned, and, if the results of such inquiry are to be accurate, comprehensive, and above criticism, it must be undertaken with the help of the Ministry of Health, local executive councils, and local medical committees and carried out on a uniform basis throughout the country. Whilst the Ministry and executive councils can supply certain data, only local medical committees can provide the full picture of the doctors' other commitments and general practice arrangements. For these reasons the Committee, in consultation with the Ministry, decided to call the Working Party together again to investigate the problem and to initiate an official inquiry designed to reveal both the number and groups of general practitioners who may, in the light of experience, be found to be adversely affected by the new distribution scheme. At the same time the

Working Party can determine more precisely the size of the final settlement in the light of the number of new principals who enter practice under the new arrangements and the number of partnerships who avail themselves of the advantages of notional lists. The Committee felt that not only would such a step safeguard the accuracy of the information which is being sought, but it has the advantage that the Ministry would be aware of the Committee's intention to examine the situation and would be prepared in advance for any adjustments in the Working Party's scheme which might in the light of experience prove necessary. The Ministry has readily accepted the suggestion and an early meeting of the Working Party is being held to determine the machinery for the proposed inquiry. The Committee is, therefore, quite satisfied that if defects are shown to exist in the new distribution scheme the steps it has taken to provide in the regulations for retrospective payments adequately safeguard the position of any practitioner who in the light of experience is found to be covered by the Conference rider.

11. The Committee believes that it has taken every possible step to carry out the intentions of the Conference in regard to cases of hardship which may arise under the new distribution scheme.

12. It first set up a subcommittee specially chosen to ensure proper consideration of all constructive suggestions which have been put forward in the Committee. This subcommittee was set up in September and has met on a number of occasions and carried out a detailed examination of the problem and of possible ways of overcoming it.

13. Realizing that no progress would be made without accurate information of the size of the problem, it made arrangements for the full Working Party to be called together so that an official inquiry could be undertaken designed to show whether, and, if so, how many and what type of, practitioners will suffer under the new distribution scheme.

14. It has asked the Ministry, and the Ministry has agreed, to include in the regulations embodying the new distribution scheme a provision to enable the Minister to evolve a scheme to provide for any necessary additional payment should this prove necessary and to make such payments retrospective for practitioners who may be found to merit special consideration.

15. To go further than this now would create new and almost insurmountable difficulties.

16. The Minister himself has stated in Parliament that the new distribution scheme must be given a fair trial, and, indeed, as from April 1 it will have full legal force as the result of regulations now before the House.

17. Again, many practitioners will have decided, and made arrangements, to take in new partners under the notional-list arrangements.

18. Others will have decided to enter practice for the first time in designated areas in the expectation of receiving initial practice allowances.

19. Indeed, there can be few practitioners who have not entered into commitments of one sort or another in the expectation of the benefits to be conferred by the new distribution scheme on April 1.

20. For all these reasons, the Committee is satisfied that it would be impracticable, and most undesirable, for any approach to be made to the Minister in the terms of the resolution to be considered by the Extraordinary General Meeting, and invites local medical committees to endorse the steps already taken by the Committee to safeguard the position of the small-list practitioner and the doctor newly seeking entry into practice. It therefore recommends:

Recommendation: That this Conference, representing National Health Service general practitioners throughout the country, fully endorses the steps already taken by the General Medical Services Committee to implement the rider passed by the Special Conference of Local Medical Committees on June 26, 1952.

British Medical Association

MEDICAL PRACTICES ADVISORY BUREAU

The following annual report of the Association's Medical Practices Advisory Bureau was presented by the Medical Director (Dr. L. S. Potter) to the Council on March 18. The report deals with the year ending December 31, 1952.

AGENCY SERVICES

Entry into Practice

The records of work in the three principal offices of the Bureau, in London, Manchester, and Scotland (Edinburgh and Glasgow), show a slight increase over 1951. Other regional or B.M.A. Branch activities are mainly concerned with locum arrangements, which can be undertaken satisfactorily in a medical school centre. For other appointments their scope is limited and they act as clearing-house for the main Branches.

The following Table shows the number of assistants with or without view to partnership introduced by the Bureau during 1951 and 1952:

	1951	1952
Assistants with view	211	213
Assistants without view and trainees	435	450

The New Distribution Scheme

The last annual report called attention to the decline in vacancies for partners (assistants with view) and the relative increase in requests for so-called "permanent" assistants. Though seasonal fluctuations in both fields make it difficult to be dogmatic the records indicate that this trend has been reversed, although stability has probably not been reached. For example, requests for the introduction of prospective partners reach their peak in the first quarter of the year and are fewest in the third quarter. In 1952, however, the number introduced in the third quarter showed for the first time a marked increase over both the preceding quarter and the corresponding quarter in 1951. This is emphasized by the fact that the number in the second quarter of 1952 was the lowest since the formation of the Bureau.

It is too early to assess the effect of the new distribution scheme on entry into general practice, but there is strong presumptive evidence that the number of new partnerships formed is very much greater than the number of new engagements of assistants with view. In other words, "permanent" assistants are being taken into partnership in far greater numbers than the above figures suggest, and therefore the comparison between assistants with view introduced in 1951 and 1952 does not give a true picture. Requests for advice on the procedure for entering partnership, the allocation of shares, the content of the agreement, etc., have shown a very marked increase in the last six months, and it is reasonable to relate this increase to the Danckwerts award and the Working Party's report. It is impossible to give figures, but this experience is confirmed by local medical committees.

The last report of the Bureau suggested that an important cause of the reluctance of established practitioners to take partners was the absence of a capital sum to offset the initial loss of income when a share is transferred. This factor will continue to affect adversely entry into general practice. The loss is not fully compensated by payment on notional lists, and seems to give rise to a tendency to carry over into partnerships the relation of employer and employee, which is the normal relationship of principal and assistant. Entry into partnership practice would be made much easier if the appropriate proportion of compensation were paid to a practitioner giving a share to a partner.

Demand for Openings in General Practice

Among the great number of doctors registered with the Bureau as seeking openings in general practice there is a

group which, because of advancing age or other reasons, will only succeed with great difficulty in obtaining other than temporary appointments. Apart from this group the majority are in posts in general or hospital practice and are seeking vacancies which offer more security and long-term prospects. The amount of actual unemployment among doctors is thought to be small, and has certainly been exaggerated.

Much has been said in committee and in the medical and lay press about the difficulty of obtaining posts with reasonable prospects in general practice. Undoubtedly the demand exceeds the supply of vacancies, but it is surprising how many attractive openings are difficult to fill. Making allowances for housing problems, domestic factors, and the fact that many are in posts which cannot be relinquished at short notice, there are inexplicable anomalies.

(i) A practitioner in a large country town, with a maximum list, offered a third share increasing by stages mutually agreeable, after an assistantship of twelve months. Salary £800 with £150 car allowance and *rent-free furnished flat*. This was sent to nearly 200 eligible applicants—very few replied, and none could take up the appointment for three months.

(ii) A large firm in a Home Counties town offered a salaried partnership to be followed by full status on an eighth share rising to parity in three years. Initial salary £750 with £150 car allowance and furnished rooms (suitable for married man without children) and *full board*. Sent to nearly 200—less than six applicants, all unsuitable.

(iii) A firm of three in a London suburb offered a fifth share (£1,800 per annum approximately) after six months—parity in due course—obstetric experience desirable—detached four-bedroomed house available at valuation on completion of partnership. Sent to 300—less than 20 applicants.

The same reluctance to apply for what seem to be very satisfactory posts is apparent in assistantships without view and traineeships.

Locum Engagements

The number of locums introduced during 1952 compared with previous years shows a fairly constant pattern. The highest seasonal peak was reached in the third quarter of 1952, when approximately 800 locums were arranged.

1949	1950	1951	1952
1,662	2,374	2,452	2,395

During the peak periods in the first quarter and during the holiday months it is usually quite impossible to meet demands.

Other Appointments

During the year the Bureau has been asked to help in filling a large variety of miscellaneous appointments, often when advertisement has been unsuccessful. Many of these have been specialist posts abroad, usually for periods of from one to three years, renewable. There is an understandable reluctance among young specialists to apply for these posts, however attractive the experience and remuneration, because they feel that absence may make it impossible for them to catch up with the keen competition for hospital appointments on their return.

Perhaps the greatest problem facing the Bureau is to find suitable part- or whole-time appointments for practitioners who have reached retiring age and whose private practices have been affected by the changes since 1948. Circumstances are forcing many of these to seek remunerative work, but they face competition from younger men, and many have no aptitude for, or experience of, general practice, where temporary work is usually available.

ADVISORY SERVICES

The demand for advice on a wide variety of personal problems associated with medical practice continues to increase. There is much evidence that this service is appreciated, and the number of complaints is negligible. The

need for an advisory service which only a disinterested body such as the B.M.A. can give is emphasized by the number of instances in which, had advice been sought in time, serious consequences might have been averted. For example, an assistantship with view to succession in one of the Dominions was recently advertised in the *British Medical Journal*. An assistant in England wrote for particulars, on receipt of which he assumed that he had been offered the vacancy and forthwith gave notice to his principal, sold his house, and booked passages. Only on the eve of departure did he learn that the post had been filled. There is of course no excuse for such impulsive action, but his present unenviable predicament and anxiety could have been avoided had he sought advice in time. Fortunately the Bureau, through its contact with B.M.A. Branches and agencies abroad, may still be able to help. There are other instances where practitioners have accepted posts overseas on mere verbal assurances and have sailed without written contracts, only to find that conditions are very different from what they have been led to expect.

The Council approved the Report and placed on record its appreciation of the services of Dr. Potter and of the loyalty and efficiency of the staff of all the offices of the Bureau.

PUBLIC HEALTH SERVICE

MEDICAL WHITLEY COUNCIL, COMMITTEE "C"

Arbitration Regarding Remuneration of Assistant Medical Officers

As previously reported (*Supplement*, January 31, p. 32) the two sides of Committee "C" of the Medical Whitley Council agreed that the Staff Side's claim for an adjustment in the remuneration of assistant medical officers should go to arbitration. The matter was referred to the Minister of Labour under the Industrial Courts Act. Notification has now been received by the joint secretaries of Committee "C" that the Minister of Labour has referred the difference to the Industrial Court. Information with regard to the date of the hearing before the Industrial Court is now awaited.

Additional Conditions of Service for Medical Officers of Health

The following circular (M.D.C. No. 16) signed by the joint secretaries of Committee "C," Medical Whitley Council, has been sent to all local authorities in England and Wales and Scotland:

"We have to advise you that Committee 'C' of the Medical Whitley Council have had under consideration a proposal that certain of the conditions of service applicable to chief officers of local authorities should be embodied in the conditions of service of medical officers of health. They have agreed that the following conditions of service should apply to medical officers of health:

"(1) *Whole-time Service*.—A whole-time medical officer of health shall devote his whole-time service to the work of the council(s), and shall not engage in any other business or take up any other additional appointment without the express consent of the council(s).

"(2) *Advice to Political Groups*.—A medical officer of health shall not be called upon to advise any political group of the council either as to the work of the group or as to the work of the council, neither shall he be required to attend any meeting of any political group.

"(3) *Inclusive Salaries*.—Salary scales within the ranges adopted by the Whitley Council shall be deemed to be inclusive salary scales, and all fees and emoluments except those for which other provision is made by or as a result of the conditions of service agreed upon by the Whitley Council shall be paid by the medical officer of health into the rate funds."

H.M. Forces Appointments

ROYAL NAVY

Acting Interim Surgeon Commander J. P. Corcoran has retired.

ROYAL NAVAL VOLUNTEER RESERVE

Temporary Surgeon Lieutenant-Commander J. H. Simpson has terminated his temporary commission on transfer to the R.A.N. (Reserve Forces).

ARMY

Major-General T. Menzies, C.B., O.B.E., Q.H.P., late R.A.M.C., having reached the age for retirement, has retired on retired pay.

Major-General R. D. Cameron, C.B., C.B.E., M.C., Q.H.S., late R.A.M.C., has retired on retired pay.

Brigadiers (Temporary Major-Generals) E. P. N. Creagh and R. Murphy, C.B.E., Q.H.S., late R.A.M.C., to be Major-Generals.

Brigadier (Temporary Major-General) E. P. N. Creagh, late R.A.M.C., to be Major-General.

Brigadier W. R. D. Hamilton, O.B.E., Q.H.P., late R.A.M.C., to be Major-General (supernumerary).

Colonel (Temporary Brigadier) F. J. O'Meara, late R.A.M.C., to be Brigadier.

Colonel K. Fletcher-Barrett, O.B.E., late R.A.M.C., to be Brigadier.

Lieutenant-Colonels P. J. Richards, D.S.O., O.B.E., and W. A. Robinson, O.B.E., from R.A.M.C., to be Colonels.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel B. Blewitt has retired on retired pay, and has been granted the honorary rank of Colonel.

Major R. A. Bond to be Lieutenant-Colonel.

Captain G. M. McEwan to be Major.

Major G. P. Crean, from Short Service Commission, has been appointed to a permanent commission in the rank of Captain. (Substituted for the notification in a *Supplement* to the *London Gazette* dated November 5, 1948.)

Short Service Commissions.—Majors A. S. Cox and G. P. Stille have retired, having received gratuities. Captain D. Ollivier to be Major.

Short Service Commission (Type "B").—Major H. Shield, M.C., T.D., has retired on retired pay.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major (Honorary Lieutenant-Colonel) F. W. A. Warren, O.B.E., T.D., from T.A.R.O., to be Major, and has been granted the acting rank of Colonel.

Major (Honorary Lieutenant-Colonel) G. S. Adams, T.D., from T.A.R.O., to be Major, and has been granted the acting rank of Lieutenant-Colonel.

Captain P. W. Ingram, from T.A.R.O., to be Captain, and has been granted the acting rank of Lieutenant-Colonel.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Colonels I. G. W. Hill, C.B.E., T.D., and A. H. Whyte, D.S.O., T.D., whose tenures have expired, have relinquished their appointments as Honorary Colonels of T.A. units.

Lieutenant-Colonel (Acting Colonel) S. G. de Clive-Lowe, T.D., to be Colonel.

Lieutenant-Colonel O. G. Prosser, M.C., to be Brevet Colonel.

Major (Honorary Lieutenant-Colonel) E. Shipman, from T.A.R.O., to the Active List, to be Major. (Substituted for the notification in a *Supplement* to the *London Gazette* dated April 14, 1950.)

Captains D. Macartney, J. H. Challenger, J. S. Lancaster, M.C., N. D. Cousins, W. G. Daynes, J. H. Orr, and I. D. Henderson to be Majors.

Captain B. J. Harries and D. L. Nicholls to be acting Majors.

Lieutenant (War Substantive Captain) P. Walsh, now T.A.R.O., to be Major.

Lieutenant J. E. Grey to be Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel L. J. Haydon, T.D., from Active List, to be Colonel.

Brevet Colonel O. G. Prosser, M.C., from Active List, to be Brevet Colonel.

Lieutenant-Colonel S. W. Barber, M.B.E., T.D., from Active List, to be Lieutenant-Colonel.

Majors (Honorary Lieutenant-Colonels) W. R. P. Templeton, T.D., J. H. Dunn, O.B.E., T.D., and R. Armstrong, having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O.

Major (Honorary Lieutenant-Colonel) J. W. E. Webster has relinquished his commission, retaining the honorary rank of Lieutenant-Colonel.

Major W. D. Jackson, O.B.E., M.C., T.D., has relinquished his commission, and has been granted the honorary rank of Lieutenant-Colonel.

Majors R. E. Haswell and A. Murray, from Active List, to be Majors.

Majors E. C. Murphy, T.D., E. G. Recordon, and J. E. Wells, T.D., have relinquished their commissions, retaining the rank of Major.

War Substantive Major G. N. Bailey has relinquished his commission, and has been granted the honorary rank of Lieutenant-Colonel.

Captain (Honorary Major) G. B. Morton has relinquished his commission, retaining the honorary rank of Major.

Captains L. K. Wills and J. D. A. Gray, T.D., have relinquished their commissions, and have been granted the honorary rank of Major.

B.M.A. LIBRARY

The following books have been added to the Library:

- Banerjee, J. C., and Bhattacharya, P. B.: *Handbook of Tropical Diseases*. Fifth edition. 1952.
- Barnes, S.: *The Birmingham Hospitals Centre*. 1952.
- Beaumont, G. E.: *Medicine: Essentials for Practitioners and Students*. Sixth edition. 1953.
- Benedek, T.: *Studies in Psychosomatic Medicine: Psychosexual Functions in Women*. 1952.
- Best, C. H., and Taylor, N. B.: *The Living Body: A Text in Human Physiology*. Third edition. 1952.
- Bourne, A. W., and Williams, L. H.: *Recent Advances in Obstetrics and Gynaecology*. Eighth edition. 1953.
- Bowlby, J.: *Maternal Care and Mental Health*. Second edition. 1952.
- Brun, R.: *General Theory of Neuroses*. 1951.
- Buchanan, A.: *The Film in Education*. 1951.
- Charlesworth, F.: *Chiropractic Orthopaedics*. 1951.
- Dal Borgo, V.: *Studio Fisico dell'Aorta Normale e Patologica*. 1952.
- Frazer, W. M.: *Textbook of Public Health*. Thirteenth edition. 1953.
- Frimann-Dahl, J.: *Roentgen Examinations in Acute Abdominal Diseases*. 1951.
- Gesell, A.: *Infant Development: The Embryology of Early Human Behavior*. 1952.
- Gray, E. A.: *Portrait of a Surgeon: A Biography of John Hunter*. 1952.
- Hewer, C. L.: *Recent Advances in Anaesthesia and Analgesia*. Seventh edition. 1953.
- Horder, Lord, and Gow, A. E.: *Essentials of Medical Diagnosis*. Second edition. 1952.
- Huffman, E. K.: *Manual for Medical Records Librarians*. Third edition. 1952.
- Kahn, R. L.: *Introduction to Universal Serologic Reaction in Health and Disease*. 1951.
- Kalinowsky, L. B., and Hoch, P. H.: *Shock Treatments, Psycho-surgery and other Somatic Treatments*. 1952.
- Kendall, H. O., Kendall, F. P., and Boynton, D. A.: *Posture and Pain*. 1952.
- Koller, L. R.: *Ultraviolet Radiation*. 1952.
- Kornitzer, M.: *Child Adoption in the Modern World*. 1952.
- Lancet, The: *Disabilities and How to Live With Them*. 1952.
- Leopold, S. S.: *Principles and Methods of Physical Diagnosis*. 1952.
- Levine, L., and Doherty, B.: *The Menopause*. 1952.
- McLaggan, J. D., and Collier, J.: *Diseases of the Ear, Nose, and Throat*. Second edition. 1952.
- McLester, J. S., and Darby, W. J.: *Nutrition and Diet in Health and Disease*. Sixth edition. 1952.
- Mahoudeau, D.: *Les Traumatismes de la Moelle Epiniere*. 1952.
- Mazer, C., and Israel, S. L.: *Diagnosis and Treatment of Menstrual Disorders and Sterility*. Third edition. 1951.
- Modern Trends in Forensic Medicine. Edited by Keith Simpson. 1953.
- Nicoll, J. T. B.: *The Span of Time: The Autobiography of a Doctor*. 1952.
- Piney, A.: *A Clinical Atlas of Blood Diseases*. Seventh edition. 1952.
- Russell, W. R.: *Poliomyelitis*. 1952.
- Schiersmann, O.: *Einführung in die Enzephalographie (Pneumenzephalographie)*. Zweite Auflage. 1952.
- Schwartz, C. W., and Collins, L. C.: *The Skull and Brain Roentgenologically Considered*. 1951.
- Selye, H.: *The Story of the Adaptation Syndrome*. 1952.
- Smith, S.: *Surgery of Pancreatic Tumours*. 1953.
- United States Army Medical Department: *Surgery in World War II. The Physiologic Effects of Wounds*. 1952.
- Vines, H. W. C.: *Background to Hospital Planning*. 1952.
- Walker, H.: *Physical Diagnosis*. 1952.
- Westwood, G.: *Society and the Homosexual*. 1952.
- Winslow, C.-E. A., et al.: *History of American Epidemiology*. 1952.
- Wintrobe, M. M.: *Clinical Hematology*. Third edition. 1951.
- Wylie, W. D.: *Practical Management of Pain in Labour*. 1953.

Correspondence

Extraordinary General Meeting

SIR,—I read with amazement the announcement of an Extraordinary General Meeting (*Supplement*, March 21, p. 76). It is the deliberate policy of the Association to confine general meetings to essential matters of business which, in company law, can be transacted only by a General Meeting. Such business is specified in the handbook of the Association and excludes subjects of a medico-political nature, which are left to the democratically elected Representative Body.

As recently as July, 1952, the Representative Body, comprising representatives from all the 300 constituencies, approved the policy of the G.M.S. Committee in relation to the Working Party's Report, with only one dissident. Can there be any doubts that such an overwhelming vote indicates the view of the vast majority of the profession? Yet, despite this vote, and despite the assurances given at the time, and since, by Dr. Wand and Dr. Talbot Rogers, and despite the inquiry already initiated by the G.M.S. Committee and the Working Party with a view of ensuring justice for the small-list practitioner, this Extraordinary General Meeting has been forced upon us by a small group of disgruntled people. The action appears to me to be an effort by a particular group to thwart the expressed wish of the majority of the profession by the summary calling of a meeting in London, attendance at which presents serious difficulties for all who reside outside London and the counties immediately adjacent.

I would therefore urge all Divisions to do everything in their power to prevent a totally unrepresentative opinion prevailing on May 5 by sending representatives with specific instructions to vote on the resolution which is to be placed before the assembly.—I am, etc.,

East Herrington, Sunderland.

IVOR JONES.

SIR,—As your readers know, the Council of the British Medical Association has called an Extraordinary General Meeting of the Association on the requisition of more than 100 members to consider a resolution concerning small-list practitioners. This meeting is to be held on the afternoon of May 5.

We now learn to our astonishment that the General Medical Services Committee, "disturbed" at this threat to upset its plan for distribution, has called a Special Conference of Local Medical Committees for the sole purpose of reaffirming its approval of the plan; this Conference is to be held on the very morning of the Extraordinary General Meeting, and so influencing its debate.

It is to be noted that the expenses of delegates to the Conference are paid from Trust Funds, while British Medical Association members attending the Extraordinary General Meeting will have to pay their own expenses. It is difficult not to regard this decision of the General Medical Services Committee as a deliberate attempt to devise a majority at the Extraordinary General Meeting by subsidizing the attendance of members whose views are known to favour the Working Party's plan.—We are, etc.,

Shrewsbury.
East Horsley, Surrey.
Edgware.
London.

W. J. GRANT.
BASIL GRANT.
A. D. MANNING.
CHARLES I. SCHIFF.

The Small-list Doctor

SIR,—I am a senior member of our profession (being now aged 68) and have only a small panel list which it is virtually impossible for me to increase. Because of these factors those who found themselves in the same position as myself were, prior to the Danckwerts award, allowed certain extra

sums out of the general sums available for the payment of doctors. Following this award, these sums are all to be reduced, and in my own case this will mean that I am likely to lose not less than £100 per annum. The loss may be greater, for the precise figures are not yet worked out. The sums which we lose are to find their way into the pockets of younger men with larger lists, most of whom have never been called upon to do the vast amount of unpaid work which was our lot when we entered the profession.

It will probably be agreed by everyone that this state of affairs involves a flagrant injustice which should be corrected by Parliament itself. I shall be grateful if I may have the hospitality of your columns to recommend all those in the same position as myself to write forthwith to their Member of Parliament, and to their local representatives on any professional committees, asking that this matter may be given urgent attention.—I am, etc.,

Sevenoaks.

GORDON WARD.

** As Dr. Ward is over the age of 65, he may become eligible for a special grant under the terms of paragraph 19 of the Working Party's report. This paragraph states: "A small sum of money should be set aside from the central pool to deal with cases of hardship which might arise, particularly where, under the new arrangements, an elderly practitioner might lose his fixed annual payment, and, after receiving an initial practice allowance for a year, find himself less well off than he was before the new scheme came into operation." A circular will shortly be issued notifying practitioners how they may claim a grant under this heading.—Ed., B.M.J.

Salaries of Whole-time Specialists

SIR,—We are pleased to see that publicity is now being given by the Association to the grievances of whole-time specialists. It is to be hoped that this will be followed by concrete results. It is certainly a very peculiar situation when a consultant, by taking up an appointment part-time under the National Health Service, is likely to receive (at least in the case of a clinician) a larger remuneration from the Service than if he were to take up the same appointment whole-time. The reason for this, of course, is that his allowances and domiciliary visits can easily make up more than the difference between whole-time and eight or nine sessions part-time salary.

Several suggestions have been made in the *Journal* and elsewhere that whole-time specialists should receive payment for domiciliary visits. This alone, however, would not solve the problem. Whole-time clinicians would, no doubt, benefit considerably, but certain specialties (e.g., radiology and pathology) would scarcely benefit at all, since in these there is seldom scope for much useful domiciliary work. Indeed, it appears to be for this very reason that so many purely whole-time appointments are made to these specialties. The only real solution to the present inequality between whole- and part-time specialists under the National Health Service is to increase considerably the difference between their basic salaries.—We are, etc.,

W. H. J. BAKER.
D. R. CHRISTIE.
P. CLIFF.

Hereford.

Cost of Prescribing

SIR,—My letter on the cost of prescribing (*Supplement*, February 14, p. 43) appears to have caused some irritation among English members of the pharmaceutical profession, as seen by the recent letters in the *Supplement* drawing attention to the "wild inaccuracy" of my figures. Let me say that my figures are dead accurate—that is, 1s. 2d. for dispensing a proprietary liquid medicament, and 2s. 3d. for dispensing an official liquid medicament. These figures are taken from the *Drug Tariff* supplied by the Department of Health for Scotland, and are in fact the figures payable in Scotland at the present time in my area. There are no doubt

complicated reasons for the different dispensing fees payable in Scotland on the one hand and England on the other, but such factors as population density and different prescribing habits in Scottish doctors are probably two of the main reasons. I would point out to Mr. F. C. Wilson (*Supplement*, March 14, p. 71) that proprietary medicines can be supplied in dispensing packs purchase-tax free—for example, "benylin" at 5d. an ounce in Scotland. Prescriptions are then made up by chemists from "broken bulk."

I am not campaigning for a reduction in chemists' remuneration, but probably I was struck with the ease with which the chemist could make 2s. 3d. simply by putting three-halfpennyworth of *lotio calaminae* into a bottle, while I, in order to make 5s., might be obliged to make three journeys into the country, give three injections, and fill in a form to immunize a child against diphtheria and pertussis. In spite of that slight intrusion of envy, I have great confidence in the chemists I deal with, and would be lost without them. At all times they are the very soul of discretion, and far be it from me to grudge them some "easy money."—I am, etc.,

Lanark.

THOMAS M. GLAISTER.

Medical Practices Committee Report

SIR,—I should like to draw attention to some of the statements in the fourth report of the Medical Practices Committee (summarized in the *Supplement*, March 21, p. 74). The report states that in the United Kingdom and Northern Ireland prior to July, 1948, there were believed to be approximately 2,100 whole-time assistants. In its first report (*Supplement*, 1949, 2, 128), the Medical Practices Committee stated that the number of assistants on July 5, 1948, was 562.

The latest report states that the number of assistants on November 1, 1952, was 1,566. This was the number of whole-time assistants, other than trainees, in England and Wales only. The total of whole-time assistants in the United Kingdom and Northern Ireland is approximately 2,400.

The report states that in the past eighteen months 344 assistants were taken into partnership. This shows that less than 15% of assistants are taken into partnership annually and bears out the contention that assistants are encountering very serious delay before becoming established as principals. The Unestablished Practitioners Group considers that this delay is one of the most serious problems facing those seeking entry into practice. It is a problem which the Medical Practices Committee has obviously failed to comprehend and for which a solution has yet to be found.—I am, etc.,

B. LANGLEY,
Secretary,

London, N.W.6. Unestablished Practitioners Group.

POINTS FROM LETTERS

Saturday Night Surgery

Dr. G. J. GRAINGER (London, S.W.4.) writes: I can answer Dr. R. S. Thubron's letter (*Supplement*, March 14, p. 72) from my own experiences. I gave up my Saturday evening surgery in April, 1950, because I grew tired of doing little other than signing final "panel" certificates for patients who should have attended on Saturday morning anyway. Very few patients have been inconvenienced by this, and to those who have I stress the fact that this is not an extra half-day for me, and that I am available for emergencies of any kind, if required.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

Association Notices

Diary of Central Meetings

APRIL

- 8 Wed. G.M.S. Subcommittee to Prepare Evidence for the C.H.S.C.'s Committee on General Practice, 2 p.m.
9 Thurs. Central Consultants and Specialists Committee, 1.30 p.m.
14 Tues. Registrars Executive Committee, 2 p.m.
15 Wed. Occupational Health Committee, 11 a.m.
15 Wed. Psychological Medicine Group Committee, 2 p.m.
16 Thurs. G.M.S. Committee, 10.30 a.m.
17 Fri. Public Health Committee, 2 p.m.
20 Mon. Armed Forces Committee, 2 p.m.
21 Tues. Grants Subcommittee, Organization Committee, 2 p.m.
23 Thurs. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.

MAY

- 1 Fri. Registrars Group Council, 2 p.m.
5 Tues. Special Conference of Representatives of Local Medical Committees, 10.30 a.m.
5 Tues. Extraordinary General Meeting, 2.30 p.m.
12 Tues. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.
20 Wed. Conference of Honorary Secretaries, 10.45 a.m.

Branch and Division Meetings to be Held

CITY DIVISION.—At Hackney Hospital, London, E., Tuesday, April 7, 8 p.m., clinical evening.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, April 9, 7.30 p.m., dinner: 8.45 p.m., meeting, address by the Reverend Leslie D. Weatherhead (Minister of the City Temple, London): "Faith Healing." Members are invited to bring along, as their personal guests, members of the clergy.

HARROW DIVISION.—At Rayners Hotel, Rayners Lane, Tuesday, April 7, 8.30 p.m., clinical meeting. Address by (1) Dr. C. G. Barnes and Mr. K. S. Mullard: "Mitral Valvulotomy"; (2) Dr. H. J. V. Morton: "Recent Advances in Anaesthesia."

LEWISHAM DIVISION.—At Lewisham Hospital, S.E., Sunday, April 12, 10.30 a.m., clinical meeting.

MID-HERTS DIVISION.—At Ashwell House, Verulam Road, St. Albans, Wednesday, April 8, 8.30 p.m., meeting. Annual B.M.A. Lecture by Dr. Charles Hill, M.P. Members' wives and dental practitioners and their wives are invited.

SALISBURY DIVISION.—At Salisbury General Infirmary, Tuesday, April 7, 8.15 p.m., meeting. Mr. E. J. Dalling: "The Dental Aspects of Plastic Surgery." All dental practitioners in the area of the Division are invited.

SHROPSHIRE AND MID-WALES BRANCH.—At Royal Salop Infirmary, Shrewsbury, Tuesday, April 7, 8.30 p.m., meeting of clinical and pathological section of Branch. Lecture by Dr. A. T. M. Myres and his colleagues, and Mr. E. G. Dolton: "Some Aspects of the Treatment of Tuberculosis."

SOUTH-EAST ESSEX DIVISION.—Wednesday afternoon, April 8, visit to Messrs. May and Baker, Dagenham

TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Bow, E., Friday and Saturday, April 10 and 11, week-end postgraduate course. Friday, 8 to 10 p.m., Mr. D. F. Ellison Nash: "Diseases of the Thyroid"; Dr. D. W. G. Smith: "Medical Cases. Saturday, 2 to 5 p.m., Mr. J. H. Carver: "Urological Problems in General Practice"; Dr. J. A. Scott: "Public Health and the General Practitioner"; 8 to 10 p.m., Dr. W. R. Bett: "Medical Bibliography and Writing of Scientific Articles"; Dr. J. A. Robertson: "Coronary Thrombosis."

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Wednesday, April 8, 8.30 p.m., meeting. Dr. John Freeman: "The Place of the Laboratory in Clinical Medicine."

WEST BROMWICH AND SMETHWICK DIVISION.—At "The Red Cow," High Street, Smethwick, Friday, April 10, 8 p.m., dinner and dance.

WESTMINSTER AND HOLBORN DIVISION.—Thursday, April 9, (1) at Westminster Arms Hotel, Page Street, S.W., 7 for 7.30 p.m., dinner meeting; (2) at Meyerstein Lecture Theatre, Westminster Medical School, Horseferry Road, S.W., 8.45 p.m., lecture: "Facilities Available for Early Diagnosis and Treatment of Cancer"; film: "Early Diagnosis of Carcinoma of the Larynx." Speakers, Mr. A. J. Gardham and Professor B. W. Windeyer. Guests and members from neighbouring Divisions are invited.

WINCHESTER DIVISION.—At Abbey House, Winchester, Saturday, April 11, 3 p.m., meeting. Winchester Address for 1953 by Dr. H. Guy Dain: "John Citizen and His Doctor. Where do we go from here?" To be delivered before an invited audience.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 11 1953

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THE EXTRAORDINARY GENERAL MEETING

THE CONSTITUTIONAL POSITION

At its last meeting on March 18 the Council of the B.M.A. had on its agenda a requisition signed by more than 100 members of the Association to convene an Extraordinary General Meeting for the purpose of considering and, if thought fit, passing the following resolution:

That the Association being concerned by the modification of the present method of remuneration by capitation fees agreed in the Working Party's Report requires the Council forthwith to approach the Minister of Health with proposals for the better protection (financial and otherwise) of the small-list doctor and of the doctor newly seeking entry into practice, and requests the Minister of Health not to implement the Working Party's report until the scheme for distribution of remuneration has been considered in the light of such proposals, and meanwhile to continue the present method of payment.

The requisition was deposited at the head office of the Association on March 6. Under the terms of Article 24 of the *Memorandum and Articles of Association and By-Laws of the British Medical Association* the Council has called an Extraordinary General Meeting of the Association for May 5 (*Supplement*, March 21, p. 76). The names of 159 signatories to the requisition are set out in the *Supplement to the Journal* of March 28, at page 92.

B.M.A. a Company

Article 24 in the *Memorandum and Articles of Association and By-Laws of the British Medical Association* is as follows: "The Council may whenever it thinks fit and (without prejudice to the provisions of the Companies Act, 1948) it shall upon a requisition made in writing as herein-after provided by any one hundred or more Members convene an Extraordinary General Meeting."

The British Medical Association is a limited company (allowed to dispense with the description "limited" in its title), and must fulfil the requirements of the Companies Act of 1948.

The Business of a General Meeting

The *B.M.A. Year Book*, 1952-3 (p. 77), contains the following: "Certain business of the Association must, in accordance with company law, be performed by the General Meeting, but it is the deliberate policy of the Association to reduce the duties of the General Meeting to the least amount compatible with the law, and to place as much as possible of the responsible deliberative work of the Association on the Representative Body. The business transacted by

General Meeting is: (1) Alteration of Memorandum or of Articles, when necessary. (2) Consideration of the income and expenditure account and of the balance-sheet. (3) Appointment of auditors and fixing their remuneration. (4) Reception and discussion of scientific matters. General Meetings are open to every member of the Association.

"An Annual General Meeting is held once in every year, usually at the time of the Annual Representative Meeting. Extraordinary General Meetings may be convened at any time by the Council, or on the requisition of 100 or more members, but only for the transaction of the above-mentioned business."

Revision of Articles

The restriction placed on the business that can be considered at an Extraordinary General Meeting, as recorded in the *Year Book*, is based upon Articles and By-laws which are now out of date, and the *Year Book* has not yet been revised. In 1949 the Council reviewed the Articles and By-laws to bring them into conformity with the provisions of the Companies Act of 1948. This Act does not restrict the objects for which an Extraordinary General Meeting may be held. Therefore in the revised Articles of the Association published in 1951 the restriction formerly included in Article 24 that the business of an Extraordinary General Meeting shall be confined to "any such business as . . . is required to be transacted at a General Meeting" is removed. However, provided that it fulfils the requirements of company law and holds general meetings for the purpose of conducting such company business as the Companies Act requires, the Association may arrange the conduct of its other affairs as it sees fit. It sees fit to vest the general control and direction of its policy and affairs in the Representative Body.

Article 37

This vesting of the general control and direction of policy and affairs in the Representative Body is governed by Article 37, which is as follows: "Subject to the provisions of any Statute, the general control and direction of the policy and affairs of the Association shall be vested in a body of representatives styled 'the Representative Body' and composed of (1) the Chairman and the immediate Past-Chairman of the Representative Body *ex officio*, (2) the Members of the Council for the time being in office or elected to take office, and (3) Members of the Association elected in the manner prescribed by the By-laws by the Divisions and by such other groups or classes of Members (if any) as may from time to time be so prescribed."

R.B. versus General Meeting

The reasons which earlier on made the Association decide the way in which it should apportion its business between the General and Representative Meetings are clearly indicated in the older *Annual Handbooks* of the Association, which, under the heading "General Meetings," contained the following paragraph: "Certain business of the Association must, in accordance with company law, be performed by the General Meeting, but it has been the deliberate policy of the Association, ever since its reorganization in 1902, to reduce the duties of the General Meeting to the least amount compatible with the law, and to place as much as possible of the responsible deliberative work of the Association on the Representative Body. The reasons for this are that the General Meeting, in the nature of the case, is an unrepresentative body, composed to a large extent of members of the Association resident in the district in which the Meeting is held, and that there can be no continuity of policy in such a body, as it cannot be governed by the same sense of homogeneity and of responsibility as has grown up in the Representative Body."

Counsel's Opinion

The object of calling the Extraordinary General Meeting on May 5 next as stated by the signatories to the requisition is to consider a resolution which relates to the general control and direction of the policy and affairs of the Association—control of which, under Article 37, is vested in the Representative Body. Furthermore, the resolution to be placed before the Extraordinary General Meeting seeks to reverse a decision of the Representative Body at Dublin in 1952. The question arises, therefore, whether a decision of a general meeting of the Association can override and reverse a decision of the Representative Body.

On the advice of the solicitors to the Association, counsel's opinion was obtained whether, in view of the terms of Article 37, it would be competent for a General Meeting to pass a resolution on a medico-political matter of the kind set out in the object for requisitioning the Extraordinary General Meeting, and whether such a matter was not one exclusively for the Representative Body. The opinion given was that under the terms of Article 24 the requisitioned Extraordinary General Meeting must be held, but that the resolution if passed at that meeting would be ineffective on the policy of the Association as decided by the Representative Body. Under Article 37 the Representative Body, said counsel, had reserved to it the rights and powers of decision in a matter of this nature.

To sum up: Under the Companies Act and the Articles of the Association an Extraordinary General Meeting can be called for any object by the Council or by requisition of more than 100 members of the B.M.A. But the Articles of the Association confer upon the Representative Body the rights and powers to decide matters concerned with the general control and direction of the policy and affairs of the Association. Therefore, although it is constitutionally in order to call an Extraordinary General Meeting, if the object of calling the meeting is to do with a matter which encroaches upon the jurisdiction of the Representative Body any resolution passed in connexion with this object would be ineffective and would not become a decision of the Association.

Conduct of Meeting

A General Meeting of the Association is open to all members to attend. The President of the Association, if present, shall preside as chairman at the opening of every General Meeting. In the absence of the President, the Chairman of the Council shall preside, and in his absence a chairman shall be appointed by the Meeting.

Article 33 states: "Except as hereinafter provided, no business shall be transacted in any General Meeting unless there be present a quorum of not less than 100 Members. If within one hour from the time appointed for the Meeting such quorum be not present, the Meeting, if convened upon

the requisition of Members, shall be dissolved. In any other case it shall stand adjourned to the same day in the following week, at the same time and place, and if at such adjourned Meeting a quorum be not present, those present shall be deemed to be a quorum."

The chairman of any General Meeting may, with the consent of the meeting, adjourn any business from time to time and from place to place, but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place.

Unless a poll is demanded by at least five members the chairman has power to decide whether a motion has been lost or carried. All resolutions of a General Meeting of the Association and of the Representative Body must be considered by the Council within one month after the date on which the resolution is passed. The Council has its next meeting on May 6.

Additional Information

No expense, other than incidental administrative costs, falls upon the Association in connexion with the holding of an Extraordinary General Meeting. Members attending pay their own expenses.

The last Extraordinary General Meeting which was requisitioned was in 1897. This was before the present constitution—including the Representative Body—became effective in 1903. The meeting in 1897 was called for the purpose of making an alteration in the Articles. The alteration was not made.

CHARGES AGAINST RUSSIAN DOCTORS

The following statement was issued by the Council of the World Medical Association in Lisbon on March 27 and is commented on in a leading article on page 824.

Because of requests from various sources, because of the nature and form of the accusations recently levelled against certain Russian doctors, and because of the international publicity given to them by Soviet news agencies and radio broadcasts, the World Medical Association, representing 700,000 doctors throughout the world, feels compelled to issue a statement.

The charges include accusations of attempts by doctors against the lives of their patients, and of other actions which violate the traditions and ethics of medicine.

These charges may have the effect of shaking the faith of patients in their doctors, who for centuries have adhered to the principles of the Hippocratic oath, recently reformulated in the Declaration of Geneva and the Code of Ethics drawn up by the World Medical Association. The normal practice of medicine would become impossible if doctors were to be too easily accused or condemned in the event of diagnostic or therapeutic failure or the death of their patients.

Accordingly the World Medical Association, on behalf of practising doctors throughout the world, urges that in this or any similar future case the matter should be investigated with the sole purpose of establishing the truth and of preventing the condemnation of any doctor without recourse to proper judicial procedure.

**GENERAL MEDICAL SERVICES
AMENDMENT REGULATIONS TO IMPLEMENT
WORKING PARTY'S REPORT**

Amendment Regulations to implement the recommendations of the Report of the Working Party on the remuneration of General Practitioners and the new Distribution Scheme came into operation on April 1. A copy of the regulations with an explanatory note (E.C.L. 16/53) has been sent to all executive councils.

**PROPOSED TOUR OF DENMARK BY
SCOTTISH DOCTORS**

The invitation received by the Scottish Committee from the Danish Society for a party of Scottish doctors to tour Denmark in September, 1953, has brought a good response. Full details of the provisional programme for the visit were given in the *Supplement* (March 21, p. 78).

It is proposed that the tour shall extend from September 1 to 14, and the programme arranged by the Danish Society in co-operation with the Danish Medical Association will include visits to hospitals, universities, medical institutes, etc., as well as sightseeing excursions. The cost of the tour will be approximately £31, including third-class travel Newcastle-Copenhagen-Newcastle and the stay in Denmark. All travelling expenses in Denmark will be met by the Danish Society.

Doctors in Scotland who are interested in this tour of Denmark are asked to communicate with the Scottish Secretary, British Medical Association, 7, Drumsheugh Gardens, Edinburgh, 3, without delay.

Notes and News

Carlisle Medical Bureau.—A telephone message centre, similar to the one in operation in Glasgow, opened in Carlisle on April 1. The scheme has been made possible by the City Fire Service and Ambulance Committee allowing the medical bureau the use of the fire and ambulance control. The local medical committee describes the bureau as a practical example of an improvement in the National Health Service made possible by the co-operation of the local health authority and general practitioners. The small administrative cost will be borne by the two specialists and 27 general practitioners resident in Carlisle who have joined the scheme.

A Question of Preference.—Our attention has been called to a newspaper advertisement which offers for sale a residence in North Wales with "4 acres of land and hay optional. Suit sheep, poultry, pigs, or surgery."

The Heart of the Matter.—A doctor recently received a telephone call from a young man who explained that three days previously he had given a lift as far as the surgery to a girl called "June" with a sprained ankle. Unfortunately, in the excitement of the first meeting he had forgotten to ask her name and address, and as he wanted to make a date with her could the doctor please let him have these very necessary details?

Correspondence**Hospital Costing Returns**

SIR,—The recently published *Hospital Costing Returns* (*Supplement*, March 21, p. 78) show a somewhat striking disparity in the cost per week of maintaining a patient in different regions. That this should be so is not surprising when it is realized that no arrangement has yet been made to distribute the money available for hospitals on a *per capita* basis. This would presumably entail the definition of catchment areas for each group of hospitals, which would receive an annual allocation of money related to the population served, with the necessary adjustments to meet the particular circumstances of teaching hospitals, regional special centres, and so on.

It is perhaps too early since the inception of the National Health Service to expect that markedly different standards amongst provincial hospitals, in buildings, equipment, and staffing, have yet been evened out to allow distribution of money on a *per capita* basis at this stage. But, as the figures given in the costing returns are average figures for

entire regions, there is some justification for the assumption that the national resources are not being equally distributed. It would therefore appear reasonable that some active steps should be taken to ensure a more even distribution of the money available. Early consideration of the possibility of there being ultimately distribution on a *per capita* basis might at least prevent further hospital development in areas already receiving an unfair share of the national resources.—I am, etc.,

Eastbourne.

I. M. BROWN.

Prescribing in the N.H.S.

SIR,—The size of the national drug bill should concern us all as taxpayers, apart from the fact that we might prefer to see the money spent on other aspects of the Service. Is it possible that the lower cost in Scotland is due to the Scottish doctor being allowed a stock of drugs and dressings, while the English one has to prescribe separately for each case? For example, a patient needs 10 gr. of sodium barbitone at night. If a prescription is written, there is the dispensing fee, the "urgent" fee, and the cost of the container, besides the retailer's profit, so that the cost is a couple of shillings. The Scottish doctor, I presume, hands over the tablets, and the cost is a few pence.

Is there any reason why drugs normally used personally by a doctor should not be supplied direct to him at wholesale cost? This is already done in the case of diphtheria prophylactic and calf lymph, and it might be interesting to have the comparative cost of supplying these and other vaccines. I imagine it works out much more cheaply, and that there would be a great saving if things like penicillin were also supplied direct.

Most important of all, something really must be done about the *National Formulary*, which could be a time- and money-saving tool instead of a cause of intense irritation. For some amazing reason the titles are in pseudo-Latin and the alphabetical order in English. E (enema) is followed by G (guttae), then C (collyrium) and O (oculenta). It might have been arranged by Lewis Carroll, and minutes are wasted finding what one wants. In fact, Lewis Carroll might have considered it mildly funny that this latinity makes sulphaguanidine feminine, while sulphathiazole is neuter. Is it their glands perhaps? One has to be both an organic chemist and a classical scholar to appreciate the beauty of many of the new names for drugs. But as one is only a rather busy doctor, is it quite impossible for most things to be prescribed by short titles which can be remembered? Why cannot I prescribe tab. SG instead of sulphaguanidine; tab. K instead of acetonephenone (which I cannot even spell)? Give me a short title for each drug and I will happily abandon proprietaries.

Prescribing is a time-consuming part of our work. Could it not be someone's job to make it as simple as possible?—I am, etc.,

Ashted, Surrey.

W. EDWARDS.

Dental Anaesthetics

SIR,—As a general practitioner whose main interest is, and always has been, in anaesthetics, I have read with considerable care the letters of Mr. J. D. Manson (*Supplement*, February 28, p. 58) and Dr. Hugh Stewart (*Supplement*, March 28, p. 96).

There are, surely, two factors to be considered—the skill of the anaesthetist, and the personalities of the dental surgeon and the doctor. Of the first, the dentist must be the best judge, and the interests of his patient and himself are identical in this matter. The occasional anaesthetist is to be deprecated, as much in dentistry as in general surgery. Dr. Stewart's letter implies (or so I read him) that the only function of the dental anaesthetist is to render the patient unconscious. Nothing could be farther from the truth. One anaesthetist working with one dentist becomes a really competent team, complete understanding soon develops, and no word need be spoken even during extensive or difficult operations. Secondly, the personalities of

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even in the big cities, such as Glasgow and Birmingham, types of practice vary considerably. There should be no difficulty in splitting up the Divisions in such a way that each new Division contained some or all types of practice.

The Power of the R.B.

The power and efficiency of the Representative Body to govern the Association have been much impaired by the creation of the autonomous bodies, the heavy agenda of its meetings, its size, and lastly, but less important, the reduction in numbers of members of Council which it elects.

The G.M.S. Committee, the autonomous body with which I am concerned, stemmed from the former Insurance Acts Committee, and the success of the latter in the days of National Health Insurance encouraged the belief that autonomy, however paradoxical it might seem, would be equally successful under the conditions of the National Health Service. It was expected, and it certainly has happened, that on occasions decisions which could not wait for the Annual Representative Meeting would have to be taken quickly, and that the Conference of Local Medical Committees could act as satisfactorily as the Representative Body. In my opinion the analogy of the Insurance Acts Committee and the G.M.S. Committee is false, because practically all general practitioners, and 95% of the patients, are now in the N.H.S., whereas before the appointed day many doctors had no panel and less than 40% of the patients were insured.

The Representative Body has very little influence upon the composition of the G.M.S. Committee. Out of 56 members the Representative Body appoints only 10, including those who are *ex officio*. The rest are elected by grouped local medical committees, and the Committee has powers to co-opt. The G.M.S. Committee is, as mentioned before, the executive of the Conference of Local Medical Committees.

The Efficiency of the R.B.

Under present conditions one annual meeting of the Representative Body is not sufficient. The volume of business is too great for the agenda to be completed properly; frequently the end of these meetings is almost farcical, quite important matters being referred to Council after a most perfunctory debate with speeches limited to two or three minutes, or even after no debate at all. Motions are frequently withdrawn because movers think that a proper hearing is impossible. At least two meetings a year should be held, preferably three. Then the need for autonomous bodies would largely disappear, the usefulness of the representatives in the periphery would be enhanced, and Headquarters would be less remote. It should be noted that, unless there is a Special Representative Meeting or the Annual Meeting is held in the Dominions and the Representative Meeting in London, the vast majority of representatives never go near B.M.A. House in an official capacity.

The Representative Meetings are now very large, and, with the increasing membership of the Association, likely to become still larger. A reduction in size and, I believe, an increase in efficiency could be achieved in two ways. First, the present basis of one representative for each constituency and an additional one for each 100 members over 50 should be modified. This should be carried out *pari passu* with the splitting of the larger Divisions. In order to produce an effective reduction in numbers it would probably mean that there would have to be a bigger member-representative ratio for the Divisions in the big towns and cities than for those in the more sparsely populated areas in order that the present balance of the Representative Body should not be disturbed.

There is nothing undemocratic in this procedure; both Parliamentary and local government constituencies vary considerably in size, and those of towns and cities are usually larger than those of country districts. The same state of affairs exists in constituencies electing members of our own Council. The second suggestion is that, with the exception of the president, the president-elect, and the immediate past

president, only representatives should be eligible for election to the Council. This method would add an additional qualification, but would not interfere with the present method of distribution of seats.

Summary

To summarize—the prime task facing the Association is still the education and the creation of interest and enthusiasm in the periphery. The representatives are the people to do this. Their work will be much more effective if the Division is a comparatively small unit. At present the influence and prestige of Divisions are lessened because the Representative Body is no longer in complete control; it is too large and meets too infrequently for its all-important function of “governing” to be carried out. Rightly or wrongly, many members do not like the idea of autonomous bodies. The necessity for this autonomy would largely disappear if the Representative Body met more frequently. The basic organization of the Association is still perfectly sound and democratic; only minor adjustments are necessary or desirable.

In conclusion, I suggest that consolidation of our forces, whatever method be chosen, is not only of paramount importance but of considerable urgency. There is still a stern struggle in front of our profession, a struggle which will last a long time and the opening moves of which may not be far distant.

FLOOD RELIEF FUND

The Trustees of the Sir Charles Hastings Fund, who have been responsible for the administration of the Flood Relief Fund, feel that the many donors to the Fund will wish to know details of the assistance which has been given to those doctors who have suffered.

In response to the Chairman of Council's appeal the Trustees received gifts from individual doctors, grants from local medical committees, and a splendid donation of \$1,000 from the Canadian Medical Association. The total was £2,780. In addition the General Medical Services Defence Trust guaranteed £5,000, of which £1,500 was made available at once. The Trustees made initial and immediate grants to a number of doctors in the flood areas, and this prompt help was much appreciated. On the receipt of additional and detailed information, and as a result of the visits of two of the regional secretaries to the flood areas, the Trustees have reviewed every case and have given additional grants where necessary.

Twenty-two doctors have been helped. They include fifteen general-practitioner principals, two assistants in general practice, three consultants, one medical officer serving with the R.A.M.C., and one retired practitioner. The total amount spent is £4,070.

The Trustees wish to thank most sincerely all those who have assisted with gifts and offers of practical help, and also the honorary secretaries of Divisions and local medical committees for the information and advice given by them.

ASSESSMENT OF PART-TIME CONSULTANT SERVICES CLINICAL RESEARCH

In paragraph 5 of the *Terms and Conditions of Service of Hospital Medical Staff*, which describes the manner in which part-time consultant services shall be assessed and illustrates the kind of duties to be taken into account, there is no mention of clinical research.

The Management Side of Committee “B” of the Medical Whitley Council, however, has assured the Staff Side that where clinical research is included in the “duties attached to the post”—as distinct from research undertaken on the consultant's own initiative—the time involved should be taken into account in computing the consultant's services.

CORONATION DAY

ROAD TRAFFIC ARRANGEMENTS IN THE LONDON AREA

The attention of medical practitioners living or practising in London is drawn to the special arrangements which it is understood will operate on June 2.

The following area will be “restricted” from midnight on June 1 to approximately 7 p.m. on June 2:

North boundary: From Notting Hill Gate by Bayswater Road, Sussex Gardens, Marylebone Road, and Euston Road to St. Pancras Church.

East boundary: By Woburn Place, Southampton Row, Kingsway, Aldwych, Waterloo Bridge, Waterloo Road, and London Road to Elephant and Castle.

South boundary: By Newington Butts, Kennington Lane, Vauxhall Bridge, Grosvenor Road to Chelsea Bridge.

West boundary: By Chelsea Bridge Road, Sloane Street, King's Road, Sloane Avenue, Onslow Square, Exhibition Road, Kensington Road, Kensington Church Street to Notting Hill Gate.

Entry or return to this area, or circulation within it, will be limited to vehicles displaying one of the special wind-screen labels. Medical practitioners who may require during this period to enter, or circulate in, the area for professional purposes should apply for an “exempted services” wind-screen label as soon as possible to the Commissioner of screen label as soon as possible to the Commissioner of screen label of the Metropolis (Coronation Traffic Department), New Scotland Yard, London, S.W.1. Envelopes with applications should be marked “Windscreen Labels” in the top left-hand corner, and for reply should enclose a stamped addressed envelope at least 7½ in. by 5 in. It has been requested that applications should not be made by telephone or personal call.

Professional Business Only

In applying it is necessary to state clearly the professional purposes for which access to the restricted area is required. An “exempted services” windscreen label is unsuitable for those wishing to enter the area by car to view the procession. For this latter purpose a “spectator” label is essential. With the appropriate label there is also issued a detailed map of the arrangements. Those with “exempted services” labels will be able to cross the processional route at fixed places at certain periods. No vehicular traffic will be allowed on the route.

EXTRAORDINARY GENERAL MEETING

The Extraordinary General Meeting on May 5 will be concerned only with the resolution submitted by the requisitionists (*Supplement*, March 21, p. 76) and any amendments to this resolution which may be proposed.

Any individual member of the Association intending to be present at the meeting and wishing to move an amendment may send his amendment, if he so desires, to the Secretary of the Association before the date of the meeting. The amendment must be signed by himself as proposer and by another member (who will attend the meeting) as seconder. Any amendments received before May 5 will be included in the agenda paper which will be issued to those present at the meeting. It would be convenient if amendments were received by the Secretary not later than the morning of Saturday, April 25, so that they might be published in the *Supplement* of May 2 for the information of all concerned. These arrangements do not preclude the handing in of amendments during the course of the meeting.

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. Conrad Hunter-Smith (Canterbury) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

CIVIL SERVICE MEDICAL OFFICERS

The Civil Service Medical Officers' Joint Committee is continuing to press for a review of the remuneration of Civil Service Medical Officers, but no agreement has yet been reached with the Treasury as to the method of any such review.

Meantime it remains the policy of the Association to refuse advertisements, if offered, of vacant medical appointments in the Civil Service except those which are outside the scope of the report of the Howitt Committee and which carry remuneration at rates agreed with the Association.

MEDICAL WHITLEY COUNCIL COMMITTEE “C”

ASSISTANT MEDICAL OFFICER ARBITRATION

The claim put forward by the Staff Side of the Medical Whitley Council Committee “C” for an adjustment in the remuneration of assistant medical officers (*Supplement*, January 31, p. 32) will come before the Industrial Court for arbitration on Wednesday, May 13, at 10.30 a.m.

Correspondence

Extraordinary General Meeting

SIR,—On May 5 there will be held at B.M.A. House a meeting open to all members of the Association. What are the steps that have led to this unusual event? The B.M.A. is a company and is subject to the provisions of the Companies Act, and this meeting has been summoned formally on the requisition of more than 100 of its members who believe that a minority will be wronged by the new Distribution Scheme. It is pleasant to note that many of the signatories are not personally interested in the issue and are rather concerned to prevent an injustice for others.

It has been argued that such questions should be, and have been, settled by the Representative Meeting; but the R.M. is composed of doctors who represent, or purport to represent, the interests of majorities in the Divisions. As we all know, it is rare indeed for a majority of any Division to be present when its representatives are instructed. Thus the “representative” can usually do little more than make an intelligent guess at his constituents' wishes and may even give up the attempt and express his own views only. Now, if it is difficult for him correctly to express the wishes of the majority of those whom he represents, it is virtually impossible for him to voice the needs of minorities, and so at Representative Meetings their case is seldom heard.

The 1952 Meeting was no exception. A completely new and complex Distribution Scheme had been prepared in secret by the Working Party and approved by a conference of delegates from local medical committees, who had themselves a bare fortnight from the date of publication in which to consider the Scheme and ascertain the views of their constituents. This approval the representatives at Dublin were called upon to endorse. Both the Conference and the Dublin Meeting were warned incorrectly that alteration of the Scheme would jeopardize the implementation of the Danckwerts award. The Minister made it clear, too late, that this threat was false and at once a torrent of criticism of the Scheme was released, much of it well informed and constructive.

The astonishing fact emerged that the General Medical Services Committee, which had predigested the Scheme before the Conference, had no reliable figures from which to estimate its impact upon the earnings of the various groups of doctors. It appointed a subcommittee to investigate the criticisms; but the subcommittee consisted essentially of the same team which had helped to compose the

Scheme (the medical members of the Working Party), and it is not surprising that after five months it reported that it could find no evidence of imperfection, but that it still had no dependable figures. Only then, it appears, did Dr. W. J. Grant and others (*Supplement*, April 4, p. 133), convinced that minority interests were being trifled with, decide to avail themselves of the provisions of the Companies Act—provisions wisely created by Parliament for the protection of minorities in just such a case as this. They drew up a requisition and invited signatures to a resolution asking that the introduction of the new plan might be delayed and the present method of remuneration continued until there had been time to re-examine the minority interest in the light of actual figures. Within a few days the G.M.S. Committee announced its intention to begin a full investigation of the whole problem.

Upon the announcement of the Extraordinary General Meeting, the G.M.S. Committee called a Special Conference for the morning of the same day to reaffirm the approval of the Scheme which it had already given last summer and to receive a report in the general sense that an investigation is being held and that no action is needed in the meantime.

The normal Annual Meeting of the Conference will take place on June 17, and it is therefore impossible to justify the expenditure of more than £1,000 from trust funds in order to hold this Special Conference on May 5. Yet it is to be noted that the 300 delegates who approved the Scheme last summer will have their expenses paid for coming to London on the same day as the Extraordinary Meeting of the Association which has been summoned to criticize the plan.

Whatever may be the intrinsic rights and wrongs of the case, it is clear that this decision of the General Medical Services Committee to overshadow the Extraordinary General Meeting by holding a Special Conference on the same day has put the Committee completely in the wrong in the eyes of all impartial observers. It would, perhaps, be charitable to regard this ill-judged decision as a reaction of panic. In my view it is of a piece with the actions which led me to resign from the Committee last summer, and I regard it as the simple duty of every open-minded member of the Association to do his utmost to attend the Extraordinary General Meeting and see that the interests of minorities receive full and fair consideration.—I am, etc.,

Orpington.

A. C. E. BREACH.

SIR,—Although not connected in any way with the requisition for an Extraordinary General Meeting, I have considerable sympathy with the small-list practitioner. As a member of the Association's Finance Committee, however, I view with concern the unnecessary expenditure involved in calling such a meeting. Those who have read the Proceedings of Council (*Supplement*, March 28, p. 85) will have noted the statement by the solicitor to the effect that learned counsel have expressed the opinion that the resolution, if passed, would be ineffective for the reason that the Representative Body has reserved to itself the right of decision on matters of this nature. In such circumstances it would be a sheer waste of time and money to hold an extraordinary meeting.

A Special Conference of Local Medical Committees has been fixed for the morning of May 5, on the afternoon of which the Extraordinary General Meeting is scheduled to be held. The result of this will be that the latter meeting is likely to be attended *en masse* by the same delegates who endorsed the Working Party's Report, and the resolution will have as much chance of being carried as if it had been brought before the Conference itself. It is obvious, therefore, that the time, energy, and money of everybody concerned in these two meetings, as well as the funds of the Association, with which I am more particularly concerned at the moment, are about to be dissipated to no effectual purpose. I therefore appeal most strongly to the requisitionists to withdraw their requisition as quickly as possible.

Any practitioner presumably still retains the prerogative of making direct representations to the source of his remun-

eration, and if the small-list practitioners still consider, as I do, that they have an inherent and intrinsic legal right to as equally proportionate a share in the public moneys of the Central Pool as have their larger-list colleagues, without dependence on the charity of their brethren implicit in para. 19 of the Working Party's Report, the only thing to do is to go direct to the paymaster himself. The small-list practitioner is not likely to succeed in obtaining what he considers to be his rights until he explains his case, with facts and figures, to the Minister himself, and dispels any misconceptions which may be operating against him. It is plain that there is a difference of opinion between the small- and the large-list practitioner, and, as the matter is a financial one, independent arbitration ought to be sought.—I am, etc.,

Harrow.

J. B. WRATHALL ROWE.

SIR,—It is illogical for Dr. C. I. Schiff and three others (*Supplement*, April 4, p. 133) to object to a Conference of Local Medical Committees to be held on the same day as the Extraordinary General Meeting of the B.M.A. However well-named we may consider this meeting, it does, nevertheless, constitute an attempt by a minority to sabotage at the eleventh hour the Working Party's distribution scheme accepted so recently by the profession, and as such must be taken seriously. If the attempt should succeed the confusion and disruption which would ensue need no emphasis.

Partnerships made possible by the notional list are daily being arranged, and there can be few whose future plans are not based on the new distribution scheme. That the small-list practitioners are being badly advised is obvious. An essential first step in gaining support for their cause would have been to supply facts and figures as to the number of practitioners adversely affected and the degree to which they are suffering loss of income.

How many doctors are suffering *unavoidable* hardship? Alongside vague allegations of distress, the report of the Medical Practices Advisory Bureau in the same issue of the *Supplement* (p. 130) makes strange reading. Accounts are given of profitable partnerships going begging for lack of interested applicants. Can it be that it is now considered "degrading" even to be a junior partner, or is the prospect of hard work a deterrent? It appears likely that in many cases a small list with free time for other activities would be considered desirable, provided the loading of fees be adjusted to make it practicable.—I am, etc.,

London, E.2.

D. E. PEAKE.

SIR,—Although I am not in general practice I cannot refrain from commenting on the letter from Dr. Ivor Jones (*Supplement*, April 4, p. 133). Contrary to your correspondent's remark about an "overwhelming vote," I seem to have read a great number of highly critical letters from small-list men. Surely Dr. Jones does not believe that a minority should be ignored, and are there not two interpretations of the "unrepresentative opinion" which he seems to fear? That the alleged opinion of the majority is not representative of that of the minority appears to be shown by the calling of this Extraordinary General Meeting.—I am, etc.,

Radlett, Herts.

R. S. MURLEY.

SIR,—I am disturbed by a letter which I have received from Dr. W. M. Knox, writing as Chairman of the Conference of Local Medical Committees. I fear that he has rather let his enthusiasm run away with him, for it amounts to a special plea to local medical committees and their constituents to pack the Extraordinary General Meeting called for the afternoon of May 5 in order to defeat the object of those who called it.

I know nothing of those who requisitioned the Extraordinary General Meeting, except that they are B.M.A. members, and nothing about the rights or wrongs of their case. On the face of things, however, it appears that, hearing nothing of any efforts on their behalf on the part of the rider committee of the G.M.S. Committee, and fearing

that after April 1 they would be even worse off financially than they already were, they exercised their democratic rights as members of the B.M.A. in order to bring their plight to the notice of the Association.

At the Special Conference of June 26, 1952, the Working Party's report was approved almost unanimously after the addition of an important rider. The rider dealt with the case of the small-list men, and the report, with this addition, was approved, I think, because we all understood that nobody would be worse off because of it. This was what I understood at least. It is as certain as anything can be, I suppose, that on May 5 the Special Conference will reaffirm its approval of the Working Party's report and its rider, and if it is true that counsel has said that no resolution at the Extraordinary General Meeting on the same day can have any effect—why all these efforts to crush the minority who have called it? It is rather like employing a steam hammer to crush a gnat, and offends against one's sense of fair play.

If our position is a just one, then we have nothing to fear, and should be willing to do justice to this group and to those—if any—they represent. What is more important, it should be apparent to all that justice is being done, and that we are playing fair.

Therefore I think it is singularly unfortunate that the G.M.S. Committee should have called its Conference for the morning of May 5, and even more unfortunate that Dr. Knox—who as Chairman of the Conference ought to remain impartial—should have written his letter to the chairmen of local medical committees, for those two things will almost certainly be construed as an attempt on the part of the G.M.S. Committee to pack a General Meeting of the Association and prevent their case from being put by those who requisitioned it.—I am, etc.,

A. VICTOR RUSSELL,

Chairman,

Wolverhampton Local Medical Committee.

SIR,—As secretary of the Unestablished Practitioners Group Committee I am authorized by my committee to make known its views on the recent developments which closely affect unestablished practitioners. These views may be summarized as follows.

(1) The Working Party's recommendations will not solve the related problems of remuneration of general practitioners, entry into practice, and the assistantship system. We think that this view will be proved correct in the course of time. (2) Unorthodox methods, such as the calling of an Extraordinary General Meeting of the British Medical Association, should not be necessary to change the Working Party's recommendations. Changes should be brought about through the recognized machinery. (3) Nevertheless, it is justifiable to use any legal method in an attempt to correct the unfortunate error arising from the Working Party's recommendations—that some single-handed practitioners receive a smaller average capitation fee (and hence income) under the new distribution scheme than under the old one. This contradicts the terms of reference, and presumably the intention, of the Working Party. (4) The antagonisms in the profession should be reduced by immediately correcting this error so that no single-handed practitioner would receive an average capitation fee smaller than the present one—i.e., 20s. 3d. (5) If the Extraordinary General Meeting should lead to the continuation for all single-handed practitioners of an average capitation fee of not less than 20s. 3d. the "requisitionists" would have rendered the profession a great service. But changes in the Working Party's recommendations (as distinct from correcting the unfortunate error) should be brought about through the recognized machinery after the findings of the Ministerial investigation into the earnings of small-list of the General Medical Services Committee are known. (6) The General Medical Services Committee should not have called a Special Conference of Local Medical Committees for the morning of May 5, since the Extraordinary General Meeting of the British Medical Association is to be held in the afternoon of the same day. Supporters of the G.M.S. Committee (with expenses paid) present at the morning meeting will thus be available to attend the afternoon meeting. This will thus be available to attend the Extraordinary General Meeting and so increase the strength of the extremists on both sides, to the detriment of reason and compromise. (7) The partial autonomy of the G.M.S. Committee is a cause of recurrent disharmony; yet complete control by the B.M.A. is clearly not a

satisfactory solution for general practitioners who are not members of the B.M.A. The only satisfactory solution for all is for the G.M.S. Committee to become fully autonomous so that it can be free to represent all general practitioners not only officially and democratically, but also harmoniously.

As regards the immediate disharmony, the Unestablished Practitioners Group Committee hopes that the supporters of the G.M.S. Committee and the "requisitionists" will agree to a compromise. This should be the continuation of an average capitation fee of not less than 20s. 3d. for all single-handed practitioners; no delay in starting the new scheme; and reconsideration of the latter after the findings of the Ministerial inquiry are known.—I am, etc.,

London, N.W.6.

B. LANGLEY.

The Constitution of the B.M.A.

SIR,—The Winchester Division of the B.M.A. is to be congratulated on its enterprise in having circulated its memorandum on the Representative Body of the Association. It is to be hoped that this will stimulate a critical examination of our present organization, which to many doctors, I am sure, appears to be failing to deal with the many urgent problems which have arisen since 1948. It does seem that the Winchester Division's suggestions for reorganization perpetuate the fundamental weakness of the present body, in that the Division fails to allow for the fact that representation of sectional interests will continue to promote conflicts which have been, and still are, against the best interests of everybody concerned. The majority of doctors are members of a team in a National Health organization, their interests are mutually interdependent, and from the financial aspect are governed by limits strictly imposed by the Treasury.

Failure to recognize this fact is only too evident in the report of the proceedings of the Council Meeting of March 18 (*Supplement*, March 28, p. 85). The requisition for an Extraordinary General Meeting is a symptom of a problem which is of the utmost importance to every doctor. The teaching hospitals are full, and every year 1,000 extra doctors are registered. The country is, in fact, over-doctored. The present interests of small-list doctors can only be satisfied by an increase in payment, which means that established practitioners' incomes must be reduced. In a few years' time there will be a further accumulation of under-privileged doctors, to whom the same remedy will, no doubt, be applied. Mr. Lawrence Abel, speaking in the Council, presumably had this solution in mind. The 600 registrars due to be "on the market" very soon will, when added to the small-list doctors, also receive his sympathetic blessing. Later in the meeting, speaking for the consultants, he did not suggest that these registrars might be given consultant status, if established consultants would agree to a reduction in income.

Surely, if sacrifices are to be made, then they should be made by everybody. This current example of procrastination by the Council is due to a failure to recognize and tackle basic problems, and, because of the system of sectional representation, to offer the now familiar solution of blatantly playing off the interests of one section of the profession against another.—I am, etc.,

Sittingbourne, Kent.

K. W. HARDY.

The Small-list Doctor

SIR,—Poor Dr. Gordon Ward (*Supplement*, April 4, p. 133)—he never had a private patient to subsidize the vast amount of "unpaid work." Sevenoaks is or was, I believe, a salubrious area. Now, at 68, he might suffer a loss of £100 a year. He could of course retire, draw his compensation, and make way for a young man who would have the health and strength to increase the list by hard work, much as I imagine Dr. Ward did many years ago.—I am, etc.,

Writtle, Essex.

J. TUDOR PEMBLETON.

Association Notices

COUNCIL OF THE B.M.A.

Election of 40 Members by Grouped Branches in the British Isles, of 2 Public Health Service Members, and of 1 Woman Member

The following have been elected unopposed for the session 1953-4:

North of England and Tees-side Branches:

J. C. Arthur, Gateshead.
Weldon P. T. Watts, Newcastle-upon-Tyne.
L. Dougal Callander, Doncaster.
W. E. Dornan, Sheffield.
Ian G. Innes, Hull.
F. M. Rose, Preston.

East Yorkshire and Yorkshire Branches:

North Lancashire and Westmorland Branch:

Divisions in Cheshire—Birkenhead and Wirral; Chester; Crewe; Hyde; Macclesfield and East Cheshire; Mid-Cheshire; Stockport; Wallasey:

Lancashire Divisions of Merseyside Branch—Liverpool; St. Helens; Southport; Warrington; Isle of Man Branch:

Lancashire Divisions of South Lancashire and East Cheshire Branch—Ashton-under-Lyne; Bolton; Bury; Leigh; Manchester; Oldham; Rochdale; Salford; Wigan:

Derbyshire, Nottinghamshire, Lincolnshire, and Leicester and Rutland Branches:

Midland Branch:

Staffordshire and Worcester and Hereford Branches:

Berks, Bucks, and Oxford and Northamptonshire Branches:

Cambs and Hunts, Norfolk, and Suffolk Branches:

Divisions of Metropolitan Counties Branch in Middlesex:

Marble Division:

Tower Hamlets, City, Stratford, and South-West Essex Divisions:

Kensington and Hammer-smith, Paddington, and Chelsea and Fulham Divisions:

Camberwell, Greenwich and Deptford, Lambeth and Southwark, Lewisham, Woolwich, and Wandsworth Divisions:

Hertfordshire, Essex, and Bedfordshire Branches:

Kent Branch:

Sussex Branch:

Southern and Dorset and West Hants Branches:

South-Western Branch:

North Wales and Shropshire and Mid-Wales Branches:

Aberdeen, Dundee, Northern Counties of Scotland, and Perth Branches:

Edinburgh and South-East of Scotland and Fife Branches:

Glasgow and West of Scotland Branch (Glasgow Division):

Glasgow and West of Scotland Branch (County Divisions):

Border Counties, and Stirling Branches:

Northern Ireland Branch:

The following candidates have been nominated:

Hampstead, St. Pancras, and Westminster and Holborn Divisions (one seat):
Surrey Branch (two seats):

J. A. Gorsky, S.W.1.
F. Gray, W.C.1.
L. A. Gibbons, Reigate.
T. W. Morgan, New Malden.
J. O. M. Rees, Guildford.
H. G. Dowler, Churchdown, Glos.

Bath, Bristol, and Somerset, Gloucestershire, and Wiltshire Branches (two seats):

H. M. Golding, Westbury-on-Trym.
J. R. Nicholson-Lailey, Taunton.
T. W. Davies, Swansea.
J. T. Rice Edwards, Newport, Mon.

South Wales and Monmouthshire Branch (one seat):

Voting papers will be issued to the members of these Groups on April 25, 1953.

Public Health Service

The following have been elected unopposed:
Kenneth Cowan (Chelmsford), *J. M. Gibson (Huddersfield). (*Since the last date for the receipt of nominations Dr. Gibson has resigned, and the vacancy thus created will be filled by the Chairman of the Representative Body under By-law 63(2). A further announcement will be made in due course.)

Woman Member

Annis Gillie, London, W.2, has been elected unopposed.
A. MACRAE, Secretary.

Diary of Central Meetings

APRIL

20 Mon. Adoption Committee, 10 a.m.
20 Mon. Armed Forces Committee, 2 p.m.
21 Tues. Grants Subcommittee, Organization Committee, 2 p.m.
22 Wed. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
22 Wed. Compensation and Superannuation Committee, 2 p.m.
23 Thurs. Journal Committee, 11 a.m.
23 Thurs. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.1), 2 p.m.
29 Wed. General Practice Review Committee, 11 a.m.

Branch and Division Meetings to be Held

BIRMINGHAM BRANCH.—At 154, Great Charles Street, Birmingham, Tuesday, April 21, 8.30 p.m., meeting. B.M.A. Lecture by Mr. Denis J. Browne: "The Early Diagnosis and Treatment of Congenital Deformities."
BROMLEY DIVISION.—At Royal Bell Hotel, Bromley, Tuesday, April 21, 8.45 p.m., meeting. Consideration of Annual Report of Council and election and instruction of representatives for A.R.M.
BURTON-ON-TRENT DIVISION.—At the General Infirmary, Burton, Tuesday, April 21, 8 p.m., meeting. Dr. G. Ramage: "The Atom Bomb and its Effects."
CITY DIVISION.—At B.M.A. House, Tavistock Square, W.C., Tuesday, April 21, 8.30 p.m., meeting. Scientific and medical films.
CROYDON DIVISION.—At Greyhound Hotel, High St., Croydon, Thursday, April 23, 7.30 for 8 p.m., jubilee dinner and dance.
EAST HERTS DIVISION.—At Haymeads Hospital, Bishop's Stortford, Thursday, April 23, 8 p.m., clinical meeting.
LINCOLN DIVISION.—At the Saracen's Head Hotel, Lincoln, Thursday, April 23, 7.30 for 8 p.m., seventh annual dinner.
MARLBOROUGH DIVISION.—At Medical Society of London, 11, Chandos Street, W., Thursday, April 23, 8.30 p.m., A.G.M.
NORTH WALES BRANCH.—At Wynnstay Hotel, Wrexham, Saturday, April 25, 3.30 p.m., meeting. Short papers by Dr. D. E. Meredith: "Constrictive Pericarditis"; Mr. O. V. Jones: "Current Trends in Obstetrics and Gynaecology"; Mr. J. Rowland Hughes: "Sprained Ankle."
OLDHAM DIVISION.—At Oldham Hotel, Monday, April 20, 9 p.m., meeting. Mr. D. Lloyd Griffiths: "Sciatica."
ROCHESTER, CHATHAM, AND GILLINGHAM DIVISION.—At St. Bartholomew's Hospital, Rochester, Thursday, April 23, 8.30 p.m., meeting. Film show. All medical practitioners in the area of the Division are invited.
SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Tuesday, April 21, 8.30 p.m., meeting of all medical practitioners in the area of the Division, followed by A.G.M.
SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, April 24, 9 p.m., clinical meeting. Symposium: "Some Aspects of Renal Failure."
STRAFORD DIVISION.—Thursday, April 23, 1.45 p.m., combined meeting of the Stratford Division and Ilford Medical Society. Visit to Ford Motor Works, Dagenham.
TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Wednesday, April 22, 8.30 p.m., annual general meeting.

SUPPLEMENT TO THE
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THE JUBILEE OF THE REPRESENTATIVE MEETING

BY

ALFRED COX, O.B.E., Hon. M.A. Durham
Hon. LL.D. Manitoba, M.B., B.S.

Fifty years ago there was a revolution in the constitution of the B.M.A. It was on July 9, 1902, that the new Articles which embodied the result of the revolution came into force. But the most striking manifestation of the change was not seen until July 28, 1903, when the first Annual Representative Meeting was held at Swansea. This seems to me an obvious event for celebration, and I propose to try to recall the memory of what to my generation was a very stirring time and an epoch in the Association's history.

Growing Despair

To appreciate fully its significance it is necessary to recall the history of the Association during the closing years of the century. Anyone reading our *Journal* of those years could not fail to be struck by the growing despair, resentment, and even desperation of a large section of our profession caused by the shocking abuses of contract medical practice, and the indifference or helplessness of the ruling body of the Association—its Council. It must seem almost incredible to those only knowing the Association as it now is, but I have no hesitation in saying that few of those suffering these grievances believed that any help could come from the Association. Anybody having any doubt as to the reality of the grievances should read the classic Report on Contract Practice in the *Journal* of July 22, 1905. There were few numbers of the *Journal* in the years 1895 to 1900 which did not contain some protests in the correspondence columns against official inaction.

The *Lancet*, more alive to the situation, employed a special commissioner, who visited many parts of the country in which the abuse was most acute, and his reports were reprinted in two volumes entitled *The Battle of the Clubs*.

Why did the Association take no action? The real reason was that it was unable to do anything effective because under its constitution it had no means of voicing the opinion either of the profession as a whole or even of its own members, and no machinery by which it could have organized effective resistance.

At this period it was possible to be a member of the Association without being a member of a Branch, and Divisions had not been thought of. The subscription to the Association was a guinea a year, and to become a member

of a Branch involved special election and an annual payment of 5s. The Branches elected the members of Council, which was the Association's only policy-making and executive organ. Forty per cent. of the members of the Association were unattached to any Branch. It was true that the unattached member could attend the Annual General Meeting and could raise any question relevant to the Report of Council, but the Council held that it was not bound by any resolution of such a meeting, and indeed it would have been absurd if it had been so bound by a meeting the composition of which largely depended on the area in which it was held. In these circumstances it was not surprising that the men suffering from grievances and seeing no prospect of help from the B.M.A. began to look elsewhere. Local societies devoted to medical politics and ethics sprang up in many areas, chiefly industrial, and in the *British Medical Journal* of September 16, 1899, there appeared a letter which became of historical importance. It was signed by Samuel Crawshaw, of Ashton-under-Lyne, acting on behalf of the Manchester Medical Guild. It announced the holding of a Conference of "delegates from all associations of general practitioners in England and Wales." It proposed that this Conference should elect an executive to carry out its wishes, and went on, "The various medical papers contain abundant evidence of the evils under which the general practitioner suffers. It is absolutely necessary that we stand together to resist aggression effectually." There was no suggestion that the B.M.A. would serve the purpose, and in reply to a suggestion that it was a mistake to multiply organizations Dr. Crawshaw said that the Guild had discussed this point and "came to the conclusion that it would be a very long business, if it ever succeeded, to get the B.M.A. to take up these questions. They wanted something complementary to the B.M.A."

The Conference of 1900

The Conference was held in Manchester on May 1-3, 1900. There were present 35 delegates from local associations, 5 from Branches of the B.M.A., and Dr. Samuel Woodcock from the Council of the Association. Papers on various medico-political and ethical subjects were read and discussed on the first two days, but the vital issue of organization came up on the third day and was hotly debated. Dr. Crawshaw proposed that a confederation of local medical societies formed for medico-political and ethical purposes should be set up "with an executive council elected by an annual meeting of delegates." In the discussion that followed there was much criticism of the B.M.A. even by prominent members of it, including Mr. (later Sir) Victor Horsley. It

is a source of pride to me that on behalf of the Gateshead Medical Society, of which I was a founder and honorary secretary, I succeeded in carrying an amendment to the effect that, for reasons given, "an attempt should be made to capture the B.M.A." This was carried eventually by a good majority. It is not without its ironic aspect that Smith Whitaker, of Great Yarmouth, who became the first Medical Secretary of the B.M.A., opposed me, saying that "he could not hope that the Association would ever reform itself." The minority did not conceal their belief that the appeal to the B.M.A. would fail, and in appointing a committee to approach the Council it was agreed that we might approach other bodies and the *Lancet* if the B.M.A. failed to respond. It is, I think, due to the *Lancet* to put on record a fact that I believe has never been published before. A few of us did unofficially sound Dr. (later Sir) Squire Sprigge, then Editor, who strongly advised us to concentrate on converting the B.M.A., which already had a national organization, whereas the *Lancet*, though very sympathetic, had none. We could come back again, he said, if we failed with the B.M.A.

But we did not fail. On the contrary, when our committee met the Council at the Ipswich Annual Meeting in July, 1900, we were received with cordiality. Our case was put by Victor Horsley, who, though never a general practitioner, had been chosen by the Manchester Conference to lead our deputation, composed, with the exception of himself, entirely of general practitioners. The way had been made easier for him because since the Conference the Council, feeling that something must be done, had brought forward a scheme of reform which strengthened the influence of the Branches but did nothing to enfranchise the "unattached" members or to make the voice of the members effective in the Annual General Meeting. This scheme had been very decisively turned down at a Special General Meeting on July 18, 1900, and the Council was in a chastened mood. It welcomed Horsley's proposal that the Council should appoint a Committee to report on the best means of reorganizing the Association, to report not later than March 1, 1901. The Constitution Committee of 24 was thoroughly representative, half being appointed by the Council and half by the Annual General Meeting, in which on this occasion we took pains to secure that there should be a considerable number of our supporters. I shall not enter into much detail about either the personnel or the findings of the Constitution Committee, for this was most thoroughly done by Dr. J. C. McVail, a member of it, in articles which appeared in the *booklet* now not easy to come by, but which is in the B.M.A. Library. To my memory is greatly indebted. It is, however, due to the memory of several fine characters them briefly. There were Mr. (later Sir) Henry Butlin, later Treasurer of the Association and President in 1910; Professor Robert Saundby, of Birmingham, later Chairman of Council and President in 1911; T. Jenner Verrall, first chair-Representative Body, 1913-15, also chairman of the Medical War Committee, 1914-18, and knighted for his service; a high official in the National Health Insurance Commission, partly because he was a very popular man and partly because he confessed he was totally ignorant both of medical politics and of the constitution of the B.M.A., but "was willing to learn." There is no doubt he had a great deal to do with the enthusiastic reception of our Report at Cheltenham in 1901.

I have had a long experience of committees in my time, but I remember none which worked more rapidly, more efficiently, or more pleasantly. We had on the Committee several senior members of the Council with conservative views, but to a man we worked together, ready to compromise when it was really necessary, but determined to produce a constitution which would put new life into the Association. In the event its report was adopted almost

without alteration, and the suggested constitution still stands unaltered in its main principles. Moreover, it was so framed that it has been found easy to incorporate in it the changes inevitable in a steadily growing and increasingly active body.

Horsley and Smith Whitaker

The main reason which has impelled me—the only survivor of the Committee—to write this account is to do what I can to honour the memory of the two men who took by far the lion's share in making our constitution what it is. They were Horsley and Smith Whitaker. Smith Whitaker was the man who came to the Committee with carefully thought out principles and the ability to state and uphold them. Horsley was the great motive force behind Smith Whitaker. The pair were irresistible. Horsley had an inter-axe to grind, and, though unpopular in certain quarters for his radicalism, his leadership was spontaneously accepted. Smith Whitaker was unknown outside Great Yarmouth, where he practised until he came to Manchester. There he made an instant impression as a thoughtful and constructive speaker. On the Constitution Committee he showed a positive genius as a draughtsman, and, as Mr. Owen said at the Cheltenham Annual Meeting, "Whitaker penned every line of the report." He had not been easy to persuade that the B.M.A. could be captured, but the appointment of the Constitution Committee convinced him that the way was open, and he threw himself heart and soul into the constructive work required. He was so obviously the man to first as Organizing Secretary, later as Medical Secretary, was inevitable.

My own opinion, looking back on this episode and linking it up with the history of the Association before and since, is that the work of Horsley and Smith Whitaker was of such importance that the Association owes them a debt of gratitude second only to that due to our Founder. This is a bold claim, but to show that I am not alone in my estimate of the outstanding importance of these men let me quote what Owen said of them in his brilliant speech when he presented the Report of the Committee at Cheltenham. Of Smith Whitaker he said, "In him we found an extraordinary man. He was splendid in debate; he knew the Articles and By-laws and Company Law, but he did not thrust his knowledge on the Committee. Whitaker was the sort of man of whom martyrs are made—he would willingly have gone to the stake for his principles. But Horsley would not have gone to the stake: with his extraordinary ability and dialectical skill he would have turned the tables on his accusers and would have had the mournful satisfaction of fixing them to the stake they had prepared for him." It is a pleasure to me to report that Dr. Donald Whitaker, a son of my old friend and chief, has been an active worker in the Guildford Division for many years and was for nine years a member of the Representative Body. He may well feel proud of his father's record.

Report of the Constitution Committee

Before our Report came before the Annual Meeting it had to run the gauntlet of the Branches, where it was generally approved. My readers will not be surprised to hear that so far as can be gathered from the reports of local meetings this epoch-making document did not succeed in attracting large audiences. But the Cheltenham Annual Meeting of 1901 gave it a hearty send-off and appointed a committee of 13 (of which I am again the only survivor) to translate the Report into Articles and By-laws—a stiff job in the *Journal* of May 24, 1902, and at an Extraordinary General Meeting held in the Exeter Hall, London, on June 18, 1902, the scheme was formally approved. But it was a near thing, for at the first of the two meetings required by a by-law a two-thirds majority was needed and the voting was 96 to 28. If the minority had been 33 . . . !

The scene once more returns to the periphery, where the Branches had to be split up into Divisions and, what was

of equal importance, men had to be found to act as secretaries for the new bodies. This was a very strenuous business, but enthusiasm for the new constitution was growing, as was the membership of the Association. A cheering sign came from the sceptical Crawshaw, who wrote to the *Journal*: "If the constitution is adopted I am convinced that the Association will enter upon a period of prosperity and usefulness such as it has never before enjoyed." The work at the periphery was greatly stimulated by the appointment of Smith Whitaker as Organizing Secretary in charge of the new Organization, Medico-Political, and Ethical Committees; and a significant sign of the times was the appearance of the first *Supplement* to the *Journal* of February 7, 1903, devoted to medico-political and cognate subjects.

In the *Supplement* of April 25, 1903, appeared the first notices of motions for the new Representative Meeting. There were two from the Council proposing small changes in the new By-laws; one from the Southern Branch proposing a new method of election of members; one from Edinburgh supported by Dundee for the establishment of a Scottish Committee. The Leinster Branch asked for improvements in the Irish Poor Law Medical Service. The Gateshead Division proposed (1) that the Medico-Political and Ethical Committees be instructed to prepare a report on contract practice, and (2) that the services of the Organizing Secretary be placed at the disposal of any Division needing help in local negotiations.

The Great Day

So we come to the great day when the new constitution was to be put to a crucial test, for both friends and opponents of the new order of things felt that it stood or fell by the success or failure of the new "Parliament of the profession." Would it spend its time in futile discussions leading nowhere? Would it get the Association to do something to satisfy the sorely tried and still sceptical industrial practitioners?

The great day was Tuesday, July 28, 1903, and the place was the King's Hall, Swansea. It is interesting to note that the date was a jubilee for Swansea, for the only previous Annual Meeting held there was in 1853. There were no indications that anything revolutionary was happening. The new Representative Meeting was not the "cynosure of all eyes." As a matter of fact it had to fit its sessions rather uncomfortably into the time-honoured Annual Meeting arrangements. But we were on the whole a young and enthusiastic body which felt it was taking part in a historic occasion. There were 133 of us. Mr. Andrew Clark, Chairman of Council, always a firm believer in the new era, took the chair temporarily. Dr. William Douglas, a handsome and eloquent Ulsterman representing Maidstone, Rochester, and Chatham, moved that Sir Victor Horsley be appointed Chairman, and I seconded. Horsley, always a stickler for strict order, said the meeting must first decide if he was eligible. The secretary of his Division (Marylebone) had informed him that he had been elected as one of its representatives but had failed to notify headquarters, so that his election could be valid only if carried by a two-thirds majority. A unanimous vote convinced him, and in taking the chair he said it was no exaggeration to say that his election was the highest honour the profession, most kind to him on many an occasion, had ever conferred on him. This was no exaggeration, as it came from a man not given to superlatives, and who always regarded the piloting of the new constitution as one of the great achievements of his life.

So far as I can ascertain there are only two or three surviving members beside myself who were present at that meeting. One of them is R. L. Langdon-Down, who represented Richmond. A. E. Larking, representing Folkestone, Dover, and Ashford, died last year. Larking was an enthusiastic worker for the Association before and after the change, first in Buckingham and later in Kent. Langdon-Down's record in the Association is a long and brilliant one, in the Representative Meeting, the Council, and on

many committees. I feel sure the Jubilee Meeting will wish to assure him that his pioneer work has not been forgotten.

We spent much time on the Standing Orders, over which the Organization Committee, under the chairmanship of Mr. Jenner Verrall, had worked very hard. The proposals for a Scottish Committee and for a Report on Contract Practice were carried with no opposition. A proposal of mine that the Association should sponsor candidates for the General Medical Council was opposed by Manchester, who thought it "might lead to cliquism and practically to holding an amateur election beforehand." It was eventually referred to the Medico-Political Committee for report. We turned down a request that the Press should be admitted (the modern craving for publicity had hardly begun). I suppose it was because of this that no report of our proceedings appeared in the *Lancet*, though it gave generous space to other sections of the Annual Meeting. Our *Journal*, of course, gave us a good report, and in its editorial comment said, "The first Representative Meeting may be pronounced a distinct success owing to the manner in which the members devoted themselves to business, and owing in a very large degree to the conspicuous ability with which Sir Victor Horsley conducted its proceedings." And in a later comment said, "All the representatives appeared to be fully conscious of the responsible nature of the duties they had undertaken; the attendance was good, the speeches for the most part short, and the whole tone businesslike." Referring to the long time taken over the Standing Orders the *Journal* said, "These seemed to work very well, and future meetings will probably be disposed to adopt them as they now stand." They seem to me to be remarkably little altered.

One of these Standing Orders in 1905 produced a humorous situation. It lays down that there shall be no smoking during the meeting. This was introduced by Blackburn and was carried by only a small majority after a heated discussion. Within an hour or so the suspension of this Standing Order was carried with great enthusiasm. I believe it still stands, but very insecurely.

These comments by our then editor, Dawson Williams, have all the more value as they came from one who had been doubtful about the new regime. His conversion was heartily welcomed by the "reformers," for Williams was a great force in the Association.

Creating a Precedent

The emphasis on the importance of a narrow time limit for speeches was largely due to Horsley, who, always with an eye on Parliamentary procedure, insisted that in this respect we should create our own precedent. I believe that nothing has more forcibly struck the Press and the occasional lay observer than the way in which speakers have shown that it is possible to combine information and brevity. The meeting has always been indulgent to speakers dealing with a subject of such importance that the time limit was obviously a hindrance to a proper discussion. But it has never had any use for the speaker who doesn't know his brief or who has nothing particular to say but feels he must say it.

I cannot find any record of a speech by Dr. Langdon-Down at that first meeting, but he tells me that, though somewhat awed by the atmosphere of the meeting, he did eventually venture timidly to say something. Dr. Larking made a vigorous speech supporting the action of the Council in making a grant to the Imperial Vaccination League, and he had the satisfaction of seeing the objectors heavily defeated.

Among the Representatives and Members of Council were several who afterwards held prominent positions in the Association. For example, Sir Hamilton Ballance, of Norwich, later Chairman of the meeting; T. W. H. Garstang, of Altrincham, later Chairman of the meeting; N. Bishop Harman, later Treasurer, Benefactor, and Gold Medallist; William Collier, President at Oxford in 1904; J. A. Mac-

donald, of Taunton, later Chairman of the meeting and of the Council, and a Gold Medallist; Jenner Verrall, of Brighton, later Chairman of the meeting and Gold Medallist; and Professor Robert Saundby, President at Birmingham in 1911.

I am not writing a history of the Representative Body. That, up to the year 1931, is succinctly dealt with in the *History of the British Medical Association*, published in 1932—a book which I am afraid is little known to the present generation but is invaluable to anyone interested in the evolution of the Association. We owe a great debt of gratitude to Mr. Muirhead Little, F.R.C.S., the author of it. Those who are interested in these reminiscences will find in the *History* the portraits of many of the eminent men I have mentioned. It is, however, useful to put on record what informed critics have said about the new constitution and the part played in it by the Representative Meeting. The *Lancet* in reporting the Annual Meeting at Leicester in 1905 said, "A glance at the meeting of representatives in the hall, the floor of which was covered with small tables at which were seated some 150 representatives—all apparently fully absorbed in the business in hand—furnished a striking contrast between the present-day method of conducting the business of the Association and that which formerly prevailed. The new constitution has evolved order out of chaos, and it is no longer possible for the clamorous minority to vote over the heads of the less assertive majority."

Tributes

The following extract from a report made to the Shropshire and Mid-Wales Branch by its representative in 1905 is a striking testimony to the value of the meeting by a highly respected senior member of the profession, Dr. H. Willoughby Gardner. He wrote: "I must confess I went to my first meeting feeling but a lukewarm interest in it all and very doubtful whether any practical good would come out of it. To my surprise I found myself among a set of men who were all keen, all enthusiastic, all evidently believing in their mission, and all intent to do their work to the utmost of their ability. Soon I found that I too was becoming infected with the same spirit. You may ask me what will be its future? Will it be helpful to us as a profession? Will it ever have any real power? Much will depend on the class of men sent up as representatives. Much, too, will depend on future chairmen and officials. . . . In time, such a meeting must attain great influence."

But the most striking tribute to the new constitution and its legislative organ the Representative Meeting appeared in an article on "Professional Organization" in the special Supplement of *The New Statesman* of April 21, 1917. It was written by Mrs. Sidney Webb. By common consent Mrs. Webb and her husband were the greatest authorities on Labour and Professional Organization in this or perhaps in any country. Praise from this quarter was praise indeed. "The B.M.A. is, alike in its constitution and in its functions, one of the most highly developed and the most efficient of all the British Professional Organizations. . . . The oldest part of the constitution, the Annual General Meeting, was until 1902 the supreme organ of government. But in that year a complicated constitution was adopted including all the devices of advanced Democracy. . . . The strength of the B.M.A., compared with all other voluntary associations of medical men, lies not only in its great traditions, but also in its status as a scientific and technical Society controlling a powerful journal and organizing a popular Annual Conference, at which science and social intercourse are happily combined."

I well remember that when I was Medical Secretary of the Association I was invited by the Webbs to their home on the Embankment to meet a group of Labour leaders. I was introduced to them by Mrs. Webb as "the Secretary of the strongest Trade Union in the country." I tried to explain that, while I had no objection to the reference to our strength, there were important ways in which we

differed from trade unions. But Mrs. Webb brushed this aside and told the Labour men that the advantage we had over them was that we had been clever enough to see the great benefit of combining in one body our scientific activities and our duties to the public with our duty to protect the legitimate interest of our profession.

Impressions of Early Meetings

Among my sharpest impressions of early meetings are those connected with Horsley and the Chair. At the end of his second year he was induced with great difficulty to stand again. He was strongly in favour of a fixed term of office for all high offices. When he did retire in 1906 he said: "It was the custom of our fathers to date everything from Waterloo—Cheltenham was our Waterloo. Before Cheltenham the Association presented to the State its scientific side. Since, they had proved their right to take a part in the socio-political life of the Empire." The episode of the proposed presentation to him when he left the Chair throws a light on his character which shows a man whose actions were difficult at times to predict and whom it was impossible to move when he had made up his mind.

A considerable sum of money had been collected by Dr. W. Douglas and a handsome piece of plate bought before Horsley heard of it. He at once informed Douglas that he could not accept a presentation, much as he valued the feeling which inspired it. First, he said, he had already been thanked very generously, and secondly he had all his life held the view that personal presentations should not be made for public work, except by the State. "Work, whether political or scientific, if done in the interests of the profession, brings with it not only the satisfaction of having contributed to social progress but also earns constantly recurring grateful acknowledgment from those who happen more directly to benefit by what has been attained."

This attitude, which no amount of pressure could alter, was very disconcerting to Douglas and his colleagues, and I happen to know that he was personally out of pocket over the transaction with the makers of the plate.

Looking Backward

Looking back over nearly 50 years of the Representative Meeting (from the gallery since 1932), it seems to me that "plus ça change, plus c'est la même chose." I fancy that if I came back in another 50 years (when I should certainly want to see how it was getting on) I should still find it discussing capitation fees—or probably by that time Civil Service salaries—for it is an axiom that these are not, never were, nor ever will be adequate. I should expect to find that the voice of the rural practitioner was still loud in the land. And that will-o'-the-wisp trade union powers would, I feel sure, duly turn up. I have seen it debated and scotched (and I had hoped killed) at least three times.

A memorable incident in the history of the Representative Meeting was the visit paid to it by the Chancellor of the Exchequer, Mr. Lloyd George, on Thursday, June 1, 1911, when a special meeting was held in the Examination Hall of the Royal Colleges to discuss the National Health Insurance Bill, of which the Chancellor was in charge.

On the previous day it had been proposed to send a deputation to the Minister with a series of questions, but he said he would prefer to come to us—"not to make a speech but to hear what we had to say." It took him two and a half columns of the *British Medical Journal* to tell us this, but it was very good listening, as were his answers to the questions read out to him by the Chairman, Dr. (now Sir) Ewen Maclean. The proceedings were quite cordial, but the *Journal* in commenting on them said, "The self-restraint which the meeting imposed on itself even when it most strongly dissented from the Chancellor's remarks was a proof of its politeness but not of its being 'nobbled,' as some had suggested it would be." Following this meeting the Association issued its national

One of the most exciting things I remember in connexion with the Representative Meeting occurred at the Edinburgh meeting of 1927. Incidentally Dr. Ewen Maclean, who was there installed as President Elect, in returning thanks said it was the first time this honour had fallen to the lot of a former Chairman of the R.M. The same distinction has since fallen to Sir Henry Souttar, who was President in 1944-5.

The exciting event was the presentation by Dr. (later Sir) Robert Bolam, Chairman of Council, of the costly and ambitious scheme for the extension of B.M.A. House. The House had been opened by King George V in 1925, and many people thought the new scheme was very rash, financially speaking. However, Bolam, a very astute business man, with the cordial support of Bishop Harman, the Treasurer, and Brackenbury, Chairman of the meeting, managed to persuade a somewhat reluctant Council to advocate a scheme calculated to occupy some years to complete and to need a great deal of borrowed money. Many prophesied that the R.M. would turn it down, and there was a certain amount of betting on the prospect. Bolam arrived equipped with lantern slides of the existing building and sketches of the proposed extension and completely swept the meeting off its feet. The scheme was adopted in a scene of enthusiasm that I have never seen surpassed in my experience of the Representative Meeting. If the orator of the day could come back to the scene of his planning he would find that his prophecies about the financial side of the scheme had been amply fulfilled.

Outstanding Men

I think this sketch of the inception and influence of the R.M. might fittingly end with an annotated list of its Chairmen. It contains the names of many men outstanding for service inside the Association and some known far outside it. Of the first, Sir Victor Horsley, it only remains to say that he was a member of the meeting until 1912; on July 16, 1916, he died on active service in Mesopotamia. His successor, J. A. Macdonald, was a general practitioner in Taunton. He with Ewen Maclean led the Association side in the National Health Insurance struggle, 1910-13, became Chairman of Council, and was awarded our Gold Medal. Hamilton Ballance, who followed, was a surgeon of Northwich, played a conspicuous part in the 1914-18 war, and was knighted. Next came Ewen Maclean, a gynaecologist of Cardiff, President of the Association in 1928. Jenner Verrall, a surgeon of Brighton, was chairman of the first mittee work in the Association, 1914-18, and was Central Medical War Committee, 1914-18, and was knighted. He was awarded the Gold Medal of the Association. E. B. Turner was a general practitioner in London, and his many years of service to the Association are commemorated by the clock which faces our courtyard.

T. W. H. Garstang, of Altrincham, was the only whole-time M.O.H. who has filled the chair. R. W. Wallace Henry, of Leicester, an ophthalmic surgeon, served the Association in many ways and was a pioneer in the Public Medical Service movement. Henry Brackenbury was a general practitioner of Hornsey. He made a great reputation as a citizen and in the educational world, was also Chairman of Council, was knighted, and awarded our Gold Medal. Charles Oliver Hawthorne was a London physician, a highly appreciated orator; he served on many committees, and was awarded the Gold Medal. E. Kaye Le Fleming was a general practitioner of Wimborne; he became Chairman of Council, was knighted, and awarded the Gold Medal. He was succeeded by Henry S. Souttar, a surgeon of London Hospital, who became Chairman of Council, and was President of the Association in 1944-5, and was knighted. His successor was Harry Guy Dain, a general practitioner of Birmingham, who was later Chairman of Council and was awarded the Gold Medal.

Peter Macdonald is an ophthalmic surgeon of York, and in addition to service on many committees was Chairman of

the Services Committee, which was the 1939-45 lineal successor to the Medical War Committee of the 1914-18 war.

He was followed by J. B. Miller—a general practitioner of Bishopbriggs, Lanark, and the only Scot who has held the office and whose residence is still in Scotland. E. A. Gregg, the next Chairman, is a London general practitioner who held office for only one year, having been appointed Chairman of Council, and has been awarded the Gold Medal. J. A. Brown and S. Wand, both general practitioners in Birmingham, are the two most recent holders of the post.

What the R.M. has Done

If I am asked, "Has the R.M. done what you reformers of 1900 expected of it?" my answer is emphatically, "Yes." Not only has it nobly performed its function as the policy-making body of the B.M.A., but it has made itself into the nearest possible approach to a Parliament of the medical profession. Not only is it so regarded by our profession, but our Association, of which it is such a conspicuous element, has been accepted by successive Governments as the body to be consulted in all matters in which doctors are concerned. The meeting has, of course, made mistakes—a bad one in 1912 when on the eve of the beginning of National Health Insurance it declared the scheme to be "derogatory" and said that the profession would not work it. Within a month it had to eat its own words. On that occasion I think it was misled by demagogue speeches and obstinate refusal to face facts. I remember no other similar episode. There have been times when it looked as if encroachments were being made on its claim to be the sole legislative body of the Association. One such occasion was when the National Health Insurance Committee was set up with apparently autonomous powers and with an Annual Conference to which its policy and actions had to be submitted. Many feared that this would undermine the supremacy of the R.M. I did not think so, and held that, the composition of the Committee being what it was—dominated by loyal B.M.A. members, many of whom were Representatives and with no other body in sight with a membership and prestige comparable to that of the B.M.A.—the Association could safely take what risk there was. As a matter of fact, there was never any clash between the Panel Conference and the R.M.

The same problem arises at the present time with the creation of the General Medical Services Committee and the Central Consultants and Specialists Committee. Theoretically they are autonomous and their relation to the R.M. is as indefinite as was that of the N.H.I. Committee. The situation needs and no doubt will receive careful watching, but I see no reason why these bodies should want to run counter to the policy of the Association which created and finances them. Just as the old N.H.I. Committee realized that its influence depended very largely on the fact that it was part of the machinery of the Association, so I believe will its successors increasingly realize. I speak with reserve, of course, as I have no responsibility now and no intimate contact, but the situation seems to me to be no more dangerous than it was in 1914—in fact, less so, because the numbers of consultants and specialists who are taking an active part in the administration of the Association steadily increases.

As an interested onlooker I cannot help feeling that the R.M. is becoming rather unwieldy. In a recent view of it from the gallery at B.M.A. House I found myself to be the only non-Representative among some thirty Representatives, who from their remote position were unable to take their full share in the proceedings. One way in which this could be remedied and at the same time save the funds of the Association would be to curtail the number of Representatives. I know I am treading on delicate ground, but this seems to me the obvious solution. It would be a pity if it were found necessary to seek accommodation elsewhere when meetings were to be held in

The subject was referred for more considered discussion at the next meeting.

HARDSHIP PAYMENTS TO GENERAL PRACTITIONERS

IMPLEMENTATION OF WORKING PARTY'S RECOMMENDATION

A letter (E.C.L. 27/53) has been sent from the Ministry to all executive councils setting out the arrangements for putting into effect paragraph 19 of the report of the Working Party. This paragraph recommends that a sum of money should be set aside to deal with cases of hardship which might arise under the new distribution scheme, particularly among elderly practitioners who previously received fixed annual payments.

Payments to Elderly Practitioners

It is recognized that elderly single-handed practitioners with small lists are less likely than younger doctors to be in a position to benefit from the incentive now to be given to the formation of partnerships, or to be able to expand their own practices. To prevent possible hardship, supplementary payments will be available to doctors in single-handed practice. Doctors who are eligible for these payments are (a) those who were aged 65 or over on April 1, 1953, and (b) those who subsequently reach the age of 65, from the beginning of the next quarter of the year—i.e., January 1, April 1, July 1, or October 1—after they reach that age. These proposals are similar to the arrangements which were previously made for elderly practitioners to claim a fixed annual payment. Supplementary payments under the new scheme may, however, be claimed by an elderly doctor irrespective of whether he was or was not in receipt of a fixed annual payment. The doctor must continue to be actively engaged in single-handed practice, and it is suggested that a list of at least 500 persons should be taken as an indication that the doctor continues to be so engaged. But, particularly in rural areas, claims from doctors with smaller lists might be accepted.

Rates of Payment

The maximum rate of payment will be £350 per annum, payable where the doctor has a list of 500 patients under the National Health Service, or a smaller list if, in an exceptional case, he is accepted as being actively engaged in practice. This rate of payment will be decreased by 9s. (one-third of the loaded capitation fee) for each person on the doctor's list over 500. The payment for any year will be limited to the amount needed to bring the doctor's income from all professional sources to £1,250.

A claim for payment from April 1, 1953, should be sent to the executive council by June 30, 1953, or in exceptional cases by December 31, 1953. Claims will not be entertained after that date. Doctors who are in doubt about their eligibility should consult the clerk to their executive council, who will be willing to assist in making a claim or advise whether a claim is likely to succeed.

Claims from Others with Small Lists

The Ministry expects that most doctors with small lists, other than those who are elderly, will benefit from the assistance given under the new arrangements to forming partnerships or to setting up practices in under-doctored areas, or in many areas will be able to build up their lists of National Health Service patients as a result of the reduction of the maximum size of lists which is to be brought about during 1953-4. Nevertheless, the Ministry thinks it is possible that some doctors with small lists may not secure any direct or indirect benefit from the new arrangements, and may suffer a loss of income amounting to hardship. The existence or extent of hardship among such doctors can be determined only in the light of actual experience after the new arrangements have been in operation for some time. Any evidence of the need to provide special assistance to doctors under the age of 65 will therefore be considered,

and, if such assistance seems to be necessary, consultations will take place with the representatives of the medical profession with a view to making further arrangements, as envisaged in the resolution of the Conference of Local Medical Committees. The problem of these practitioners is to be considered by the Working Party in the near future.

CHESTER-LE-STREET URBAN AND RURAL DISTRICT COUNCILS

APPOINTMENT OF M.O.H.

In September, 1951, the appointment of medical officer of health to the combined urban and rural districts of Chester-le-Street was advertised in the *Journal*. The temporary medical officer of health of the rural district applied for the combined appointment and was interviewed by a joint committee of the two authorities, which unanimously recommended his appointment. This recommendation was accepted by the urban district council, but was rejected by the rural district council on the grounds that the selected candidate had declined to answer questions about trade union membership.

Illogical Attitude

The attitude of the rural district council to the selected candidate was illogical, because, although he had publicly stated that he was not a member of any trade union and had no intention of joining one under any form of duress, the rural district council had employed him as their temporary medical officer of health since 1948.

The Association took up the case of the selected candidate, and it can now be announced that he has been appointed to a new post (mixed appointment) shared by the county council and the Chester-le-Street rural and urban district councils.

NORTHERN IRELAND GENERAL PRACTITIONERS

INCREASE IN REMUNERATION

The Government of Northern Ireland has made regulations which will improve the remuneration of general practitioners in the Health Service in Northern Ireland to the same amount as in England, Scotland, and Wales under the Danckwerts award, with back pay to 1948. A distribution scheme on precisely the same lines as the Working Party's scheme which started in this country on April 1 has also been introduced in Northern Ireland.

EXTRAORDINARY GENERAL MEETING

AMENDMENT TO RESOLUTION

The following amendment to the resolution proposed by the requisitionists has been received by the Secretary of the Association:

"To delete all the words following the words, 'entry into practice.'"

The amendment is proposed by Lord Horder and seconded by Dr. F. G. Tomlins.

Each member of the Association who proposes to attend the Extraordinary General Meeting on May 5 is asked to bring, and to hand to one of the attendants on entering the hall, a card or slip of paper on which are legibly written his or her name and the name of the Division of which he or she is a member. The co-operation of members in this way will greatly facilitate the recording of the attendance at the meeting.

British Medical Association

ANNUAL MEETING, CARDIFF

JULY 9-17, 1953

SECOND LIST OF HOTEL AND GUEST HOUSE ACCOMMODATION

Name of Hotel or Guest House	Tel. No.	Beds Available for	Bed and Breakfast per Day From	Special Remarks
CARDIFF				
Aberdare Hall, Cathays Park (See note below re booking arrangements)	—	80 guests	—	30/- per day full board. Minimum period 5 days. Students' residential hall
Central Hotel	25749	Unspecified	17/6	—
*Grand Hotel, Westgate St.	26626	13 guests	19/6	—
*Philharmonic Hotel, St. Mary St.	30678	12 "	18/6	Double rooms only
*Sandringham Hotel, St. Mary St.	321611	15 "	19/6	—
Glenmor Private Hotel, 154, Newport Rd.	248371	10 "	14/6	—
Kingswood Guest House, 5, Highfield Rd., Heath Linden Court Hotel, 191, Newport Rd.	Llanishen 1087 246361	7 "	15/-	—
Monkstone Club and Guest House, Newport Rd., Rumney	St. Mellons 34	6 "	14/6	—
Parklands Guest House, 49, Ninian Rd., Roath Park	46551	10 "	14/6	Double rooms only
Philips' Commercial Hotel, 154, Colum Rd., Cathays Park	25972	8 "	16/6	—
St. David's Guest House, 103, Newport Rd.	239531	6 "	12/6	Double rooms only
NEWPORT (20 minutes by car from Cardiff)				
*King's Head Hotel	3340	60 guests	19/6	—
*Queen's Hotel	2171	38 "	17/6	—
*Tredegar Arms Hotel	428011	16 "	17/-	—
PORTHCAWL (40 minutes by car from Cardiff; seaside resort with excellent golf course)				
*Esplanade Hotel	1	42 guests	22/6-27/6	—
*Marine Hotel	292	26 "	20/-	—
*Porthcawl Hotel	57	24 "	19/6	—
*Seabank Hotel	142	44 "	21/-	—
Branksome Private Hotel, Promenade	118	6 "	Unspecified	—
Bryn-y-Mor Private Hotel, Esplanade	269	8 "	"	—
Glanwern Private Hotel, Esplanade Avenue	685	12 "	12/6	—
Westward Ho Private Hotel, West Drive	135	Unspecified	Unspecified	Sat. to Sat. bookings only
OGMORE-BY-SEA (40 minutes by car from Cardiff; seaside and golf)				
Brig-y-Don Hotel	Southern-down 101	9 guests	16/6	—
SOUTHERNDOWN (40 minutes by car from Cardiff; seaside and golf)				
*Marine	Southern-down 21	Unspecified	Unspecified	—
ST. MELLONS (10 minutes by car from Cardiff; golf course, all amenities of club)				
*County Club	Castleton 355	12 guests	26/-	Twin-bedded rooms only
PENARTH (15 minutes by car from Cardiff; seaside with adjacent golf course)				
Oaklands Hotel	Penarth 599	11 guests	18/6	—
Penarth Vegetarian Guest House, 3, Rectory Rd.	" 423	12 "	15/-	Double rooms only
Penlee Guest House	" 557	12 "	15/6	" "
Breyton Guest House, 2, Beach Road	" 1274	6 "	21/-	" "
Eversleigh Guest House, 16, Windsor Terrace	" 367	4 "	15/-	" "
BARRY (20 minutes by car from Cardiff; seaside resort)				
*Barry Hotel	Barry 47	Unspecified	19/6	—
*Marine Hotel	" 44	"	17/6	—
CAERPHILLY (20 minutes by car from Cardiff)				
*Clive's Arms Hotel	Caerphilly 2227	10 guests	14/6	—

Name of Hotel or Guest House	Tel. No.	Beds Available for	Bed and Breakfast per Day From	Special Remarks
PONTYPRIDD (20 minutes by car from Cardiff)				
*New Inn Hotel	Pontypridd 2201	6 guests	20/-	—
BRIDGEND (30 minutes by car from Cardiff; country town)				
*York Hotel	Bridgend 224	6 guests	13/6	—

* Licensed hotel.

When writing to hotels regarding reservations members should mention that they are attending the B.M.A. Meeting.

Members who have difficulty in making arrangements for their accommodation are advised to write direct to the Executive Officer, B.M.A. House, 195, Newport Road, Cardiff, stating their exact requirements. A further list of private guest houses which have been approved by the local hospitality committee is available at this office, and every effort will be made to suit all applicants.

Aberdare Hall.—Accommodation is available in double and single rooms in the Aberdare Hall, Cathays Park, Cardiff. This is a well-equipped modern students' residential hall very conveniently situated to the meeting-places. Its amenities include a bar and ample bathrooms. The charge will be 30s. per person per day, which will include full board, but no reduction can be made for meals not taken. It is requested that guests should book for a minimum of five days. Ration books and towels and soap must be brought by guests. Parking space for cars is available near by. Members wishing to book at Aberdare Hall should write direct to Dr. J. D. Williamson, 175, Newport Road, Cardiff, stating any particular requirements.

The provisional programme of the scientific meetings was published in the *Supplement* of March 28 (p. 89). It is hoped to publish the full programme in the *Supplement* of May 9.

GENERAL MEDICAL SERVICES COMMITTEE

The usual monthly meeting of the General Medical Services Committee was held on April 16, with Dr. A. TALBOT ROGERS in the chair.

Further consideration was given to the question of co-option of members of the Assistants and Young Practitioners Subcommittee to the General Medical Services Committee. At present Dr. A. Joffe and Dr. L. Russell represent the subcommittee, and it was agreed that the present arrangement should continue.

Concerning the forthcoming Special Conference, Dr. D. F. HUTCHINSON brought forward a resolution which had been passed *nem. con.* by the Middlesex Local Medical Committee strongly approving the recommendation which the General Medical Services Committee is to place before the Special Conference on May 5.

Dr. RUSSELL raised the question of the size of the final settlement. Some impression appeared to have been given that there might be no surplus at the end of the financial year but a deficit.

In reply it was pointed out that they would shortly be in a position to know, in round figures, the amount available for the final settlement. Dr. WAND explained how the Working Party proposed to deal with the question of the small-list practitioner. It was necessary first to find out the extent of the problem and the cost of solving it. The G.M.S. Committee had said over and over again that it would face up to this matter as soon as the information became available.

Dr. RUSSELL said that the Working Party subcommittee failed to make recommendations because it was not known

whether there would be any surplus available, and among assistants and young practitioners there was a strong feeling that the new Working Party might be under a similar limitation.

Dr. FRANK GRAY said that if they were convinced in the light of the information about to be sought that any group had a claim on the grounds of justice that claim had to be met.

Medical Service Committees

Dr. DAIN, the Chairman of the Special Subcommittee which had been considering Medical Service Committee procedure, mentioned the desirability, arising out of what is known as the Glasgow case, that a practitioner's obligations under his terms of service should be demarcated from professional misbehaviour or unethical conduct. He said that in the Glasgow case a doctor had been removed from the list, although not found guilty of any breach of regulations, because his behaviour was judged to be detrimental to the Service. This seemed to open up the possibility of the removal of doctors on account of conduct not really connected with the Service at all.

It was agreed that further consideration of this problem be deferred until a later meeting.

Domiciliary Nursing of Tuberculosis

Discussion arose on a memorandum on domiciliary nursing of tuberculosis proposed to be issued under the auspices of the Ministry and prepared by the Standing Nursing Advisory Committee in consultation with other standing advisory committees of the Central Health Services Council.

Strong exception was taken by the Committee to certain paragraphs in the memorandum which were regarded as likely to create unnecessary alarm to the patient. One member said that it would be inadvisable for such a document to get into the hands of the general public, and, while its detailed instructions might be admirable under ideal conditions, they would prove difficult to fulfil in practice.

The CHAIRMAN commented on the fact that there appeared to be no general practitioner on either the Nursing or the Tuberculosis Standing Advisory Committees.

The Committee expressed the view that the document was unsuitable for distribution in its present form and should be subject to revision. The comment of the Society of Medical Officers of Health was that, although the memorandum as such could not be criticized, the advice given was impracticable in many households. The recommendations were too detailed and the essential information was already available in several handbooks for nurses.¹ It was agreed that the Committee's comments should be forwarded to the Public Health Committee.

A memorandum by the British Dental Association on fees for the arrest of dental haemorrhage was considered by the Committee. It was agreed that an early opportunity be taken of discussing it, in company with representatives of the British Dental Association, at the Ministry.

Rural Mileage

A lengthy report from the Rural Practices Subcommittee on mileage was presented by Dr. C. F. R. Killick. The Subcommittee held the view that the figures of average remuneration submitted by the Mileage Committee set up by the Minister in 1950 were open to certain criticisms which rendered it impossible to make a realistic comparison of the remuneration levels of the urban and rural practitioner, and also ignored a number of other important factors which in equity should be taken into account. It felt that no case had been made for any reduction in the size of the mileage fund, and recommended that the matter be kept under review.

The CHAIRMAN said that there had been a feeling among rural practitioners that the mileage fund was not providing sufficient extra money to finance rural practice. Their

¹The memorandum was also discussed by the Public Health Committee of the Association on the following day, and it was proposed that the chairman of that committee and the chairman of the General Medical Services Committee should meet and endeavour to arrive at an agreed statement.

expenses had gone up out of all knowledge, and they looked to some increase in the mileage fund. Examination of the position by the Ministry of Health seemed to show that the rural practitioner was not as badly off as had been thought, a conclusion with which the subcommittee did not completely agree. What the rural practitioners said in effect was that, the statistics notwithstanding, it would not be unfair to continue the same allocation of money to the mileage fund as at present.

It was agreed, on the proposition of Dr. WAND, seconded by Dr. KILLICK, to recommend that no steps be taken to alter the allocation of £2m. to the mileage fund, at which figure it had stood for the last four years.

The National Formulary

It was reported to the Committee that the Joint Formulary Committee was now revising the *National Formulary*, 1952, with a view to the publication of a further edition in the summer of 1954. It had been suggested to the Committee that in a special edition for use by prescribers the preparations be listed in pharmacological classifications, instead of under the various sections such as mixtures and injections as at present. Another suggestion from one local medical committee was that prices of preparations be included in the *Formulary*, but the National Formulary Committee had decided against this on the ground that there should be no suggestion that the practitioner's choice of appropriate preparations should be guided by considerations of cost. It was stated that in Scotland practitioners were informed of the prices of the drugs.

The view of the General Medical Services Committee after a long discussion was against pharmacological classification or classification under diseases, one member voicing strong objections to the introduction of any new system which would suggest that a particular drug was good for such and such a condition. The Committee wanted the classification retained as in the present edition. Discussion also took place on a proposal to use English titles and Latin translations, but Dr. SORSBY drew attention to the international repercussions of such an alteration, and said that any proposal of this kind ought to be considered by an international pharmacopoeial body.

It was agreed, on the suggestion of the Wiltshire Local Medical Committee, to make representations to the Ministry in favour of 2 in. by 2 in. squares of "vaseline" gauze being included in the drug tariff. The larger size at present included was said to result in considerable waste.

The Committee devoted a great deal of time to considering and amending its draft report to the forthcoming Annual Conference.

REMUNERATION OF HOSPITAL MEDICAL STAFF

Junior members of hospital medical staff are asking if they will be affected by the discussions now taking place in Committee "B" of the Medical Whitley Council on what is often referred to as "consultants' betterment." The claim for increased remuneration submitted to the Management Side of Committee "B" embraces all grades of hospital medical staff, although it is based on the Spens Report, which dealt only with the salaries of consultants and registrars.

THE BUDGET AND DOCTORS' CARS

The Budget proposal to reinstate the system of initial allowances for capital expenditure on "plant and machinery" will be welcomed by many practitioners. A similar allowance was in operation until April 5, 1952, except that the allowance then amounted to 40% of the capital cost and practitioners were able in certain circumstances to obtain this relief on the purchase of a car for professional purposes. The new rate of initial allowance is 20% and operates as from April 15, 1953. This allowance is, of course, in addition to the annual depreciation allowance.

Scottish News

S.H.M.O. REVIEW IN SCOTLAND

Arrangements are now nearly complete for an S.H.M.O. review in Scotland similar to that which was recently undertaken in England and Wales (*Supplement*, 1952, 2, 164). The review will be in two parts: (a) a final review of the professional status of senior hospital medical officers, and (b) to determine whether in fact posts designated as S.H.M.O. are properly graded as such, having regard to the duties devolving on them and the facilities associated with them.

SCOTTISH REGIONAL HOSPITAL BOARDS

New appointments to fill vacancies in the five Scottish regional hospital boards have been made by the Secretary of State for Scotland. The vacancies arise from the statutory requirements that one-third of the members should retire annually. Eighteen are reappointments of retiring members. The tenure of office will be for three years, until March 31, 1956. The Secretary of State has made a slight reduction in the size of the boards, the number of members (excluding the chairman) being now as follows: Northern Region, 16; North-eastern Region, 18; Eastern Region, 18; South-eastern Region, 23; Western Region, 29. There are two current vacancies in the South-eastern Region still to be filled. The members reappointed or newly appointed are:

Northern Regional Hospital Board.—Reappointed: Miss M. B. Clyne, Rev. Father Neil MacKellaig, Mr. G. Ralph, Mr. J. South. New member: Rev. A. Gemmell.

North-eastern Regional Hospital Board.—Reappointed: Mr. D. Cochran, Provost H. J. Milne, M.C., Mr. R. Ollason, Mrs. J. Wolrige-Gordon. New Member: Mr. R. Esslemont.

Eastern Regional Hospital Board.—Reappointed: Mr. W. I. Brown, Professor W. L. BURGESS, Miss M. C. Cameron, Councillor J. R. Christie. New member: Dr. J. C. ANDERSON.

South-eastern Regional Hospital Board.—Reappointed: Dr. W. Boyd, Councillor R. Burnside, Bailie D. R. Matheson. New member: Dr. G. J. SUMMERS.

Western Regional Hospital Board.—Reappointed: Dr. T. ANDERSON, Dr. P. K. McCOWAN, Mr. J. Stewart. New members: Mr. R. S. BARCLAY, Mr. D. Burns, Mr. W. H. Dunlop, Mr. P. R. Jacobs, Mr. A. M. Robertson.

The Secretary of State has also made the following appointments to fill casual vacancies:

North-eastern Regional Hospital Board.—Miss Bell Jobson (to March 31, 1955).

Western Regional Hospital Board.—Mr. J. BRUCE DEWAR (to March 31, 1954).

Questions Answered

Purchase of Car

Q.—As a medical officer of health I purchased a new car in February, 1951. I am paid a fixed allowance per year and also a mileage allowance. Can I claim a 40% capital allowance, less any difference between the travelling allowance and actual expenditure incurred over the year?

A.—The questioner's remuneration is assessable under Schedule E, and the statutory rule with regard to expenses restricts the allowance to expenses incurred wholly, exclusively, and necessarily in the performance of the duties of the office held. The expenses of using a car can include the capital allowances provided in the Income Tax Act—i.e., 40% of the cost of purchase (so far as incurred before

April 6, 1952) and 25% of the written-down value of the car as an annual allowance. But if the car is used partly for private purposes—including travelling between the residence and the main place of employment—then only a proportion—e.g., on a mileage basis—of such allowances and of the cost of licence, insurance, petrol, repairs, etc., can be claimed for income-tax purposes. In other words the 40% allowance cannot be treated as a separate subject of claim, but, so far as it is appropriate, only as part of the total cost of using the car. If the cost of travelling in the performance of the duties calculated on the above basis is found to exceed the car allowance received from the employing authority, a claim can be made for the deduction of the excess from the amount of the remuneration. Experience suggests, however, that it is usually very difficult to persuade one authority—i.e., the Commissioners of Taxes—that an allowance given by another authority is in fact inadequate to cover the "necessary" expense.

Income-tax Allowance on New Car

Q.—By 25% annual depreciation, the value of my car has been written down to £200. I could sell it for £400. If I buy a new car for £800 can I deduct 40% initial allowance plus 25% depreciation allowance for the year of purchase?

A.—The initial allowance ceased to apply to expenditure incurred after April 5, 1952, and consequently the only allowance applicable to a car bought now is the annual allowance calculated at 25% per annum. The figures mentioned in respect of the present car suggest that when sold part of the amount received will be liable to assessment as a "balancing charge."

Correspondence

The National Formulary

SIR,—It is common knowledge that a revision of the *National Formulary* is in progress, and the very interesting account by Professor Dunlop *et al.* of prescribing in Scotland (*Journal*, March 28, p. 694) suggests the importance of this work. The fact that the Budget estimates that next year £52,000,000 will be spent on pharmaceutical services (not, of course, only on drugs) emphasizes the financial implications of prescribing habits, on which the *National Formulary* has a considerable bearing.

The revision can be considered under two heads—content and format. I want in this letter to confine myself to format, for it has some bearing on the content and still more on the usefulness of the *Formulary*. If it is convenient to use, it probably will be used more and more extensively and intelligently; and now is the time when doctors can—and I hope will—make their views known. I give my own opinions in the hope that they will stimulate others to contradict or confirm them.

People are getting more familiar with the present layout and may not take kindly to any drastic alteration. But against this is the fact, which Professor Dunlop mentions, that proprietary preparations are rapidly displacing the more official ones. This means either that the *Formulary* does not contain the preparations that doctors find their patients need, or that the presentation of the *Formulary* is not so attractive or so easy to remember as the advertisements of the drug firms. I believe that both are true, but perhaps the second is the more important.

G.P.s are not the only people involved; students, teachers, and consultants also have their points of view and must use the *National Formulary*. There is the trouble about metric and English measures to be considered, also the fact that to-day many medical students do not know Latin and the new B.P. uses English throughout. This introduces great difficulties. Taking these and other factors in mind, I think that a therapeutic classification would prove an immense improvement on the

present layout—that is, putting all the cough medicines together, those for gastro-intestinal, genito-urinary troubles, and so on. There is such a classification on pages 42-55 of the present *Formulary*. This could then be omitted. I would displace and modify the present monographs and place them at the head of each section, giving us the latest authoritative views on therapy—or at least of pharmacology—in these sections. I know that a *Formulary* is not a potted *materia medica*, but it seems reasonable to ask the compilers of a *formulary* that they should give some indications of what was in their minds. This arrangement would have great advantages, particularly in that it would largely overcome the language difficulty; for if in every section one had first the liquids, mixtures, etc., followed by the solids, tablets, pills, etc., none of the subsections would actually contain many items, so that it would not take long for anyone to see all that were available. Furthermore, grouping them in this way should lead to greater variety and exactness in prescribing, for one would constantly have brought to notice the wealth of preparations available for related conditions. The monographs at the head of the sections will help those of us who are getting on to use the newer drugs more effectively, and all of us will find having the theoretical and practical brought together in this succinct way stimulating or refreshing. Students and housemen will, I think, share these feelings, while even teachers may find them useful.

Besides the sections based on therapeutic usage there would have to be others based on pharmacology—for example, antibiotics, vitamins, sulphonamides. As many of these would occur in several sections, in each section the most suitable ones would just be mentioned with a reference to the fuller information elsewhere. In a therapeutic classification some duplication is unavoidable, but I think it is justifiable. One more advantage of a clinical classification is that it would make it possible to put formulae for children at the end of each adult section instead of putting them all together at the end of the book, particularly as for older children the adult formulae in smaller doses are often more suitable than those *pro infantibus*.

This matter is one of the greatest importance, and I sincerely hope that other readers will make their views known. Now is the time that they can have an effect, for the format of the book may considerably modify its content and its usefulness.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

SIR,—May I add my testimony to Dr. W. Edwards's sound letter (*Supplement*, April 11, p. 137), which points out the difficulty, almost the hopelessness, of finding one's way about the *National Formulary*? The whole book needs completely re-editing, and, above all, the simplification of names. I agree with him that this measure alone will save thousands of pounds. Who on earth can be expected to write out inj. procain. benzylpenicil. confirm. B.P.C., or ung. iod. denig. c. methyl. salicyl. B.P.C. (which are the recognized abbreviations of preparations) when there are well-known proprietary equivalents of a few letters?

A last point, and an important one, why is not more trouble taken to render many of the mixtures more palatable? Chloroform water and similar flavours can be most nauseating. Palatability does matter.—I am, etc.,

Thornton Heath, Surrey

S. G. HAMILTON.

The Registrar Problem

SIR,—At this critical period in the affairs of many senior registrars we should appreciate an opportunity to state the views of the Registrars Group. In April, 1952, we put to the Joint Committee our opinion that within a year there would be a serious crisis because, for the first time since the start of the National Health Service, large numbers of senior registrars would reach the end of their four-year tenure. A review carried out by us this month reveals the following facts.

In 19 of the 20 regions there are at least 326 senior registrars whose appointments are shortly due to be terminated as they are in their fourth or subsequent years. Figures for the remaining region, and for a considerable number of teaching hospitals, are not yet available, nor does this total include university officers of registrar grade who are likely to compete for consultant vacancies. The great majority of these senior registrars are employed in general medicine or surgery.

A survey of the advertisement columns of the medical journals has shown that during 1952 only 25 consultant posts in general medicine and 28 in general surgery were advertised; these figures do not include the six posts in medicine and five in surgery created in late 1952 by the North-west Metropolitan Regional Hospital Board in an endeavour to solve the senior registrar problem in their region.

We have never held the view that all senior registrars should eventually obtain consultant posts; on the contrary, in all discussions we have agreed that competition is essential to ensure a high-quality consultant service. On the other hand, it is surely reasonable to suggest that the wastage at senior registrar level should be no more than about 25%, an ideal which should be fulfilled when the senior registrar establishment is eventually scaled down to the agreed level so as to be related to future consultant vacancies. Last year, however, between 50 and 70 well-qualified surgeons applied for each general surgical post advertised in one region. This situation bears no relation to the fair competition we have envisaged; it is the direct outcome of post-war expansion, for which the Ministry must bear responsibility. It is the present generation of senior registrars for whose welfare we are particularly concerned; this is a special, non-recurring problem which needs special and immediate measures for its solution.

The following suggestions of the Registrars Group Council have been received sympathetically by the Joint Committee.

(1) The consultant service can still be expanded to the benefit of the National Health Service. Although the Ministry of Health have admitted their error in announcing abruptly a "freezing" of hospital establishments (*Supplement*, January 24, p. 23) it is clear that they would not welcome a general expansion of the consultant service. However, senior registrars are at present doing important work; they are not just supernumerary trainees, and when establishments are cut their work will have to be done. Consultants will be needed to replace them, and it is surely better to foresee the need and to create additional posts while the present senior registrars are available to fill them. We must point again to the action of the North-west Metropolitan Regional Hospital Board, which appears to us to be an important contribution to the problem.

(2) The run-down to the agreed senior registrar establishment should be slow. This would allow a gradual but parallel increase in the consultant service as suggested above. We have agreed that a reduction in establishment is necessary to prevent the present problem from continuing indefinitely, but we feel that no senior registrar appointment should be terminated before the end of the normal four-year term. It will still be possible to reduce the establishment when posts are vacated voluntarily or when the holders of posts no longer "established" reach the end of their fourth year. It is hoped that the suggestions in the next paragraph will enable suitable individuals in the latter category to continue a specialist career in another post.

(3) Any senior registrar reaching the end of his normal tenure should be allowed and encouraged to apply in open competition for his own post or for other posts in the same grade and specialty, either in his own region or elsewhere. It has been suggested that any senior registrar who fails to obtain a consultant post before the end of his four years in office is unlikely to be successful and that prolongation of tenure would only postpone the final disappointment. With this we would agree far from being normal. It is also admitted that there may be some senior registrars who for one reason or another are unlikely to attain consultant status. We believe that the method outlined above is the most equitable way of solving the present dilemma. A full selection committee is given the onus of deciding whether a man is likely to become a consultant; if so, they will reappoint him, and if he is not reappointed it will be clear that he would be unwise to continue further. A senior registrar whose post is discontinued owing to a reduction in establishment would be able to apply for posts in the same specialty elsewhere. This plan would ensure that good potential consultants are not lost to the Service purely owing to passage of time. Registrars (intermediate grade) might criticize this plan as lessening their chances of promotion. They would of course be eligible to compete with senior registrars for the vacant posts; furthermore, it has been agreed that there need be no limit on the duration of registrar (intermediate grade) appointments. This objection also loses

substance as the shortage of registrars in the intermediate grade increases, and it is becoming difficult even to fill certain senior registrar posts. Indeed, we would suggest that unless the Ministry encourages reapplication by senior registrars the shortage of suitable applicants will increase. We appreciate that it may be necessary to place some time limit (say two years) on the duration of tenure when a man is reappointed to his own post.

(4) Entry into general practice should be made a more practicable proposition for the ex-registrar. This is an immensely complicated subject. We have been pressing its importance for over three years, as there is no doubt that registrar experience is usually a positive disadvantage when application is made for a position in general practice. It is now clear that this is the main reason for the increasing shortage of junior medical staff in many hospitals. It seems to us that the manifold problems involved remain unsolved because of the sharp division which has been created between the hospital and general-practitioner services; there appears to be no mechanism within the Ministry or even within the B.M.A. for discussing it, let alone for taking action.

The Joint Committee have been negotiating registrar affairs with the Ministry of Health for a long time, but, although the Ministry have said that they are considering the problem sympathetically, there is no indication that they realize its urgency or that they are taking steps to solve it. The figures given in this letter have been forwarded to the Joint Committee in the hope that they will be able to persuade the Ministry not only that the problem is a serious one, but also that it is capable of solution.—We are, etc.,

R. M. FORRESTER,
Late Chairman, Registrars Group, B.M.A.
JOHN N. WALTON,
Chairman, Registrars Group, B.M.A.

Newcastle-upon-Tyne.

SIR,—There are many areas throughout the country to-day which comprise populations of well over 100,000 persons, and which are served by only one part-time consultant in gynaecology and obstetrics. This individual works at a maximum nine sessions a week and is only on call for cases of emergency. Such an arrangement in an extensive district necessitates that he is frequently not available, and so the hospital work falls upon the senior registrar or his deputy—in other words, the majority of the hospital work is being done, or is likely to be done, by cheap registrar labour. Surely this state of affairs demands instant revision of hospital staffing in order to ensure that the public has available to it a worth-while consultant service at all times.

At the moment there are a large number of senior registrars amply trained for consultant practice who have become redundant owing to the fact that few such appointments are vacant or available. It is for this reason that I would suggest that senior registrars of tried experience and skill be employed as junior consultants on a sessional basis—e.g., five sessions a week. Financially this would be equivalent to, or less than, their present salaries. After four years of satisfactory service such an officer would be eligible for consultant status on a full or part-time basis.

To my mind it is certain that the type of man envisaged and so enrolled as an assistant consultant in a populous and scattered area would not scamp his work any more than he would dream of so doing as a senior registrar. There is no question whatever that thereby the public would greatly be the gainers.

Such a scheme would adequately fulfil an urgent demand in many county areas to-day, and would permit the executive of the National Health Service to build up a graded scale of hospital officers. Moreover, this plan would encourage juniors in our specialty to apply for hospital appointments, realizing that there was some reasonable prospect of advancement; for is it not a matter of common experience to-day to find that recently qualified doctors in sufficient numbers are unwilling to undertake specialist training, because many of their seniors with years of experience and consultant qualifications are being forced to embark upon general practice or quit the profession?—I am, etc.,

London, W.1.

V. B. GREEN-ARMYtage.

Whole-time Consultants

SIR,—In the part of the Annual Report of Council which deals with Hospital and Consultant Services, the first sentence of the second paragraph of the section headed "Whole-time Officers" (*Supplement*, April 4, p. 106) is not clear. I understand it to mean that the Council regards a university professor as representing the point of view of whole-time consultants in the N.H.S. No doubt professors have problems in common with whole-time consultants, but because a professor is not paid by the National Health Service he cannot be regarded as an adequate spokesman for whole-time consultants.

The report suggests that one of the causes of unrest amongst whole-time officers is ignorance of the efforts made on their behalf. The efforts are undoubted; it is harder to know with how much determination these efforts are made. In part, at least, the increasing disquiet of the whole-time consultants results from the growing differences between the conditions of service of whole-time and part-time consultants, added to the knowledge that, with the solitary exception of the university professor, all the consultants on the Joint Committee and the Staff Side of Committee "B" are part-time.

The whole tenor of the section of the Annual Report dealing with whole-time officers suggests that the Council is still unwilling to allow whole-time officers any share in negotiations affecting them.—I am, etc.,

Sheffield, 11.

ARTHUR JORDAN.

Extraordinary General Meeting

SIR,—I note that, following the requisition for an Extraordinary General Meeting of the Association, the Working Party has been called together in order to take effective steps to investigate and relieve any injustices inherent in the Distribution Scheme. This belated action does, in fact, secure the main purpose of the requisitionists, for it is accompanied by an assurance that any injustices which are found to exist will be made good retrospectively to April 1, 1953. It therefore appears to me that it is no longer necessary to ask that the implementation of the scheme should be postponed pending a proper inquiry, and I have accordingly submitted an amendment, which I trust will be acceptable to the requisitionists, that the last four lines of the resolution commencing "and requests the Minister..." should be deleted.

May I trespass on your space to add a personal reflection? The Working Party should have taken effective action to inform itself of the nature and size of the problem and to devise a suitable solution not later than last October. Had it done so, small-list practitioners and others would have been spared much anxiety and distress and there would not now be this need for the requisitioning of an extraordinary meeting.—I am, etc.,

London, W.1.

HORDER.

SIR,—It has been suggested that those who have requisitioned the Extraordinary General Meeting (and their supporters) might agree to the deletion from the Resolution proposed for consideration by the meeting of those words asking the Minister of Health to continue the method of remuneration in force up to March 31 and to postpone the implementation of the Working Party's scheme of distribution until fresh agreements were agreed.

In my opinion such a course could be readily agreed if the Council and the G.M.S. Committee would signify their unqualified acceptance of the principle that all practitioners, regardless of size of list, should participate as of inherent and equitable right in a substantial increase of capitation rate for persons on their lists, such as is made possible by the Danckwerts award, and that, particularly, no practitioner should find his remuneration less (relative to numbers on his list) after the award than before it.

or be submitted to any kind of means test before participating in the increase of remuneration. Remuneration should be on the basis of work done and expenses incurred in its doing.

In making his award, Mr. Justice Danckwerts found the profession had been underpaid since the inception of the Service. He found a "betterment" figure, and increased the central pool by some £10,000,000 on 1951-2 figures, declaring he had adjusted his figure "to the number of practitioners in the Service and not the population." No one asks that this sum, capable of allowing a yearly increase of payment to every practitioner of over £500, should be divided equally to all. But clearly it makes available a substantial increase of remuneration to every practitioner; and it would be an act of injustice to exclude any practitioner from a substantial share in the Danckwerts award, or to submit him to any means test before according it.

If the Council and the G.M.S. Committee at any date before the Extraordinary General Meeting would signify acceptance of the above general principles for distribution of the central pool and agree that they should become B.M.A. policy in fresh negotiations to be initiated immediately with the Minister, complete unanimity could be attained at the meeting. Had such a principle been accepted earlier, our Association would have been saved this otherwise unnecessary, undignified, regrettable, and artificially created seeming dispute between small-list and big-list practitioners and the Extraordinary General Meeting would never have been requisitioned. One act of vision and statesmanship now would immediately resolve the unnatural situation.

—I am, etc.,
Shrewsbury.

W. J. GRANT.

SIR,—The honorary secretary of my Division has shown me a letter sent to him—and, indeed, to all honorary secretaries of B.M.A. Divisions in London—by Dr. Frank Gray in his capacity as secretary of the Local Medical Committee for the County of London, which is a statutory body constituted by the National Health Service Act, using funds deducted from practitioners' pay.

In this letter Dr. Gray requests each honorary secretary to call a meeting of the executive committee of his Division for the express purpose of endeavouring to see that as many members of the Division as possible attend the Extraordinary General Meeting on May 5, the letter being so worded as to suggest that those requisitioning the Extraordinary General Meeting are attempting to bring serious discredit on the Association.

As chairman of my Division, I have not agreed to such a meeting being summoned at the behest of the secretary of an outside, statutory committee attempting to intervene and to prejudice members of the British Medical Association against fellow-members.—I am, etc.,

London, E.8.

CHARLES SCHIFF,
Chairman, City Division.

Dental Anaesthetics

SIR,—There is, unfortunately, some feeling among medical men about not being asked to act as dental anaesthetist for their own patients. In an experience of over seventeen years I find the most important factor for a successful administration is practice together as a team, which includes the dental surgery assistant(s). Questions of premedication, throat packing, manipulation of mouth gags, adjuncts to nitrous oxide, maintaining adequate airway, maintaining adequate oxygenation and depth of anaesthesia, maintaining access to and sight of the teeth, control and prevention of trugging, etc., demand the fullest possible degree of understanding and co-operation between administrator, operator, and assistants. A predetermined system is essential if difficulties are to be forestalled and a high level of success maintained.

The advantages of a practised team over the occasional coming together of the patient's own doctor and the dentist would be obvious. This correspondence, however, shows that they are not.—I am, etc.,

Birmingham.

C. N. JEFFRIES.

Association Notices

Diary of Central Meetings

APRIL

29 Wed. General Practice Review Committee, 11 a.m.

MAY

1 Fri. Registrars Group Council, 2 p.m.
5 Tues. Special Conference of Representatives of Local Medical Committees, 10.30 a.m.
5 Tues. Extraordinary General Meeting, 2.30 p.m.
6 Wed. Council, 10 a.m.
8 Fri. Ophthalmic Qualifications Committee, 1.45 p.m.
8 Fri. Ophthalmic Group Committee, 2 p.m.
8 Fri. Physical Medicine Group Committee, 2 p.m.
13 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m. (date changed from May 12).
15 Fri. Glasgow Arrangements Committee, 11 a.m.
20 Wed. Conference of Honorary Secretaries, 10.45 a.m.
27 Wed. Alcohol and Road Accidents Committee, 2 p.m.
29 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.

Branch and Division Meetings to be Held

BERKS, BUCKS, AND OXFORD BRANCH.—At Forum Restaurant, High Street, Oxford, Tuesday, April 28, 2.45 p.m., council meeting; 3.30 p.m., annual general meeting.

BIRKENHEAD AND WIRRAL DIVISION.—At Arrowe Park Hotel, Birkenhead, Saturday, May 2, 7.30 for 8 p.m., dinner; 9 p.m., address by Dr. Ffrangcon Roberts: "Medical Progress: A Centenarian Looks Back from the Year 2053."

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Thursday, April 30, 3 p.m., annual meeting.

BLACKBURN DIVISION.—At Royal Infirmary, Blackburn, Sunday, April 26, 11 a.m., annual general meeting.

CHELSEA AND FULHAM DIVISION.—At Fulham Town Hall, S.W., Friday, April 24, 9 p.m., annual general meeting.

COVENTRY DIVISION.—Tuesday, April 28, general practitioners' evening.

DERBY DIVISION.—At Derbyshire Royal Infirmary, Friday, May 1, 8.30 p.m., annual meeting.

DUDLEY DIVISION.—At Educational Offices, St. James's Road, Dudley, Tuesday, April 28, 9 p.m., meeting. Consideration of Annual Report of Council, etc.

FINCHLEY DIVISION.—At Finchley Memorial Hospital, London, N., Friday, May 1, 7.45 p.m., annual general meeting.

HOLLAND DIVISION.—At Bridge Hotel, Sutton Bridge, Saturday, May 2, 7.30 for 8 p.m., dinner. Dr. C. C. Bowley: "The Rhesus Factor in General Practice."

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Mary Abbots Hospital, Marloes Road, Kensington, W., Tuesday, April 28, 8.30 p.m., annual general meeting.

MANCHESTER DIVISION.—At The Library, Midland Hotel, Manchester, Thursday, April 30, 8.30 p.m., medical brains trust.

NORTH-WEST WALES DIVISION.—At Royal Hotel, Capel Cerrig, Sunday, April 26, 2.30 p.m., annual general meeting.

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, April 28, 8.30 p.m., special Divisional meeting. Discussion: "The Care of the Elderly Sick."

ST. PANCRAS DIVISION.—At B.M.A. House, Tavistock Square, London, W.C., Wednesday, April 29, 8.30 p.m., meeting. Mr. W. B. Purchase: "Coroners' Procedure During the Last Thirty Years in London."

SOUTHAMPTON DIVISION.—At Stoneham Golf Club, Sunday, May 3, 2.45 p.m., Divisional qualifying round for Treasurer's Cup Golf Competition.

SOUTH-WEST ESSEX DIVISION.—At Thorpe Coombe Maternity Hospital, Forest Road, Walthamstow, E., Wednesday, April 29, 8.30 p.m., (1) meeting. B.M.A. Lecture by Dr. B. F. Russell: "Some Dermatological Problems in General Practice." (2) Special meeting of all medical practitioners in the area of the Division to follow.

STRATFORD DIVISION.—At Minor Hall, East Ham Town Hall, Wednesday, April 29, 9 p.m., meeting of all medical practitioners in Barking, East Ham, West Ham, and Ilford.

WEMBLEY DIVISION.—At Wembley Hospital, Tuesday, April 28, 9 p.m., annual general meeting.

WEST NORFOLK DIVISION.—At West Norfolk and King's Lynn Hospital, Thursday, April 30, 3 p.m., meeting. Talk by Sir Alan Rook: "Our Aims in Human Ecology."

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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British Medical Association

GENERAL MEDICAL SERVICES COMMITTEE

REPORT OF THE GENERAL MEDICAL SERVICES COMMITTEE TO THE ANNUAL CONFERENCE OF REPRESENTATIVES OF LOCAL MEDICAL COMMITTEES, 1953

PERSONNEL OF GENERAL MEDICAL SERVICES COMMITTEE, 1952-3

Ex-officio: Dr. P. T. J. O'Farrell, Dublin (President); Dr. S. Wand, Birmingham (Chairman of Representative Body); Dr. E. A. Gregg, London (Chairman of Council); Mr. A. M. A. Moore, Upminster, Essex (Treasurer); Dr. W. M. Knox, Glasgow (Chairman of Conference of Local Medical Committees).

Elected by A.R.M. of B.M.A. (1952): England and Wales: Dr. J. A. Brown, Birmingham; Dr. H. Guy Dain, Birmingham; Dr. J. A. Gorsky, London; Dr. F. Gray, London; Dr. J. T. Baldwin, Milton Bridge, Midlothian; *Scotland*: Dr. J. T. Baldwin, Milton Bridge, Midlothian; *Northern Ireland*: Dr. J. Bleakley, Belfast (deputy: Dr. J. H. Cronhelm).

Direct Representatives of Local Medical Committees: Dr. W. Neil Darling, Edinburgh (Group A1); Dr. C. J. Swanson, Aberfeldy, Perthshire (Group A2); Dr. J. R. Langmuir, Glasgow (Group A3); Dr. R. C. Hamilton, Kilmarnock (Group A4); Dr. F. Lishman, Bishop Auckland, and Dr. D. T. MacDonald, Belford (Group B); Dr. H. F. Hollis, Leeds, and Dr. H. Thorp, Todmorden, Yorks (Group C); Dr. A. Campbell, Accrington, Lancs, Dr. F. S. Catto, Manchester, and Dr. P. J. Gibbons, Liverpool (Group D); Dr. Chester, and Dr. P. J. Gibbons, Liverpool (Group D); Dr. Miles Parkes, Crewe (Group E); Dr. D. B. Evans, Wrexham, and Dr. T. J. Hargest, Swansea (Group F); Dr. E. W. Goodwin, Leicester, and Dr. A. S. Wilson, Gosberton, Lincs (Group G); Dr. A. B. Davies, Walsall (Group H); Dr. F. A. Smorffitt, Southam, Warwickshire (Group I); Dr. C. F. R. Killick, Williton, Somerset (Group J); Dr. R. W. McConnel, Wendover, Bucks (Group K); Dr. J. D. R. Murray, Exmouth, Devon (Group L); Dr. K. S. Maurice-Smith, Ely, Cambs (Group M); Dr. H. S. Howie Wood, Isle of Wight (Group N); Dr. D. F. Whitaker, Guildford (Group O); Dr. A. W. Gardner, Lewes (Group P); Dr. A. T. Rogers,

Bromley, Kent (Group Q); Dr. D. F. Hutchinson, Middlesex, and Dr. A. N. Mathias, Cricklewood, N.W.2 (Group R); Dr. J. L. McKenzie Brown, London, and Dr. C. M. Scott, New Barnet, Herts (Group S); Dr. H. H. D. Sutherland, London, and Dr. Max Sorsby, London (Group T); Dr. J. B. Young, Belfast (Group U).

Elected by Annual Conference of Local Medical Committees, 1952: Dr. J. C. Arthur, Gateshead; Dr. A. Beauchamp, Birmingham; Dr. I. G. Innes, Hull; Dr. J. A. Pridham, Weymouth; Dr. F. M. Rose, Preston; Dr. W. Woolley, Bristol.

Nominees of Other Bodies: Dr. T. Rowland Hill, London, W.1, and Mr. H. H. Langston, Winchester, Hants (Central Consultants and Specialists Committee); Dr. Catherine Harrower, Glasgow (Medical Women's Federation); Dr. H. D. Chalke, London, N.W.3 (Society of Medical Officers of Health); Dr. Bruce Cardew, London, W.C.1, and Dr. I. M. MacAlister, Wallasey, Cheshire (Medical Practitioners' Union).

Co-opted Members: Dr. O. C. Carter, Bournemouth; Dr. A. Joffe, London, W.1, and Dr. L. Russell, London, N.W.10 (Assistants and Young Practitioners Subcommittee); Mr. D. C. Bowie, London, W.C.1.

Observer from the British Dental Association: Mr. G. M. Hickley, London, S.W.9.

CHAIRMAN

1. Dr. A. Talbot Rogers was appointed Chairman for the session 1952-3.

THE WORK OF THE COMMITTEE

2. The past session has proved a busy period for the Committee, and inevitably a considerable amount of its time has been taken up with matters arising out of the

Danckwerts adjudication and the Report of the Working Party on the future distribution of the Central Pool. A good deal of preparatory work had to be undertaken in co-operation with officers of the Ministry of Health in order that the new scheme of distribution could be brought into operation on April 1, 1953, and in addition the Committee has had to deal with a number of consequential problems arising from the Working Party's Report.

3. Other major tasks which the Committee has undertaken during the year include the preparation of a memorandum of evidence for submission to the Central Health Services Council's Committee on General Practice, an examination of proposals it has received for the optional return of the right to buy and sell the goodwill of medical practices, and an exhaustive survey of the Medical Service Committee and Tribunal Regulations.

4. Throughout the year representatives of the Committee have met officers of the Ministry at regular intervals to discuss the many detailed points of day-to-day administration of the Service which continue to arise. These discussions have been of great value and have enabled the Committee to take immediate action upon points brought to its notice by local medical committees.

5. The Committee has maintained a close liaison with the Medical Practices Committee and wishes to pay tribute to the way in which it speedily undertook the task of re-classifying the country in the light of the Working Party's recommendations.

6. The close contact which has also been made with the organizations representing other professions engaged in the Health Service has been of particular value in considering administrative problems where more than one profession is affected.

7. A list of attendances at various meetings and the membership of the various Subcommittees set up is given in Appendix A. This does not include attendances of members at meetings of other Association Committees upon which they serve as representatives of the G.M.S. Committee.

REPRESENTATION ON B.M.A. COMMITTEES

8. The G.M.S. Committee is represented on the following B.M.A. Committees: Private Practice (Dr. A. N. Mathias—Deputy: Dr. C. M. Scott); Central Consultants and Specialists (Dr. A. Talbot Rogers and Dr. D. F. Hutchinson—Deputies: Dr. A. W. Gardner and Dr. J. D. R. Murray); Ophthalmic Group (Dr. M. Sorsby); Occupational Health (Dr. H. F. Hollis—Deputy: Dr. F. Lishman); Public Relations (Dr. A. Talbot Rogers, Dr. D. F. Hutchinson, Dr. F. M. Rose, and Dr. W. Woolley—Deputies: Dr. J. T. Baldwin, Dr. P. J. Gibbons, Dr. R. W. McConnel, and Dr. H. H. D. Sutherland); Compensation and Superannuation (Dr. A. N. Mathias, Dr. A. Campbell, and Dr. S. Wand); Joint Committee of B.M.A. and Pharmaceutical Society (Dr. A. Talbot Rogers, Dr. F. Gray, and Dr. E. W. Goodwin); Consultants and General Practitioners Liaison Committee (Dr. A. Talbot Rogers, Dr. H. S. Howie Wood, Dr. D. F. Hutchinson, Dr. A. W. Gardner, Dr. J. D. R. Murray, Dr. S. Wand, and Dr. D. F. Whitaker); Joint Formulary Committee of B.M.A. and Pharmaceutical Society (Dr. S. A. Forbes, Dr. A. Smith Pool, Dr. D. F. Whitaker, and Dr. A. B. Davies); Arrangements Committee (Dr. A. Talbot Rogers, Dr. I. G. Innes, and Dr. F. M. Rose—Deputy: Dr. A. W. Gardner); Pharmacopoeia Subcommittee of Science Committee (Dr. S. A. Forbes); Committee on the Relation of Drunkenness and Alcohol to Road Accidents (Dr. A. B. Davies).

CENTRAL HEALTH SERVICES COUNCIL

9. Dr. S. Wand has served for a further year on the Standing Medical Advisory Committee of the Central Health Services Council, to which he was appointed after nomination by the Association.

NOMINEES ON MINISTRY OF HEALTH DISTRIBUTION COMMITTEES

10. The following nominees were accepted by the Ministry for appointment on Central Distribution Committees for 1952-3:

International Distribution Committee: Dr. F. Gray (London), Dr. J. D. Wells (Billericay, Essex), Dr. D. B. Evans (Wrexham), and Dr. A. C. Blair (Kilsyth).

Distribution Committee for England and Wales: Dr. A. Talbot Rogers (Bromley, Kent), Dr. F. Gray (London); Dr. W. Woolley (Bristol), Dr. D. B. Evans (Wrexham), and Dr. D. P. Stevenson (Deputy Secretary of the B.M.A.); together with Dr. J. C. Pearce (Diss, Norfolk), Dr. J. D. Wells (Billericay, Essex), and Dr. C. F. R. Killick (Williton, Somerset) when questions concerning mileage are under consideration.

BRITISH DENTAL ASSOCIATION'S GENERAL DENTAL SERVICES COMMITTEE

11. A close liaison has been maintained with the General Dental Services Committee of the British Dental Association by the attendance of an observer from the B.D.A. (Mr. G. M. Hickley, of London) at meetings of the Committee, and the appointment of Dr. F. Gray (London) to the General Dental Services Committee of the B.D.A.

12. This cross-representation has been of great value and enabled the two bodies to reach agreement on a number of matters of mutual interest.

GROUPING OF AREAS FOR REPRESENTATION ON THE GENERAL MEDICAL SERVICES COMMITTEE

13. Representations have been made by the Cumberland Local Medical Committee that the special interests of that isolated area were not adequately represented on the General Medical Services Committee. The local medical committee felt that one additional representative of Group B should be allocated to the Cumberland area, which it was claimed had little geographical affinity to the other areas of the Group.

14. The Committee has considered this matter on previous occasions, and, whilst not unsympathetic to the views expressed by the local medical committee, it does feel that any proposal to constitute Cumberland and Westmorland as a separate group would disturb the balance of representation on the Committee. The Committee therefore felt that, as any problems which would arise in Cumberland would be mainly of a rural nature, the position could best be met by offering facilities for direct representation to Cumberland and Westmorland on the Rural Practices Subcommittee, and, at the same time, to grant direct access to a representative from the area to the G.M.S. Committee on an *ad hoc* basis should the need arise. This proposal was accepted by the local medical committees concerned.

LIAISON BETWEEN THE GENERAL MEDICAL SERVICES AND PUBLIC HEALTH COMMITTEES

15. It has hitherto been the practice for the representative of the Public Health Service on the General Medical Services Committee to be appointed by the Society of Medical Officers of Health, and there has been no direct representative of the G.M.S. Committee on the Public Health Committee of the Association. The Committee has therefore welcomed a proposal that the Public Health Service representative should be jointly nominated by the Public Health Committee and the Society and that a direct representative of the G.M.S. Committee should be appointed to the Public Health Committee. The necessary arrangements are being made to give effect to this proposal, and it is understood that the Public Health representative will be a medical officer of a local health authority who is a member both of the Public Health

Committee and of the council of the Society. This new procedure will promote an even closer liaison between these two branches of the profession.

COMMITTEE ON GENERAL PRACTICE OF THE CENTRAL HEALTH SERVICES COUNCIL

16. The Committee has prepared a memorandum of evidence for submission to the Committee on General Practice of the Central Health Services Council. The evidence is confined to recommendations and observations of a general character based upon policy which has already been determined either by the Representative Body or the Conference of Local Medical Committees.

17. In addition to the very considerable help which it received from local medical committees, the Committee was assisted in its task by representatives of the Central Consultants and Specialists, the Public Health, and General Practice Review Committees, whose experience and viewpoints in their own fields were of the greatest value in compiling the memorandum. The memorandum of evidence is set out in Appendix B.

FLOOD AREAS

18. Immediately news was received of the serious floods along the East Coast, telegrams were sent on behalf of the Committee to the secretaries of local medical committees in the areas affected expressing the Committee's sympathy and seeking information as to how best assistance might be given. It was anticipated originally that additional doctors might be required in the reception areas to cope with the sudden influx of population, but reports received subsequently indicated that the normal medical services were able to meet the extra demands placed upon them.

19. The Committee decided to take immediate action to prevent hardship among individual practitioners whose practices were in the flood areas, and, on consideration, it appeared that this could best be achieved by—

- (a) providing immediate financial assistance to doctors whose property had been lost or damaged, and
- (b) the introduction of long-term measures to protect the practices of doctors in the flood areas and to compensate them for any loss of income.

20. In the meantime the Committee learned that an appeal had been made by the Chairman of Council for contributions to the Sir Charles Hastings Fund for the relief of doctors in the flood areas, and decided to recommend to the Trustees of the General Medical Services Defence Trust that a sum of money should be made available to the Hastings Fund. This recommendation was accepted by the Trustees, and a donation of up to £5,000 has been guaranteed to the Hastings Fund.

21. The Committee has also discussed with the Ministry the steps to be taken to compensate doctors for loss of income due to the evacuation of many of the coastal areas and the likelihood that many seaside resorts would not this year receive their usual quota of holiday visitors. Arrangements have been made to ensure that, for the time being, doctors who have suffered as a result of the recent flood disaster will not suffer any loss of income from capitation payments and temporary resident fees.

22. It is hoped that by the end of the year conditions will have returned to normal, but the position will be reviewed from time to time, and, if it appears necessary, further discussions will be held so that these emergency arrangements may be extended for a longer period.

COLLEGE OF GENERAL PRACTITIONERS

23. The Committee has learned with interest of the formation of the College of General Practitioners and has conveyed to the College its congratulations and best wishes for its success. Representatives of the Council of the College attended a meeting of the Committee to discuss the

relationship between the two bodies, and points of detail are now under examination by a small subcommittee upon which both organizations are represented. The results of this detailed examination will be reported to the Committee in due course.

REMUNERATION

24. Following the Danckwerts award and the acceptance of the Working Party's Report on the future distribution of the Central Pool, much of the Committee's time during the earlier part of the session was taken up in discussions with the Ministry of Health on the application of the principles established by the award, to the calculation of the size of the Pool, and in considering again in consultation with the Ministry the detailed administrative machinery necessary to give effect to the Working Party's proposals.

Payment of Arrears

25. First, it fell to the Committee, in consultation with its accountants, to reach agreement with the Ministry on the detailed calculation of the arrears due under the Danckwerts award and to secure their prompt distribution to the profession. This was accomplished by November 28, 1952, and the Committee wishes to place on record its appreciation of the whole-hearted co-operation on the part of the Ministry and executive councils which enabled this big administrative task to be completed by that date.

Income Tax

26. The Committee, assisted by Counsel, had discussions with the Board of Inland Revenue on the assessment of income tax and surtax on the arrears paid to general practitioners. The Committee wishes to acknowledge the co-operation of the Board and to report that the discussions enabled agreement to be reached on an equitable method of assessing the arrears for tax purposes.

Size of the Pool

27. It will be remembered that the size of the Pool each year depends upon a number of variable factors, in particular the number of doctors in the Service and the level of practice expenses. Hence, it was of first importance to see that proper arrangements were made to enable a reliable and accurate assessment to be made each year of the number of doctors in the Service. The Committee is glad to report that agreement has now been reached with the Ministry as to the method to be used for making this calculation. At the Committee's request, its accountants, Messrs. Price, Waterhouse & Co., have agreed to carry out each year a detailed check of the Ministry's records and of the records maintained by a number of executive councils.

28. The Special Conference last year asked the Committee to consider the preparation, on a permanent basis, of lists of practitioners providing general medical services, as a check against the records maintained by the Ministry. The great difficulty in maintaining separate records is that inevitably, if they are to be accurate, the information must be supplied by executive councils, whose information forms the source of the Ministry's own figures. Apart from the difficulties which would be experienced in reconciling the two separate sets of records, such machinery would not necessarily be accepted as a reliable check, and the Committee felt that the situation could best be met by making both Departmental and executive council records available for examination by independent auditors acting on its behalf. The Ministry has offered its full co-operation to enable such a check to be carried out, and the Committee is satisfied that this method amply safeguards the situation and at the same time overcomes the disadvantages inherent in the maintenance of a second set of records by the Committee.

29. The Committee is in consultation with the Ministry about a further inquiry into practice expenses, which in future will be undertaken at regular intervals.

Reduction of the Maximum Number of Patients whom a General Practitioner may accept under the Service

30. With the introduction of the new distribution scheme in April this year, the new and reduced maxima envisaged in the Working Party's Report came into effect. It will be remembered that the new maxima are:

- 3,500 for a single-handed practitioner;
- 4,500 for a member of a partnership, provided the average for the partnership is not above 3,500;
- 2,000 in respect of the employment of a permanent assistant.

31. Since it was felt that the reduction of the permitted maximum lists must lead to a substantial redistribution of patients, in order to avoid inconvenience to patients and doctors alike it has been agreed that the new maxima will not come into full effect until April 1, 1954. Thus practitioners who, under the new Regulations, are required to bring their lists within the new limits will do so by stages. At the end of the second quarter of the new distribution scheme, lists should be brought within 300 of the new maxima, at the end of the third quarter to within 200, and at the end of the fourth quarter to within 100. The tolerance of 100 allowed for the last quarter of the present year will continue after April, 1954. The operation of these new maxima means that, apart from the tolerance of 100 mentioned above, a practitioner will not be paid capitation fees for any patients in excess of the number permitted.

32. In the case of partnership lists, any partner whose share in the practice is less than one-third of the share of the partner with the greatest share will, for the purposes of the new maxima, be regarded as an assistant. This is in line with the criteria which existed under the old distribution scheme.

33. The problem of the "salaried" partner who is guaranteed a minimum income has been met by providing that such a practitioner will be regarded as a full partner so long as his share is not below the level of one-third mentioned above and that he will participate in any balance of income which is available to the partnership over and above the amount needed to provide the guaranteed minimum.

Payment on the Basis of Notional Lists

34. One major feature of the Working Party's scheme which the Committee is confident will do much to stimulate the formation of partnerships is the arrangement whereby members of a partnership can apply to be paid on the basis of "notional lists." In order that practitioners would have as much time as possible to make any necessary arrangements before the advent of the new distribution scheme, the Committee had early discussions with the Ministry on the administrative machinery necessary to give effect to the new proposals, and detailed instructions have now been issued to executive councils.

35. Any partnership which wishes to take advantage of these arrangements is required to notify the executive council of its intentions. No special form of application is needed, and notifications must be sent either to the executive council in whose area the majority of the partners reside or, if there is no clear majority, to the executive council in whose area the majority of the partnership's patients reside. There has been a good deal of confusion in the minds of some practitioners about the notional-list arrangements, and the Committee would like to emphasize that no physical transfer of patients between the partners is necessary for this purpose—it is an arrangement purely in connexion with remuneration, to enable partnerships to take the maximum advantage of the system of loaded capitation fees.

36. To avoid any possibility of abuse and to safeguard the Central Pool, the Committee has agreed that only applications from bona fide partnerships should be granted. For this reason executive councils, in consultation with local medical committees, have been given full discretion in dealing with requests for payments on the basis of notional lists.

37. Initially, applications from partnerships which were in existence when the new scheme was announced are granted without question. In the case of new partnerships, executive councils are required to satisfy themselves generally that all the partners are taking an active part in the practice and, in particular, that no partner's share in the practice is less than one-third of the share of the partner with the greatest share. If a member of a partnership does not conform to these criteria, he will be regarded as an assistant, the notional-lists arrangement will not apply, and no loaded capitation fees will be payable for any of the additional 2,000 patients allowed in respect of such a practitioner. These provisions, which are in line with the regulation governing the size of lists, should adequately safeguard the position so far as the problem of "sleeping partners" is concerned. In addition, executive councils have discretion to withdraw consent by giving at least one month's notice if they have good reasons to doubt the bona fides of any particular partnership.

38. In the case of consent being either withheld or withdrawn, a right of appeal to the Minister has been established. In deciding such appeals, the Minister will be advised by a panel consisting equally of nominees of the Department and of the Committee.

39. The position of "salaried" partners who receive a guaranteed minimum under their partnership agreement has also been considered, and, provided that such a partner qualifies under the one-third share criterion mentioned above and that his share in the partnership rises in proportion to any increase in the firm's income over the amount needed to secure the guaranteed minimum, any application for payment on the basis of notional lists will be granted.

Initial Practice Allowances

40. One other important feature of the Working Party's Report came into operation on April 1 this year. From that date, initial practice allowances became payable in areas classified as "designated" by the Medical Practices Committee, and detailed instructions were issued to executive councils on the subject in November, 1952, following discussions between the Committee and the Ministry of Health. The Committee feels that these arrangements will do much to ease the problem of the new entrant, who, provided he commences practice in an area which is in need of further doctors, will be assured of a minimum income for three years.

41. For this period of three years initial practice allowances are payable at maximum rates of £600 in the first year, £450 in the second year, and £200 in the third year, subject in the second and third years to the conditions:

- (i) that the practitioner had obtained 150 patients by the end of the first year and 500 patients by the end of the second year; and
- (ii) that the payment in the second year is not greater than the amount necessary to make up to £1,000 the practitioner's gross income from professional sources (excluding his initial practice allowance) during the first year, and in the third year that it is not greater than the amount necessary to make up to £1,100 the gross income of the second year, again excluding his initial practice allowance.

42. In designated areas doctors genuinely setting up in single-handed practice in a practice area new to them otherwise than as a successor to a vacant practice qualify for these allowances. Doctors filling single-handed vacancies in designated areas are also eligible for an initial practice allowance for three years. The allowance in the first year will be such sum as is required to raise the income calculated on the size of the list, when taking over, to a gross total of £1,000, subject to a maximum payment of £600. Allowances in the second and third years are subject to the same conditions of income level as for doctors setting up new single-handed practices, and the same conditions as to the minimum number of the list to be reached apply to the second and third years' payments. Practitioners in receipt

of initial practice allowances are paid, in addition, normal capitation fees without any deductions.

43. Payment of initial practice allowances begins from the date on which the doctor starts his practice following his admission to the medical list. A doctor whose application to be included in the medical list is received whilst an area is classified as designated has a right to be included in the list, and his application is granted automatically by the Medical Practices Committee.

44. Executive councils are required to consult local medical committees in considering applications for initial practice allowances, and a right of appeal to the Minister exists in those cases where the application is refused. The Minister will be advised by a committee consisting of equal numbers of representatives of the Department and of general practitioners from a panel nominated by the Committee.

Qualification for Initial Practice Allowances

45. The Committee has examined a motion which was referred to it by the Special Conference to the effect that practitioners who had completed their military service before qualifying should be eligible for an initial practice allowance after two years' qualification as a medical practitioner. After careful consideration, however, it has concluded that no case exists for relaxing the criteria laid down by the Working Party.

Doctors Previously Receiving Fixed Annual Payments

46. Doctors in all areas who, when the scheme began on April 1 this year, had been in receipt of a fixed annual payment for less than three years, and whose applications for payment were received before November 24, 1952, receive a special payment on the appropriate initial practice allowance rates for the balance of the three-year period or for one year, whichever is the longer. Payment is subject to the appropriate maxima on professional earnings during the preceding year (excluding any fixed annual payment and the percentage increase in respect of it paid as a result of the Danckwerts award). If payment is due for more than one year its continuance is subject to the standard conditions relating to the size of list to be secured at the end of each year.

47. A doctor who, on April 1, 1953, was in receipt of a fixed annual payment which had continued for three years or more receives a special payment for one year. The payment is restricted to the amount by which his gross professional earnings due for the preceding year (excluding a fixed annual payment and percentage increase) fell short of £1,100, subject to a maximum of £200.

Classification of Areas

48. Shortly after the acceptance by the Conference of the Working Party's Report, the Medical Practices Committee circularized local medical committees seeking information as to the medical manpower position in each individual area. Subsequently, the Medical Practices Committee published a report containing the classification of areas as envisaged by the Working Party. It will be remembered that the country has been divided into three areas:

- (i) "designated" areas—where an application for admission to the medical list will be granted automatically by the Medical Practices Committee, and where, on admission, a doctor not proposing to practise in a partnership will be entitled to receive an initial practice allowance;
- (ii) "intermediate" areas—where an application for admission will be considered in the light of the particular circumstances and where, if granted, a doctor would not be entitled to an initial practice allowance;
- (iii) "restricted" areas—where there are generally already a sufficient number of doctors practising in the area and the admission of new doctors not already engaged in National Health Service practice in the vicinity will therefore be exceptional.

49. Average lists of 1,500 and 2,500 have been adopted as the datum lines demarcating the new types of area. The application of these figures is essentially flexible and dependent upon the type of area, the number of principals practising there, local geographical conditions, housing development, slum clearance, and possible future shifts of population, whilst the scope for professional work outside the provision of general medical services is also taken into account.

50. Although the new distribution scheme did not come into effect until April 1, 1953, the Committee felt it most desirable that doctors should be well aware in advance of the future classification of areas so that those who were proposing to set up in practice or to change their practices would be fully apprised at the earliest possible date of the position in any particular part of the country. It was therefore decided, in consultation with the Medical Practices Committee and the Ministry, that local executive councils and local medical committees should, on this occasion, be asked to content themselves with making written representations and that the classifications made in the first instance by the M.P.C. would be provisional. Now that the new schedules have been published, it will be open to executive councils, should they wish, to make any oral representations which they may deem necessary in the light of any change which may have taken place in the circumstances of their own particular areas.

51. Arrangements have also been made for the prompt publication in the medical press of any changes in the classification of an area. The M.P.C. has also undertaken to provide individual doctors with general information about the classification of any particular area, but practitioners will be well advised to get in touch with a particular executive council or local medical committee before making any final decision to set up in practice.

Group Practice

52. The Committee has considered what further steps may be necessary to stimulate the formation of partnerships working as a group practice. It will be recalled that the Working Party recommended that a sum of money (provisionally £100,000) should be set aside for this purpose. One of the major difficulties in the way of implementing this recommendation has been the absence of any clear definition of what is meant by "group practice."

53. The Committee noted with interest that the Minister of Health had announced in the House of Commons that he was asking the Committee on General Practice of the Central Health Services Council to define the term "group practice," and the Committee has been assured that any definition suggested will be submitted to it for consideration. At this stage the Committee intends to discuss with the Ministry the measures which may be found necessary to give effect to paragraph 29 of the Working Party's Report.

Additional Remuneration for Special Qualifications and Experience

54. The Committee was asked by the Special Conference last year to consider the possibility of preparing a scheme to make available from the Central Pool an agreed sum for distribution to general practitioners by way of recognition for seniority in the Service, special qualifications, and experience. This proposal was, of course, one of the matters to which the Working Party itself gave careful consideration before framing its recommendations.

55. There are many obvious difficulties in devising a practical scheme, and the Committee feels that, particularly in view of the consideration which has already been given to the proposal by the Working Party, it would be inadvisable to take the matter any further at the present time.

Inducement Payments

56. The Adjudicator, in determining the size of the Central Pool, decided that no account should be taken of the special

Inducement Fund. In consequence, the Ministry put forward the view that this Fund could not, in the light of the award, in future be regarded as a fixed percentage of the Central Pool, and that the Inducement Fund, as such, would no longer exist. Nevertheless, the Ministry agreed that in appropriate cases inducement grants would still be forthcoming from public moneys outside the Central Pool. In view of the Adjudicator's decision, the Committee could not contest this point of view. So far as the past is concerned, the Ministry has agreed that the percentage increase made under the Danckwerts award should be applied to payments which have been made since the inception of the Service from the Inducement Fund to assist doctors in these unattractive areas. Percentage additions ranging from 11% to 22% have accordingly been made in respect of the years 1949-53. They do not apply to "hardship" payments which have in the past been made from the Inducement Fund.

57. Discussions are proceeding with the Ministry on the new levels of income which should be taken into account in deciding upon future *ad hoc* payments in inducement areas.

The Danckwerts Award and the Small-list Practitioner

58. A full report of the Committee's efforts to inquire into and, where necessary, to provide assistance for certain practitioners who may suffer injustice under the new distribution scheme will be considered by the Special Conference of Local Medical Committees on May 5. A further report of the decisions taken at the Special Conference and the outcome of the Extraordinary General Meeting of the Association will be made to the Annual Conference.

Assistance for Elderly Practitioners

39. Paragraph 19 of the Working Party's Report provided for a small sum of money to be set aside from the Central Pool to deal with cases of hardship which might arise, particularly where, under the new arrangements, an elderly practitioner might lose his fixed annual payment and, after receiving an initial practice allowance for a year, finds himself less well off than he was before the new scheme of distribution came into operation.

60. Discussions were therefore held with the Ministry on the arrangements to be made for implementing this recommendation, and detailed instructions have now been issued to executive councils setting out the method and manner of the assistance which is to be given in these cases. Generally, financial help will be given to doctors who were aged 65 or over when the new distribution scheme came into effect or who subsequently attain that age and who are actively engaged in single-handed practice under the National Health Service. For this purpose, a list of at least 500 persons will normally be taken as an indication that the doctor is so engaged, but, particularly in rural areas, executive councils have discretion to accept claims from doctors with smaller lists if they are satisfied that it is reasonable to do so.

61. For the year 1953-4 the rates of payments are as follows :

(a) The maximum rate of payment is £350 per annum, payable where the doctor has a list of 500 patients under the National Health Service, or a smaller list if, in an exceptional case, he is accepted as being actively engaged in practice.

(b) This rate of payment will be decreased by 9s. (one-third of the loaded capitation fee) for each person on the doctor's list over 500.

(c) The payment for the year, subject to the overriding maximum of £350 per annum mentioned above, is limited to the amount needed to bring the doctor's income from all professional sources to £1,250.

(d) The payment for 1953-4 will be reduced by the amount of any payment to be made for this year under the arrangement to make a special allowance to practitioners who have been in receipt of a fixed annual payment for three years or more.

MODEL DISTRIBUTION SCHEME

62. With the introduction of the new proposals for the distribution of the Central Pool, it became necessary to prepare a model distribution scheme which came into effect on April 1, 1953. The scheme covers the payments to be made by executive councils under the following headings :

- (a) capitation payments ;
(b) loadings ;
(c) payments for emergency treatment ;
(d) payments for the administration of anaesthetics ;
(e) payments for the treatment of temporary residents ;
(f) the supplementary distribution to be made by executive councils after the end of each year.

63. Executive councils are normally given discretion, subject to the approval of the Minister, to vary their local distribution schemes to take account of the wishes of the doctors in their areas. Unfortunately, through pressure of work in connexion with other aspects of the Working Party's Report, it was not found possible to prepare and issue the new model scheme until the middle of March, and by then there was insufficient time for local executive councils and local medical committees to consider and to secure the approval of the Minister to any local variations which they wished to introduce. Again, the Committee is informed that, for constitutional reasons, it is not possible to present to Parliament a model scheme which provides for variation in fees not specifically included in the model. In consequence, the Regulations provided that the terms of the model distribution scheme would operate, without modification, for the year beginning April 1, 1953. In order that local variations might be introduced after April 1, 1954, executive councils were instructed to consult local medical committees and consider whether they wished to suggest any modifications in the model scheme for subsequent years.

64. In the case of fees for emergency treatment the Committee is convinced that the "knock for knock" system, which is one of the alternatives available under the model scheme, is a very satisfactory method of dealing with these payments, and a circular letter has been sent by the Committee to local medical committees advocating the adoption of this system.

**DATE OF INCLUSION OF A GENERAL
PRACTITIONER'S NAME IN THE
MEDICAL LIST**

65. The importance of assessing accurately the number of doctors in the Service has been mentioned elsewhere in this Report. Equally, it is important to ensure that uniformity of treatment is achieved so far as the date of inclusion of a doctor in the medical list is concerned. In consequence, at the Committee's request the Ministry has now issued a circular letter to executive councils, pointing out that, if a practitioner applies to have his name included in the medical list (either to succeed to a practice declared vacant or otherwise) and there is only one applicant for the vacancy, he is entitled to be placed on the medical list as from the date he was informed of his selection by the Medical Practices Committee.

66. In the case of vacancies where there are several applicants the doctor's name in the absence of an appeal is to be included in the list as from the eighth day from the Medical Practices Committee's decision. If there is an appeal the council must await the outcome of that appeal in accordance with Section 34(7) of the Act.

**PROVISIONAL APPLICATION FOR INCLUSION IN
THE MEDICAL LIST**

67. It has been the practice in the past for an applicant for inclusion in the medical list to be provisionally accepted on the understanding that the application would be confirmed when satisfactory practice premises had been obtained. With the introduction of the new distribution

scheme, the Medical Practices Committee felt that this practice should be discontinued on the grounds that the addition of one more doctor to the list might result in the reclassification of the area and have the effect of excluding another practitioner who was about to seek admission to the list and who had earmarked suitable practice premises.

68. Following discussions between the Committee and the Medical Practices Committee, it has been agreed that the practice of granting provisional admission to the medical list should be continued, and full admission to the list will be subject to the new entrant starting his practice within one month after provisional admission. This period will be renewable month by month for up to a further two months at the discretion of the council. In those cases where another practitioner is in the field who has already taken steps to secure practice premises, no extension of the original period of one month will be granted.

**REMOVAL OF PRACTITIONER'S NAME FROM THE
MEDICAL LIST**

69. The Committee received from the Ministry the draft of a new Regulation made under Subsection (2) of Section 33 of the N.H.S. Act and Section 14 of the N.H.S. (Amendment) Act, 1949. The purpose of the Regulation is to lay down the procedure to be adopted by executive councils in giving notice to a medical practitioner that it is proposed to remove his name from the medical list in cases where it is apparent that he has never undertaken the provision of general medical services, or where, having done so, he has ceased to provide such services for some considerable time. It is satisfied that adequate safeguards

70. The Committee is satisfied that adequate arrangements were provided in the draft Regulations, and that the local bodies concerned are given a large measure of discretion in dealing with these cases. It therefore accepted the new arrangements, and a circular has now been sent to executive councils on the subject.

CODE NUMBER FOR GENERAL PRACTITIONERS

71. The Committee has considered a suggestion that all general practitioners in contract with executive councils should be provided with a national code number in lieu of the present local code number which is allocated to a doctor by individual executive councils. Although the Ministry accepts the Committee's point of view that it may be inconvenient and at times confusing for doctors on the lists of several councils to have more than one number, the introduction of the Committee's proposal would require the maintenance of a central register of doctors, and the Department feels that, on the grounds of expense, such a scheme could not at present be justified. The Committee proposes to keep the suggestion under review.

FILLING OF VACANCIES

Acquisition of Vacant Practice Premises

72. The Annual Conference last year agreed that an amendment should be made to the Regulations to add a condition to the terms of service that a doctor would not, without the consent of the executive council or, on appeal, of the Medical Practices Committee, provide general medical services from the premises of an outgoing doctor for a period of not more than one year from the date of confirmation of the appointment of the successor, with a proviso that, where the owner had previously agreed with the executive council to give the successful applicant an option on the premises, if that option were not taken up within the first month the restriction on practice from the premises would lapse.

73. The Committee has now discussed with the Ministry the necessary amendment to the Regulations to give effect to this decision and the safeguards necessary to prevent any hardship arising as a result of its application. Briefly, the effect of the new regulation is that the successor to a vacant practice will have one month in which to decide whether to accept an offer of the practice premises. The terms of the

offer will have to be approved by the Medical Practices Committee, which, following the necessary inquiries, will act as expeditiously as possible. If the successor does not want the premises, or if he fails to accept the offer in a month, the premises can then be used by another doctor. If no offer of the premises is made, they cannot be used by any other doctor for a Health Service practice for a period of 12 months from the successor's appointment, except with the consent of the executive council, or, on appeal, of the Medical Practices Committee. The successor, if he is prepared to accept the offer, will be expected to complete the purchase with reasonable expedition. In certain circumstances the council, or, on appeal, the Medical Practices Committee, has power to consent to the use of the practice premises by a doctor other than the successor to the vacant practice even though their use is otherwise prohibited under the new regulation.

74. The Committee hopes that the action which has been taken will in a large measure solve the problem which has arisen when the appointed successor to a practice vacancy has found that the practice premises of the outgoing doctor have been secured by another general practitioner.

Succession to Vacant Medical Practice by a Partner

75. The Committee's attention has been drawn to the increasing practice whereby partnerships have been formed between an established single-handed doctor who intended shortly to retire and a doctor who was new both to the practice and to the district, with the intention of enabling the latter to secure the succession to what was essentially a single-handed practice. The Committee felt that this practice was against the best interests of the Service, and it has therefore agreed with the Ministry and the Medical Practices Committee that in future that Committee will not, unless there are special circumstances, accept one partner as a logical successor to another partner who has died or resigned, unless the partners have been in active practice together for about a year. The Medical Practices Committee will, of course, retain full discretion if the circumstances of any particular case merit special consideration, and the Committee appreciates that there will often be good reasons for an exception to be made. A genuine partnership might, for instance, have been formed and then terminated soon afterwards by the sudden death of the original partner or his resignation because of unexpected illness. Similarly, there might be special reasons for making an exception when the partnership had existed for less than a year but the two partners are related. Sympathetic consideration will and must be given to such cases, but the Committee is satisfied that the action it has taken is necessary in the best interests of the Service.

Transfer of Patients in Cases of Partnership

76. The Ministry, in consultation with the Committee, has advised executive councils that where a single-handed practitioner or a practitioner working with an assistant forms a new partnership there will not normally be any need for the transfer of patients *en bloc* from one list to the other, since the provisions for partners to be paid on the most advantageous division of patients between them (notional lists) will operate. Executive councils in future will not therefore be required to make block transfers of patients between lists where new partnerships are formed, except where one of the partners has a list in excess of the prescribed maxima.

Certificates Granted by the Medical Practices Committee

77. It is a common practice for doctors proposing to establish a partnership to apply to the Medical Practices Committee for a certificate under Section 35 (9) of the National Health Service Act, 1946, as proof that nothing in the proposed partnership deed involves the sale of goodwill.

78. The Ministry has advised executive councils that a certificate granted by the Medical Practices Committee for

105. During the course of its deliberations the Mileage Committee has discovered a number of anomalies in the present mileage distribution scheme, and, as a first step, a number of urban areas hitherto included in the mileage scheme have now been excluded, following consultation with the local executive councils and local medical committees concerned.

106. As the information collected for the purpose of the adjudication became available, the Mileage Committee also took the opportunity of examining the adequacy of the total amount of the Mileage Fund—namely, £2m. As a result of its deliberations, the views of the G.M.S. Committee were sought, and, in the light of the data which were made available to it, the Committee is satisfied that the overall size of the fund should not be altered, and has informed the Mileage Committee to that effect.

Classification of Practices for Mileage Purposes

107. The Committee's attention has been drawn to cases where, as a result of the operation to eliminate inflation from doctors' lists, the application of the formula which is used to classify a doctor's practice for mileage purposes results in a new classification of the practice. The Ministry has agreed that, as soon as it is practicable, executive councils should give effect to any amended classifications which emerge as a result of the pruning of lists, and make the necessary adjustments to the mileage payments.

MEDICAL SERVICE COMMITTEE PROCEDURE

108. The special subcommittee appointed to carry out a full investigation of the status, composition, procedure, and functioning of the Tribunal and Medical Service Committees has now completed its task, and its report is set out in full in Appendix C. In reaching the conclusions set out in its report, the subcommittee took full note of the views expressed by local medical committees in England and Wales, who were asked to examine the existing machinery and suggest any modifications which they felt might be necessary. Representatives of the dentists and of the pharmacists were present throughout the subcommittee's deliberations and its report expresses the views of the representatives of all three professions.

109. Subject to any views which may be expressed by the Conference, the recommendations contained in the report will be discussed with the Ministry of Health.

110. The Committee's attention was drawn to a case in which a service committee, although acquitting a practitioner of the charge brought against him, passed a rider which was, in effect, critical of his methods of conducting his practice. The Committee held that the publication of such comments was clearly undesirable, and the matter was raised with the Ministry of Health, which has now agreed that, when a service committee desires to draw the attention of a doctor to a particular point in connexion with the administration of the services, it should do so by means of a private communication and not by way of a reference in any part of its report.

111. The Committee has also considered a case which arose in Scotland in which the Tribunal had pronounced judgment on a doctor whose name was removed from the medical list although no breach of the terms of service had been committed. Counsel's opinion was obtained on the principles involved in this case, and there is no doubt that the action taken was in accord with the Act and existing regulations. Further consideration is being given to ways and means of overcoming this problem.

112. Another problem which the Committee has examined during the past session is the position of a member of a partnership *vis-à-vis* his responsibility for the acts or omissions of a second practitioner acting as his deputy or assistant.

113. Under his terms of service a practitioner is held responsible for his deputy's acts or omissions, and whilst the Committee appreciates that this provision may be equitable in the case of assistants and locums, it holds that where a

partnership exists each partner should be held fully responsible for his own actions. Moreover, in this respect, the terms of service appear to be at variance with the provisions of the Partnership Act. The Committee is therefore initiating discussions with the Ministry with a view to securing an appropriate amendment of the terms of service.

DISPENSING CAPITATION FEE

114. Following discussions between the Ministry of Health and the Rural Practices Subcommittee, the Committee agreed that a provisional increase of 50% should be made in the dispensing capitation fee from April 1, 1952. Payment was made when the Danckwerts award was implemented, and the increase has been allowed for in future calculations of the size of the Central Pool.

DISCOUNT ON DRUGS

115. The Committee has again received complaints from individual practitioners and local medical committees about the loss sustained by dispensing doctors paid on the basis of the Drug Tariff when supplying a number of proprietary preparations. This loss arises as a result of the lower rate of discount which dispensing doctors receive from wholesale drug houses, combined with the fact that the prices in the Drug Tariff are based on the wholesale price of the article to the chemist.

116. Although representations have been made on a number of occasions in the past both to the Association of the British Pharmaceutical Industry and the Ministry of Health, it has not been found possible to overcome the problem. The Committee feels it most inequitable that a doctor should suffer financial loss when dispensing for his patients, and will pursue its efforts to find a solution.

ECONOMY IN PRESCRIBING

117. The Committee has considered whether it would be practicable or desirable to impose a requirement that the dispensing costs of proprietary articles should be shown in the advertising material issued by the drug houses. A meeting was held with representatives of the Association of the British Pharmaceutical Industry, and a most helpful exchange of views took place. Both sides were agreed that doctors should be informed of the cost of the articles which they were prescribing, and that any steps which could be taken to achieve this end should be encouraged. There are, however, a number of technical difficulties in printing the price of a particular article on promotion material which is designed to cater for different markets with consequent variations in price, and the Committee feels that it would not be wise at this juncture to press for any measure of compulsion. At the same time, the Association of the British Pharmaceutical Industry was asked to use its influence with the drug houses to ensure that doctors were kept informed of the prices of drugs, particularly the more recently introduced preparations. Similarly, the Committee felt that representatives calling on general practitioners should always be prepared to provide prices of the drugs supplied by their houses, and that general practitioners should be encouraged to ask or write for this information.

118. The Committee has also considered a proposal that in the interests of national economy patients who are attending hospital regularly should have their medicines dispensed by the hospital and not by the family doctor. In the Committee's view, the sole criterion should be the interests of the patient, and the Committee takes no exception to the proposal in those cases where it is in the interests of the patient that the hospital shall undertake the dispensing.

119. Under National Health Insurance one of the greatest aids to economy lay in the doctor's ability to check his prescribing costs against an areal average. The Committee has constantly advocated the reintroduction of this system, but the arrears of work in the Pricing Bureaux, and the fact that not all prescriptions are costed, have prevented its re-establishment. Nevertheless, the Committee is discussing

with the Ministry the possibility of instituting the system of areal averages determined for the time being on a sampling basis.

MEDICINES AND APPLIANCES FOR DOCTORS' SURGERIES

120. The Committee has again pressed the Ministry to introduce arrangements for stock orders for doctors' surgeries. The Ministry itself is in favour of such a scheme on the grounds of convenience and economy, but unfortunately, because of complications arising out of the charge for prescriptions, the pharmacists have declined to proceed any further at the present time. The Committee appreciates that the pharmacists cannot be compelled to take part in the proposed arrangements, but every effort will be made to reach early agreement on this important aspect of the Pharmaceutical Service.

INVESTIGATION OF PRESCRIBING

121. The attention of the Committee has been drawn, on a number of occasions, to cases in which charges of over-prescribing brought against general practitioners and investigations into whether a particular substance is a food or a drug were not finally resolved until very many months after the issue of the prescription in question. This is obviously an unsatisfactory state of affairs both from the point of view of the individual doctor concerned and of the efficient working of the Service. The Committee therefore discussed with the Ministry ways and means by which this procedure might be speeded up without in any way infringing upon the doctor's legal rights. The main difficulty has been the time lag between the issue of a prescription and its pricing by the Pricing Bureau, but the Committee understands that Pricing Bureaux are diminishing arrears at a steady rate and that it should shortly be possible for an investigation to be initiated within three months from the issue of the prescription.

122. During the course of its discussions the Committee suggested to the Department that the time after which a prescription might be referred for investigation should be limited to a reasonable period, and this particular aspect is dealt with more fully in the report of the special subcommittee which has been reviewing the disciplinary machinery. The proposal is still under discussion.

DETERMINATION OF WHETHER A SUBSTANCE IS A DRUG

123. On several occasions during the past session the Committee's advice has been sought by local medical committees on whether a particular substance which has been prescribed by a practitioner is to be regarded as a food or a drug. Although prescriptions for these substances are referred for investigation by the Pricing Bureaux, the Committee wishes to emphasize that the reports of the Committee to the Joint Subcommittee of the Central Definition of Drugs are no more than a guide, and that every case must be dealt with on its merits.

124. The Committee recognizes that these investigations have thrown a heavy burden of work on local medical committees, but this is inevitable if the profession is to sustain its contention that an individual practitioner is quite free to prescribe whatever he considers to be in the best interests of his patient, provided always that if subsequently challenged he can justify his action before his colleagues on the local medical committee. The Committee regards this task as one of the most important of those falling on local medical committees and wishes to express its appreciation of the painstaking manner in which it has been discharged.

PRESCRIBING OF COD-LIVER OIL AND MALT AND GLUCOSE

125. The Committee received a number of complaints from general practitioners about the surcharges which were being levied in respect of prescriptions for cod-liver

oil and malt and glucose. It was felt that the increasing number of references were largely due to the result of the publication of a Report of the Joint Subcommittee on the Definition of Drugs. In consequence, the matter was discussed with the Ministry of Health, and a circular letter was issued to executive councils reminding them of the conclusions reached by the Joint Subcommittee that, as a general principle, these preparations, whose primary purpose was to provide nourishment in established diseases, should be classed as drugs.

126. Although the principles set out in the Joint Subcommittee's Report are by no means mandatory, and the individual doctor must continue to accept full responsibility for prescribing for the needs of his patients, the Committee felt that local medical committees should consider prescriptions for these substances in the light of the broad policy laid down by the Joint Subcommittee. This advice was therefore incorporated in a circular letter which the Committee sent to all local medical committees.

PRESCRIBING OF DISINFECTANTS

127. The Ministry has informed the Pricing Bureaux that, in the case of disinfectants, only prescriptions ordering more than 16 fluid ounces should be referred to executive councils for subsequent investigation by local medical committees. The Committee feels that this step will greatly diminish the number of prescriptions referred.

CHARGES FOR PRESCRIPTIONS

128. In its last Report the Committee referred to the discussions which were then taking place with the Ministry of Health as a result of the Government's decision to impose charges for prescriptions issued under the National Health Service. As a result of the Committee's intervention the original proposal that an arbitrary deduction should be made from the dispensing capitation fee was replaced by the present system whereby a dispensing doctor is called upon to account for only the number of shillings which he is actually able to collect. The Committee feels that not only does the method now adopted for the collection of these charges adequately safeguard the interests of the dispensing doctor but that the system which involves the use of postage stamps is a clear indication to the patient as to the ultimate destination of the money which is collected.

129. When the scheme was under discussion the Committee agreed that, to protect the Treasury, the existing disciplinary machinery should be extended to cover possible cases of abuse. Draft Regulations have now been approved by the Committee and will shortly be issued by the Department.

USE OF FORM E.C.10 FOR PRESCRIBING FOR MORE THAN ONE PATIENT

130. The National Pharmaceutical Union has drawn the attention of the Committee to difficulties and dangers which arise as a result of prescriptions being issued on Form E.C.10 for more than one person. Cases have occurred where a script has been issued containing prescriptions for different members of a family—some of whom may be adults and some children—with insufficient means of identification. Although the Committee is informed that this practice is not widespread, there are indications that it has increased recently, particularly since the adoption of the shilling charge on prescriptions. Apart from the fact that it is a breach of the practitioner's terms of service and renders him liable to disciplinary action, there are obvious dangers if the chemist is unaware of the doctor's intentions, and in the event of a mishap responsibility would fall mainly upon the chemist. The Committee has asked local medical committees to do all in their power to make general practitioners in their areas alive to the potential dangers involved and to co-operate to this end with local pharmaceutical committees.

AUREOMYCIN

131. The Committee has suggested to the Ministry that aureomycin should be made freely available to general practitioners. At present it can be obtained only through a hospital.

LIST OF SPECIALLY EXPENSIVE DRUGS

132. The Ministry, in agreement with the Committee, has added methyltestosterone to the list of specially expensive drugs, for the supply of which dispensing doctors paid by capitation fee receive payment over and above such fee.

133. The Committee received a number of requests that penicillin tulle should be added to the specially expensive list, in common with the sulphonamide preparations. It is at present excluded, as it is held by the Department to be an appliance and therefore not within the term "penicillin and preparations of penicillin" in the Drug Tariff. Appropriate representations are being made to the Ministry. Representations are also being made for the inclusion of "sulphex" nasal drops and "clintest" and similar types of apparatus (with the accompanying tablets).

LIST OF APPLIANCES

134. The Ministry has agreed to the inclusion of 2-in. and 3-in. stockinette bandages in the list of appliances prescribable by general practitioners in the National Health Service. It has accepted in principle the inclusion of waterproof dressings, and discussions are proceeding with the manufacturers as to a suitable specification.

135. Requests for the inclusion of the following items are under consideration by the Ministry:

Hypodermic insulin syringe calibrated at 40 units per ml.; catheter lubricant; "vaseline" gauze in 2 in. x 2 in. squares.

NATIONAL FORMULARY

136. The Committee's views were sought by the Joint Formulary Committee on the "lay-out" which would be most useful to prescribers should it be necessary to publish two editions of the *Formulary*, preserving the alphabetical classification in the edition which is predominantly in Latin. It had been suggested that with a gradual change in the use of English nomenclature there should also be a change to a pharmacological rather than an alphabetical classification.

137. After careful consideration, the Committee feels that the majority of subscribers would not welcome a formulary compiled in this way, and the Joint Formulary Committee has been so informed. The Committee, for its part, also holds that there are many advantages in reverting to the use of Latin throughout.

THE OBSTETRIC LIST

138. The Committee has given very careful consideration to a proposal put forward at the Annual Representative Meeting that the special obstetric list should be abolished. The Committee takes the view that every general practitioner is qualified in law to practise midwifery, and the artificial distinction imposed by the present Regulations is unwarranted.

Again, standards imposed by local obstetric committees for admission to the obstetric list are by no means uniform, and it is not uncommon to find that a practitioner has been included in the list of one executive council but been unsuccessful in a neighbouring council into which his practice overlaps. The Committee holds that what the general practitioner requires is the opportunity and experience to further his skill in obstetrics both domiciliary and institutional, and that this end will never be achieved by the purely administrative and artificial device of an obstetric list.

139. In Scotland and Northern Ireland every registered medical practitioner is eligible to have his name included in a list of practitioners undertaking to provide maternity services, and admission is automatic upon application.

140. The Committee believes that this procedure is much to the advantage of both the patient and the maternity

services as a whole, and an appropriate recommendation has been made to the Committee on General Practice of the Central Health Services Council.

141. The Committee was, in the meantime, asked to comment by the Ministry on the draft of a circular letter which it was proposed to send to executive councils containing advice tendered to the Ministry by the Central Health Services Council upon the procedure for the admission of doctors to local obstetric lists. Briefly, the circular stated that the existing machinery for dealing with applications passed to local obstetric committees should be continued, but that in future those committees should be recommended to insist that the applicant should have held a six months' resident appointment in an obstetric unit.

142. The Committee pointed out that, apart from the impracticability of some of the suggestions made, it was undesirable and premature that a circular embodying the advice should be sent to executive councils at the present stage when the whole question of the future of the obstetric list would shortly be under discussion. Again, many executive councils would consider the advice given in this manner as being mandatory. The Ministry was not unappreciative of the Committee's difficulties, but pointed out that the Minister was bound to publish any advice which he received from his statutory advisers. Indeed, the profession itself had attached great importance to this principle before the appointed day.

143. It was therefore agreed that, in order to meet both points of view, instead of sending an official circular to executive councils the advice would be transmitted on a personal basis to the chairmen of executive councils. It was agreed that the letter would include a paragraph which would make it clear that, although wishing to commend the advice of the C.H.S.C. to local obstetric committees, the Minister had not in the past prescribed any rigid criteria to be applied for applications to the obstetric list and he did not now propose to do so.

**ASSISTANTS AND YOUNG PRACTITIONERS
SUBCOMMITTEE**

144. The special subcommittee which was established to represent the views of assistants and unestablished principals has continued its work during the past session, and its views have been sought by the parent Committee on a number of occasions. The subcommittee has, of course, been particularly concerned with the general problem of entry into practice and of the effects of the Working Party's recommendations on the small-list practitioner. The Committee feels that the opportunity which it has, through the subcommittee, of ascertaining the views of the assistant and the unestablished principal is most valuable.

145. Particularly in the case of assistants the Committee considers it important that local medical committees should be aware of the views of this section of the profession, and hopes, wherever possible, that assistants will find representation on the local medical committee. This procedure has been adopted in a number of areas and has proved of considerable advantage both to the established practitioners and to the assistants, and the Committee therefore recommends:

Recommendation: That local medical committees be asked to take such steps as will ensure that assistants in their areas are, wherever possible, represented on each local medical committee by at least one assistant.

146. The subcommittee itself is considering further methods of facilitating the entry of assistants into practice as principals.

**MATERNITY MEDICAL SERVICES—POST-NATAL
EXAMINATIONS**

147. The National Health Service (General Medical and Pharmaceutical Services) Regulations lay down that a doctor providing maternity services shall carry out a post-natal

examination of the mother at or about six weeks after pregnancy. In the past, the Minister of Health has advised executive councils that a doctor may be taken as having complied with his obligations if the examination is undertaken within 10 weeks. In view of the importance attached to the examination, and after discussion with the Committee's representatives, the Minister has advised executive councils to accept an examination given up to 12 weeks from the date of confinement as complying with the regulations.

**DRUGS AND DRESSINGS FOR MATERNITY
PATIENTS**

148. The Ministry has been asked to examine the arrangements for providing drugs and dressings for maternity patients supplementary to those included in the maternity outfits supplied by local health authorities. It is the Ministry's policy that the outfits should be self-contained and that midwives should not encourage patients to ask their own doctors for additional supplies. Similarly, if anaesthetics, surgical spirit, and requirements such as crêpe bandages not normally included in the maternity pack are obtained from the local health authority, and not prescribed on Form E.C.10.

149. The Committee has reason to believe that there may be difficulty in some areas in obtaining supplies from the local authority, and a copy of the Ministry's letter on the subject was sent to local medical committees with a suggestion that, if necessary, those committees should approach the local authority to ensure that adequate provision for the supply of maternity outfits is made in the next year's financial estimates.

**GENERAL PRACTITIONERS AND INSTITUTIONAL
MIDWIFERY**

150. The Committee has again drawn the attention of the Ministry to its view that no maternity case should be admitted to hospital without consultation with the patient's own doctor, and that the selection of patients for maternity beds on account of home conditions should be made only after consultation between the general practitioner and the staff of the hospital concerned.

151. The Ministry is in general agreement with this policy, subject to the proviso that when the question of home conditions is under consideration the hospital should be advised through the local authority. The Ministry is prepared to say that consultations with the general practitioner should always take place, and the Department has undertaken to bring to the notice of both hospital authorities and medical officers of health the importance of such consultation, especially in those cases where the patient had originally booked a general practitioner for maternity medical services.

**CARE OF MOTHERS AND BABIES DURING THE
LYING-IN PERIOD**

152. A memorandum prepared by the Ministry for the guidance of hospital authorities, local authorities, and executive councils as to their respective responsibilities for the care of women confined in hospital and for their babies during the lying-in period was received in September, 1952. The Committee, in consultation with the Central Consultants and Specialists and Public Health Committees, welcomed the issue of the memorandum, with which it was generally in agreement, and at the same time informed the Ministry that it was desirable that the hospital authority should always ensure that not only the medical officer of health but also the general practitioner is advised of the discharge of a maternity patient from hospital.

NATIONAL INSURANCE BILL

153. Under the terms of a Bill which has now been published to amend the National Insurance Acts, the maternity

grant will be increased from £4 to £9, and the former condition of payment of the grant, that the woman should obtain a medical certificate that the confinement had taken place, has been replaced merely by a requirement that the woman has been confined. Similarly, the need for a medical certificate in connexion with applications for maternity allowances has been abolished.

154. The Committee welcomes the payment of an additional grant of £3 in the case of home confinements, which it hopes will do something to encourage domiciliary midwifery.

SALE OF GOODWILL**Preamble**

155. The Annual Representative Meeting in 1952 referred to the Council a resolution calling for an examination and report upon ways and means of procuring the restoration of the right to buy and sell the goodwill of medical practices to those general practitioners who wished to reacquire it. Subsequently, the Amending Acts Committee of the Association, after a detailed investigation of the problem, prepared a memorandum which has been submitted to the Committee for its comments and which is set out in Part I of Appendix D to this report.

Measure of Support for the Proposal

156. In the Committee's view, it is fundamental that if negotiations are to be opened with the Government it should first be firmly established whether there is any strong desire among general practitioners to return to the custom of the sale of goodwill and particularly whether the volume of support is sufficient to justify an attempt to amend Section 35 of the National Health Service Act. Consideration has been given to the possibility of instituting an inquiry throughout the profession to discover, once and for all, the views which are held on this controversial subject. Such an inquiry would, however, need to be accompanied by a very full account of the considerations involved, and even then, so complicated are the details affecting individual practices, it is by no means certain that a plebiscite would give an accurate picture of the measure of support upon which the profession's representatives could count. The Committee therefore feels that local medical committees should be given an opportunity of full discussion on the subject and that the inclusion of a reasoned statement in the Committee's Annual Report to the Conference will best achieve this end.

Practical and Economic Aspects of the Proposal

157. The principle behind the right to buy and sell goodwill, so forcibly expounded by the profession before the "appointed day," is no less a principle at the present time. Indeed, many of the difficulties in connexion with succession to practice which were prophesied by the profession in 1946 have come to pass through the insistence of the Government in abolishing the right to buy and sell goodwill. Nevertheless to-day, after four years of National Health Service practice, conditions are very different, and, apart from the question of whether the profession itself is in favour of the proposal, the Committee has had to consider the practical and economic aspects of an optional return to the sale of goodwill, on the lines suggested by the Amending Acts Committee. In this connexion it has had the benefit of the views of the Association's Compensation and Superannuation Committee (Part II of Appendix D), with which it is in full agreement.

158. In its memorandum the Amending Acts Committee suggests that, if a majority of practitioners were able to exercise the option, the value of goodwill could be stabilized at 1.5 or 1.6 years' purchase. Apart from the fact that this suggestion might be regarded as incompatible with freedom to sell in the open market, it does not take into account that the value of goodwill always varies with the type of practice, the introduction to the practice, whether it is a single-handed or partnership practice, and other factors.

Such artificial control would therefore be quite impracticable. Even if a standard rate of 1.5 or 1.6 years' purchase were established at the outset, there is no guarantee that such a rate would be maintained, and it would therefore lack the security which compensation affords. Even in a free market there is no certainty, under present circumstances, and in competition with a system of appointments to practices, that a doctor could obtain a price equal to the amount of compensation which he would be renouncing.

159. Private practices have sold, since the inception of the Act, on the average at considerably less than 1½ years' purchase price, and in the Committee's view it cannot be assumed that the return of a free market in goodwill would result in a return to the values existing in pre-Act or pre-war days. Thus, a doctor renouncing his compensation in the hope that he could enhance the goodwill of his practice would inevitably be taking a serious risk.

160. The Committee is certain that the optional return of the right to buy and sell goodwill would inevitably over the course of time lead to a universal restoration of the right. As the years go by more and more practitioners will take the compensation moneys due to them, whereas many new entrants to the Service are likely to exercise their option because they have little to lose and everything to gain. Thus the Government would have to justify the expenditure of a large sum of public money designed to compensate practitioners for the loss of the right to sell goodwill when at the same time they were parties to a proposal which would restore the very thing which the Compensation Fund was designed to prevent. The failure of any political party to support the system of sale and purchase of goodwill in a public service was a significant factor in 1946. There is no reason to believe that the position is different to-day. Indeed, it must be faced that the natural corollary to granting such an option might inevitably be a refusal on the part of the Government to pay any further compensation, a risk which would bear hard on those not exercising their option.

161. Medical practices are not static, and the complications which would ensue as a result of attempting to restore the goodwill of practices which had been dispersed or altered in any way to their detriment are obvious. Serious complications would inevitably arise in partnership practices where one partner who had entered the practice since the "appointed day" without purchasing a share might wish to exercise the option. For those in health centre practice even greater difficulties would arise. Another practical difficulty is that any area scheduled as "open" can at any time in the future be declared "closed," with the result that the practitioner who relinquishes his compensation in favour of the right to dispose of his practice may, when the time comes, find that he has what is, in effect, an unsaleable asset.

162. The Committee has also considered the probable effects of the return of goodwill upon the problem of entry into practice. Of first importance is the fact that conditions to-day are very different from those which existed before the "appointed day." The substantial increase in the capital necessary to start a practice, even without the purchase of goodwill, is already creating a serious problem for the young doctor wishing to establish himself in general practice. Moreover, the measures taken by the Government to restrict credit, the rates of interest charged by banks and financial houses, and current rates of income tax have aggravated the problem, and even if the additional money required for the purchase of a practice could be obtained it is very doubtful if the newly established doctor could meet, in his early years of practice, the very heavy commitments he would have incurred.

163. To meet this aspect of the problem it has been suggested by the Amending Acts Committee that that proportion of the £66m. renounced or repaid by those wishing to sell their practices should be used to finance purchasers if banks or finance houses refuse to accept the practice as security. (The Committee does not regard this as a likely

or practicable possibility even if the principle of sale and purchase were conceded.) For example, the suggestion would still not obviate the need for some form of selection machinery—in this case to select the applicants who would be granted loans from the Fund—and new difficulties would arise similar to those the Medical Practices Committee now experiences in selecting the successor to a vacancy.

164. The Committee is of the opinion that a universal restoration of the right to buy and sell goodwill is impracticable, since certain practitioners have already received compensation and many have received substantial sums on account. It would be unrealistic to expect that these sums could be returned to the Government. Moreover, the Committee can see no possibility of the Ministry accepting the proposal to repeal Section 35 of the Act, as by so doing the Minister would cease to retain such control over the distribution of doctors as will enable him to discharge the duties laid upon him by Parliament to provide an adequate and comprehensive Service.

165. Again, it is suggested that, where a doctor has been appointed to a vacancy, he should have the right to decide whether he should regain his right to sell by refunding to the Treasury the compensation paid to his predecessor. It seems to the Committee that this proposal again ignores the fact that the value of a practice may well have increased by the endeavours of the appointed doctor's predecessor rather than by the successor himself. Yet the latter is to benefit without any apparent exertion on his part.

166. Nevertheless, the Committee would not wish administrative difficulties or political expediency to stand in the way if the change sought is in the interest of the profession itself. On this the Committee has grave doubts. The lack of any unified call for the return of goodwill, the possible hazards facing the doctor who exercises the option, and the increased financial burden which will be placed upon the new entrant are factors which cannot be ignored. Above all, the Committee is concerned to ease the position of those wishing to enter practice. The return of the right to buy and sell goodwill, even on an optional basis, can, in the absence of such a fund as is referred to in paragraph 9, lead only to a situation where the most desirable vacancies will, in course of time, become available to those who can afford to buy. This will inevitably result in a form of discrimination in the case of new entrants which many would regard as undesirable.

Summary

167. The Committee has carefully considered the proposals put forward by the Amending Acts Committee. It has studied the practicability of these proposals in the light of the comments submitted by the Compensation and Superannuation Committee of the Association. It has had in mind the very strong views expressed by the profession on the subject before the "appointed day," and has balanced them against the very real practical and economic difficulties which would arise if an attempt were made to repeal Section 35 of the National Health Service Act. The Committee believes that under the totally different circumstances which prevail to-day many of the advantages claimed for its restoration, even if practicable, would impose a serious financial hardship upon the young man entering practice. The Committee is anxious to ensure that those who might otherwise be in favour of the principle of the right to buy and sell goodwill are fully alive to all the considerations set out above, and recommends:

Recommendation: That the Conference of Local Medical Committees, representing National Health Service practitioners throughout the country, having considered the memorandum prepared by the Amending Acts Committee and the comments of the General Medical Services Committee and the Compensation and Superannuation Committee upon it, is not in favour of the optional return of the right to buy and sell goodwill of practices, which it believes to be impracticable.

EMPLOYMENT OF GENERAL PRACTITIONERS IN HOSPITALS

168. In June, 1952, the Committee appointed a special subcommittee to consider the status and remuneration of general practitioners working in hospitals, and in particular to examine certain suggestions made by the Ministry of Health about the position of junior hospital medical staffs generally. These proposals provided for the classification of general practitioners working in hospitals into several categories according to the work undertaken and the responsibility involved.

169. In the Committee's view this subdivision was unnecessary, as it was considered that, with the exception of a small number of posts of a purely training nature, in the vast majority of general practitioners working in hospitals, although their duties might be of a diverse character, carried a comparable degree of responsibility. In character, the Committee's opinion the general practitioner, because of his knowledge of general practice and the environment of his patients, brought to the hospital a fresh outlook which would otherwise be missing, and if the right type of general practitioner was to be attracted to hospital posts proper recognition should be given to that fact. The Committee therefore recommended that all general-practitioner posts in hospitals, with the exception of a few which are more of a postgraduate educational nature, should be remunerated at the rate of £175 per annum per weekly half-day as laid down in paragraph 10 (b) of the Terms and Conditions of Service of Hospital Staffs. It was recognized, however, that the usefulness of the general practitioner might vary with the number of years which he had spent in general practice, and the Committee was therefore prepared if necessary to accept a sliding scale based on age and/or seniority within the range of £160-£190 per annum per weekly half-day.

170. The Committee agreed that the type of post which might be held to be of a training nature was that described by the Ministry in the following terms:

"The out-patient clinical assistant, often in such special departments as dermatology, paediatrics, etc. These appointments are often temporary, one or more years, and may be of a training character. The G.P. sees interesting new cases with the consultant and may see selected old ones or take histories. Responsibility is very limited."

Whilst the Committee was in agreement that these posts should not carry a salary, it felt that, if in fact they involved work over and above that which could normally be expected of a post of a training nature, an honorarium of, say, £50 should be paid. Equally, it was felt to be important that such posts should be well defined so that hospital boards would have no opportunity to set them up in place of posts which would normally be remunerated under the paragraph 10 (b) arrangements outlined above. With this in mind, it was suggested that local medical committees should be consulted before such posts were designated.

171. The Committee has made its views known to the Joint Consultants Committee, which is in negotiation with the Ministry on the subject, and representatives of the General Medical Services Committee have taken part in the discussions.

172. The Ministry was in general agreement with the Committee's contention that all non-specialist general practitioners working in hospitals other than those holding honorary posts of a training nature should be remunerated at the rate of £175 per annum per weekly half-day. Indeed, during the course of the discussions, the impression was gained that the Ministry intended to put forward proposals through the Management Side of Committee "B" of the Medical Whitley Council for alternative rates of remuneration for certain types of post.

173. The Joint Consultants Committee therefore made it quite clear to the Ministry that it could not agree upon any

points of principle regarding the classification of hospital posts to be held by general practitioners, if such agreement would prejudice the position of the Staff Side of Committee "B" in any subsequent discussions on remuneration. The Ministry has accepted this position, and it now remains to be seen whether and, if so, what proposals regarding remuneration are submitted in Whitley Council.

CO-OPERATION BETWEEN HOSPITAL, LOCAL AUTHORITY, AND GENERAL-PRACTITIONER SERVICES

174. The Committee's attention was drawn to a circular letter which was issued by the Ministry of Health to executive councils accompanying a report by a subcommittee of the Central Health Services Council on co-operation in the National Health Service between hospital, local authority, and general-practitioner services. Whilst the Committee accepts the position that any advice which the Minister receives from his statutory advisers must be published, it made a strong protest against the departure from a previous undertaking that the Ministry would always consult the Committee before proceeding with the implementation of any advice which affected general practitioners as a whole. An assurance was given by the Ministry that it had no intention of departing from the undertaking which had been given, but that in this instance it was felt that the circular letter contained nothing but a factual statement of the report and in no way constituted an acceptance of the report.

175. The Committee accepted this position, but at the same time it made a number of suggestions which it felt would facilitate the arrangements referred to in the circular and in particular ensure that general practitioners were brought into the discussions.

REPRESENTATION OF GENERAL PRACTITIONERS IN HOSPITAL ADMINISTRATION

176. The Ministry's attention has again been drawn to the importance attached both by the Annual Conference and by the Representative Body to the adequacy of general-practitioner representation at all levels of hospital administration.

177. The Committee has been in close touch with the Ministry, and is happy to report that some progress is being made in this matter. The Committee will continue to press for greater representation whenever the opportunity occurs.

DOMICILIARY CONSULTATIONS

178. The Committee's attention was drawn to the domiciliary consultation form which the South-west Regional Hospital Board proposed to issue in place of the form already agreed by the profession. The Committee felt that the certificate proposed by the regional hospital board was undesirable in a number of respects, and that no departure should be made from the model form which had previously been agreed between the Ministry of Health and the Joint Consultants Committee. Strong representations were made both centrally and locally, and the Committee now understands that the board has dropped its original proposals.

PROVISION OF DIAGNOSTIC AND ANCILLARY FACILITIES

179. The Committee continues to urge on the Ministry its firm policy that general practitioners should have direct access to diagnostic and similar hospital facilities. In particular, it made strong representations against the attempt to deny to general practitioners the direct use of the x-ray department at the Boston General Hospital. Subsequently, instructions were given by the regional hospital board that practitioners who wished might send patients directly to the x-ray department, but that the radiologist should have a right to refer the patient back without undertaking the examination, or to refer the patient first for an examination by a clinical colleague. The Committee has accepted this

arrangement, and it is hoped that general practitioners and radiologists will co-operate to secure the minimum of friction in working the scheme.

PREGNANCY TESTS AT SHEFFIELD

180. Complaints were received by the Committee that general practitioners who had formerly had direct access to the pregnancy diagnosis station at Sheffield would no longer be allowed to use the facilities provided unless the patient was referred to the centre through one of the regular clinics and examined by an obstetric specialist.

181. The Committee took the matter up with the Ministry, which pointed out that there had been some misunderstanding, as it was not its intention to restrict the use of the facilities provided in this way. It was, however, more convenient from an administrative point of view if the material was sent via the hospital laboratory normally used by the practitioner. Further, the practitioner was asked to state the reason for requiring the test, as it was intended to limit the testing to those cases where, for medical reasons, it was vital to know at once if pregnancy existed or continued. The facilities available would break down if a test was demanded in every case where a patient as a matter of convenience wished to know at an early date whether she was or remained pregnant.

182. The Committee has accepted the Ministry's explanation and is seeking an assurance that the position is fully understood by the officers of the Leeds and Sheffield Regional Hospital Boards.

NOTIFICATION OF DISCHARGE FROM HOSPITAL

183. The Committee has, on a number of occasions, referred to the failure of hospital authorities to notify the general practitioner about patients discharged from hospital. The Committee originally suggested that each hospital patient should, on discharge, be given a note to be handed to his family doctor. The Committee, however, understands that the additional clerical work involved if such a suggestion were to be universally adopted is too great an obstacle, and it has, for the time being, dropped this proposal. In return, the Ministry has given an undertaking that it will do all it can to expedite the transmission of information to general practitioners. The Committee intends to watch the position closely.

184. The Committee has also discussed with the Ministry a resolution of the Annual Conference that all hospitals should be asked to issue letters and reports to general practitioners regarding patients on stationery of a standard size. The Ministry supports this suggestion, and has agreed to bring it to the notice of hospital management committees.

RELATIONSHIP BETWEEN GENERAL PRACTITIONERS AND THE SCHOOL HEALTH SERVICE

185. Following a conference between representatives of the Association and of the Society of Medical Officers of Health to discuss the relationship between general practitioners and the School Health Service, the Committee has sought further information from local medical committees on how the agreed scheme of notification works in individual areas. The agreed scheme provides that:

(i) Where in the opinion of a medical officer employed by a local authority a child needs special investigation, other than ophthalmic examination or treatment, he should send the child to a specialist only after prior consultation with the child's own doctor, upon whom rests the responsibility for general medical care;

(ii) In consulting the general practitioner, the medical officer should give him the opportunity to make the arrangements for the consultation or to agree—by replying or in the absence of a reply—that the arrangements should be made by the medical officer;

(iii) A copy of any special report on the child received by the medical officer should be sent to the child's own doctor.

186. The Committee is satisfied from the replies received that no further action on its part is required.

VACCINATION AND IMMUNIZATION

187. Following the agreement which was reached some years ago with local authorities on the payment of a notification fee for vaccination and immunization, the Committee was surprised to learn that a local authority had refused payment of fees which were due in respect of records of a hospital staff which had been submitted by the medical officer responsible for the health of the hospital personnel. The Ministry, however, takes the view that vaccination of hospital staffs is essentially a hospital function, and that records of the vaccinal state of such staffs is a hospital responsibility. If, therefore, the local authority preferred to make use of hospital records and chose not to accept notifications in respect of individual members of the hospital service it was perfectly free to do so.

188. The Ministry, however, accepted the Committee's view that in these cases the local authority would be justified in paying the usual notification fee if it required records submitted by a hospital medical officer for individual members of the hospital staff for whom he was providing general medical services under Part IV of the Act.

HEALTH CENTRES

189. Further discussions have taken place with the Ministry of Health and with the London County Council on the draft model contract for the use of general practitioners who consent to practise from health centres. Although the negotiations have taken some time, the Committee has been mindful of the very great care which was required in drafting a form of contract which would ultimately serve as a model for other general practitioners who provided general medical services in this experimental form of practice. Nevertheless, considerable progress has been made, and it is hoped that the model contract will shortly be available to local medical committees.

SUPERANNUATION—GENERAL MEDICAL PRACTITIONERS

190. "Net remuneration" for superannuation purposes has in the past been calculated as 50% of mileage payments and 65% of all other payments. The deduction of 35% from other payments is in respect of practice expenses, and was fixed in the early days of the National Health Service. Subsequently it was established during the course of the Adjudication that practice expenses for the year 1950-1 amounted to 38.7%. With the increase in the size of the Central Pool as a result of the Danckwerts award, the formula requires adjustment, and, on the assumption that the ratio of expenses to remuneration since the award has not varied, the appropriate figure would now be 33%. The formula now put forward by the Ministry to calculate remuneration for superannuation purposes is to take 50% of payments for mileage and drugs and 70% of all other payments. The Committee, on the advice of its accountants, has accepted this proposal as reasonable but without prejudice to the result of any further inquiry into the present actual level of practice expenses.

RETIREMENT OF GENERAL PRACTITIONERS

191. Some confusion has arisen in the public mind that, when a doctor retires from his National Health Service practice, he also automatically relinquishes his private practice. At the request of the Committee, the Ministry has issued a short circular to executive councils asking them to make it clear in the notice which is sent to patients that it relates exclusively to the retirement of the doctor from his National Health Service practice.

CERTIFICATION

Certification in Times of Epidemic

192. During the influenza epidemic in the New Year the Committee asked the Ministry of National Insurance to take steps to ease the certification burden borne by general practitioners. The Ministry subsequently issued a Press statement that a note sent within three days by a patient (or a relative or friend), bearing his particulars and the date on which the illness began, would be accepted in lieu of a first medical certificate, the certificate to follow when the doctor had seen the patient at any time within the next 10 days. The Committee wishes to record its appreciation of the prompt and practical assistance given by the Ministry in this way.

Stocks of Certificate Forms

193. At the request of the Committee the Ministry of Health has arranged that, in addition to the usual sources of supply, a stock of the forms for certificates most commonly in use should also be kept by executive councils. Certain certificates, such as death and stillbirth certificates, must necessarily be excluded from such a scheme, but generally it is felt that it will be of assistance to the general practitioner to be able to obtain supplies from a common source.

Certification for Surgical Corsets

194. The Committee has again discussed with the Ministry the burden of certification falling upon general practitioners as a result of the purchase-tax concession which may be obtained on the production of a doctor's certificate for a surgical corset. The Committee felt that the time had come when the practice of requiring such a certificate for the remission of tax on a made-to-measure corset of the non-surgical type should be discontinued. The Ministry, however, has been reluctant to withdraw this form of certification in case it should increase the call for free corsets from the hospitals, but, following the Committee's representations, the Board of Customs and Excise has amended the list of conditions in respect of which a certificate from a doctor entitles the patient to a tax-free appliance.

195. It is hoped that this will have the effect of reducing the demand for certificates made upon the doctor, but, at the same time, the Committee feels that the complete abolition of the concession is the only satisfactory method of solving the problem.

REMUNERATION OF TRAINEE GENERAL PRACTITIONERS

196. The Committee is proposing to discuss with the Ministry the remuneration of trainee general practitioners in the light of the standards of remuneration established by the Danckwerts award. When the scheme was originally launched the amounts then agreed were based generally upon rates of assistants' remuneration then prevailing. The Ministry is prepared to review the present rates of payment for trainee assistants and as a preliminary step is seeking information as to the extent to which the scheme is being used. At the same time the Committee has undertaken to collect evidence as to the effect of the Danckwerts award on salaries paid to ordinary assistants.

197. The Committee has taken the opportunity to bring to the notice of the Ministry the report of its subcommittee on the whole question of the trainee general practitioner scheme.

REMUNERATION FOR ATTENDING A CASE OF DENTAL HAEMORRHAGE

198. It will be remembered that it was only after protracted negotiations that agreement was reached with the Ministry of Health that a fee should be payable to a general practitioner for attending a case of haemorrhage following a dental operation. Although local authorities were also

authorized to pay a similar fee for cases of haemorrhage which arose following dental treatment in a local authority clinic, the problem remains unresolved so far as extractions undertaken at hospital are concerned. Whilst the Committee appreciates that such cases may be few it is felt that, having conceded the principle that a general practitioner should receive a fee for this service, no discrimination can be drawn between cases which occur following treatment by a dentist and those following extraction in a hospital. Discussions on this point are proceeding with the B.D.A. and the Ministry.

199. The Committee is also considering, in consultation with the B.D.A., methods by which a general practitioner who treats a case of dental haemorrhage may secure the payment of the appropriate fee in the following circumstances:

- (i) where the haemorrhage follows an extraction by a dentist who is not in the National Health Service, and
- (ii) where the dental treatment was originally given privately, although by a dentist who undertakes National Health Service work.

THE MEDICAL ACT, 1950

200. The Committee has examined a motion referred to the Council at the Annual Representative Meeting to the effect that it would be in the interests of both the public and the profession that a period of employment of six months in general practice should be considered as one of the required appointments needed to qualify for full registration.

201. The Committee has considered the implications of this motion very carefully, and wishes to point out that the Act at present requires the provisionally qualified practitioner, in order to obtain full status, to take a post where his activities are under constant supervision. The organization and administration of present-day general practice do not permit of such detailed supervision, and the Committee is strongly opposed to the suggestion that the Medical Act should be amended in this way.

DISCLOSURE OF INFORMATION REGARDING TUBERCULOUS PERSONS TO THE MINISTRY OF HEALTH

202. The Committee's attention was drawn to a circular issued by the Ministry of Health which requested hospital management committees to send to the local offices of the Ministry of Labour particulars of all men born in 1935 who were shown by chest clinic registers to have a tuberculous history.

203. The Committee has given its support to the views expressed by the Central Ethical Committee, and agrees that a strong protest should be made to the Ministry of Health.

ADMISSION OF STUDENTS TO MEDICAL SCHOOLS

204. In his judgment Mr. Justice Danckwerts expressed the view that it might be necessary to reconsider his decision that the Central Pool should be based on the number of doctors in the Service if the number of new entrants to general practice subsequently proved to be disproportionately high. The Committee, wishing to take a long view of this problem, has decided to seek information about the numbers of students admitted to medical schools in relation to the probable future need for doctors.

205. A special subcommittee has been established with the object of investigating—

- (a) the number of students entering medical schools;
- (b) the number qualifying from the schools; and
- (c) the number of newly qualified practitioners absorbed into various branches of the profession.

206. During the course of its investigations, which will necessarily be lengthy, the special subcommittee proposes to seek the advice of an expert statistician.

MEDICAL CARDS

207. The Committee has suggested to the Ministry that a patient who wishes to take advantage of the supplementary dental and ophthalmic services although electing to remain a private patient should not be given an ordinary medical card but should be provided with a plain card which merely shows his name, address, and National Health Service number.

208. The window envelopes used by executive councils for the transmission of medical cards carry the following advice:

"If a home visit is necessary, please help your doctor by telling him before 10 a.m. (unless the case is urgent)."

209. It was suggested that it would assist doctors if this wording was expanded, and the Ministry, in agreement with the Committee, has amended the form of words to read:

"If a home visit is necessary, please help your doctor by telling him before 10 a.m. (unless the case is urgent), and giving details of symptoms."

MEDICAL RECORDS

210. Under the National Health Insurance scheme a fairly elaborate document of guidance was issued to practitioners as to the form in which their records should be kept. Until recently nothing comparable was issued under the National Health Service, and it was represented to the Committee by the Ministry that difficulties were arising in determining whether particular practitioners had complied with their obligations under the relevant paragraph of the terms of service.

211. The Ministry felt that it was desirable that clinical records should contain all information that would normally be considered by a general practitioner as necessary both to the doctor and to other practitioners who might subsequently be responsible for the care of a patient to enable proper and necessary treatment to be given. In consequence, the Ministry has, in consultation with the Committee, now issued a circular for the guidance of general practitioners indicating the form in which it is considered that medical records should be kept.

MEDICAL EXAMINATION OF STUDENT NURSES

212. For some time past the Committee has urged the Ministry to reconsider the arrangement whereby the fee for the medical examination of student nurse candidates is paid by the candidate to the doctor, the candidate being reimbursed by the hospital. The Ministry considers that the alternative put forward by the Committee, that the fee should be paid direct to the doctor by the hospital authority concerned, is not workable and that it is inadvisable to impose a uniform procedure, as the practice in different hospitals varies widely with the type of certificate they require. The Committee is not satisfied with the position and will hold further discussions with the Ministry.

CIVIL DEFENCE

213. The Ministry of Health has asked the Association to encourage general practitioners to co-operate in the Civil Defence Scheme by giving their services voluntarily in training the personnel of first-aid teams. The Ministry has asked regional hospital boards to invite local medical committees to nominate general practitioners for this purpose. Voluntary service in this capacity does not involve any commitment for service in any national emergency, nor does it release any reservist from his Service commitments.

214. The Committee has given its support to the Ministry in seeking the participation of general practitioners in this work.

PROPRIETY OF DISCLOSING CLINICAL DETAILS TO LOCAL MEDICAL COMMITTEES OR EXECUTIVE COUNCILS

215. The Annual Representative Meeting in 1952 drew to the notice of the Council the plight of practitioners who, having been asked by the executive council for clinical details of a patient prior to the council deciding whether a preparation prescribed on E.C.10 was a food or a drug, failed to get the patient's consent to such disclosure and were consequently surcharged.

216. The Committee is discussing with the Ministry a suggestion which appears to be a practical solution of the problem—namely, that clinical records of these cases should be made available only to the medical secretary of a local medical committee and not to a lay official. The local medical committee would thus be in possession of the clinical details, but it would not be informed of the name of the patient. When the committee finally reports to the executive council the clinical details would be suppressed, but the council would be advised by the clerk of the name of the patient. Thus, the medical secretary would be the only person who could connect the patient by name with the clinical details.

CENTRAL COUNCIL FOR HEALTH EDUCATION

217. The Committee has, for some time, been disturbed about the nature of various educational pamphlets which have been issued by the Central Council for Health Education warning parents against the dangers of diphtheria, measles, whooping-cough, and other diseases to which children are particularly susceptible. The Committee felt that the wording used in the pamphlets was likely to cause unnecessary alarm and that insufficient regard had been paid to the special position of the general practitioner in the field of preventive medicine.

218. Discussions have taken place with the Central Council for Health Education, and arrangements are being made to secure a closer liaison between the Central Council and the Committee on all matters affecting the general practitioner. It is hoped that, in the future, the Committee will see reprints of existing pamphlets and all new pamphlets in draft before they are issued.

NATIONAL MARRIAGE GUIDANCE COUNCIL

219. The Committee has discussed with representatives of the National Marriage Guidance Council the wording of a memorandum which that council wished to issue to Divisions of the British Medical Association, setting out ways in which it was considered that marriage counsellors and general practitioners might co-operate in this field.

220. General agreement was reached on the terms of the memorandum, except that the Committee was unable to accept a paragraph which the National Marriage Guidance Council wished to include suggesting that it would be desirable for those contemplating marriage to undergo a medical examination by their own doctor as a routine procedure. The council amended the memorandum to meet the Committee's wishes, and it has now been issued.

ACCIDENTAL POISONING OF CHILDREN BY MEDICINAL PREPARATIONS

221. The Committee, in consultation with the Pharmaceutical Society, has considered what measures can be taken to protect children against accidental poisoning by medicinal preparations. A number of meetings have been held with representatives of the Pharmaceutical Society, and various possibilities have been explored. In particular, the Committee has examined any possible legal and practical implications which might ensue from some of the suggestions which have been made, and, after careful deliberation, both

bodies have agreed that, whatever precautions the professions may jointly suggest, the main duty of protection must always rest with the parents or guardians of the children.

222. Consideration has been given to the desirability of using a standard container and of printing on the container details of a patient prior to the council deciding whether a preparation prescribed on E.C.10 was a food or a drug, failed to get the patient's consent to such disclosure and were consequently surcharged.

223. A further meeting between the representatives of the Committee and the Society will be held to consider the publication of a joint statement on these points.

THE DEFENCE TRUSTS

224. The balance sheets and statements of income and expenditure of the National Insurance Defence Trust and the General Medical Services Defence Trust for the year ended December 31, 1952, are being sent to local medical committees.

225. A statement showing the contributions so far received from each area is also being circulated to local medical committees.

A. TALBOT ROGERS,

Chairman, General Medical Services Committee.

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

Chairman and Vice-chairman

226. Dr. J. T. Baldwin and Dr. C. J. Swanson were re-appointed Chairman and Vice-Chairman respectively for the session 1952-3.

Subcommittees

227. The following subcommittees were appointed for the session: Chairman's, Rural Practitioners, Colliery Practitioners, Dispensing Capitation, Fee, and Joint Subcommittee with the Central Consultants and Specialists Committee (Scotland) on Relation of General Practitioners to Hospitals. A special subcommittee was also appointed to consider the effect of the Working Party's proposals on general practitioner remuneration in Scotland.

Representation

229. Representatives of the Subcommittee were appointed to the following Committees: Central Consultants and Specialists Committee (Scotland) and their Anaesthetic Services, Ophthalmic Services, and Radiological Services Subcommittees; Maternity Services, Public Health, Partnership Advisory, and N.H.S. (Scotland) Review Subcommittee of Scottish Committee; Staff Side of Medical Subcommittee of Scottish Advisory Committee (Whitley); Liaison Committee with Scottish Association of Executive Councils; International and Scottish Advisory Distribution Committee; Editorial Subcommittee of Prescribers' Bulletin; Medical Scottish Central Medical Recruitment Committee; Medical Advisory Committee under Regulation II of the Medical and Pharmaceutical Committees and Tribunal Regulations; Scottish General Dental Services Committee of the British Dental Services Committee of the British Dental Association. The Subcommittee has also nominated an assistant and an unestablished practitioner to represent Scotland on the Assistants and Young Practitioners Subcommittee of the G.M.S. Committee.

Training of Assistants Scheme in Scotland

231. Local medical committees were invited to nominate representatives for appointment to the regional selection committees, and each regional consultants and specialists

committee was asked to appoint a panel of consultants from which up to three would be selected by the Secretary of State to serve *ad hoc* on the selection committee.

Liaison with British Dental Association

232. Cross-representation on the Scottish General Dental Services Committee and the G.M.S. Subcommittee has been established in view of the desirability of maintaining liaison between the two professions.

Assistants and Young Practitioners Subcommittee of the G.M.S. Committee

233. Considerable discussion has taken place regarding the representation of Scotland on the above subcommittee and the means by which the interests of unestablished principals and assistants in general practice would receive adequate consideration. The Subcommittee unanimously decided that, whilst in England the representatives on the Assistants and Young Practitioners Subcommittee were elected, similar procedure would not be realistic so far as Scotland was concerned and that Scotland's representation would best be obtained by the Subcommittee appointing suitable nominees.

234. The Subcommittee has recommended that local medical committees, where possible, should co-opt an assistant, and has asked them to submit the name of a suitable assistant and/or unestablished practitioner willing to undertake the representation of his respective class of practitioner on the above subcommittee. On receipt of these names the General Medical Services Subcommittee will nominate the representatives to serve on the subcommittee for the ensuing year.

235. The attention of assistants and unestablished practitioners in Scotland has been drawn to the fact that they are represented on the above subcommittee, and they have been invited to communicate with their representative through the Scottish Office if they have any questions to raise.

Model Distribution Scheme

236. The Subcommittee has approved in general the model distribution scheme prepared by the Department giving effect to the changes introduced as a result of the Working Party's report for the distribution of the remuneration pool. Since it has not been found practicable, in the time available, to consider individual schemes, the Subcommittee has agreed to the model scheme being operated throughout Scotland for one year as from April 1, 1953, and that any variations which executive councils may wish to make as regards their own areas, after consultation with the local medical committee, and with the approval of the Secretary of State, will be given effect to on April 1, 1954.

Initial Practice Allowances

237. The Subcommittee, after consulting local medical committees, approved the criteria proposed by the Scottish Medical Practices Committee for dealing with applications for initial practice allowances. It felt, however, that difficulties in this connexion might arise once the new distribution scheme was in operation, and has suggested that adequate means of consultation between the Scottish Medical Practices Committee, executive councils, and local medical committees should be established for the purpose of dealing with any such problems.

Appeals Machinery

238. The Department of Health has proposed that an appeal by a practitioner against the decision of an executive council to grant or continue an initial practice allowance should be determined by the Scottish Medical Practices Committee with two members nominated by the Subcommittee, but without voting powers, sitting with it. The Subcommittee, after giving the question careful consideration, agreed to this procedure.

239. The Subcommittee has agreed to the same machinery for determining an appeal against the refusal of an executive council to agree to the payment of a partnership on the basis of notional lists.

Inducement Payments in Remote Areas

240. The Subcommittee's negotiations with the Department of Health for increased inducement payments resulted in the figure, taken as a guide to the level of net professional income normally appropriate to such cases, being raised to £1,400 as from April 1, 1953. The same percentage increases as applied to capitation fee payments under the Danckwerts award are to be added retrospectively to inducement payments.

Back Payments to Locumtenents

241. The Subcommittee was in agreement with the suggestions put forward by the Department (1) that a locum who had acted in a practice vacancy and who had received as remuneration the earnings of the practice should be entitled to the back money due to the practice under the award for the period of the vacancy; and (2) that a locum who had been paid on a salary basis should not receive any additional remuneration, it being assumed that the salary was in proportion to the current cost-of-living index.

Removal of Long-stay Patients from General Practitioners' Lists

242. The Subcommittee has agreed to the Department's proposal to remove from practitioners' lists the names of National Health Service patients who have been inmates of mental hospitals for two years or longer. This measure will be brought into effect along with the new distribution arrangements.

Keeping of Medical Records

243. Local medical committees have been asked to draw the attention of their constituents to the need for keeping adequate medical records, not simply for statistical purposes but also to ensure continuity of treatment, and to suggest as a guide that a practitioner should record such information as he himself would hope to receive when a patient comes to him from another area.

Excessive Prescribing

244. Considerable discussion has taken place on the question of excessive prescribing. Some local medical committees have been experiencing difficulty in deciding in certain cases referred to them for investigation whether or not a practitioner's prescribing is excessive or extravagant, and in assessing any surcharge to be imposed. The Subcommittee felt that no hard-and-fast rules could be laid down, since the decision must lie with the local medical committee according to the particular details concerning each case. It has, however, issued to local medical committees a memorandum of guidance on the general principles to be observed with a view to some degree of uniformity being obtained.

245. Another aspect of this question is the difficulty caused to practitioners by some specialists and consultants in hospitals recommending, at times, the administration of preparations which cannot properly be prescribed by practitioners under the National Health Service and the prescribing of which may result in their being asked to justify their action. Local medical committees have been asked to consider the arrangement adopted in one area for dealing with difficulties of this nature whereby it is open to a practitioner, on receiving a prescribing recommendation of the type referred to, to contact the medical superintendent of the hospital to which the specialist or consultant is attached, so that the latter may be advised of the difficulty. In this way also the undesirability of any recommendation regarding treatment being

forwarded to a practitioner via the patient in an open letter may be brought to the notice of the consultant or specialist concerned.

246. Local medical committees have also been asked to remind their constituents of the conditions under which stock order forms should be used, since it has been alleged by certain chemists that some practitioners are using Form E.C.10A for purposes other than those laid down in the Regulations.

247. An exhibition prepared by the Department of Health to illustrate the cost of certain drugs and dressings is to be shown to general practitioners and consultants through the Divisions of the Association.

Automatic Reinstatement of Servicemen's Names on Doctors' Lists

248. A solution to this question has been difficult to find, and considerable discussion has taken place with the Department. The automatic reinstatement of names on completion of national service was found to be impracticable in view of the percentage, said to be in the region of 20%, of men who do not return to their former addresses. The possibility of names being left on doctors' lists during the period of national service was also ruled out because of the element of inflation which would be involved. The Subcommittee felt, however, that since many demobilized Servicemen are under the impression that their names remain on the doctor's list the need to re-register should be stressed on Form E.C.13, and it has asked the Department to submit a draft of the revised form before it is issued to Service Departments.

Future Arrangements for Fees for Treating Temporary Residents

249. As from April 1, 1953, a fee of 5s. will be paid to practitioners for treating persons temporarily resident in convalescent homes and any other similar institutions where special arrangements for medical services are made—that is, a place of residence at which ten or more persons reside temporarily and where the executive council is satisfied that the practitioner is in regular attendance. A fee of 17s. will be paid for treating persons in private residences and institutions which do not come within that category. Executive councils are being asked to classify, in consultation with local medical committees, homes and institutions in their area to which the 5s. rate will apply. Executive councils will have discretion to vary the ratio in consultation with local medical committees. Any additional money required to operate a local scheme will be payable only in the following year and will be treated as a first charge on the final settlement money due to the council, thus reducing the amount for distribution locally to individual doctors by way of final settlement.

Future Arrangements for Payments of Fees for Emergency Treatment and Anaesthetics

250. The following scale of fees for emergency treatment has been agreed with the Department for the year 1953-4, and thereafter may be varied locally with the approval of the Secretary of State:

	£	s.	d.
(1) Emergency consultation (at any place or time)	8	6	
(2) Emergency consultation involving minor surgical operation requiring:			
Local or general anaesthetic			
Treatment of fractures		15	0
Reduction of dislocation			
(3) Administration of general anaesthetic	1	15	0

Mileage

251. The question of the division and distribution of the mileage fund has been under consideration. The Subcommittee suggested that the Interdepartmental Mileage Committee in England and the Mileage Subcommittee of

the Scottish Advisory Distribution Committee should each formulate its own distribution scheme, and that a joint committee should be set up at an appropriate stage to consider the international division of the fund. Both mileage committees have agreed to this suggestion and are examining the problem carefully before coming to any conclusion.

Dispensing Capitation Fee

252. Pending the results of the U.K. inquiry into the drug costs of dispensing doctors paid on the capitation fee basis, it would appear that prospective partners have found the information contained therein helpful in drawing up their agreements. The Partnership Advisory Subcommittee of the Scottish Committee frequently receives requests to advise and comment upon draft agreements. It will be necessary shortly to have the memorandum reprinted, as present supplies are diminishing, and this will afford an opportunity of revising the memorandum and bringing it up to date.

Partnership Arrangements

253. The memorandum on medical partnerships prepared by the Subcommittee has been in considerable demand, and it would appear that prospective partners have found the information contained therein helpful in drawing up their agreements. The Partnership Advisory Subcommittee of the Scottish Committee frequently receives requests to advise and comment upon draft agreements. It will be necessary shortly to have the memorandum reprinted, as present supplies are diminishing, and this will afford an opportunity of revising the memorandum and bringing it up to date.

Scottish Health Services Council's Report on the General Practitioner and Hospital Service

254. The Joint Subcommittee of the General Medical Services Subcommittee and the Consultants and Specialists Committee on the relation of general practitioners to hospitals has undertaken to ascertain what steps have been taken by local medical committees and regional consultants and specialists committees to consider the proposals contained in the report of the Scottish Health Services Council and what action, if any, has been taken towards implementing any of them. When this information is available the Joint Subcommittee will discuss the report further.

Mass Vaccination

255. The remuneration of practitioners for services to local authorities in the event of an outbreak of smallpox in Scotland has now been agreed. Sessional fees for vaccination etc., at clinics arranged by local authorities will be 45s. for sessions lasting from 1½ to 2½ hours and 30s. for sessions not exceeding 1 hour. A fee of 2s. 6d. for each vaccination notified will be paid to a practitioner conducting "mass vaccination" in his own surgery.

Bonus Shift Certificates

256. The Subcommittee's attention has been drawn to the frequent requests made to practitioners in colliery areas for certificates in respect of one day's absence to enable miners to claim bonus shift money. On investigation it appeared that the problem was fairly widespread, and the Private Practice Committee of the Association has taken the matter up with a view to reporting on the position in colliery areas in England and Wales. The Colliery Practitioners Subcommittee is to consider the position in Scotland when the Private Practice Committee's report is available.

Attendance at Accidents at Privately Owned Mines

257. As a result of representations, the Federation of Small Mines in Great Britain has recommended to its members that practitioners who attend at their collieries in the event of serious accidents should be granted *ex gratia* payments on a scale similar to that agreed in Scotland with the National Coal Board.

J. T. BALDWIN,

Chairman, G.M.S. Subcommittee (Scotland).

APPENDIX A

ATTENDANCES AT MEETINGS OF GENERAL MEDICAL SERVICES COMMITTEE AND ITS SUBCOMMITTEES

Name	General Medical Services Committee		Subcommittees, Deputations, etc.	
	Actual	Possible	Actual	Possible
Arthur, J. C.	8	11	—	—
Baldwin, J. T.	7	11	4	5
Beauchamp, A.	10	11	—	5
Beakley, J.	10	11	4	6
Bowie, D. C.	10	11	—	—
Breach, A. C. E.	1	1	—	—
Brown, J. A.	8	11	—	—
Brown, J. L. McKenzie	3	11	—	—
Campbell, A.	3	11	3	8
Cardew, B.	10	11	4	6
Carter, O. C.	5	11	—	—
Catto, F. S.	10	11	—	—
Chalke, H. D.	5	6	3	4
Dain, H. Guy	11	11	5	8
Darling, W. N.	6	11	—	—
Davies, A. B.	9	11	6	10
Evans, D. B.	5	11	2	3
Gardner, A. W.	2	11	1	4
Gibbons, P. J.	7	11	2	3
Goodwin, E. W.	7	11	2	5
Gorsky, J. A.	8	10	1	3
Gray, F.	9	11	18	30
Gregg, E. A.	1	11	—	5
Hamilton, R. C.	9	11	1	3
Hargest, T. J.	10	11	—	—
Harrower, Kate	9	11	3	4
Hickley, G. M.	7	7	1	1
Hill, T. Rowland	1	10	2	4
Hollis, H. F.	3	11	—	—
Hutchinson, D. F.	10	11	8	12
Innes, I. G.	10	11	3	7
Joffe, A.	9	11	2	3
Killick, C. F. R.	8	11	10	16
Knox, W. M. (Chairman of Conference of L.M.C.s)	10	11	7	12
Langmuir, J. R.	8	11	—	—
Langston, H. H.	—	10	—	—
Lishman, F.	10	11	—	—
MacAlister, I. M.	9	11	—	—
McConnell, R. W.	10	11	—	—
McDonald, D. T.	6	11	2	3
Manning, A. D.	2	2	—	—
Mathias, A. N.	10	11	3	4
Maurice-Smith, K. S.	10	11	1	3
Moore, A. M. A.	—	11	—	—
Murray, J. D. R.	11	11	2	4
Nicholson-Lalley, J. R. (deputy for T. Rowland Hill)	1	1	—	—
O'Farrell, P. T. J.	—	10	—	—
Parkes, Miles	8	11	—	—
Pridham, J. A.	6	11	7	10
Rogers, A. T. (Chairman)	11	11	29	31
Rose, F. M.	9	11	—	—
Russell, L.	8	9	8	11
Scott, C. M.	11	11	—	—
Smorfit, F. A.	8	11	4	7
Sorsby, M.	11	11	—	—
Struthers, J. A.	1	5	—	—
Sutherland, H. H. D.	10	11	8	14
Swanson, C. J.	9	11	—	—
Thorp, H.	11	11	1	17
Wand, S.	9	11	16	17
Whitaker, D. F.	11	11	4	5
Wilson, A. S.	9	11	4	7
Wood, H. S. Howie	11	11	5	7
Woolley, W.	11	11	—	—
Young, J. B.	2	11	—	—
Anderson, D. T.	—	—	3	3
Brooks, J. J. (deputy for A. Domar)	—	—	2	2
Browne, H. J.	—	—	—	3
Charlton, C. G. H.	—	—	1	1
Domar, A.	—	—	3	3
Elliott, J. E.	—	—	—	1
England, E. G.	—	—	1	3
Gethen, R. C. R.	—	—	—	3
Harbord, D. A.	—	—	1	3
Harrison, R.	—	—	3	3
Hughes, D. M.	—	—	3	3
Lawrence, R. A. A. R.	—	—	1	3
Macheth, J. M.	—	—	3	3
Malloch, G. C.	—	—	1	3
Marshall, J. E.	—	—	2	3
Mathews, R. G.	—	—	2	2
Milner, A.	—	—	2	2
Pictou, A. D.	—	—	3	3
Riddolls, A. W. (deputy for A. Milner)	—	—	2	2
Shapiro, J.	—	—	1	3
Taylor, C.	—	—	2	3
Vickers, H.	—	—	2	3
Wells, J. D.	—	—	2	3

GENERAL MEDICAL SERVICES SUBCOMMITTEE
(SCOTLAND)

	G.M.S. Sub-committee (Scotland)		Sub-committees and Deputations	
	Actual	Possible	Actual	Possible
Alston, D. M.	—	—	—	—
Anderson, J. R.	2	4	—	—
Anderson, W. D.	3	4	1	6
Auchterlonie, N. L.	2	4	—	—
Bain, J. C. B.	—	—	—	—
Baldwin, J. T.	4	4	7	8
Blair, A. C.	4	4	6	6
Bowman, F. J. S.	4	4	—	—
Cable, J. Ewen	4	4	5	6
Cameron, A.	3	4	—	—
Campbell, J. M.	—	—	3	3
Cumming, A.	—	4	—	—
Darling, W. Neil	4	4	3	5
Easton, I. D.	2	4	1	1
Emslie, W. I.	3	4	—	—
Fordyce, A. B.	—	4	—	—
Gardner, W. S.	3	4	—	—
Gibson, W.	3	4	—	—
Gillespie, W. D.	3	4	—	—
Girvan, A. M.	4	4	—	—
Grant, I. D.	3	4	—	—
Hamilton, J. G. M.	1	4	—	—
Hamilton, R. C.	—	4	6	5
Harrower, Kate	3	4	3	5
Henderson, S. J.	—	—	—	—
Hutchison, B.	4	4	—	—
Ireland, G. W.	—	—	4	5
Jamieson, G.	—	—	—	—
Jarvis, O. D.	4	4	—	—
Jope, W.	—	—	1	1
Knox, W. M.	2	4	1	5
Langmuir, J. R.	1	4	—	—
Logan, D. Dale	4	4	—	—
MacArthur, J. C.	3	4	—	—
Macaulay, J. L.	1	4	—	—
MacFeat, Geo.	—	—	—	—
MacIver, Geo.	—	—	—	—
MacLeod, I. M.	1	2	—	—
MacQueen, L.	—	—	—	—
Marshall, Sir Wm.	—	—	—	—
Millar, A. F. Wilkie	4	4	5	5
Mitchell, A. D.	—	—	—	—
Nelson, Noel	3	4	—	—
Nisbet, B. R.	—	—	—	—
Philip, P. W.	3	4	1	1
Pitkeathly, A. J.	—	—	—	—
Pool, A. Smith	2	4	—	—
Robertson, D. S.	3	4	—	—
Ross, W. B.	—	—	—	—
Sandeman, C. Stewart	4	4	—	—
Sandison, A. E.	3	4	—	—
Scott, A.	—	—	—	—
Shand, P. K.	—	—	—	—
Sinclair, F. McEwen	—	—	—	—
Smith, W. E.	—	—	—	—
de Soldenhoff, R.	1	1	—	—
Strathern, H.	4	4	1	1
Summers, G. J.	—	—	—	—
Swanson, C. J.	4	4	7	7
Taylor, J. L.	2	4	—	—
Thomson, R. H.	—	—	—	—
Weatherhead, W. A.	2	4	—	—

APPENDIX B

MEMORANDUM OF EVIDENCE TO THE
CENTRAL HEALTH SERVICES COUNCIL'S
COMMITTEE ON GENERAL PRACTICE

I. INTRODUCTION

1. The British Medical Association is a voluntary association of over 67,000 registered medical practitioners resident in Great Britain and overseas, and practising all branches of medicine. Of its total membership approximately 21,000 are engaged in general practice in the United Kingdom, the great majority under the National Health Service. It may therefore be claimed that the Association is in an advantageous, if not unique, position to express the views of general practitioners and to gather together the opinions of its members in other branches of medicine where they impinge upon the field of general practice.

2. The Council of the Association is conscious of the long delay in responding to the invitation to submit evidence, and wishes to express its appreciation of the patience shown in awaiting its observations.

3. The delay has been due to a number of factors, not the least being the preoccupation of the Association's Standing

Committee on National Health Service general practice with matters concerning the administration of the Service and the day-to-day problems which have arisen since the appointed day. The demands which have been made upon the time of members of this Committee, the great majority of whom are engaged in active general practice, have been heavy. In particular the long discussions which culminated in the Danckwerts award and the Report of the Working Party on the future distribution of the Central Professional Pool have, until now, made it difficult for the Committee to devote the necessary time to gather together all the information and experience it has obtained about conditions of National Health Service general practice.

4. Even now the Council does not feel that with the Service in its present stage of development it is possible to prepare a fully comprehensive memorandum embodying final recommendations on the ultimate future of general practice. The Service is less than five years old and the process of change is continuous. The Council would justifiably be open to criticism if, in the light of this comparatively short experience, it attempted to recommend far-reaching reforms in National Health Service general practice which it has not had the opportunity of submitting to the profession for discussion and approval. *Moreover, the Danckwerts award and the recommendations of the Working Party on the future distribution of the Pool must inevitably have a bearing upon the future of general practice, but the effects will not become apparent for some time to come.*

5. The Association is constantly aiming to effect improvements in the National Health Service, and has already formulated its views on a number of facets of general practice. For example, it has issued reports on "Health Centres" and "General Practice and the Training of the General Practitioner," and it is in a position to make known its views on these and many other matters on which the profession has already determined its policy.

6. The Association holds the view that the standard of service given to the public by general practitioners is of a high order, but the general medical services are kept (as are other parts of the Service) constantly under review, and the Association is ever seeking to consider and to make constructive suggestions for their improvement.

7. The future of general practice, its trends and development, is a matter of the greatest concern to all, for the service of the general practitioner to the community must necessarily be influenced by the conditions under which he works.

8. It will not be disputed that the general practitioner, in common with his professional colleagues, must have a voice in the development of the Service, and it is vital that any far-reaching modifications should be made only after the fullest possible consultation and agreement with the profession.

9. The Association has, during the course of the last four years, through the Representative Body of the Association and the Conference of Local Medical Committees, formulated a substantial number of recommendations designed to improve conditions in general practice.

10. Some of these recommendations have, after discussion with the Ministry of Health, already been implemented. Others have received partial acknowledgment, and their full implementation could be profitably pursued. Not a few have fallen by the way, and the Service has sometimes suffered as a result.

11. The Council is grateful, therefore, for the opportunity to submit this memorandum of evidence embodying existing Association policy on many matters relevant to the future of general practice. It is anxious to give all the help it can to the Committee on General Practice of the Central Health Services Council.

II. SOME GENERAL OBSERVATIONS

12. It is not always sufficiently appreciated that, so far as general medical services are concerned, the National Health Service is an extension of the facilities which were available under National Health Insurance and the Public Medical Services before July, 1948. Prior to the National Health

Service only a limited section of the community qualified for free treatment, and the right to benefit did not extend to their dependants.

13. It has been the policy of the Association since 1930 to extend the facilities provided under National Health Insurance to include dependants, and the heavy demands made upon the Service by those brought within its scope for the first time were therefore anticipated by the profession. The general practitioner has done his utmost to meet the calls made upon him, though inevitably, in so doing, he has laid himself open to certain criticisms brought about largely by the magnitude of the task devolving upon him. Indeed, there is no doubt that the general practitioner, by his full co-operation, has provided so good a Service that the public has sought to use it to capacity. That this has led to long hours of consultation in surgeries and sometimes to overcrowded waiting-rooms is not the fault of the doctor. Rather it is a measure of the public's confidence in and appreciation of the family doctor.

14. The large and increasing proportion of the public availing themselves of general medical services under the Act and the small and diminishing amount of private practice does indicate that, even allowing for changed economic conditions, the public is, by and large, well satisfied with the service given. Yet medical practice can never remain static, and general practitioners are anxious to play their full part in securing improvements in the Service. The Association is constantly in touch with the Ministry with this aim in view, and a number of recommendations which have been put forward over the past few years have already been acted upon and have become a permanent feature of the Service.

15. An obvious defect in the present Service is the tendency for the general practitioner in some areas to become isolated. In a comprehensive Health Service it was anticipated that there would be the closest possible co-operation between the three main branches of the Service at administrative level, and that this of itself would encourage the fullest co-operation between individual consultants, general practitioners, and those engaged in the field of public health. This hope has not been fulfilled, and it should be the continuous aim of those responsible for its administration to secure the complete integration of the Service both at administrative and at individual levels.

16. It is becoming more and more the policy of regional hospital boards to regard cottage and other small hospitals as annexes to the main group hospitals, and to employ consultants to the exclusion of the general practitioner. The resulting divorce of the general practitioner from his local hospital is to the detriment of both and is not in the best interests of the patient.

17. Bad housing conditions, changed economic and social circumstances, particularly the wider employment of women, and the provision of free hospital treatment are factors which have made it increasingly difficult for patients to be cared for at home. Since the introduction of the National Health Service there has been an increasing tendency on the part of the family to shift on to the State their responsibility for the care of aged and sick relatives. This is to a certain extent inevitable when so many members of the family have to be employed outside the home. Advances in methods of investigation and treatment in the specialist field have also led to an increased demand for hospital beds.

18. At the same time, modern research, the development of antibiotics, and ancillary diagnostic facilities have greatly extended the range of cases suitable for domiciliary treatment, and it is discouraging to the general practitioner when he finds that, because of the factors mentioned above, many of the most clinically satisfying of his cases must be transferred to hospital.

19. The cumulative effect of all this is reflected in the long waiting-lists for hospital beds.

20. The Association believes that, not only should the general practitioner be given every opportunity to treat his patients at home—*inter alia*, by the development of improved nursing facilities—but he should also be able, whenever appropriate, to continue the treatment of his

patients in hospital. Only in such a manner will patients be able to obtain the fullest benefit from the family doctor and hospital services.

21. The general practitioner has a particular interest in those matters of hospital policy and administration which affect the general-practitioner service, and it is important that he should be afforded an opportunity of making his point of view known. The most practicable way of achieving this is for at least one general practitioner who enjoys the confidence of his colleagues to sit on every board of governors, regional hospital board, and hospital management committee, and on medical advisory committees at all levels. He is then in a position to make known in the hospitals the views of the general practitioners in the area, and, at the same time, to keep his fellow practitioners informed on hospital matters.

22. In the past four years the general practitioner has at times felt that his work, so often referred to as the "essential link" in the whole Service, has not been properly recognized. The long delay in fully implementing the Spens Report (Appendix A), with the resulting inadequate level of general-practitioner remuneration, led to bitter controversy, anxiety, and frustration. Happily, this long and contentious chapter has now closed, for the significance of the Danckwerts award lies not only in the material benefits which it confers but in the public acknowledgment of the justice of the general practitioner's claim. The award has justified the profession's faith in itself, and the new distribution scheme which followed should go far to remedy many of the present difficulties in general practice. The methods adopted include the reduction of the maximum number of patients any individual doctor may accept under the Service; a fresh classification of the country by the Medical Practices Committee into "restricted," "designated," and "intermediate" areas (instead of the four categories previously in use), and the constant revision of individual areal classifications in the light of changing circumstances; the introduction of initial practice allowances in designated areas; the maintenance of a standard capitation fee; and a special loading in favour of the doctor with a medium-sized list. These measures should stimulate the formation of partnerships and materially ease the problems of new entrants to practice. This scheme is set out in full in Appendix B ("The Danckwerts Award and the Working Party's Findings on the Future Distribution of the Central Pool").

23. Another defect of the National Health Service which has a direct bearing upon general practice is the failure to co-ordinate at local levels the three main branches of the Service.

24. It has been said that, without sweeping changes in the whole administration of the Service, it is difficult to see what more can be done to remedy this defect other than the encouragement of a close liaison between the existing committees, councils, and boards.

25. The Association is watching with interest the progress of the liaison committees which are at present being established in some regions. Although there is much to be said for a system of cross-representation, there are obvious difficulties in advocating any one method which would give universal satisfaction. The Association is, however, firmly convinced that the local medical committee, as a statutory committee, must remain an integral part of any liaison machinery, and must continue to be regarded as the authoritative voice of general practitioners in the area. It should be recognized as the body from which advice should be sought on every occasion on matters affecting general practice. In the areas of some regional hospital boards local medical committees have formed a joint committee which has been able to make useful and practical liaison with the board on matters affecting both hospital and general practice.

26. Ultimately, it is felt that radical changes in the administrative machinery will be necessary, but the Association believes that it is still too early to decide what form these should take.

27. The problem of entry into practice is referred to elsewhere in this memorandum, and it is sufficient here to indicate that, apart from administrative modifications, no important changes are suggested at present.

28. The Association is in favour of the Trainee General Practitioner Scheme, which provides a valuable introduction to the problems of general practice. A number of modifications to the existing scheme have been suggested in a later section of this memorandum.

29. The Association is anxious to do all in its power to encourage partnership practice, and considers that assistantship "with a view" is an ideal mode of entry into general practice. Various suggestions are made elsewhere in the memorandum, particularly in Appendix D, as to the relationship between principal and assistant.

30. The Association favours, in certain areas, experiments in the development of health centres and group practice, where general practitioners may share the pooled provision of ancillary help and diagnostic aids.

31. In the past the exigencies of general practice have permitted little time for leisure. The general practitioner needs greater opportunity for postgraduate study and for reading and reflection. It is hoped that the recommendations contained in the section of the report dealing with postgraduate education, coupled with the benefits conferred by the Dankwerts award, particularly the spread of the numbers of patients, will make this possible.

32. It is believed that the widespread adoption of the recommendations which follow would go far towards providing the improvements that are needed in the conditions of general practice.

III. THE TRAINING OF THE GENERAL PRACTITIONER AND POSTGRADUATE FACILITIES

33. The training of the general practitioner has already been the subject of a report by a special committee of the Association under the chairmanship of Sir Henry Cohen. This report (see Appendix C) has been discussed by the Representative Body, and comments on its recommendations are now being sought from local Divisions of the Association in order that those most intimately concerned may have an opportunity of voicing their opinions before the Association's policy is finally determined.

34. Facilities for postgraduate training should play an important part in the general-practitioner service, and, in the Association's view, these fall into two main categories: first, those required in the period of training after registration for the special work of general practice; and, secondly, those needed in the subsequent continuous education of the general practitioner throughout his professional life.

35. In the first category, reference is made elsewhere in this memorandum to the Trainee General Practitioner Scheme, which the Association maintains is one of the valuable new features of the service in that the trainee is required under the terms of his grant to instruct his trainee in the specialty of general practice.

36. It is equally important that those practitioners who receive their first introduction to general practice as ordinary assistants should derive as much experience as possible during the tenure of their post. The principal should make it his responsibility to pass on to the young doctor his knowledge and experience. This will include not only a wide understanding of clinical medicine but also experience in the general management of patients and their relatives, the detailed administration of a practice, and the application of the law to medicine. To absorb all this will require of the assistant a different approach from that adopted towards other specialties with which he has become acquainted in hospital, but it is a valuable and indeed an essential introduction to the problems which he will have to face in general practice.

37. In the second category, it is contended that specially designed postgraduate training for general practice should go far beyond the old conception of the occasional refresher course or occasional lecture. It should take several shapes—

organized courses, ward-rounds, participation in clinical conferences, hospital work, and consultation with specialists on individual cases. In the past too little study has been made of the mechanics of the postgraduate education of the general practitioner. This, including the selection of instructors, is a matter requiring urgent consideration.

38. The association of the general practitioner with the hospital is one form of postgraduate medical education which should particularly be encouraged, and it is hoped that the good will and co-operation of boards of governors of teaching hospitals and regional hospital boards will make this increasingly possible. Reference is made to this in more detail in a later section of the memorandum dealing with the association of the general practitioner with hospital work.

39. Apart from his formal education, it is again stressed that the general practitioner must have leisure for the valuable self-education which is derived from reading and reflection.

40. The general practitioner should be given ample opportunity through postgraduate lectures and courses, including the extended use of visual methods, to keep himself up to date on modern methods of treatment and of relating them to the social conditions and types of occupation and illness which he will find in his own practice. This should be achieved with the minimum of disturbance of his practice.

41. Every regard should be had by the authorities responsible for the postgraduate education of the general practitioner, whatever form it may take, to the wishes and particular requirements of those concerned. The local medical committee can offer valuable advice on this and should always be consulted before definite arrangements are made.

42. Postgraduate facilities for principals must also be open equally to assistants in general practice.

43. Insufficient stress is laid in the education of both student and general practitioner upon preventive and social medicine and upon health education. It is essential that the general practitioner should make himself acquainted with the latest advances in preventive medicine, and he should be given every opportunity of extending his knowledge in this field. Health education should form a recognized part of his postgraduate training.

44. The late Sir Henry Brackenbury held that medicine had three main aspects—constructive, preventive, and curative. It is constructive in that the general practitioner is called upon to instruct the individual patient and the family as to the best methods of maintaining sound health; preventive in that the doctor advises each patient on the measures to be taken to avoid disease and ill-health; and curative because the practitioner is called upon to advise and treat those patients who are ill. What was true then is true to-day, and the Association holds that the general practitioner's responsibility is the attainment, maintenance, and enhancement of the physical and mental health of his patient.

45. The general practitioner is in a specially favourable position to undertake constructive and preventive work, because the patient is consulting a person whom he already knows and trusts and whose advice therefore he will more readily accept; because he is going at a time when he is not well, and will therefore be more interested in how to keep in his future; and because he is likely to be going at a stage in his complaint where preventive measures can be effectively applied.

46. It is encouraging that the present Minister of Health has recognized the unique position of the general practitioner in this field, for in a recent speech he used these words: "The general practitioner could now be the clinical leader of a team comprising all services provided by the local authority."

IV. ENTRY INTO PRACTICE

(a) General

47. The problem of entry into general practice has been under constant review since the inception of the National Health Service, and the Association is confident that many of the difficulties which have been

will largely disappear when the recommendations of the Working Party on the future distribution of the Pool have had time to take their full effect. New partnerships will be encouraged by the "notional lists" arrangement, which entitles those in partnership to claim the maximum number of "loaded" capitation fees in respect of each partner. The reduction in the maximum number of patients whom a practitioner may accept on his list and the provision of a sum of money to stimulate the formation of partnerships working as group practices are other factors which should ease the problems of the new entrant. In future, the new entrant will have accurate information about the areas which are in need of new doctors, and, provided that he chooses such an area, he can be assured of receiving substantial help.

48. The Association is alive to the fact that the problem of entry into general practice has been accentuated by the decision to reduce the hospital establishment of registrars. Although it is hoped that this will prove to be a short-term problem the Association is anxious to ensure that registrars are displaced as a result of hospital reorganization should be absorbed into general practice, while yet being afforded real opportunities of maintaining a link with the hospital service.

(b) The Machinery for Filling Practice Vacancies

49. The general arrangements for filling practice vacancies are still under consideration, and the Association is anxious to speed up the procedure, wherever possible, and to afford a greater measure of responsibility to executive councils. No final decision as to the best procedure has yet been reached, and the Association will later be discussing the matter with the Ministry of Health. The problem is one which has only arisen since the introduction of the National Health Service. Discussions have taken place with the Medical Practices Committee upon defects which have become apparent during the four years that the system has been in operation, and this has proved to be a most fruitful form of liaison.

(c) Assistantships

50. The role of the assistant in general practice is a valuable one, and, in the Association's view, provides the newly qualified practitioner with the best introduction to general practice. It is the Association's aim to encourage principals to take their assistants into partnership, and the recommendations of the Working Party were designed with that object in view. Only time and experience can show whether the further measures are likely to be required. As always, the process of achieving modifications in the Service is continuous, and the position will be carefully watched.

51. Generally the principal-assistant relationship is good, and the Association is anxious to preserve it and to give the assistant every help in making his way. One positive step which the Association has taken in this field has been the inclusion in its *Handbook* of detailed guidance on conditions of service which should be observed by both parties. A model contract has also been prepared. Extracts from the *Handbook* are set out in Appendix D. It is emphasized that terms of service for assistants should remain on a personal basis and not be governed by official regulations.

(d) Partnerships

52. The Association holds the view that partnership is a most satisfactory form of medical practice, which should be given all possible encouragement. This view was also held by the Working Party, who provided in the new distribution scheme that partners might apply to their executive councils to be paid on what the partners consider will be the most financially advantageous division of the patients between them—i.e., on the basis of notional lists.

53. Nevertheless, it must be recognized that the abolition of the sale of goodwill will continue to have a deterrent effect on partnerships. Before the introduction of the Act a practitioner taking a partner could rely upon receiving a capital sum to tide him over the difficulties of the subsequent period of reduced income whilst the practice was building

up to a level which would in some measure redress his loss of income. The abolition of this financial inducement is a deterrent which it is difficult to overcome, but, as a short-term remedy, it is suggested that a general practitioner taking another into partnership should be allowed the option of receiving forthwith a percentage of the compensation moneys due to him in proportion to the share of the practice which he surrenders. A precedent for this exists in the National Health Service (Amendment) Act, 1949, which provides that, where there is an agreement in force between members of a partnership to purchase the share of one of the partners, there shall be paid to the partner from whom the share is transferred the appropriate compensation for his share in the goodwill of the practice.

54. The Association is convinced that this one recommendation would stimulate the formation of partnerships and go a long way towards solving the immediate problem of entry into practice and diminish the number of permanent assistantships.

(e) Trainee General Practitioners

55. A detailed examination has been made of the Trainee General Practitioner Scheme, and the Association is convinced of the value of this scheme, both to the profession and to the National Health Service. The Association is aware that there are certain difficulties in the administration of the scheme which it believes can be rectified if the measures advocated in a detailed report by the General Medical Services Committee are adopted (see Appendix E). Generally, it is satisfied that the scheme should continue and that executive councils should, to demonstrate the value of these assistantships, give special consideration, other things being equal, to applications to fill vacancies in general practice which are submitted by former trainee general practitioners.

V. HEALTH CENTRES

56. The Association holds the view that the provision of health centres should be on an experimental basis, and that no large-scale building programme should be undertaken until experience has been gained in experimental centres and considerably more information is available. It is considered that new towns and large housing estates still in the planning stage would be the most appropriate places for the construction of health centres on an experimental basis. Conditions here are specially favourable in that the demand for medical services is newly created and not as yet met, and there is greater freedom in the choice of sites. It may actually be more economical to build health centres under these circumstances than to provide separate premises for local authority services and individual doctors' surgeries. Nevertheless, the Association does not consider that any one method should be adopted to the exclusion of others, and it consequently dissents from the invariable application of the view previously expressed by the Central Health Services Council that new communities should be provided with health centres from the start concurrently with schools and other public services.

57. It is difficult to see how health centres can ever be a practical proposition in rural areas; patients are not likely to take kindly to the distances which they have to travel to a centre covering a large area with a scattered population. In such areas some less formal type of group practice is likely to develop, and this could with advantage be centred upon an existing cottage hospital.

58. It must be remembered that health centres will prove to be a costly venture, and a good deal of experience will be necessary before any attempt can be made to assess their value and the enthusiasm of doctors and the public for this experimental form of practice. The views of doctors and patients at such recently opened health centres as Bristol and Woodberry Down are therefore awaited with interest. Traditionally, the patient has grown accustomed to attending for consultation at the doctor's house, where the ease of access and the more intimate environment are factors which

cannot be ignored in assessing the need and demand for health centres. During the time that health centres are being provided on an experimental basis, and under conditions which are by no means uniform, it is important to ensure that the centre has a reasonable chance of establishing itself. This could be effectively assisted by promulgating regulations that no doctor (other than a principal in the health centre or a doctor who, at the commencement of a specified period, had premises in the area in which he practised and was at that time on the executive council list) should be allowed to open a surgery (including a surgery at his residence) within an agreed area round the centre for a specified period before and after the opening of the centre. Only by the introduction of safeguards of this nature will it be possible to induce doctors to take part in what must still be regarded as an experimental form of practice with an unpredictable future.

59. It is important that, before any plans for a health centre in an area are formed, there must be the fullest consultation between the local authority, the executive council, and the local medical committee. There should also be early consultation on the choice of a site. Not only must the doctor's position in practice be safeguarded, but the financial arrangements at the centre must be discussed and agreed with the profession in advance.

60. The Report of the Association on Health Centres and a report by the General Medical Services Committee on certain administrative considerations, including a model contract, are attached (see Appendices F and G).

VI. THE DOCTOR-PATIENT RELATIONSHIP

61. In his book, *Patient and Doctor*, published in 1935, the late Sir Henry Brackenbury regarded it as fundamental that the doctor-patient relationship should be one existing between a person who is a patient and a person who is a doctor, and not between healer and disease. Sir Henry Brackenbury pointed out that: "No doctor can be, or should be, a cool, detached scientific observer dealing quite objectively with some morbid condition or process." "The attitude of the patient should not be that indicated by the question, 'What disease have I got, and will you cure it?' but that shown by such a question as, 'Will you try to discover how and why I am ill, and help me to restore my health and keep it?'" Sir Henry went on to add that "the doctor should be regarded primarily as an expert helper and health adviser rather than as a disease curer," and that "mutual confidence between patient and doctor is of the first importance for successful medical relationship, advice, and treatment."

62. No one is likely to dispute the wisdom of these views on the doctor-patient relationship, and those responsible for the administration of general medical services under the National Health Service have a responsibility to ensure that they are put into effect under conditions prevailing to-day. Has the National Health Service in any way changed the relationship between patient and doctor? There is no doubt that the inauguration of the Service has led to a generally increased demand both on the general practitioner's time and for drugs, dressings, and appliances. Some part of this demand was a natural and foreseeable result of the removal of any financial barrier between doctor and patient. Unfortunately, the publicity with which the Service was launched, and the emphasis which was laid on this very absence of financial restraint, also led a small but irresponsible section of the public to make unnecessary demands upon the profession and to fail to observe those elementary courtesies customary between doctor and patient, and so essential to the maintenance of a proper relationship between them.

63. Generally, the doctor-patient relationship has remained at a high level, and many doctors have not been slow in pointing out that the freedom from financial anxiety, if it has led to an increased demand on the doctor's time, has also improved the relationship between patient and doctor. The doctor has certainly continued to retain complete freedom in clinical judgment and treatment, and it is essential that this should continue.

64. Nevertheless, a small minority of the public have undoubtedly abused their privileges, and it may be necessary to strengthen the doctor's hand if they continue to make exorbitant demands upon the Service and fail to recognize that the doctor, though now in contract with an executive council, is still in contract also with the patient and entitled to as much consideration as he was before. During the existence of the National Health Insurance Scheme any flagrant breach of normal courtesy could adequately be dealt with by a reference by the general practitioner to the rules of conduct for patients which appeared on the medical card. Such a set of rules, even if not enforceable by penalties, would lend authority to the doctor's refusal to accede to unreasonable requests for either services or drugs. The Association strongly urges that the Minister, in consultation with the Association, should draw up a new code of conduct for patients, and that the Minister should take determined steps to bring it to the notice of every patient.

VII. RANGE OF SERVICE

65. The Association is of the opinion that general practitioners should be given every encouragement to develop special interests within the scope of general practice. This is most easily arranged in a group practice, and has been one of the arguments used in favour of health centres. The fulfilment of this need raises again the importance attached to a close association of general practitioners with hospital work, and the provision of an adequate number of clinical assistantship posts.

66. It should be emphasized that the development of a special interest should not normally be a step towards transferring to a specialty, but it would add variety to general practice and enable the practitioner to provide a fuller service for his patients. In some areas, general practitioners have found it an advantage to have among their number one who has made a special study of a particular aspect of practice and can help with difficult cases.

VIII. ACCOMMODATION

67. It is important to the future of general practice that doctors should provide clean, pleasant, and adequately equipped surgery and waiting-room accommodation compatible with the size and circumstances of the practice.

68. The Danckwerts award and the improved rates of remuneration present a new opportunity for general practitioners to review the surgery and accommodation facilities provided for the public and, where necessary, to effect improvement.

69. Unfortunately, the shortage of houses will inevitably retard progress in this direction for some time to come. While most war damage has now been made good, many property owners find themselves faced with a backlog of repairs and dilapidations which it was impossible to deal with during the war period and which, by reason of the high cost of labour and materials and of licensing restrictions, cannot all be made good at once.

70. The general practitioner himself has certain obligations under his terms of service, and representatives of executive councils already have power to inspect surgery premises. The Association thinks that this provides adequate safeguards and is opposed to any suggestion that minimum standards should be laid down.

IX. CERTIFICATION

71. The position of the State as an interested third party, the continued shortage of essential commodities, food rationing, and the growth of various forms of industrial insurance resulted at the commencement of the National Health Service in an increase in the number of certificates required. These certificates vary slightly in form according to the purpose for which they are needed or the stage which the patient's illness has reached, and it is the doctor's task to be familiar with the different types of certificate and their uses. Certification must never be more than a subsidiary

function of a general practitioner, but it has at times proved unnecessarily irksome, and the Association welcomed the helpful suggestions made by the Safford Committee for reducing the number of certificates in use. This report is annexed (Appendix H).

72. It would be of great help to the general practitioner if he could obtain the more usual forms of certificates required by the various Ministries, the local health authority, the public health laboratory, and the hospital authority from his local executive council as well as from normal sources. This may well be a matter for arrangement at local level, and while it would not be possible to extend it to all certificates—the death and stillbirth certificate forms issued by the registrar of births and deaths, for instance, could hardly be supplied in this way—nevertheless it would be a great convenience to the busy general practitioner.

73. It is also strongly recommended that, when any trade, industrial, or professional agreement is being negotiated which will necessitate the presentation of medical certificates or a medical opinion, the profession should be represented in order that it may have an early opportunity of making known its views on the kind of information which its members will subsequently be called on to provide.

X. PRESCRIBING AND DISPENSING

74. The Association has been seriously concerned at the steadily mounting cost of the pharmaceutical services, and has been active in suggesting to the Ministry ways and means by which the expenditure can be reduced without detriment to the patient.

75. A number of proposals have been made by the Association, and discussed with the Ministry. These included the issue of the *Prescribers' Notes*, now an established and successful feature of the Service, the reintroduction of the system of notifying areal averages of prescribing costs, and the issue of a comprehensive list of proprietary preparations with their reputed therapeutic equivalents.

76. The Association has on all possible occasions emphasized the need to bring home to the public the heavy cost of drugs and appliances. It has also suggested that those responsible for teaching medical students should draw attention to the cost of drugs, particularly those in the more expensive ranges, and emphasize the need for reasonable economy at all times.

77. As another step towards economy, it is hoped that, wherever possible, promotion material distributed by the drug houses will show the price of the drugs being advertised. Discussions have been held with the Association of the British Pharmaceutical Industry, which, whilst for practical reasons opposed to any legal requirements, has expressed its willingness to co-operate in this way. The practitioner should also be kept advised of the cost of analogous *National Formulary* preparations so that he may be in a position to make comparisons of cost. The Association recognizes that this may prove difficult, but it is important that all practitioners should be made aware of the cost of the more expensive preparations they prescribe.

78. One major practical proposition put to the Ministry by the Association was that doctors should be allowed to order on official prescription forms stocks of medicines and dressings for emergency use in their surgeries. Apart from the inconvenience to the public, there is no doubt that the introduction of such an arrangement would lead to considerable economies in the drug field. Discussions have taken place on a number of occasions between the Association, the Ministry of Health, and the National Pharmaceutical Union. Indeed, at one time the two professional bodies had prepared an agreed list of preparations and appliances which it was intended a doctor should order in bulk on a special form E.C.10A. An outline of the scheme is shown in Appendix I. Unfortunately, shortly after this agreement had been concluded, the introduction of the shilling levy on prescriptions brought new problems to light, and the National Pharmaceutical Union felt unable to proceed with the scheme. The arrangements set out above have been working well in Scotland since 1914, and the Association recommends that

they should be extended to England and Wales without further delay in the interests of the patient and as a means of reducing the costs of the pharmaceutical service.

79. The general practitioner must always be free to prescribe whatever drugs he considers necessary for the proper treatment of his patients. The Association is glad to note that the policy of the Definition of Drugs Joint Subcommittee supports this view, though the Association recognizes that a general practitioner must always be prepared to justify his action should a case of alleged extravagant prescribing be brought against him.

80. The general practitioner has full control over what he prescribes, but he is sometimes placed in an embarrassing position when, for good and sufficient reasons, he considers it necessary to order some drug in a form other than that recommended by the consultant to whom the patient has been referred for advice. It is felt that hospital medical staffs should be notified of the measures which are being designed to effect economy in prescribing and that, when patients are referred back to their general practitioners with advice, due regard should be paid to economy.

81. The Association considers that the normal practice of the consultant informing the general practitioner of his findings by letter is the best way of passing on information about the treatment he has ordered. In this way the complete confidence of the communication is ensured, and the consultant has an opportunity of informing the general practitioner why he may have considered it necessary to order some particularly expensive preparation.

82. One continuing source of irritation is that a doctor is frequently required to justify his prescribing many months after the incident which gave rise to the issue of the prescription. Many of these cases do not relate to over-prescribing at all, but to the prescription of articles not strictly defined as drugs. This delay is understood to be entirely due to the fact that pricing offices are many months behind in their work and are unable promptly to inform executive councils of cases in which they consider a surcharge might be levied. Some reasonable restriction should therefore be placed upon the period after which a pricing committee can refer a prescription for investigation.

83. Under National Health Insurance one of the greatest aids to economy lay in the doctor's ability to check his prescribing costs against an areal average. While it is unlikely that full costing can be achieved for some time to come, it is understood that pricing bureaux are now reducing their arrears of work and that in the near future it may be expected that any prescription challenged will be investigated within a period of three months from issue. Every effort should be made to establish the system of areal averages, if only on a sampling basis, as this is considered to be far and away the most effective method of drawing attention to and so controlling excessive prescribing.

XI. MATERNITY MEDICAL SERVICES

84. On the whole, the arrangements for maternity medical services have worked satisfactorily, but experience has brought to light a number of difficulties which, in the interests of doctor and patient alike, should speedily be removed.

85. The family doctor has always regarded midwifery as a most important—and indeed essential—part of his work. It is recognized to-day that the number of domiciliary confinements is determined largely by social conditions. It should be the rule, however, that hospital maternity beds should be occupied by patients requiring them on medical grounds or where admission is necessary for social reasons.

86. They should not otherwise be used for normal confinements. For a normal maternity case to occupy a hospital bed solely to suit the convenience of the patient may be to deprive another patient of a bed at a time when the services of a consultant may urgently be required. The position has been worsened by the Maternity Benefit Regulations, which at present take no cognizance of the fact that confinement in hospital carries with it free board and maintenance.

87. The decline in the number of confinements undertaken by the general practitioner alone, or in conjunction with the domiciliary midwife, is depriving him not only of necessary experience in dealing with deviations from the normal but also of a most interesting and satisfying part of his work. The Association considers that immediate steps should be taken, wherever possible, to reduce the increasing number of institutional confinements, and recommends that maternity cases should be accepted at clinics or hospitals only on the recommendation of the general practitioner. Normally, such a recommendation would be made on grounds of medical need or where confinement at home is not possible for social reasons.

88. Finally, the inability of the general-practitioner obstetrician to follow his patients into hospital is one of the most unfortunate aspects of the service. The provision of an adequate number of beds in hospital maternity units for general-practitioner obstetricians would give great encouragement to the general practitioner. A logical development would be the establishment of maternity units fully staffed by general practitioners, to which consultant services would always be available when required.

The Obstetric List

89. Every general practitioner is qualified, in law, to practise midwifery, and the artificial distinction imposed by the present regulations has, in practice, done nothing to raise the standard of midwifery.

90. The standards imposed by local obstetric committees for admission to the obstetric list are by no means uniform, and in not a few instances a practitioner has been included in the list of one executive council and has been unsuccessful in a neighbouring council in which his practice overlaps.

91. It is submitted that what the general practitioner requires is opportunity and experience to further his skill in obstetrics, both domiciliary and institutional, and this will never be achieved by the purely administrative and artificial device of an obstetric list.

92. The Association believes that the procedure followed in Scotland is much to the advantage both of the patient and of the maternity services as a whole. In Scotland and Northern Ireland every registered medical practitioner is eligible to have his name included in a list of practitioners undertaking to provide maternity services. Indeed, unless the practitioner expresses a wish not to be so included, admission is automatic upon his inclusion in the medical list.

93. This policy has been fully vindicated by the lack of any differentiation in the maternity morbidity and mortality rates for the two countries. The Association recommends that the Scottish procedure should be extended to England and Wales.

XII. THE GENERAL PRACTITIONER AND HOSPITAL WORK

94. Reference has already been made in the introduction to this document to the isolation of the general practitioner and his exclusion from hospital work. Opportunities for co-operation with consultant members of hospital staffs should be increased.

95. This problem has two main aspects. First, the need to provide an adequate number of general-practitioner beds where the general practitioner can accept full clinical responsibility for the care of his own patients whose treatment is within his competence. Modern social conditions often prevent the general practitioner from continuing domiciliary treatment although medical considerations alone would not always necessitate the removal of the patient to hospital. Because of the lack of general-practitioner beds these patients are obliged to occupy beds under the care of specialists to the exclusion of more serious cases which require consultant attention. The Association holds that, as a first step, the smaller general-practitioner and cottage hospitals should be returned to and retained by the general practitioner, and that, as a long-term policy, beds

should be set aside in every general hospital, of whatever size, for the treatment of patients by their own general practitioners. These general-practitioner hospitals should be closely linked with a "parent" hospital for the purpose of regular consultant visiting arrangements. It is important that they should not become isolated units and that the general practitioner and the visiting consultant should work in harmony. Consultants should not merely be on call for emergency work or consultations, but should attend at regular intervals. Their visits should be made in an advisory rather than a supervisory capacity.

96. Secondly, it is essential that the general practitioner should be given every opportunity of taking part in the life of his local hospital. This has been achieved to some extent in the smaller hospitals in rural areas where personal contact is more readily maintained, but it is essential to the future of general practice that the general practitioner should ultimately have a recognized place in the larger provincial and teaching hospitals. It was confidently expected that the introduction of a comprehensive health service would achieve this end, but unfortunately the opportunity has not been seized, and the integration of the general practitioner with the hospital service has been the exception rather than the rule. The situation can, however, quickly be remedied by the appointment of such general practitioners as are appropriately qualified and experienced to all grades of hospital appointments, as part-time consultants, senior hospital medical officers, junior hospital medical officers, registrars, or clinical assistants. Such a step would ensure a closer integration between the two branches of the Service and bring lasting benefit to the patient. It is clear from his address to the annual meeting of the Executive Councils' Association that the Minister himself attaches great importance to the integration of the hospital and family doctor service. The Minister said:

"General practitioners in the smaller towns and rural areas should be able to have charge of their own patients not needing specialist care although needing admission to hospital; selected general practitioners should hold part-time hospital posts of a general or specialized character." The creation of non-specialist posts for the general practitioner in hospitals is a policy which has the full support of the Association, and the Minister's pronouncement on the subject has been widely welcomed.

97. Particular importance is attached to clinical assistantships, and it is anticipated that many of these posts, although in themselves permanent, would be held by a number of general practitioners in rotation. Where they are not purely educational, the holders would have certain definite responsibilities. The Association is of the opinion that the general practitioner, because of his knowledge gained in general practice of the environment and the social and occupational problems of his patient, brings to the hospital a fresh outlook which would otherwise be difficult to obtain. Proper recognition should be given to this fact, as it affects the general practitioner's usefulness in whatever role he enters the hospital.

98. To-day the great majority of consultants have obtained their hospital appointments with no experience of general practice and have spent their period of training entirely within the precincts of the hospital, whereas in the past a number of them undertook a period in general practice before securing a hospital appointment. It should be entirely a matter for the individual concerned to decide whether he will personally benefit from experience gained in this way, and it should in no way jeopardize his consultant career if he decides to work temporarily in general practice. The normal "hospital ladder" of promotion has, however, become so rigidly established that it is now virtually impossible to obtain a hospital appointment of senior status through any other channel, and this necessarily influences the potential consultant. The Association believes that this is wrong and that the future consultants should have a free choice, and that equally there should be no bar against the general practitioner as such who seeks consultant status.

99. The Association's policy on this whole question is set out fully in a report entitled "The Association of the General Practitioner with Hospital Work." (Appendix J.)

Diagnostic Facilities

100. One of the faults of the Service still persisting in many areas has been that hospital authorities tended to require that requests from a general practitioner for some diagnostic procedure—an x-ray examination or a pathological report—should first be referred to the appropriate department, where the consultant in charge would decide whether the request should be met. This procedure is wasteful both of out-patient facilities at the hospital and of the time of the consultant concerned, for the point at which the consultant's opinion may be of greatest value is when the necessary preliminary investigations have been made. In many cases the results of the investigations are satisfactory, and it is not necessary to seek consultant advice at all. This "closed door" policy has resulted in a good deal of annoyance and justifiable criticism, and promotes misunderstanding between general practitioner and consultant.

101. The Association holds strongly to the view that general practitioners should have direct access to the consultants in charge of pathological and radiological departments in all areas. In areas where this policy has been adopted, great care has been exercised by general practitioners not to abuse the facilities available.

Physiotherapy

102. The Association believes that physiotherapy is a valuable adjunct to the rehabilitation of the patient, but the more extensive facilities provided in the last few years have sometimes been used improvidently, and unnecessarily heavy demands have been made upon the departments themselves and upon ambulance and other hospital transport. The present long waiting period for treatment might well be reduced if patients could be sent by the general practitioner direct to the medical officer in charge of the department without having first to go through other clinics in the hospital out-patient department. In country districts mobile physiotherapy units have proved to be of considerable value.

103. It is desirable that the physiotherapy department should work in close co-operation with the family doctor. In smaller hospitals the day-to-day supervision of such a department might well be placed under the care of a general practitioner who has acquired special experience of the work and who would work in co-operation with a consultant charged with the supervision of a number of physiotherapy departments in the region. At present, as a general rule, a general practitioner who sends a patient to hospital for physiotherapy loses contact with the case, and has no control over and little information about his patient's progress.

104. The initial treatment of a patient by a general practitioner and his subsequent rehabilitation often involving physiotherapy are parts of one and the same process, and it is essential that the general practitioner and medical officer in charge of the department should work together with the object of returning the patient to suitable work at the earliest possible moment. For the convenience of the patient who is fit to return to work but still requiring some treatment, the Association favours the provision of evening clinics whenever possible.

Hospital Admission and Discharge, Including the Role of Almoner and Out-patient Department: Ambulance Arrangements

105. Experience has shown that a number of improvements could readily be made in hospital administration which would free the general practitioner from a number of tasks which at present unnecessarily take up a good deal of his time.

106. It is the policy of the Ministry, in which the Association concurs, that every hospital should have a reasonable appointments system. The Association also considers it essential that a proportion of the time available for out-patient consultations should be kept free for urgent cases.

107. Every effort should be made to restrict hospital out-patient departments to cases on which the general practitioner requires a second opinion, and the departments should not be used for the continued treatment of cases which can properly be treated by the general practitioner. Patients should be returned to the general practitioner at the earliest opportunity, except where essential treatment can be given only at hospital. There will, of course, be cases where for good and proper reasons the consultant himself will wish to maintain direct supervision over a particular patient. If these measures are adopted it should be possible to effect a quicker turnover of out-patient waiting-lists.

108. It is considered that, as a general rule, once a hospital has agreed to accept a patient for consultation or admission the responsibility for providing transport should fall upon the hospital authorities. It is not suggested that the ambulance service should be administered by the hospital, but rather that the requisition of an ambulance should be the responsibility of the hospital at the request of the general practitioner. In country areas, general practitioners have found that requests for ambulance transport, usually by telephone, are time-consuming. The general practitioner's time is thus wastefully employed, and proper attention to these points of detail would enable him to give greater individual attention to his patients.

109. Another matter of concern to general practitioners is the time lag between the discharge from hospital or death of a patient and the receipt of information by the family doctor. In general, it has been the experience of general practitioners that, although reports on patients are full and helpful, they do not reach him until the patient has been discharged for some time. One remedy would be for arrangements to be made for a note to be given to each patient on discharge, setting out the position regarding treatment and certification, with instructions to hand it immediately to the patient's own doctor. In certain cases, it might be found preferable to send the note through the post. It is suggested that the normal procedure might be for the initial notification to take the form of a brief note by the house-officer, which would serve to keep the general practitioner informed of the patient's discharge, followed at the earliest opportunity by a more detailed report from the consultant in charge of the case. The exact method to be adopted would in any case be a matter of administrative procedure to be settled locally between the two branches of the profession.

110. The Association is concerned with the difficulties experienced by general practitioners and the time involved in obtaining speedy admission of patients to hospital, and has considered, in conjunction with the Ministry, ways and means of relieving the present shortage of beds and improving the existing machinery for the admission of emergency cases.

111. It is considered that, once the initial request for a bed has been made by a general practitioner, all subsequent arrangements should normally be made through the hospital administrative machinery, as was the case prior to the Act, when the public assistance department accepted responsibility for making any necessary arrangements. The Ministry has brought a number of the suggestions made by the Association to the attention of regional hospital boards—particularly a proposal to establish closer liaison between regional hospital boards and local medical committees, so that the general practitioner's difficulties in hospital matters may more readily be made known.

112. Every endeavour is being made to improve the emergency admissions machinery, and, while it is not possible at present to establish a uniform method throughout the country, it is important that at least in the more popu-

lated parts admission should be on a group basis. In a number of areas it appears to be the normal practice for the general practitioner to make a direct approach to the hospital he considers appropriate, and it is not proposed to interfere with this practice. He often has difficulty, however, in making contact with the appropriate resident at the hospital, and a great deal of time can be wasted in this way. A modern telephone and "call" system is of the greatest assistance to all concerned, and the efficiency of the Service would be much increased if all hospitals were equipped with up-to-date internal communications. Generally the aim is to establish machinery at each level—small hospital, large hospital, hospital management committee, emergency bed service, or regional headquarters—whereby there will be an officer who will be responsible for allocating beds in the area, so that once the general practitioner has made his request for a bed he will have done all that is required of him to secure the admission of the patient.

113. It is hoped that additional facilities for general practitioners on these lines, so essential in times of epidemic, will be extended through the country.

114. The Association is also concerned with the problem of finding suitable accommodation for elderly people who require nursing or whose home conditions are unsuitable. At present, a great deal of the general practitioner's time is taken up in abortive efforts to find suitable institutional accommodation for the elderly sick. It would be of assistance if financial help could be given more extensively to provide night-attendant care and similar services and so enable these people to be cared for in their own homes.

115. The Association is well aware that the present pressure on hospital accommodation leaves little margin, and it has made several suggestions to the Ministry for alleviating the present shortage of beds, which could be of serious consequence should an epidemic arise. Amongst these are proposals that special accommodation should be provided for elderly people who do not require skilled nursing, and that the practicability of extending the district night-attendant service (already in operation in certain areas) and the daytime home nursing and home help services should be explored.

XIII. RELATIONS BETWEEN GENERAL PRACTITIONERS AND CONSULTANTS

Representation of the General Practitioner in Hospital Administration

116. It is the Association's policy that there should be adequate representation of the general practitioner at all levels of hospital administration. Especially is this important at hospital management committee level, where the general practitioner, particularly if he finds a place on the group medical advisory committee, can ensure that the day-by-day problems of general practice are brought to the notice of those who shape and are responsible for hospital policy and administration. Where representation has been secured, there is no doubt that a closer integration of the hospital and general-practitioner services has resulted, to the benefit of the patient. It is to be hoped that in future the Ministry of Health will set an example by ensuring that there is a general-practitioner representative enjoying the confidence of his colleagues on every regional hospital board or board of governors. This step alone would give an impetus to general-practitioner representation at lower levels of hospital administration.

XIV. LIAISON WITH LOCAL AUTHORITY SERVICES

117. Section 19 (3) of the National Health Service Act and Part II of the Fourth Schedule provide that every local health authority shall establish a health committee, to whom shall stand referred all matters relating to the discharge of its functions as a local health authority. It is laid down that the majority of the members of the health committee shall

be members of the local authority, but no directions are given as to the exercise of its powers of co-option. The Association considers that there should be an amendment of the Act requiring local authorities to exercise their powers of co-option to secure the inclusion in the statutory health committees of not fewer than two medical practitioners representative of the local medical profession, selected from among those nominated by the appropriate local medical committees, part-time employment by the local authority not being a bar to co-option.

118. In fairness, it should be said that the majority of local authorities have secured general-practitioner representation on their health committees, but an amendment of the Act, as recommended, would ensure universal application of this essential liaison between the two fields.

119. The closest possible liaison should exist between the general practitioner and the medical officer of health. Their problems overlap to a large extent, and there is much to be said for a medical officer of health spending a period in general practice before embarking upon his permanent career. Certainly more stress should be laid on preventive and social medicine in the training of the general practitioner.

XV. LOCAL AUTHORITY CLINICS

120. In the past relations between local authority clinics and the general practitioner have not always been good. Indeed, it was common experience to find that instructions had been given without the knowledge of the patient's family doctor to the embarrassment of both doctor and patient. The position has improved in some areas in the last few years, but the only certain way to obviate difficulties of this kind is to ensure an effective liaison between the various branches of the Service as advocated elsewhere in this report.

121. It is hoped that general practitioners will in the future be given every encouragement to play a full part in the type of work at present undertaken by local authority clinics. Indeed, it would be difficult to give effect to the Minister's view that the general practitioner should be the "leader of the team" unless this were the case.

XVI. SCHOOL HEALTH SERVICE

122. Considerable thought has been given to the position of the School Health Service and the desirability of maintaining the closest possible liaison between the general practitioner and the school medical officer. The general practitioner's role is one of continuous responsibility, and the closer the liaison between the School Health Service and the general practitioner the greater the benefit to the child. Some of the difficulties which have been experienced may well be due to the fact that the School Health Service was established before the National Health Service Act, and still is independent of the National Health Service.

123. The Association believes that the following principles should govern the relationship between the general practitioner and the school medical officer:

(1) Where, in the opinion of a medical officer employed by a local authority, a child needs special investigation (other than an ophthalmic examination) or treatment, he should send the child to a specialist only after prior consultation with the child's own doctor, upon whom rests the responsibility for general medical care.

(2) In consulting the general practitioner, the medical officer should give him the opportunity to make the arrangements for the consultation or to agree—by reply or in the absence of a reply—that the arrangements should be made by the medical officer.

(3) A copy of any special report on the child received by the medical officer should be sent to the child's own doctor.

124. These views are shared jointly by the Association and the Society of Medical Officers of Health, and every effort is being made to introduce them throughout the country.

XVII. AFTERCARE AND DUTIES OF HEALTH VISITORS

125. The Association welcomes the view of the Ministry of Health that there should be the closest co-operation between the medical officers of health and general practitioners on the provision of aftercare. When a patient is discharged from hospital there will in certain circumstances be a statutory requirement that details of aftercare requirements should immediately be transmitted by the hospital to the medical officer of health. It is of even greater importance that they should at all times be sent to the patient's family doctor.

126. Complaints are sometimes received of the attitude adopted by certain health visitors which suggest that there is need for a review of the functions and activities of these officers. Hitherto, health visitors were mainly concerned with maternity and child welfare, but now they have tended to become general social workers, visiting the home for a variety of purposes. Some reorientation of training and attitude is required to meet the new type of duty, and in the present transitional stage a number of health visitors, failing to appreciate the change, are causing difficulty between doctors and patients. The training of the health visitor should consist of a basic training in nursing and a general training in social work specially related to the environment of the patient, and it should emphasize the need for close co-operation with the family doctor. It should not be, as has sometimes happened in the past, that independent advice contrary to that given by the family doctor is given by the health visitor. It is advisable for the medical officer of health to make such administrative arrangements in consultation with local medical committees as will ensure proper co-ordination.

127. The patient will derive the maximum benefit only when the general practitioner, the health visitor, the home nurse, and the midwife work together as a team, and the Association is strongly of the opinion that all possible steps should be taken by those responsible to achieve this desirable end.

XVIII. CONVALESCENT FACILITIES

128. At present, patients who require a period of rehabilitation under medical supervision may be accommodated in convalescent homes by arrangement with the hospital authority. The local authority is enabled to provide suitable persons with recuperative holidays when no medical attention is required. The Association would like to see a return to the simpler procedure in existence before the war, when a general practitioner was able to arrange convalescent care for his patient on the strength of his personally signed note, and was not required to refer his patient first to the hospital or to the local authority.

XIX. ANCILLARY HELP

129. There is no doubt that the provision of efficient secretarial assistance is an important factor in the administration of a busy practice, and enables the general practitioner to devote more time to his clinical work.

130. The Danckwerts award will, it is hoped, enable doctors to review their practice arrangements and make it easier for them to provide the necessary ancillary help. Moreover, the recommendations of the Working Party are designed to promote partnership practice, and this of itself will enable the expenses of a secretary to be shared by the various members of the firm.

131. The Association is, however, firmly of the view that the provision of ancillary help is a matter which every general practitioner must decide for himself in the light of his own particular circumstances and wishes.

XX. DISCIPLINARY PROCEDURE

132. Generally, the Association is satisfied that the present disciplinary machinery of a quasi-legal character is effective and best suited for dealing with alleged breaches of the

terms of service by professional men and women. Inevitably, however, experience has brought to light a good many faults which should be remedied. The Association is now in the course of investigating the whole Service Committee and Tribunal procedure. The results will be submitted to the profession in the near future, and such changes as are recommended will be referred to the Ministry of Health.

XXI. ARBITRATION

133. The Association, in surveying the progress made by the profession in negotiating improvements in the terms and conditions of service for general practitioners, is convinced that the absence, after nearly five years, of any agreed arbitration machinery has had a stultifying effect on negotiations. It is admitted at once that the Ministry gave its consent to the appointment of an adjudicator to settle the dispute on the size of the Central Pool. Nevertheless, this consent was obtained only after four years' difficult negotiation, and in future it is desirable that such delays should be avoided. There is good reason to believe that we have entered a new era of co-operation between the profession and the Ministry, but, with the best of good will on both sides, it is difficult to envisage negotiation in the proper sense if one side can decline to concede a point and then proceed to refuse the other side the right to have the point settled by arbitration.

134. The Association therefore considers that any amendment of the National Health Service Acts should provide for the establishment of a National Health Service court of arbitration, to which could be referred by the Ministers, or representatives of the profession, disputes on the terms of service, including remuneration, without the consent of the other party, whether existing terms or new terms affecting any section or individual member of the profession.

135. The essential features, composition, and terms of reference of such a court have been approved by the Representative Body of the Association and are fully set out in Appendix K together with, in Appendix L, Counsel's opinion on arbitration. This scheme has, of necessity, been designed for the medical profession as a whole, and has as its basis the negotiating machinery set up under the Whitley Council for the Health Services.

136. It is therefore important to point out that traditionally and over a period of 30 years negotiations on the terms and conditions of service for general practitioners have been carried out direct between the Minister and his officers on the one hand, and the Insurance Acts Committee and its successor the General Medical Services Committee on the other.

137. By and large these arrangements have proved to be the most suitable for dealing with the day-to-day problems of general practice, and the Association would not wish to make any fundamental changes in them.

138. Nevertheless, the right to arbitration, at present absent, is as much the concern of general practitioners as those in other fields, and it should not be difficult to adapt the model scheme set out in Appendix K to meet the particular requirements of general practitioners.

139. It would be implicit that every effort would be made on both sides to reach agreement by direct negotiation. Recourse to arbitration in the general-practitioner field would no doubt be rarely used, but the existence of a court to which either side can apply would, it is submitted, bring a spirit of reality to negotiations in the future.

XXII. PRIVATE PRACTICE

140. The profession has always understood it to be the policy of the Ministry of Health that facilities for private practice should be available, that the public should not be compelled to obtain their treatment through the National Health Service, but should be able to elect to receive private treatment, and that a doctor should be permitted to undertake both forms of practice. It would be true to say, however, that the Ministry has done little to enable the public

to exercise this freedom of choice. It frequently happens that patients who would otherwise elect to receive their medical treatment privately are discouraged from doing so by the high cost of drugs, medicines, and appliances obtained at the patient's personal expense.

141. An amendment of Section 38 of the National Health Service Act, 1946, to enable private patients to obtain drugs and appliances at the public expense, on the prescription of the attending practitioner on Form E.C.10, on the same terms as patients registered in the National Health Service would be a welcome indication of the Ministry's intentions towards private practice, and the Association urges that this step be taken at an early date.

APPENDICES

The following are the documents to which reference is made in the Memorandum:

- "A."—The Spens Report on the Remuneration of General Practitioners.
- "B."—The Danckwerts Award and the Working Party's Findings on the Future Distribution of the Central Pool.
- "C."—General Practice and the Training of the General Practitioner (The Report of a Committee of the British Medical Association).
- "D."—Extract on Assistantships from B.M.A. Handbook.
- "E."—Report of the General Medical Services Committee on the Trainee General Practitioner Scheme.
- "F."—Report by the Council of the Association on Health Centres.
- "G."—Interim Report of the General Medical Services Committee on Health Centres.
- "H."—Report of Interdepartmental Committee on Certification (Safford Report).
- "I."—Stock Orders Scheme.
- "J."—Report on the Association of the General Practitioner with Hospital Work.
- "K."—Extract from Report of Special Representative Meeting, December 13, 1951 (Arbitration machinery).
- "L."—Counsel's Opinion on Arbitration.

APPENDIX C

REPORT OF SUBCOMMITTEE ON SERVICE COMMITTEES AND TRIBUNAL REGULATIONS

PRELIMINARY

1. The Subcommittee was appointed in November, 1951, with the following reference and personnel:

Reference: That a Subcommittee be appointed to carry out a full investigation of the status, composition, procedure, and functioning of the Tribunal and Medical Service Committees, to hear evidence, to take legal advice, and to prepare a full report with recommendations as a preliminary step to securing amending legislation.

Personnel: S. Wand, A. C. E. Breach, A. Campbell, H. Guy Dain, F. Gray, Kate Harrower, D. F. Hutchinson, C. F. R. Killick, W. M. Knox, F. Lishman, A. N. Mathias, A. T. Rogers, and H. H. D. Sutherland, together with three representatives of the dentists and one representative of the pharmacists when matters of common interest are under discussion.

2. Subsequently, when reappointing the Subcommittee for the session 1952-3, the parent Committee modified both the terms of reference and the personnel of the Subcommittee in the following manner:

Reference: That a Subcommittee be appointed to review the constitution and procedure of Medical Service Committees and to report with recommendations to the parent Committee.

Personnel: A. Talbot Rogers, B. Cardew, H. Guy Dain, J. A. Gorsky, F. Gray, R. C. Hamilton, Kate Harrower,

D. F. Hutchinson, W. M. Knox, A. N. Mathias, F. A. Smorfit, and H. H. D. Sutherland, together with three representatives of the dentists and one representative of the pharmacists when matters of common interest are under discussion.

3. At the outset it was agreed that, as most of the provisions of the Service Committees and Tribunal Regulations affected general practitioners, dentists, and pharmacists alike, it would be to the mutual advantage of the three professions if the representatives of the dentists and pharmacists were present throughout the Subcommittee's deliberations. The British Dental Association and the National Pharmaceutical Union accepted the Subcommittee's invitation to send representatives, and the following were appointed:

British Dental Association:

Mr. L. E. Balding (Hove).

Mr. A. Smith (Hull).

Mr. C. W. Spendelow (Grimsby).

Mr. G. M. Hickley (London) (in place of Mr. Spendelow, who subsequently resigned).

National Pharmaceutical Union:

Mr. H. Noble (London).

CHAIRMAN

4. H. Guy Dain was appointed Chairman of the Subcommittee.

EARLIER DISCUSSIONS

5. The Subcommittee wishes to point out that the review of the Service Committees and Tribunal Regulations procedure dealt with in this report is not the first which has taken place since the introduction of the National Health Service. In 1949 the General Medical Services Committee appointed a similar subcommittee which carried out an extensive review of the regulations and recommended changes where it was considered that the existing machinery was defective or was not working smoothly. A statement containing a number of proposals requiring amendment of the regulations was prepared and discussed with the Ministry of Health. The Ministry made it clear at that time that, whilst it was necessary to set out the framework and general procedure in regulations, it was the Department's policy to discourage the promulgation of additional regulations except where the need for them was clearly established. The Department held the view that the present and future improvements in the machinery for considering complaints could best be secured by issuing a handbook of guidance to all concerned. Much of the Subcommittee's time was occupied subsequently in discussions with the Ministry on the text of the handbook, which was issued to executive councils and Service Committees in April, 1952. The Subcommittee is, however, by no means satisfied that this handbook goes far enough, and holds strongly to the view that changes in the Act and its regulations will be necessary to eliminate a number of faults in the present arrangements which experience has brought to light.

CONSULTATION WITH LOCAL MEDICAL COMMITTEES

6. Although local medical committees had previously been asked to review the present Medical Service Committee procedure, it was again decided to invite them to consider the subject and to submit their views. This was done in the early autumn of 1951, when local medical committees were sent a memorandum setting out in detail the provisions of the Service Committees and Tribunal Regulations.

7. Previously the Kent and Canterbury Local Medical Committee had issued to every local medical committee a

memorandum containing recommendations for a more "legal" procedure for the hearing of complaints. The changes proposed were:

(1) That the Medical Service Committee should be abolished.

(2) That "local courts" should be set up in each county.

(3) That local medical committees should continue to hear complaints of alleged over-prescribing, failure to keep records, and faulty certification.

(4) That England and Wales should be divided into three judicial regions, each region being served by a "regional circuit" court holding sessions in the county towns of its Region as may be convenient.

(5) That there should be no other special courts, committees, or tribunals.

(6) That the Minister and the executive council, being interested parties, should have no right of intervention at any stage except as complainant or respondent.

8. The General Medical Services Committee accordingly invited local medical committees, when sending in suggestions for any modifications of the present procedure, to indicate whether they wished to have substituted for the present informal procedure any other scheme providing, for example, for the appointment of a lawyer as chairman of the Medical Service Committee, legal representation of the parties, the giving of evidence on oath, and, generally speaking, a more legal procedure than obtains at present.

9. The following is a summary of the replies that have been received:

Total No. of Committees in England and Wales	138
circularized	101
Total No. of replies received	101

23 Committees specifically stated that they did not wish to have the general framework of Service Committee and Tribunal procedure superseded by a more formal judicial machinery.

30 Committees, without commenting generally on the present procedure, put forward small but important suggestions for its revision.

17 Committees were satisfied with the present Regulations and did not wish to put forward any suggestions for their modification.

1 Committee was not satisfied with the present Regulations, but made no suggestions for their modification.

15 Committees supported the Kent proposals without modification.

15 Committees supported the Kent proposals with some modification.

10. The above analysis of the replies received shows that there is a substantial majority among local medical committees in favour of the present Service Committee procedure, modified in the light of experience gained since the appointed day. Although only a minority of local medical committees supported the Kent proposals for a more formal procedure, representatives of the Kent Local Medical Committee were invited to meet the Subcommittee to put their point of view. The Subcommittee, in view of the lack of support among local medical committees, and having heard the Kent representatives, is satisfied that it would not be in the profession's interest to press for an entirely new and more legal set-up. It is convinced that the General Medical Services Committee's efforts would most usefully be concentrated on securing such modifications of the present machinery as will ensure an improvement in its efficiency.

It is of interest to record that the dental and pharmaceutical representatives on the Subcommittee report that among their constituents there has been no demand for a radical alteration of Service Committee procedure on the lines suggested by Kent and Canterbury.

REVIEW OF SERVICE COMMITTEES PROCEDURE

11. The Service Committees and Tribunal Regulations have been examined section by section in the light of the observations from local medical committees, and the conclusions reached by the Subcommittee are given below.

Constitution of Service Committees

12. Absence of criticism of the present constitution of the Service Committees, as laid down in the regulations, leads to the conclusion that there is general satisfaction under this heading, and no change is recommended.

Appointment of Chairman and Deputy Chairman

13. At present, Regulation 3 (3) stipulates that only the lay members of the executive council are eligible for appointment as chairman or deputy chairman of a Service Committee in the first instance. It is felt that this unnecessarily restricts the field of selection, and the Subcommittee recommends:

Recommendation A: That Regulation 3 (3) should be modified so as to leave the field open to non-members of the executive council, it being understood that, notwithstanding the wider field of selection envisaged, the person appointed should be acceptable to both parties represented on the Service Committee.

14. A number of local medical committees have suggested that the chairman should hold a legal qualification. Among the reasons given were that such a chairman would be able to advise the committee upon the legal aspects of the matter under inquiry and that the presence of a trained legal mind at the Service Committee stage of any investigation would provide some safeguard against the possibility of a serious miscarriage of justice.

15. The Subcommittee recognizes that there are advantages in having a lawyer in the chair, but feels that such an appointment should not be an obligation on the committee, which should be free to exercise discretion upon the point.

Position of an Interested Person who is a Member of the Service Committee

16. The Subcommittee considers that it is of vital importance that every member of a Service Committee should be uninfluenced in his judgment of the case under consideration by any personal association with either party. For this reason the Subcommittee recommends:

Recommendation B: That provision should be made in the Regulations for a requirement that a member of a Service Committee who is an interested party in the matter under consideration shall be required to disclose his interest either to the chairman before the meeting or at the commencement of the proceedings.

17. The Subcommittee is satisfied with the present arrangements for appointing the deputy chairman, but recommends:

Recommendation C: That consideration be given to the practicability of appointing a deputy chairman for a defined group of executive council areas adjacent to each other.

Investigation by Service Committee

18. At present Regulation 4 requires the Service Committee to investigate "any complaint made by a person against a medical practitioner in respect of an alleged failure to comply with the terms of service." This regulation is so wide as to give complete freedom to anyone who feels disposed to lodge a complaint against a doctor. Although there are certain safeguards against frivolous or vexatious complaints, it is felt that the right to lodge a complaint should be restricted (i) to a patient of the doctor concerned or someone who is acting on his or her behalf because of the inability of the patient to make the complaint, and (ii) in appropriate cases to a representative of the Ministry of National Insurance. It is therefore recommended:

Recommendation D: (1) That the following proviso be inserted after Regulation 4 (1):

Provided that no such complaint shall be investigated as aforesaid unless made by a person for whose treatment the medical practitioner is responsible in respect of treatment afforded to him by such medical practitioner or person authorized by him in writing to make such complaint or

his spouse or in the case of an infant his parent or guardian or in the case of a person unable to make such complaint owing to mental infirmity a close relative or in the case of a deceased person his personal representative(s), or in the case of the Ministry of National Insurance a responsible official of that Department.

(2) That the following be inserted in place of Regulation 4 (3):

Subject as hereinafter provided the Dental Service Committee shall investigate any complaint that a dental practitioner has failed to comply with the terms of service made by a person for whom the dental practitioner has undertaken or agreed to undertake treatment.

Any complaint made under this regulation shall be made by the person for whom the dental practitioner has undertaken or agreed to undertake treatment provided that on being satisfied that any such person is deceased or that he is unable through age, infirmity, or other reasonable cause himself to make the complaint the committee may investigate a complaint made by some other person on his behalf.

Time Limit for Making Complaints

19. As a general rule complaints against a medical practitioner or pharmacist are required to be lodged with the clerk to the executive council within six weeks of the event giving rise to the complaint. This is considered to be an unnecessarily long period. In addition, in the event of an application being made to the Minister for permission to investigate a complaint, the application need not at present be supported by a majority vote of the members of the Service Committee. Indeed, in the Minister's view, it may be made on the decision of the chairman alone. Similar considerations apply to the dental profession.

The Subcommittee recommends:

Recommendation E:

- (i) That the period of six weeks referred to in Regulation 4 (4) (a) be reduced to four weeks;
- (ii) That the period of two months referred to in 4 (4) (c) (i) be reduced to six weeks;
- (iii) That any application to the Minister for permission to investigate a complaint, notice of which is received more than six weeks after the event, should be supported by a majority vote of the members of the Service Committee;
- (iv) That the following be substituted for Regulation 4 (4) (b):

The person desiring to make a complaint under this Regulation against a dental practitioner shall within six months after the completion of treatment, or within four weeks after the event which gave rise to the complaint, whichever is the sooner, give written notice to the clerk of the council stating the substance of the matter which it is desired to have investigated.

- (v) That the following be substituted for Regulation 4 (4) (c) (ii):

(ii) in the case of a complaint against a dental practitioner the complaint is made within six months after the completion of the treatment or within six weeks after the said event, whichever is the sooner, or

- (vi) That Regulation 4 (4) (c) (iv) be modified so as to make it clear that the practitioner's representations relate solely to the question of the departure from the time limit for making the complaint.

20. The Subcommittee also agrees with the views of its dental members that there should be an overall time limit outside which the Minister should have no power to authorize the hearing of a complaint in those cases which relate to the fit and efficiency of dentures. Under the new and simplified procedure which is shortly to be introduced, the executive council will deal with such complaints, and it is felt that the Minister should have no power to authorize a hearing of a complaint of this nature if more than twelve months have elapsed since the completion of treatment. Any evidence relating to the adequacy of treatment which consists in the provision of dentures necessarily deteriorates

rapidly in value as time passes, and it can reasonably be said that after twelve months have elapsed from the original provision of a denture it is extremely difficult, and in many cases impossible, to decide whether the treatment provided was in fact satisfactory. For these reasons the Subcommittee supports its dental colleagues in seeking the early introduction of an overall time limit of twelve months.

21. The Subcommittee recommends:

Recommendation F: That the substance of the following paragraph of the Handbook on Service Committee Procedure should be incorporated in the Regulations:

7. Similarly if a practitioner's observations on alleged acts of omission or commission are sought by the executive council prior to possible reference of a case to a Service Committee under Regulation 4 (5) the source from which the information has come should be indicated and also any provisions in the terms of service alleged to have been broken. If no term of service is affected the reason why the conduct of the practitioner is being investigated should be clearly set out.

Procedure of Service Committee

22. Several local medical committees have suggested that the chairman of the Medical Service Committee should not be the sole judge as to whether the statement made by a complainant discloses prima facie ground of complaint. The Subcommittee is in general agreement with this view, and recommends:

Recommendation G: That the chairman of a Service Committee should confer with a professional adviser who is not a member or a deputy member of the Service Committee but selected by the Service Committee from a panel nominated by the local professional committee, when deciding whether a statement made by a complainant discloses prima facie ground of complaint.

Rules of Procedure for Service Committees under Regulation 5

23. Rule 1 (1) (a) requires the clerk of the executive council, when informing the complainant that his statement discloses no prima facie ground of complaint or is frivolous or vexatious, to invite the complainant to submit a further statement within seven days. The Subcommittee is of opinion that the rule goes unnecessarily far, and recommends:

Recommendation H: That the clerk should be required only to inform the complainant of the procedure which will be followed if a further statement is not received within seven days—namely, that the case will be brought before the Service Committee, which has power to dispense with the hearing.

24. Under Rule 1 (1) (e) the documents of a case must be sent to each member of the Service Committee three clear days before the meeting of the Service Committee. This period is thought to be too short, and it is recommended:

Recommendation I: That the period of three days referred to in Rule 1 (1) (e) be extended to seven days and a further requirement of the clerk be added to ensure that copies of the documents are sent to the secretary of the local professional committee.

25. Rule 1 (1) (f) states that "either party shall be entitled to be present at the hearing and to give or call such evidence as the committee may think relevant to the matters at issue." The Subcommittee feels this rule is unnecessarily all-embracing, as the issue of relevancy should be one of fact. It therefore recommends:

Recommendation J: That the words "such" and "as the committee may think" be deleted from Rule 1 (1) (f) so that it reads:

Either party shall be entitled to be present at the hearing and to give and call evidence relevant to the matters at issue, and may put questions relevant to the matter in dispute to the other party or to any witness called by him, either

directly, or, if the committee so direct, through the chairman of the committee. Subject as aforesaid, the procedure at the hearing shall be such as the committee may determine.

26. Rule 1 (1) (h) provides that, if in the course of a hearing any new issue is introduced by the complainant, the chairman has discretion to admit or exclude such issues as he thinks fit, but if it is admitted the respondent may ask for an adjournment, which shall be granted. The Subcommittee feels that this is unsatisfactory, and recommends:

Recommendation K: That Rule 1 (1) (h) be amended so as to make it obligatory to adjourn the committee if a new issue is admitted.

Report of Service Committee

27. At present, a Service Committee is required to report on every case brought before it, including cases in which the chairman has decided that there is no prima facie ground of complaint. It is felt that it should not be necessary to report in detail to the executive council on this type of case, and the Subcommittee recommends:

Recommendation L: That the rules of procedure should be amended so that a Service Committee is not required to report in detail on those cases where there is no prima facie ground of complaint.

28. In giving the Service Committee discretion in its report to draw the attention of the executive council to any previous reports made by the committee in connexion with the practitioner whose conduct has been under consideration, no distinction is made between cases in which the complaint has been proved and cases in which it is not proved. The Subcommittee therefore recommends:

Recommendation M: That an amendment be sought to Regulation 5 (4) so as to ensure that reference to previous cases should be made only when failure to comply with the terms of service was found in those cases and is also found in the present case.

Representation of Executive Council to Tribunal

29. Regulation 8 states that if an executive council decides to make representations to the Tribunal with regard to the continued inclusion in any list of the name of any practitioner, and an appeal is made to the Minister against the executive council's decision on other matters, the Minister may treat as conclusive for the purpose of the appeal any relevant findings of the Tribunal. The Subcommittee recommends:

Recommendation N: That the words "any relevant findings" in Regulation 8 be amended to read "any relevant findings of fact."

Procedure on Appeal

30. Regulation 9 (5) provides that, in the event of an oral hearing following an appeal, and where one of the parties is a medical or dental practitioner and the decision of the executive council involves the finding that he has been guilty of a breach of certain of the terms of service, the persons appointed to hear the oral representations shall include a medical or dental practitioner, as the case may be, selected from the panel of practitioners referred to in Regulation 11. There is no similar provision, however, when the practitioner has been found not guilty of a breach of those terms of service and the patient then appeals against the decision of the executive council. The Subcommittee feels that proper provision should be made for this contingency, and recommends:

Recommendation O: That, in cases where the practitioner has been found not guilty of a breach of the terms of service and a patient then appeals against the decision of the executive council, the persons appointed to hear the oral representations shall include a medical or dental practitioner, as the case may be, selected from the panel of practitioners referred to in Regulation 11.

Appeal to the Court

31. Eighteen local medical committees have recommended that there should be a right of appeal to the courts, or some other judicial body, against decisions of the Minister and/or the Tribunal.

32. The Subcommittee, bearing in mind the original controversy on this point, has given very careful consideration to the issues involved and has reached the following conclusions:

(a) That the Minister's responsibility to Parliament "to provide or secure the effective provision of services" in accordance with the National Health Service Act and its Regulations is indisputable and in accord with democratic procedure.

(b) That there are advantages in having a right of appeal to the Minister of Health and not to the Courts, in that—

(i) the Minister has power to reinstate a practitioner's name in the appropriate list at any time after the decision to remove the name from the list; no such power rests with the Court, and it would be a more difficult procedure to reinstate the practitioner.

(ii) an appeal to the courts if granted would normally be held in public. This applies at present to hearings by the Tribunal if the respondent wishes it, but not otherwise.

(iii) if the Minister is not satisfied on appeal that a practitioner's name should be deleted from the list he has the option of imposing the lesser penalty of a fine. If the appeal lies to the Court, the Court has not that alternative.

(c) If representations are made to the Court against a decision of the Tribunal, it follows that the Minister and also the patient would have the right to be heard. Under the present system only the defendant has the right of appeal to the Minister, and any change might therefore not be in the defendant's best interests, as it would mean that the present one-way channel of appeal would be capable of being used in the opposite direction. At the same time, while the Minister is limited to revoking the direction of the Tribunal in favour of the doctor, dentist, or pharmacist, the Court would not be so limited and might, in fact, impose a heavier sentence.

33. The Subcommittee feels that, on balance, it would not be to the advantage of the profession to press for a right of appeal to the Courts, but believes that some modification of the present procedure is desirable. It therefore recommends:

Recommendation P: That the present appeals machinery be amended so as to provide that the person appointed under Section 42 of S.I. 507 (1948) to hear the appeal should be appointed by the Lord Chancellor, and should be a practising barrister or solicitor of not less than ten years' standing, not being a member of the staff of the Ministry of Health.

Procedure on Withholding Money

34. The Subcommittee has sought legal advice on the powers of the Minister under Regulation 11 (1) to impose a fine following a hearing which results in a verdict favourable to a practitioner. It appears that the present Regulations do permit the imposition of a monetary penalty in such circumstances, and, whilst the Subcommittee appreciates that such a power may be equitable in the case of the Tribunal, it is certainly not in the case of Service Committee proceedings. The Tribunal is concerned only with whether a practitioner should be removed from the list following representations by an executive council. To prevent the Minister imposing a fine would mean that a practitioner who was guilty of misconduct, which although not serious enough to justify his removal from the list had nevertheless resulted in a breach of his terms of service, would suffer no penalty at all, whereas another practitioner found guilty of a lesser

offence by a Service Committee could have money withheld from his remuneration. A verdict favourable to the practitioner having been reached by the Service Committee, or on appeal by the appeals body, however, clearly vindicates the practitioner against the charges which have been brought against him, and the Minister should certainly have no power to impose a fine in such circumstances. The Subcommittee therefore recommends:

Recommendation Q: That Regulation 11 (1) be amended to provide that the Minister should not be empowered to impose a fine following either a hearing by a Service Committee, or an appeal against the findings of a Service Committee, which results in a verdict favourable to a practitioner.

35. Similarly, the Subcommittee is strongly of the opinion that the Minister should not be empowered to impose a fine following consideration of the report of either a medical or dental officer under Regulation 14, which deals with the investigation of record-keeping, nor should the power to impose a monetary penalty exist where a case of this nature is referred to the local medical committee or local dental committee for consideration and a verdict favourable to the practitioner is reached either by the local committee concerned or, on appeal, by the appeals body. The amendment to Regulation 11 (1) recommended in Recommendation Q above should make specific provision to this end.

36. Regulation 11 also provides for the constitution of advisory committees to assist the Minister in discharging his duties under the Regulation when he decides that a sum of money shall be recovered from the remuneration of the practitioner whose conduct has been the subject of an investigation. In the case of the medical advisory committee, the selection of medical practitioners to serve on it is required to be made in rotation from the panel of practitioners nominated for this purpose, but in the case of the dental advisory committee no mention is made of the selection being made in rotation. The Subcommittee recommends:

Recommendation R: That Regulation 11 (6) be amended by:

- the addition of the words "so far as may be in rotation" after the word "Minister" in line 4;
- the insertion of the words "for that purpose" after the word "nominated" in line 6.

Appeals from Dental Estimates Board

37. It is recommended:

Recommendation S:

(i) That Regulation 18 (2) be amended by the addition of the following:

"The Minister may on the application of any person desiring to appeal, extend the time for giving notice of appeal and may do so although the application is not made until after the expiration of one month from the date on which notice of the Board's decision was received."

(ii) That the following be substituted for Regulation 18 (3):

"The Minister shall appoint two dental practitioners, of whom one shall be selected from a panel of dental practitioners who are or have been engaged in the provision of general dental services nominated for that purpose by organizations which are, in the Minister's opinion, representative of the dental profession. The practitioners so appointed shall hear the representations of the appellant and the Dental Estimates Board and determine the appeal."

Investigation of Alleged Excessive Prescribing

38. It is not clear from the Regulations whether, at the investigation by the local medical committee, a practitioner

may be represented by counsel or other paid advocate, or may call witnesses. The Subcommittee recommends:

Recommendation T: That Regulations 12, 13, 14, 15, and 16 be amended so as to make it clear that the decision as to whether a practitioner may be represented by counsel or other paid advocate, or may call witnesses, rests with the local medical committee.

Determination of Question Whether a Substance was a Drug

39. At present there is no time limit within which a question as to whether a substance ordered by a practitioner was a drug or not may be raised. In practice, the absence of any time limit has led to considerable inconvenience, and busy practitioners cannot be expected to remember the clinical details of a case for which a prescription was ordered and which is the subject of investigation often eighteen months or more later. Similarly, the Subcommittee feels that there are good grounds for imposing a time limit within which a practitioner must be informed of the result of any appeal. Experience has shown that in a number of cases even after the appeal has been heard a considerable time elapses before the practitioner is informed of the outcome of his appeal. It is manifestly unfair that, even when a decision has been reached, there should be a long delay before it is communicated to the respondent. The Subcommittee therefore recommends:

Recommendation U: That any question under Regulations 16 and 17 as to whether a substance ordered by a practitioner was a drug or not may only be investigated within a period of six months subsequent to the date of issue of the prescription, and that in the event of the practitioner appealing against the decision of the local medical committee the results of such appeal shall be notified to the practitioner within one month from the date of the appeal.

The Tribunal

40. The Subcommittee has no suggestions to make for the amendment of the Regulations relating to inquiries by the Tribunal. It is felt that, having regard to the safeguards laid down in the Regulations, it would be undesirable to interfere with the right of any person or executive council who believes that a practitioner's name should be removed from the appropriate list, to make representations to that effect direct to the Tribunal.

41. One local medical committee suggests that the period of fourteen days within which an appeal against the decision of the Tribunal must be lodged should be extended. The position is safeguarded, however, by the Ministry being given discretion to extend this period.

Notices to be Given under the Regulations

42. The Subcommittee recommends:

Recommendation V: That all documents required or authorized by the Regulations to be sent to persons concerned with the hearing should be sent by registered post.

Complaints Against Patients

43. The Subcommittee endorses the policy of the General Medical Services Committee that there should be provision for the investigation of a complaint by a doctor against a patient on account of frivolous and unreasonable demands on the doctor's services.

"Code of Behaviour" for Patients

44. At the request of the Annual Conference, the Ministry of Health is being pressed to draw up a "code of behaviour" for patients which would be brought to their notice on appropriate occasions. It is recognized that such a code would not necessarily be enforceable, but it is believed that it would be helpful to medical practitioners in the National Health Service.

APPENDIX D

SALE OF GOODWILL

PART I—MEMORANDUM BY THE AMENDING ACTS COMMITTEE

1. The Committee has decided that for the purpose of discussion and consideration by the Council detailed reasons should be set out for the desirability of restoring to general practitioners the option to buy and sell the goodwill of their practices and of the premises from which they practise.

2. Notwithstanding arguments adduced by the General Medical Services and Superannuation and Compensation Committees, the Committee adheres to the view that Section 35 of the National Health Service Act, 1946, should be repealed. It believes that a substantial number of the profession share this view.

3. It believes also that a mistake of judgment was made in 1948 in entering the Service without retaining the right to buy and sell goodwill of practices. This was done in the belief that the younger practitioner could not raise sufficient capital to buy a share in the practice. This view is apparently still held by the Compensation and Superannuation Committee. They forget that the most important thing in the right to buy and sell goodwill is that it maintains the ability of the doctor to disagree with the Government Service if the regulations issued by the Government interfere with his liberty.

4. We know that many of the people concerned with lay administration of the National Health Scheme had for a long time been averse to the idea of buying and selling practices, and we know that the Socialist Medical Association, in particular, agreed with the idea of a salaried service with powers of direction by a Minister and entry by selection.

5. Entry by selection since 1948 has been tried and found wanting by young practitioners seeking to enter practice. Unfortunately the situation has now arisen whereby, having lost the cover of ownership of practice and in its place instead relying on selection committee procedure as the main method of entry into the profession, we have seen after four years a tendency towards a hardening of the regulations governing this form of entry into general practice.

6. We have created in the lay mind the idea that general practices are now publicly owned.

Definition

7. Goodwill is that attachment to a person or persons engaged in a profession, trade, or business which results from appreciation of services rendered in that said profession, trade, or business.

8. By "ownership of goodwill" is meant the right of the said person or persons engaged in a profession, trade, or business to sell, or otherwise dispose of, by deed, gift, or inheritance, the goodwill of their patients, clients, or customers.

Preamble

9. As will be seen in Sub-Appendix I, goodwill is a legal entity and a form of property, and as such is a saleable and inheritable entity and a capital asset.

10. The ownership of goodwill has, up to the present, been a right enjoyed by all engaged in forms of trade, business, or professional activities not controlled by bodies such as local and central authorities or corporate boards. Those employed by these latter bodies have the right to resign, to start an undertaking of their own, and so to acquire goodwill. Thus there exists an inherent right for all citizens to own goodwill if they so wish, and to be able to exercise it without penalty.

11. It is unjust and inequitable that, by sudden legislation (compulsory purchase), one section of the community should be deprived of the right exercised by their fellow citizens as individuals, partners, or companies.

12. Goodwill and all it entails has, by arbitrary action, been transferred from the Chancery Division of the High Court to an inferior criminal court. This is against natural law and the basic principle of criminal law, in that a person committed to a criminal court is presumed to possess *mens rea* or "guilty mind." The doctor's position is so complicated by regulation and statute that he may offend quite unwittingly.

13. What is needed for a medical practitioner is, therefore, at least the right to choose whether or not he wishes to exercise his right to the goodwill of his practice and the freehold (or "restricted leasehold") of his premises.

14. Better still would be the absolute return of this right to the whole profession.

15. It has been contended that the restoration of goodwill is not practicable. The Committee does not hold this view. Indeed, precedent is being established in the proposed legislation to restore the freehold ownership of goodwill to certain sections of Road Transport. No Act is sacrosanct, but is capable, as experience has shown, of amendment or annulment.

16. The present situation is really intolerable, since, having removed the power from the doctors to realize the capital value of the hard work they have put in, the Government itself is building up valuable capital assets, both in new practices and by the improvement of old ones, using the doctors' hard work without repayment.

17. It will not take long for the younger doctors to realize this, and they will then demand suitable salaries from the start. After all, why should they start from nothing (or even from £600 per year I.P.A.) building up something which they will never be able to realize but which the Government will be able to use as an attraction for other new entrants to the Government Service in the future?

18. At the moment the new entrant is getting the worst of both worlds. He has to build up a practice which he can never own and is getting no pay whilst doing this.

19. The question of compensation is no cure, as the new entrant is not entitled to it, and, indeed, unless compensation were given to each G.P. at his retirement, irrespective of when he entered the Service, it can act as no incentive to the new doctor entering practice for the first time.

Practical Reasons

20. Fundamentally there exist three main reasons for the restoration of goodwill to the medical profession:

(1) The Moral Right

This is incontrovertible. Article 17 of the "Universal Declaration of Human Rights," passed and proclaimed by the General Assembly of the United Nations (to which Great Britain subscribed) on December 10, 1948, states:

(i) Everyone has the right to own property alone as well as in association with others.

(ii) No one shall be arbitrarily deprived of his property.

(2) The Legal Right

This is fully outlined in the preamble, and substantiated in the Appendix.

The right of purchase and sale of goodwill was abolished by decision of the Government itself, and not at the request of the profession. The great majority of general practitioners who entered the Service in 1948 (under the financial duress of the Minister) were at that time established in practice and had taken up this mode of medical life as *free men*, believing their goodwill to be unassailable.

(3) The Practical Right

Here it may be as well to consider some of the arguments for and against the restoration of the right of general practitioners to own the goodwill of their practices and premises.

(i) AGAINST:

(a) The initial outlay for incoming partners is said to have constituted a millstone round their necks for many years; or that practitioners who commenced practice in an area without purchasing a share in an existing practice often received an inadequate income for many years.

The first of these is dealt with below; the second is well covered under the National Health Service Act.

(b) Disapproval of the policy of a practitioner selling a "block of patients" to an incoming partner, leading to a suggestion that the patients were "sold" and thereby lost the freedom of choice of doctors.

"Sale of patients" has never existed, but there has been allocation of patients between partners on an agreed share basis. A similar situation exists under the National Health Service, and patients retain the right they have always possessed to change their doctors if they so wish. The unsatisfactory nature of the remuneration received by the practitioner under the Service may, however, deter him from taking in a partner as he would otherwise have done, with the risk that through overwork his service to his patients may deteriorate.

(ii) FOR:

(a) Prior to the Act the increase in the value of goodwill which accompanied increase in practice provided an incentive to personal effort which does not now exist to the same extent. It is true that the amount of superannuation which a practitioner receives under the provisions of the Act is related to the income he makes in practice, but the stimulus to effort is lacking. There is also less incentive to retire.

(b) The lack of compensation offered to principals when taking on new partners leads to a diminished number of vacancies for "assistants with a view" and encourages unemployment. At present those taking on new partners have to face an immediate loss of income with no capital reimbursement; they have to bear in mind also the falling value of money and its effect on their eventual compensation.

(c) Dentists and practitioners engaged in certain types of specialist practice such as ophthalmology and radiology retain the right to dispose of their goodwill. It is inequitable that this right should be enjoyed by certain classes of practitioner engaged in the National Health Service and denied to others.

(d) A practitioner under existing circumstances may be appointed to a practice after some considerable delay, only to find that some or all of his predecessor's practice has been taken from him by a new entrant to practice in the area, who meantime has purchased the "practice house" from the widow. In the matter of practice premises, the present regulations make what amounts to a criminal waste of the country's money and resources, as in many cases they are not handed on because their true value might be considered as containing an element of payment for goodwill which would not be allowed. Now we find a succession of new doctors starting new premises from scratch, and in course of time there will be complete duplication of medical premises over the country.

(e) It is admitted that in present-day conditions the borrowing of capital for the purpose of acquiring a practice or partnership entails a heavy financial burden. To offset this, however, the practitioner would acquire a capital asset, and the financial burden might be eased by a scheme of long-term Government loans at a low rate of interest and capital return, as indicated in para. 23 (b) below. For existing doctors who are due to receive compensation on retirement the position is not much better. When they retire after 30 years the value of their compensation in terms of real money, which has already dropped by approximately one-third, will mean absolutely nothing to them.

(f) The return of the right to buy and sell goodwill, or at least the option to do so, would at once promote the regrowth of flourishing partnerships and group practices. This is the surest way to safeguard the interests of the patients, by efficient practice and full cover, and also the health and happiness, at work, of the members of the partnership.

Method

21. The profession may be divided into two groups:

- (1) *Those doctors who have retired*
These are automatically dealt with, since they have received or are about to receive their compensation.
- (2) *Those who have not retired*
Of these:

(i) Those who do not wish to resume ownership present no problem.

(ii) Those who do wish to resume ownership must be considered in three groups:

(a) *Those who were in practice before the appointed day.*
These would give formal notice of their intention to resume ownership, would refund any capital they have received; and resign any claim to capital compensation not yet received.

(b) *Those who have started new practices since the appointed day, either by "squatting" or by selection.*

These are not entitled to compensation and have none to relinquish. They would give formal notice to assume ownership.

(c) *Those who have entered existing practices since the appointed day through the selection machinery.*

These have received a valuable asset. They should be entitled to assume ownership upon refunding to the Treasury any capital compensation which has been paid out or credited to the previous owner or owners of that asset.

Summary

22. Summing up the above, it may be said, therefore, that if only a few doctors avail themselves of the right to own the goodwill of their practices substantial progress will have been made in the following directions:

(a) Towards solving the problem of the unestablished practitioner.

(b) Returning partnerships to a normal and logical basis.

(c) Separating the ownership of all doctors' premises from the goodwill they may or may not have reclaimed from the Government. This will abolish the injustices of the penal clauses relating to the sale of goodwill affecting doctors' premises, and incidentally would free these premises to the ultimate benefit of new entrants.

23. It may be said that the restoration of goodwill would divide practitioners into those who could and those who could not afford to buy, and thus result in ill-feeling (even a black market atmosphere) or violent competition for the "free" practices. In reply it is again emphasized:

(a) That the goodwill of a practice bought at once gives the owner a saleable capital asset, which, by skill and hard work, he can enhance.

(b) That for those not able to raise the capital the Government could well lend the practitioner the required sum from the fund at present used for payment of compensation. Both the Government and the practitioner would gain.

24. If only a proportion of doctors elected to own their goodwill then the number of years' purchase must be left to the natural operation of the market, but if all or the majority should do so it would be equitable legally to fix the years' purchase at an agreed figure, say 1.5 or 1.6.

25. The views of the Compensation and Superannuation Committee cannot be accepted, particularly when they refer to the fact that the doctor makes up in pension what he loses by loss of the right to buy and sell goodwill. Under the superannuation regulations agreed by this committee the doctor who employs an assistant cuts his pension by approximately one-half in some cases, as he is not allowed to pay into the superannuation fund on his total earnings but only on his earnings after he has deducted the earnings of his assistant.

Medical Practices Committee

26. The return to the principle of the purchase and sale of goodwill, even on an optional basis, would considerably affect the work of the Medical Practices Committee, and would necessitate review of its existing powers in reference to the filling of vacancies in and entry to practice.

27. Finally, by the present recent judgment of the Master of the Rolls (in *Whitehill v. Bradford*) (1) Times Law Reports, 1952, 73) the goodwill of all practices still belongs to the doctor, or his heirs, although the right to buy and sell is denied by the Act of 1946. Since the goodwill belongs to the doctor (or his heirs), he has a legal right to choose his successor. It would appear that the judgment referred to above completely nullifies the present method of filling vacancies.

28. There is no regulation which permits of a vacancy being declared either by the executive council or by the Medical Practices Committee.

29. It would appear, therefore, that the Amending Acts Committee is expressing the will of the profession and reasserting the profession's legal rights in asking for a repeal of Section 35 of the Act and all its co-related sections in other parts of the Act.

SUB-APPENDIX I

1. The Bankruptcy Act, 1914, the Landlord Act, 1937, the Trademark Act, 1938, and the Copyright Act, 1911, all specifically recognize the right of citizens, in partnership or otherwise, to own, buy, sell, or inherit goodwill, and the old National Insurance Act of 1911-12 does so by the fact that ownership of goodwill was confirmed.

2. In addition, there is a wealth of evidence in Common Law recognizing an individual's rights to the ownership of goodwill.

3. In Halsbury's *Laws of England*, second edition, vol. 32, pages 445-8, goodwill is defined, and is separated into two parts: that associated with the name and recommendation of the person who owns the business, and that associated with the premises in which the business was carried on. Both these must be taken into account either separately or together. In this section doctors, surgeons, separately or together. In this section doctors, surgeons, and dentists are amongst others specified. Further, Halsbury states that goodwill is property within the meaning of the Stamp Act, 1891.

Transfer of goodwill can be affected without writing, except in so far as writing may be required by the Statute of Frauds, 1677, and the Law of Property, 1925.

Such transfer confers on the transferee the exclusive right to carry on the business transferred, the exclusive right to REPRESENT himself as carrying on such business, and as against the transferor, the exclusive right to use the name under which this business has been carried on, but such a name must not be used to expose the transferor to risk of personal liability.

4. Roland Burroughs, K.C., in *Words and Phrases Judicially Defined*, vol. 2, pages 425-7, quotes Case Law to the effect that if a person continues to practise from, or to the effect that if a person continues to practise from, or to own and occupy, the premises from which he has practised heretofore, that goodwill is attached to him as well as by and through the premises.

5. Further, the general practitioner under his terms of service is now in "contract for services" not "contract of service," and, in addition, pays his insurance contribution at the higher rate as a self-employed person, and under Regulation S.I. 1376 is not considered to be a "workman"—that is, he "gives service to" and is not in "the service of." Therefore he is, as a citizen, entitled to the same rights of ownership of goodwill as, say, an author who, under contract for services, undertakes to write a book for a publisher as an independent contractor, continuing to own his goodwill for the said book—that is, his copyright.

(It might be argued that, because the Minister of Health to a large extent controls practitioners' salaries and conditions of service, they are therefore his servants. But—using the above comparison again—because a publisher may decide the payment an author is to receive for his book, and other conditions of publication, it cannot be said that these powers make the author the servant of the publisher.)

PART II—MEMORANDUM ON THE PRACTICAL ASPECTS OF THE SALE AND PURCHASE OF GOODWILL PREPARED BY THE COMPENSATION AND SUPERANNUATION COMMITTEE

At the request of the Amending Acts Committee, the Compensation and Superannuation Committee considered a proposal that the Association should press for the amendment of the N.H.S. Act, 1946, to restore to general practitioners the right to buy and sell goodwill.

The Committee informed the Amending Acts Committee, first, that it had no evidence of strong desire among general practitioners to return to the custom of the sale of goodwill, or of a united opinion in the profession sufficient to justify an attempt to annul Section 35 of the N.H.S. Act; and, secondly, that it was of the opinion that a proposal to give an option was impracticable.

The Amending Acts Committee has challenged the Committee to give the reasons for its opinion, and has submitted for consideration a case for the repeal of Section 35 of the Act or for an option to renounce compensation rights.

General Considerations

The Committee is asked to consider whether a resumption of the sale and purchase of goodwill is practicable. It is not asked whether such a step would be desirable. After three years of the operation of the Act the Committee lacks evidence of a strong desire or of united opinion among general practitioners, and the following notes are directed solely to the question of the practicability of amendment or repeal of Section 35 of the Act.

Economic Considerations

(1) The Amending Acts Committee suggests that if a majority of practitioners were able to exercise the option the value of goodwill could be stabilized at 1.5 or 1.6 years' purchase.

Apart from the fact that this suggestion might be regarded as incompatible with freedom to sell in the open market, it does not take into account that the value of goodwill has always varied with the security offered or, in other words, the introduction to the practice. For this reason the Compensation Committee would regard artificial control, or pegging of the value of goodwill, as impracticable and undesirable. In any case, a rate of 1.5 or 1.6 years' purchase does not give to an established practitioner a higher rate than he will receive in compensation, and lacks the security which compensation affords. It does, of course, enable him to increase the capital value of the goodwill by increasing the practice.

Even if the market were free, there is no certainty that under present circumstances (in a publicly organized service available to the whole population), and in competition with a system of appointments to practices, a doctor could obtain a price equal to the amount of compensation he is renouncing.

Experience shows that private practices sold since the appointed day realize 1.5 years' purchase only in ideal conditions, and the average is very much less. Too much should not be made of this argument, because circumstances are different, but it should not be assumed that to return to a free market would mean a return to the values existing in pre-Act or pre-war days.

A doctor who renounces his compensation in the hope that he could enhance "by skill and hard labour" a saleable asset would be taking a serious risk. Let us assume that a doctor in practice on the appointed day forgoes his compensation at 1.58 years' purchase. Two years later, unexpectedly, he dies or has to retire permanently on health grounds. He, or his executors, would be unlikely to obtain even one year's purchase, and those dependent on him would lose heavily.

(2) In answering the suggestion that to have two systems side by side would divide the profession, the Amending Acts Committee stresses the fact that purchase gives the owner a saleable asset which he can enhance. This is of course true, but no mention is made of the financial barrier, which is immeasurably greater now than formerly.

The amount that a practitioner who has no capital resources has to borrow in order to establish himself in practice is now so great that repayment of capital and interest out of income is often nearly impossible, even when there is no payment for the goodwill which the income represents.

What was possible in pre-war days is now no longer possible. For example:

A practitioner purchases

(a) a share calculated to bring in £1,200 net income. Even at 1.5 years' purchase, which is much lower than the rate formerly paid for a share in a partnership, this represents £2,700 (1½ times a gross income of approximately £1,800).

(b) a house at, say, £3,500 (a very moderate estimate).

(c) a car and equipment for, say, £600 (probably an underestimate).

He therefore faces a total loan of nearly £7,000 for which he may have to find some collateral security. On a

modest estimate, and if repayable over a maximum period of 20 years at 4%, he will have to face annual repayments of capital and interest amounting to approximately £685. If these are repayable over a shorter period the annual instalments would be proportionately greater. There would be little or no margin out of a net taxable income of £1,200 a year.

If he were able to borrow the whole amount on overdraft without the necessity for regular repayments of capital, the interest would amount to £300/£350 per annum. These figures do not take into account (a) allowances which can be claimed against income tax, (b) the cost of premiums for insurance policies required as collateral security (at least £50 per annum), and (c) reduction of income through superannuation deductions (at least £70 per annum).

It would be very difficult for this doctor to contemplate the purchase of a further share in order to improve his prospects, within a reasonable time. If he were purchasing a single-handed practice giving an annual gross income of between £2,000 and £3,000 per annum, then his initial capital outlay and burden of debt would be very much greater.

The value of goodwill in a free market might well be adversely affected by economic factors of this kind.

(3) The Amending Acts Committee suggests that that proportion of the £66m. renounced or repaid by those wishing to sell their practices should be used to finance purchases if banks or finance houses refuse to accept the practice as security. The Compensation Committee does not regard this as a likely possibility even if the principle of sale and purchase were conceded.

Administrative Difficulties

If an option were granted it could only be a matter of time before sale and purchase became general. It can be assumed that all practitioners who have started new practices since the appointed day would give formal notice to assume ownership. They have nothing to lose and everything to gain. If to these be added those who would resume ownership with voluntary surrender of compensation rights, the result would be a gradual return to the *status quo* which in an early draft of its interim report the Amending Acts Committee did not regard "as right or practicable."

The Compensation and Superannuation Committee agrees with the view that total repeal is impracticable, since certain practitioners have already received compensation and many have received large sums on account which could not now be repaid. It submits that the existence of a dual system would present even greater administrative difficulties than total repeal. For instance, for an indefinite period practices, as distinct from practitioners, would have to be considered and records of both maintained.

The Amending Acts Committee suggests that where a doctor has been appointed to a vacancy he shall have the right to decide whether he shall regain his right to sell by refunding to the Treasury the compensation paid to his predecessor. If he does not exercise this right but after some years leaves the practice, his successor will, presumably, still have this option, but might have to buy back the right to sell for a sum which no longer represents the value of the goodwill.

Compensation has already been paid in respect of a large number of practices rendered vacant by death or retirement. In the case of practices which have been dispersed, neighbouring practitioners who, in consequence, have increased their lists would presumably be able to regain the right to sell goodwill for which compensation had already been paid, but it would be quite impossible to assess the proportion to be refunded. Alternatively, they would be denied the exercise of the option.

Again, where an appointment is made to a vacancy there is often a fall in value, and a practitioner who wished to exercise the option would have to buy back his right to sell at a figure which might be considerably higher than the value of the goodwill he may eventually acquire.

Great difficulties would arise in partnership practice. Some partners holding options in force on the appointed day would no doubt complete purchase, though amendment

of the N.H.S. (Amendment) Act, 1949, would be necessary. In cases where partnerships have been formed since the appointed day without payment, there might well be disagreement which would be detrimental to the partnership and would cause severe hardship. In order to continue in practice a junior partner might be forced to purchase a share which he could not afford. In group practices, or in health centres, the difficulties would be enormously increased and there would be a risk of abuses which would be difficult, if not impossible, to control. At present partners have a right to determine with whom they shall work and how the practice shall be conducted, but the need for adequate safeguards against abuses in a dual system might well lead to controls and restrictions which would affect this right.

Entry into Practice

These notes are concerned with the practicability of a gradual return to sale and purchase through the exercise of an option, but the Compensation and Superannuation Committee has considered the reasons given in the Amending Acts Committee's Memorandum for the statement that "a return to sale and purchase of goodwill will go a long way to solving the problem of the unestablished practitioner." In the opinion of the Committee the lack of incentive to maintain goodwill, or, in other words, to increase income, and the lack of incentive to retire, which may result from the inability to sell goodwill, are more than offset by the opportunity of increasing the pension, which is related to total net income. Further, though the lack of compensation offered to principals taking on new partners may lead to a diminished number of vacancies, this difficulty could be removed at once if the Ministry concedes the principle for which the Compensation and Superannuation Committee has been pressing for nine months and for which no amendment of the Act is necessary. Any increase in vacancies following an option to sell goodwill could only be spread out over a number of years.

The Committee submits that, following the exercise of an option, the most desirable vacancies will in course of time become available only to those who can afford to buy, and an increasing number of areas will be effectively closed to many wishing to enter general practice. This must surely increase, rather than decrease, the difficulties facing assistants and unestablished practitioners.

Political Considerations

The legal and moral rights to buy and sell goodwill are ably set out in the Amending Acts Committee's Memorandum, but the fact remains that the Act of 1946 abolished the right to sell goodwill.

It is relevant to recall that, in the negotiations in 1947, the question of the abolition of sale and purchase of goodwill was closely linked with the proposals for securing a better distribution of general practitioners. The Negotiating Committee pressed for, but failed to secure, amendments of the Act in both these fields.

A return to sale and purchase, even on an optional basis, would have repercussions on Section 34, and sooner or later, for the reasons suggested above, amendment or repeal of Section 34 would be necessary, since the Medical Practices Committee and executive councils would lose control over those practices where options had been exercised. What, for instance, would be the position in an over-doctored area which had been declared closed by the Medical Practices Committee? If practitioners retained the right to sell goodwill, then the power of the executive council to control the distribution of doctors in the area would be reduced and eventually abolished. If, on the other hand, when a doctor retired in a closed area the executive council retained the right to recommend, and the Medical Practices Committee to rule, that the practice should be dispersed or that there should be no vacancy, the practitioner who had opted for or repurchased the right to sell would be in an impossible position. Further, in all areas there would be a risk, since no doctor could be certain from year to year that the area would not be closed.

There is little or no evidence that a change of Government has caused a change in the attitude of Parliament on this question. One of the factors which undoubtedly had some weight with the profession in 1948 was the discovery that for the party then in opposition was not prepared to press for the continuance of sale and purchase. Even if a majority in Parliament were convinced of the advantages of a free market in goodwill, they would be likely to resist on political grounds any proposal which would seriously affect the administrative structure of Part IV of the Act.

Within the profession such a step might have a serious effect on the unity of general practitioners, since there must be a large number who would not be in a position to exercise the option, and practitioners would be divided into those who can and those who cannot afford to buy. The Committee considers that strong, forceful, and concerted action by a very substantial majority of general practitioners in the Service would be required before any Government would be likely to concede the principle. It is pertinent to ask whether, assuming that 25% of general practitioners would wish to exercise an option, as suggested by the Amending Acts Committee, the rest of the profession would give sufficient support.

Lastly, as a matter of practical politics, there is the question whether the time is opportune to raise a matter with such serious implications in the field of general practice at a time when a Working Party is seeking a form of distribution of general practitioners' remuneration which may well have a marked effect on incomes and which may well result, through incentives to take partners, in an improved prospect to those wishing to enter practice. In the view of the Committee, it would be unwise to come to a decision on this subject before the findings of the Working Party are received.

To sum up, the Compensation and Superannuation Committee regards an option to buy and sell goodwill as impracticable because:

- (1) Under present economic circumstances it is virtually impossible for a practitioner without substantial private means to buy a sufficient amount of goodwill at a rate which would recompense a principal for the loss of the security afforded by compensation.
- (2) The administrative difficulties associated with a dual system would be very great, if not insuperable.
- (3) There is no evidence of even a hard core of opinion in Parliament which would press for the virtual recasting of the N.H.S. Act, 1946.
- (4) There is no evidence of a united front among general practitioners on this question. The hardship to many of a choice forced upon them by a majority opinion might cause dangerous friction in that section of the profession where unity is of paramount importance.
- (5) It would be unwise to reach a decision on this subject before the findings of the Working Party are received.

EXTRAORDINARY GENERAL MEETING

The following additional amendment to the resolution to be presented to the Extraordinary General Meeting on May 5 has been received:

"That after the words, 'approach the Minister of Health,' and before the words, 'with proposals for the better protection,' the words, 'through appropriate channels,' should be inserted."

The amendment is proposed by Dr. H. C. Faulkner and seconded by Dr. G. M. Gould.

Each member of the Association who proposes to attend the Extraordinary General Meeting on May 5 is asked to bring, and to hand to one of the attendants on entering the hall, a card or slip of paper on which are legibly written his or her name and the name of the Division of which he or she is a member. The co-operation of members in this way will greatly facilitate the recording of the attendance at the meeting.

PRE-REGISTRATION-YEAR HOSPITAL APPOINTMENTS

ALLOWANCES TO EX-WAR-SERVICE MEN

A brief reference is made in the Annual Report of Council (*Supplement*, April 4, p. 120) to the action taken by the Association to relieve financial difficulties facing married ex-war-service men holding hospital appointments during the pre-registration year. The following is a more detailed factual statement for the information of members of the Association particularly concerned.

Unforeseen Hardship

Long before the announcement of the day appointed for the Medical Act (1950) to come into operation, after which all those qualifying would have to spend 12 months as house officers, it was apparent that some students, particularly ex-Service men who had been receiving special grants, might suffer financial hardship. Their remuneration as house officers was likely to be substantially less than the income they had derived from their grants during the student period and which ceased abruptly on qualification. In addition they would be prevented from seeking more remunerative work—for example, as trainee practitioners—on the expectation of which they had based their family budgets.

Approach to Ministries

The British Medical Students Association had been concerned for some time with the position. When postponement of the appointed day of the Act proved to be impossible, it approached the two departments concerned—the Ministries of Health and Education—on behalf of the group of students who would qualify after January 1, 1953. During the discussion in Parliament on the Order of Council approving the Regulations, the Minister of Health announced measures which it was hoped would meet the situation. On examination, however, it appeared that, notwithstanding some help, the house officer would still receive substantially less than the income he had received from special grants. The main cause of the difference was that the student's marriage allowance of £121 would no longer be forthcoming. In addition, the house officer would be liable for superannuation and national insurance contributions, from which as a student he was exempt. These amount to £86 in the year, making a difference of approximately £150 between his total receipts as a student and his net income as a house officer.

B.M.A. Council's Action

The provisionally registered practitioner is eligible for membership of the B.M.A., and the Council of the Association, after consultation with representatives of the British Medical Students Association, requested the departments concerned to review the position urgently. The Council asked first that the income of the house officer should be brought into line with his former income as a student by restoration of the marriage allowance, or by some other form of subsidy; secondly, that where there was unavoidable delay in obtaining an approved appointment (or between two appointments), the practitioner should receive an adequate weekly payment; and thirdly, that financial assistance should be available to all ex-war-service house officers on evidence of need whether or not they were formerly in receipt of grants from the State or from local education authorities.

Modifications Proposed

The Ministry announced that for those who had received Further Education and Training Scheme grants, in addition to the grants already announced, there would be a special hardship allowance of £25 per annum included automatically in the assessment made of each individual applicant, as well as the £25 "two homes" allowance payable where the house officer has to maintain his family in a separate home set up by him.

The Ministry of Education has discretion in individual cases to increase this hardship grant. Practitioners formerly in receipt of grants under the Ministry's Further Education and Training Scheme (F.E.T.S.) who feel that their circumstances justify an exceptional addition should apply in writing to the Ministry of Education (Awards Branch), Curzon Street, W.1. The hardship allowance is also available from January 1, 1953, to those who qualified before that date and are serving in hospital posts.

Allowance Pending Appointment

The Ministry will also pay for a limited period a vacation allowance of 30s. a week, together with dependants' allowance at the usual rates, to a qualified practitioner who is awaiting appointment to an approved post. This allowance will be available for two months, but it may be extended if the Ministry of Education is satisfied that further delay in obtaining the post is unavoidable. The Ministry stated that payment would normally be made on taking up the appointment, but has agreed, following further inquiry by the Council, that the allowances shall be payable forthwith on evidence of appointment to an approved post and on proof of need. The Ministry emphasized that, as hitherto, these grants would be available only to married ex-war-service men with dependent children who held awards under the Further Education and Training Scheme. It has now agreed to consider sympathetically individual cases where there are no dependent children, but where special circumstances make it impossible for a wife to undertake remunerative employment.

Local Education Authority Grants

The Minister of Education will not accept responsibility for those who were receiving grants paid by local education authorities. It has no power to make grants to those outside the F.E.T.S., but any individual may apply for a grant to his local education authority. This applies both to those who were formerly in receipt of grants from local authorities and to those who received grants from other sources, or no special subsidy.

Inquiries Welcomed

The Council feels that the proposals, while not completely filling the gap, go some way towards it—taking into account the saving in the family budget due to the fact that the house officer holds a resident post. After consultation with the British Medical Students Association, the Council has accepted the Ministry's proposals, reserving the right to re-examine the position in the light of experience. It will continue to watch the interests of those who may find it necessary to approach local authorities, and individual practitioners or students seeking provisional registration are invited, in case of difficulty, to seek advice from either the B.M.A. or the B.M.S.A.

OCCUPATIONAL HEALTH COMMITTEE

FUTURE OF OCCUPATIONAL HEALTH SERVICES

An all-day meeting of the Occupational Health Committee was held at B.M.A. House on April 15, with Dr. J. A. L. VAUGHAN JONES in the chair. The whole of the morning was occupied with a detailed study of the draft memorandum on the future of occupational health services, prepared by the Planning Subcommittee for submission to the Ministry of Labour. The memorandum received a careful examination, and amendments were made at various points. It was passed for comment to the Public Health Committee, which met later in the week.

Dr. L. G. NORMAN, for the Remuneration Subcommittee, reported that the National Coal Board's proposed injury benefits scheme for its whole-time medical officers had been discussed and found acceptable in principle. Before

a final decision, however, it had been thought desirable to refer it to the whole-time medical officers of the Board for their comments.

Occupational Dermatitis

Dr. H. ALEXANDER, for the Occupational Dermatitis Subcommittee, reported further stages in the correspondence which has taken place on dermatitis in relation to the National Insurance (Industrial Injuries) Act. The Ministry of National Insurance, in reply to representations that examining medical practitioners should in all referred cases be provided with a copy of the dermatologist's report, had suggested that copies should be provided only in individual cases where the practitioner had made a specific request. This was not regarded as satisfactory, as the examining medical practitioner was not aware which cases had been referred. It had been stated that there were 20,000 claimants a year in respect of occupational dermatitis, but the proportion of these claims which were referred to dermatologists was in doubt. One figure mentioned was 14,000, which, if valid, was a very high proportion (two out of three).

It was agreed that the possibility of circularizing a group of examining medical practitioners to secure facts from their records should be considered; also that further representations be made to the Ministry to secure that general practitioners, in addition to examining medical practitioners, be supplied with a copy of the dermatologist's report.

Dr. Alexander said that there was now a tendency to send cases to dermatologists in the out-patient departments of hospitals instead of to their private consulting-rooms. This meant that the normal work of hospital departments was interfered with, and, moreover, that the dermatologist did not receive a fee. The question turned on whether this service, which was concerned with prognosis, came under the National Health Service Act. Discussions are proceeding between the Joint Committee and the Ministry.

Liaison

A point which the Committee desired to be emphasized was that dermatologists should be encouraged to have Appointed Factory Doctors as their clinical assistants or, where no opportunity existed for such appointment, the Appointed Factory Doctor should be invited to attend the dermatological department of a suitable hospital as post-graduate student. This would mean better liaison between industrial medicine and hospital dermatology.

It was also agreed that representatives from the Ministry of National Insurance and the Factory Department of the Ministry of Labour should be invited to attend a joint conference on the subject of dermatitis as a notifiable disease, in particular on the question of making available to the Ministry of Labour for its preventive work any information in possession of the Ministry of National Insurance. It was felt that the latter Ministry should notify the Factory Department of all cases accepted as occupational dermatitis, and that both the examining medical practitioner and the patient's general practitioner should be informed of the notification.

Yet another matter in connexion with dermatitis arose out of the disapproval expressed by the Central Ethical Committee of the disclosure of the names of employees qualifying for industrial injuries benefit. It was the view of the Occupational Health Committee that the information sought was not a disclosure of medical matters by a medical practitioner and did not contravene medical ethics. The Central Ethical Committee was asked to give the matter further consideration.

Medical Standards of Public Transport Operators

On behalf of the subcommittee appointed at the previous meeting to examine the medical standards required for drivers of public transport, it was stated that the sub-

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committee had got down to its work under the chairmanship of Dr. L. G. NORMAN. It asked for a widening of its reference in two respects—the first that it should not be limited to passenger-carrying transport, and the second that not only drivers but other persons concerned with the operation of transport should be included. This widening of reference was agreed to. The scope of the subcommittee covers all road, rail, and air transport. A member suggested that navigation by water should be included.

Ethical Rules

Further discussion took place on the action taken by the Central Ethical Committee in connexion with the *Notes for the Guidance of Industrial Medical Officers*, submitted by the Association of Industrial Medical Officers as a suggested replacement of the *Duties and Ethical Rules of Industrial Medical Officers*. The chief point turned on the requirement or otherwise that, except in an emergency, the industrial medical officer should consult the employee's family doctor before undertaking treatment for trivial and minor complaints. One industrial medical officer on the Committee stated that he had sent as many as 280 letters to general practitioners in cases of this kind. It was true that the letters were so worded that they did not call for a reply unless the practitioner objected, but in not one of these cases had he received any acknowledgment.

At a previous meeting the Association of Industrial Medical Officers had been asked to consider its document again in the light of comments from the Central Ethical Committee. The question was now again argued, particularly the aspect of continued treatment at the factory without consultation with the family doctor.

It was agreed eventually to call a joint conference of representatives of the General Medical Services, Central Ethical, and Occupational Health Committees to discuss this whole matter, the Occupational Health Committee's representation to consist of three whole-time industrial medical officers, two part-time, and one public health medical officer.

PUBLIC HEALTH SERVICES

MEETING OF ASSOCIATION COMMITTEE

A meeting of the Public Health Committee of the Association was held on April 17, with Dr. K. COWAN in the chair. A report was made by the Secretary of the Committee (Dr. Kelynnack) on the implementation of the Industrial Court awards Nos. 2285 and 2321, and the result of appeals against certain authorities. Three regional appeals have been won recently by the Association acting on behalf of the medical officers. The position was judged by the Committee to be satisfactory.

On the question of the Whitley arbitration machinery, it was reported that the Management Side of the General Whitley Council at a recent meeting had agreed to look at the matter again, and it is to be the subject of further discussion by the General Council on May 11.

Conditions of Service for Part-time Medical Officers

The Committee again devoted attention to the question of certain conditions of service for medical officers who are remunerated on a proportional basis related to the National Award scale for whole-time medical officers. It was decided to refer the matter to the Staff Side of Committee "C" for advice, and, if thought fit, appropriate action.

Domiciliary Nursing of Tuberculous Patients

The Committee turned its attention to a draft circular on the domiciliary nursing of cases of tuberculosis to be issued by the Ministry of Health. At its meeting on the previous day the General Medical Services Committee had commented on certain of the advice given in the memorandum. Dr. COWAN thought that the memorandum was

a straightforward document, embodying useful guidance, although some of the items were of a controversial nature.

It was agreed that the chairman of the two Committees be asked to agree a joint statement with comments, to be forwarded to the Ministry.

Future of Occupational Health Services

A draft memorandum on the future of occupational health services, prepared by the Planning Subcommittee of the Occupational Health Committee, came forward for consideration. Certain paragraphs of the memorandum, however, had been considerably revised by the Occupational Health Committee at its meeting two days previously. Disagreement was expressed mainly on two points in the scheme recommended—namely, (1) that the new occupational health scheme should be developed independently of the National Health Service although co-ordinated with it, and (2) the uncertain role of the medical officer of health, which appeared to mean the possible exclusion of the Public Health Service in the recommended scheme.

The Chairman of the Committee was instructed to state these points of view to the Council of the Association.

Resettlement of Tuberculous Persons

A report on the occupational resettlement of tuberculous persons, the result of a conference between representatives of the Public Health, Occupational Health, and Tuberculosis and Diseases of the Chest Group Committees, was received, but detailed consideration was deferred until after a meeting with the Ministry, fixed for April 21.

Ministry of Health circulars on the need for continuity in the care of mothers and babies, on the Public Health (Infectious Diseases) Regulations, and on local publicity campaigns for diphtheria prophylaxis were laid before the Committee. A report from the Central Consultants and Specialists Committee on the organization of the obstetric service, and a report of the Joint B.M.A. and Royal College of Nursing Committee dealing particularly with the special register for fever nurses, were received.

The Public Health Service Defence Trust

A formal meeting of the trustees of the Public Health Service Defence Trust was held at the conclusion of the meeting of the Public Health Committee.

MISUSE OF HORMONE PREPARATIONS BY THE PUBLIC

It has recently been suggested that there may be serious misuse of hormone preparations by the public, especially sex hormones. Self-treatment with ovarian type hormones is said to be a cause of dangerous delay in seeking medical advice in potential cases of cancer of the uterus. It has also been suggested that the efforts of nurses and midwives to encourage breast-feeding are often in vain, as young mothers can so readily obtain these substances in order to suppress lactation.

The Science Committee of the Association wishes to discover whether abuse of hormones by the public does indeed exist, and any member of the Association who can provide information on this problem is invited to communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

I believe that serious doubts of the nature I have stated exist in the minds of many of us. Anything which will tend to increase the loss of contact and co-operation between the various branches of the profession is to be gravely deplored, and we should all strive to encourage and bring back the consultative method of dealing with our patients. Only in

this way can we justify our claim that we are treating patients and not cases and have that respect for each other which should exist in a wise and intelligent profession.—I am, etc.,

Braintree, Essex.

B. A. J. MAYO.

POINTS FROM LETTERS

Splitting the Profession

Dr. R. E. CLARKE (St. Osyth, Essex) writes: The medical profession is once more in the throes of controversy. Having been corralled into a State service we are now split asunder; the consultants are divided into whole-time and part-time, and the G.P.s into small-list, large-list, and new entrants. Divide and defeat is still good pragmatics. G.P.s are suffering from the inequitable decisions of a Ministry-dominated Working Party handing out absurd directions on how to distribute a sum of money in wages to men doing the same kind of work. The results of the Working Party's decisions are what they obviously would be—unfair to both small-list and big-list men. The small-list doctor is worse off and the new entrant G.P. is thoroughly hamstrung. If he is without private means he will not get a living from his profession for years and years, if ever.

Entry Into Practice

Dr. C. J. DE VERE SHORTT (London, S.W.18) writes: In the *Supplement* (April 4, p. 130) you publish the report of the B.M.A. Medical Practices Advisory Bureau. In this report it is stated that the cause of "the reluctance of general practitioners to take partners was the absence of a capital sum to offset the initial loss of income when a share is transferred. This factor will continue to affect adversely entry into general practice. . . ." The future of the young doctor should be the concern of the profession, and a select committee (in more senses than one) should be appointed to formulate some means whereby the above part of the Bureau's report could read very differently and give the young doctor a more rosy outlook in the future.

Standard Size for Communications

Dr. W. F. BENSTED-SMITH (Newton Ferrers, Devon) writes: For a long time I have urged upon manufacturers' representatives that what we want is not a reproduction of the works of eminent or obscure artists but a concise statement on the drug concerned printed on a thin card the size of an N.H.S. record envelope. These could then be filed in standard cabinets at the doctor's discretion for reference. . . . Hospital (and consultant) reports if typed on paper of a size which, plain or folded, would equal an N.H.S. continuation card (7 in. by 4½ in.) would be an immense advance too.

H.M. Forces Appointments

COLONIAL MEDICAL SERVICE

The following appointments have been announced: C. P. Allen, Ch.M., F.R.C.S., D.T.M.&H., M. A. X. Cocheme, M.B., B.Ch., D.T.M.&H., D.P.M., R. T. B. Green, M.D., D.T.M., B. D. Molesworth, M.B., B.Ch., and R. A. Pallister, O.B.E., M.D., M.R.C.P., D.T.M.&H., Specialist Officers, Grade "A," Federation of Malaya; G. Drury, M.R.C.S., L.R.C.P., D.T.M.&H., Assistant Director of Medical Services, Kenya; L. G. Eddey, M.B., Ch.B., D.T.M.&H., Director of Medical Services, Gold Coast; G. C. Franklin, M.B., B.Ch., Medical Officer, Hong Kong; R. E. Shaw, M.B., F.R.C.S., Medical Officer, Kenya; P. J. Ndow, M.B., B.Ch., Medical Officer, Gambia; J. C. Ryan, M.B., B.Ch., Medical Officer, British Guiana; W. Sinclair, M.B., B.Ch., J. A. D. Bradfield, M.B., B.Ch., G. A. Jeffery, M.B., Ch.B., and R. N. Weir, M.B., Ch.B., Medical Officers, Nyasaland; J. A. Attard, M.D., Medical Officer, Gold Coast; H. J. Barclay, M.B., Ch.B., Resident Medical Officer (Intern), Northern Rhodesia; T. D. Brick, M.B., B.Ch., D.M.R.D., Radiologist, Federation of Malaya; A. M. G. Kissaun, M.D., Medical Officer, Nigeria; H. N. Davies, O.B.E., M.B., Ch.B., D.T.M., Senior Specialist, Tanganyika; E. O'D. C. Grattan, M.B., F.R.C.S., D.T.M.&H., Surgeon Specialist, Kenya; J. F. Jarvis, M.B., F.R.C.S., D.L.O., D.T.M.&H., Ear, Nose, and Throat Specialist, Kenya; W. E. S. Merrett, O.B.E., M.B., B.Ch., Principal, Medical School, Nigeria; S. P. W. Street, F.R.C.S., and M. R. Thompson, F.R.C.S., Surgeon Specialists, Jamaica; W. H. K. Willis, M.B., F.R.C.S., Orthopaedic Specialist, Kenya; Lieutenant-Colonel A. C. S. Hobson, M.B., B.S., M.R.C.P., and J. C. G. Stewart, M.R.C.S., L.R.C.P., Medical Officers, Federation of Malaya; D. E. Evison, M.B., B.Ch., Medical Officer of Health, Northern Rhodesia; A. W. H. Thomson, M.B., Ch.B., Medical Officer, Uganda.

Association Notices

ASSAM BRANCH

Notice is hereby given by the Council to all concerned that it is proposed to dissolve the Assam Valley and Surma Valley Divisions of the Assam Branch, and to reconstitute the Branch into one without Divisions. Any member affected by this proposal and objecting thereto should write to the Secretary of the Association by May 30.

A. MACRAE,
Secretary.

Diary of Central Meetings

MAY

- 5 Tues. Special Conference of Representatives of Local Medical Committees, 10.30 a.m.
- 5 Tues. Extraordinary General Meeting, 2.30 p.m.
- 6 Wed. Council, 10 a.m.
- 8 Fri. Ophthalmic Qualifications Committee, 1.45 p.m.
- 8 Fri. Ophthalmic Group Committee, 2 p.m.
- 8 Fri. Physical Medicine Group Committee, 2 p.m.
- 13 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m. (date changed from May 12).
- 14 Thurs. Central Consultants and Specialists Committee, 12 noon.
- 15 Fri. Glasgow Arrangements Committee, 11 a.m.
- 20 Wed. Conference of Honorary Secretaries, 10.45 a.m.
- 21 Thurs. G.M.S. Committee, 10.30 a.m.
- 21 Thurs. Trustees of the Dain Fund, 1 p.m.
- 27 Wed. Alcohol and Road Accidents Committee, 2 p.m.
- 27 Wed. Consultants and G.P.s Liaison Executive Committee, 2 p.m.
- 27 Wed. Film Committee, 2 p.m.
- 28 Thurs. Central Ethical Committee, 2 p.m.
- 29 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.

Branch and Division Meetings to be Held

- BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, Blackpool, Monday, May 4, 7.15 p.m., dinner; 8.30 p.m., meeting. Address by Dr. E. E. Claxton (Assistant Secretary, B.M.A.).
- BOLTON DIVISION.—At Old Links Golf Course, Wednesday, May 6, between 1 p.m. and 4 p.m., local competition for Treasurer's Cup Golf Competition of B.M.A.
- BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Boscombe, Friday, May 8, 8.15 p.m., annual meeting.
- CAMBERWELL DIVISION.—At St. Olave's Hospital, Rotherhithe, S.E., Thursday, May 7, 8.30 p.m., annual general meeting. Talk by Mr. McDonald Scammell: "Mountain Climbing" (illustrated by films).
- GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, May 7, 8.30 p.m., meeting. Lecture by Dr. J. Russell Reynolds: "X-ray Cinematography."
- HAMPSTEAD DIVISION.—At Central Library, Finchley Road, N.W., Monday, May 4, 8.30 p.m., annual general meeting.
- HENDON DIVISION.—(1) At Hendon Hall Hotel, N.W., Tuesday, May 5, 8.15 p.m., annual general meeting and medico-political meeting; (2) Thursday, May 7, 1.45 p.m. to 6 p.m., visit to Roche Laboratories, Welwyn Garden City.

Meetings of Branches and Divisions

MATABELELAND BRANCH

The annual general meeting was held at Bulawayo Hospital on January 15. With Dr. G. A. Jamieson in the chair, there were 27 members present. The following officers were elected for 1953: President.—Dr. G. A. Jamieson. Vice-president.—Dr. O. N. Ransford. Hon. Secretary.—Mr. R. W. Grant Stuart.

A proposal to raise the annual subscription to 8 guineas for all members was carried.

FOLKESTONE AND DOVER DIVISION

A meeting was held at the Esplanade Hotel, Folkestone, on February 9. With Dr. Broatch in the chair, in the absence of the chairman, there were 16 members present. Dr. L. P. Ribet was appointed hon. public relations secretary.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 9 1953

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British Medical Association

EXTRAORDINARY GENERAL MEETING

The Extraordinary General Meeting of the British Medical Association, summoned on a requisition signed by more than 100 members, took place in the Great Hall of B.M.A. House, London, on Tuesday afternoon, May 5, following the Special Conference of Local Medical Committees, which was held in the morning. The meeting was attended by about 850 members. The chair was taken by Dr. E. A. GREGG, Chairman of Council, in the absence of the President of the Association.

The CHAIRMAN said that they found themselves in a somewhat peculiar position. The Council had been advised by the learned counsel to convene the meeting in answer to the requisition, but also it had been advised that the resolution proposed by the requisitionists, if carried, might be ignored by the Council, since it dealt with matters within the province of the Representative Body, in which was vested by Article 37 the general control and direction of the policy of the Association. He confessed that this was a somewhat untidy way of ordering their affairs and called for some consideration in the future. He then proposed certain rules for the conduct of the meeting, and these were generally approved.

The Resolution

The resolution which the meeting was called to consider was as follows:

"That the Association being concerned by the modification of the present method of remuneration by capitation fees agreed in the Working Party's report requires the Council forthwith to approach the Minister of Health with proposals for the better protection (financial and otherwise) of the small-list doctor and requests of the doctor newly seeking entry into practice, and requests the Minister of Health not to implement the Working Party's report until the scheme for distribution of remuneration has been considered in the light of such proposals, and meanwhile to continue the present method of payment."

Dr. W. J. GRANT (Shrewsbury), in moving the resolution, said that for years general practitioners had been underpaid. The General Medical Services Committee said that the Danckwerts award made it clear that remuneration had been inadequate since the National Health Service began. The necessity for increased remuneration was universally recognized. But the method of distribution of the money rendered available created grave injustice for those with small lists. There was severe discrimination against the less fortunate of their fellows. There should, said Dr. Grant, be equal pay for equal work. Why, he asked, should the small-list practitioner's capitation fee be less because he

received payments from outside the Service? If this principle was to apply it should apply to lists of all sizes. It had been suggested in some quarters that the intention behind this distribution was direction of labour by economic pressure. The smaller the practice the relatively less the rate of remuneration *per caput*. "We do ask that, in accordance with every canon of justice, and with the statements made by the General Medical Services Committee, every practitioner should receive, without any tinge of charity, his due share of remuneration from the central pool in respect of the work he does for the patient."

Dr. Grant concluded by saying that he had in his possession letters from hundreds of practitioners which revealed a sad picture of urgency, distress, and almost despair. For five years men with good qualifications had been carrying on with great difficulty. He asked that such men should not be condemned to a further delaying period, like guinea-pigs awaiting experiment in a laboratory. Some 1,500 to 2,000 of their colleagues were in need through no fault of their own.

Dr. CHARLES I. SCHIFF (City of London), in seconding, said it was encouraging to see such a packed meeting. (Laughter.) This meeting was not hurriedly requisitioned. There was no question here of throwing spanners into works. The small man was being regarded as a helot. He was going to be remunerated at the rate of 17s. It was said that he had other sources of income, and this would mean that other corporations and services were expected to exploit him in his Health Service work.

The Negotiators' Work

Dr. TALBOT ROGERS pleaded "Not guilty" to the charge of negligence concerning the interests of the small-list man. "We believe in our Committee that, had we been able to keep the periphery fully and properly informed of what we were doing month by month during the course of our preparations for negotiation on this matter, this Extraordinary General Meeting would not have been summoned." He then recounted certain of the events of the last four years, from the negotiations with a very obdurate Minister in 1949 and the two years that followed.

Dr. Rogers went on to quote resolutions of the Special Conference in June, 1952, and the Annual Representative Meeting in that year. These were the answer to the representation that the Working Party, by considering and acceding to a form of distribution which did not load the first thousand, was doing what it had no right to do.

British Medical Association

ANNUAL MEETING—CARDIFF, JULY 9-17, 1953

President-Elect: J. W. TUDOR THOMAS, D.Sc., M.D., M.S., F.R.C.S.

General Secretary: JOHN D. SPILLANE, M.D., F.R.C.P.

Science Secretary: PROFESSOR GILBERT I. STRACHAN, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G.

Executive Officer: G. A. PECK, B.Sc., B.M.A. House, 195, Newport Road, Cardiff.

PROGRAMME

The 121st Annual Meeting of the British Medical Association will be held in Cardiff from Thursday, July 9, to Friday, July 17, 1953, inclusive.

On the evening of Wednesday, July 8, there will be a Sherry Party for Representatives and their Ladies, arranged by the Cardiff Division.

The first part of the Meeting—the Annual Representative Meeting—will begin on Thursday, July 9, and continue on Friday, Saturday, and Monday, July 10, 11, and 13.

In view of the visit of Her Majesty the Queen to Cardiff on July 9, the Representative Meeting will be held that day in the Cory Hall, Station Terrace, with the A.R.M. Inquiry Office in the adjoining Y.M.C.A. centre. On the following day, Friday, July 10, the Annual Representative Meeting will transfer to the City Hall, where it will remain until the conclusion of the meeting on July 13.

The Representatives' Dinner and Ladies' Dinner take place on Thursday, July 9, followed by a dance.

The Overseas Luncheon is arranged for Friday, July 10.

On Sunday, July 12, a visit has been arranged for Representatives and their Ladies to St. Donat's Castle, and that evening there will be a Welsh Choral Concert.

The second part of the Meeting—the Annual Meeting proper—occupies the period from the conclusion of the A.R.M. on Monday, July 13, to the evening of Friday, July 17.

The adjourned Annual General Meeting and President's Address will take place in the Park Hall Cinema on the evening of Monday, July 13, and the President's Reception which follows will be at the National Museum of Wales.

Three Plenary Scientific Sessions are arranged as follows: Tuesday morning, July 14, "Coronary Disease"; Thursday morning, July 16, "Fibrositis"; Friday afternoon, July 17, "Overweight."

Seventeen Scientific Sections have been arranged, the meetings to take place on Wednesday morning and Wednesday afternoon, July 15, and Friday morning, July 17 (details are given below).

The Official Religious Service will be held in St. John's Church, Cardiff, on the afternoon of Tuesday, July 14.

A Roman Catholic Service will be held in St. Peter's Church, Cardiff, on the morning of July 14.

The Popular Lecture will be given by Sir Russell Brain, F.R.C.P., on the evening of Friday, July 17.

There will be a Joint Reception by the University College of South Wales and Monmouthshire and the Welsh National School of Medicine on Tuesday evening, July 14, and a Civic Reception on the following evening.

The Annual Dinner of the Association will be held in the City Hall on Thursday, July 16.

Two large Garden Parties have been arranged—on Thursday, July 16, at Margam, by invitation of Mr. Evans Bevan, and on Friday, July 17, at Duffryn House, by invitation of the Board of Governors of the United Cardiff Hospitals.

The Monmouthshire Division is giving a Sherry Party on Tuesday, July 14.

An attractive social programme has been drawn up, including many functions specially arranged for the ladies accompanying members. There are also a number of visits to Welsh industrial concerns, including one to the Abbey Steel Works, Margam, the largest of its kind in the world.

The South Wales Association of the Medical Women's Federation is giving a Sherry Party on July 10 for medical women visitors.

The usual golf competitions will take place, and there will also be facilities for bridge, bowls, and tennis. Various sports and social clubs have offered honorary membership to B.M.A. Members throughout the Meeting.

The Overseas Conference will be held on Wednesday afternoon, July 15, followed by an "At Home" for Overseas Delegates given by the Empire Medical Advisory Bureau.

The Christian Medical Fellowship is holding its Annual Breakfast (formerly known as the Medical Missionary Breakfast) on July 15, and the usual graduate luncheons and dinners have been arranged.

The Reception Room for registration in the Sophia Gardens Pavilion will be opened on Monday, July 13, at 9 a.m.

The Ladies' Club will be situated in the University College and will be open throughout the Meeting.

The Annual Trade Exhibition of Surgical Appliances, Foods, Drugs, and Books will be housed in the Sophia Gardens Pavilion. The official opening will take place on Monday, July 13, at 9 a.m., and the Exhibition will remain open on July 14, 15, 16, and 17 from 9 a.m. to 6 p.m.

The Scientific Exhibition will also be held in the Sophia Gardens Pavilion and will be open daily from July 13 to 17. Demonstrations will be given at fixed advertised times (details are given below).

HOTEL ACCOMMODATION

A list of hotels and guest houses in and around Cardiff was published in the *Supplement* of April 25 (p. 153), and members who have not already made their arrangements for accommodation at the Meeting are advised to do so without further delay. Those who have difficulty in making arrangements are advised to write direct to the *Executive Officer*, B.M.A. House, 195, Newport Road, Cardiff, stating their exact requirements.

REGULATIONS REGARDING DRESS

Academic Dress is to be worn at the President's Address, the President's Reception, the Official Religious Service, the Roman Catholic Service, the University Reception, and the Civic Reception.

Robes may be hired from Messrs. Ede and Ravenscroft, Ltd., 93, Chancery Lane, London, W.C.2, who request that the gowns be sent to the home address of the individual concerned. Early application is advised, as the supply of gowns is limited.

Evening Dress (Tails or Dinner Jacket), with Decorations, is to be worn at the President's Reception, University Reception, Civic Reception, and Annual Dinner. Evening Dress without Decorations should be worn at the Representatives' Dinner and the Representatives' Dance.

REGISTRATION FEE

Members attending the Annual Meeting (other than members of the Representative Body and overseas visitors) are required to pay a fee of one guinea towards the expenses of the Meeting. The fee will be payable when members register at the Reception Office.

TICKETS

No tickets for functions or excursions can be issued in advance.

All tickets for functions up to Sunday, July 12, will be available at the A.R.M. Inquiry Office at the Y.M.C.A. on July 9 and at the City Hall on July 10 and 11, or at the Ladies' Club, University College.

Tickets for all other functions will be available from Monday, July 13, at the Reception Office, Sophia Gardens Pavilion, or at the Ladies' Club.

BADGES

Members will not be admitted to the Plenary Sessions or Scientific Sections unless wearing badges. They should therefore make a point of visiting the Reception Office, Sophia Gardens Pavilion, on the first day of their attendance at the Annual Meeting to obtain their handbook, badge, registration card, and tickets.

Officers of Scientific Sections and other office-holders should inquire for special badges at the Reception Office.

CAR-PARKING

Windscreen labels may be obtained at the Reception Offices, and members bringing their own cars are advised to use these labels to facilitate car-parking.

Only limited covered accommodation is available for cars in Cardiff, but open-air accommodation is available at Messrs. E. R. Forse & Co., Kingsway, and The Friary, Cardiff.

ABERDEEN GRADUATES' DINNER

A dinner arranged by the South Wales and West of England Branch of the Aberdeen University Graduates' Association will be held in the Royal Hotel, Cardiff, on Friday, July 10, at 7.30 p.m. Tickets will be one guinea each, excluding wine.

This dinner is open to all Aberdeen graduates and their wives attending the Annual Meeting, and those intending to attend the A.R.M. or resident in the area. Those attending the A.R.M. or resident in the area, Mrs. Scott be present are asked to notify the local secretary, Mrs. Thomson, Glasfryn, Lower Cwrt-y-vil Road, Penarth, Glam. Tickets will be available at the A.R.M. Inquiry Office, Y.M.C.A. (opposite Queen Street Station), on July 9.

GLASGOW GRADUATES' DINNER

The Glasgow Graduates' dinner will be held in the Royal Hotel, Cardiff, on Saturday, July 11, at 7 for 7.30 p.m. This dinner is open to all Glasgow graduates and their ladies attending the A.R.M. or resident in the area.

Tickets, at a cost of 25s., including aperitifs, are obtainable from Dr. Robert Forbes, Tavistock House South, Tavistock Square, London, W.C.1.

WELSH DINNER

A dinner open to all doctors with Welsh associations and their wives attending the Annual Meeting will be held in the New Continental Café, Cardiff, on Saturday, July 11, at 7.30 p.m. Tickets will be one guinea each, and those wishing to attend are asked to apply for tickets, with remittances, to the Hon. Secretary, Welsh Dinner, B.M.A. House, 195, Newport Road, Cardiff.

CHRISTIAN MEDICAL FELLOWSHIP ANNUAL BREAKFAST

The Annual Breakfast of the Christian Medical Fellowship (formerly known as the Medical Missionary Breakfast) will be held at the New Continental Café, Cardiff, on Wednesday, July 15, at 8.30 a.m. The chairman will be Mr. J. W. Tudor Thomas, and the speaker Dr. D. Martin Lloyd-Jones. The proceedings will terminate at 9.40 a.m. Those intending to be present are asked to notify the local secretary: Mr. A. S. Aldis, F.R.C.S., 3, Heol Don, Whitchurch, Cardiff.

SCIENTIFIC MEETING

PLENARY SESSIONS

All sessions will be held in the Reardon Smith Theatre, Park Place.

Tuesday, July 14, 10 a.m.: "Coronary Disease"

Chairman: Professor H. SCARBOROUGH (Cardiff).

Speakers: Dr. D. EVAN BEDFORD (London), Dr. WILLIAM PHILLIPS (Cardiff), Professor G. W. PICKERING (London), Dr. CLIFFORD G. PARSONS (Birmingham), Dr. A. RAE GILCHRIST (Edinburgh), Dr. JOHN H. HUNT (London).

Thursday, July 16, 10 a.m.: "Fibrositis"

Chairman: Mr. A. LAWRENCE ABEL (London).

Speakers: Dr. A. TALBOT ROGERS (Bromley), Dr. A. H. DOUTHWAITE (London), Dr. J. P. SPILLANE (Cardiff), Mr. J. S. BATCHELOR (London), Mr. LESLIE H. W. WILLIAMS (London), Dr. J. H. CYRIAX (London), Dr. G. D. KERSLEY (Bath).

Friday, July 17, 2.15 p.m.: "Overweight"

Chairman: Right Hon. LORD HORDER (London).

Speakers: Dr. J. H. SHELDON (Wolverhampton), Professor R. A. McCANCE, F.R.S. (Cambridge), Dr. ARNOLD P. MEIKLEJOHN (Edinburgh), Dr. H. M. SINCLAIR (Oxford), Dr. LEONARD H. HOWELLS (Cardiff), Dr. EMRYS WILLIAMS (Cardiff).

SCIENTIFIC SECTIONS

All sessions will be held in University College, Cathays Park.

MEDICINE

President: Professor A. M. KENNEDY, M.D., F.R.C.P. (Cardiff).

Vice-Presidents: Professor W. MELVILLE ARNOTT, B.Sc., M.D., F.R.C.P. (Birmingham); Sir DANIEL DAVIES, K.C.V.O., M.D., F.R.C.P. (London); LEONARD H. HOWELLS, M.D., F.R.C.P. (Cardiff); and Professor W. J. E. JESSOP, M.Sc., M.D., F.R.C.P.I., D.P.H., F.R.I.C. (Dublin).

Hon. Secretaries: BYRON EVANS, M.D., M.R.C.P., 59, Cathedral Road, Cardiff; JOHN RICHARDSON, M.V.O., M.D., F.R.C.P., 33, Devonshire Place, London, W.1.

The following programme has been arranged:

Wednesday, July 15 (Room 103).—10 a.m., The Use and Abuse of Antibiotics. To be opened by Dr. R. W. FAIRBROTHER (Manchester), Dr. THOMAS ANDERSON (Glasgow), and Mr. J. S. JEFFREY (Edinburgh); followed by Dr. KENNETH S. MACLEAN (London), Dr. H. M. FOREMAN (Sully, Glam), and Dr. F. A. WHITLOCK (Truro). 2 p.m., The Early Diagnosis of Intrathoracic New Growths. To be opened by Sir GEOFFREY MARSHALL (London), Mr. VERNON THOMPSON (London), and Dr. PETER KERLEY (London); followed by Dr. BRIAN TAYLOR (Birmingham) and Mr. DILLWYN THOMAS (Cardiff).

SURGERY

President: Professor LAMBERT C. ROGERS, V.R.D., M.Sc., M.D., F.R.C.S., F.A.C.S., F.R.A.C.S. (Cardiff).

Vice-Presidents: D. J. HARRIES, M.D., F.R.C.S. (Cardiff); J. B. HAYCRAFT, M.C., M.B., F.R.C.S. (Cardiff); D. IOAN-JONES, M.B., F.R.C.S. (Cardiff); C. JENNINGS MARSHALL, M.D., M.S., F.R.C.S. (London); A. DICKSON WRIGHT, M.S., F.R.C.S. (London).

Hon. Secretaries: STANLEY AYLETT, M.B.E., M.B., F.R.C.S., 114, Harley Street, London, W.1; D. B. E. FOSTER, M.B., F.R.C.S.Ed., Hillboro, Llandough, Penarth, Glamorgan.

The following programme has been arranged:

Wednesday, July 15 (Room 129).—10 a.m., The Treatment of Toxic Goitre. To be opened by Mr. R. V. COOKE (Bristol). The Treatment of Diseases of the Gall-bladder and Bile Ducts. To be opened by Mr. R. J. McNEILL LOVE (London). 2 p.m., The Relief of Pain of Vascular Disease in the Lower Limb. To be opened by Sir JAMES PATERSON

ROSS (London) and Mr. J. B. OLDHAM (Liverpool); followed by Mr. HAROLD DODD (London), Professor C. G. ROB (London), and Mr. S. M. COHEN (London).

OBSTETRICS AND GYNAECOLOGY

President: Professor G. I. STRACHAN, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G. (Cardiff).

Vice-Presidents: M. D. ARWYN EVANS, M.D., F.R.C.S.Ed., F.R.C.O.G. (Cardiff); Professor H. HARVEY EVERS, M.B., M.S., F.R.C.S., F.R.C.O.G. (Newcastle-upon-Tyne); R. G. MALIPHANT, M.D., M.R.C.P., F.R.C.S., F.R.C.O.G. (Cardiff); H. K. PACEY, M.D., F.R.C.S., F.R.A.C.S., F.R.C.O.G. (Wellington, New Zealand); LESLIE H. W. WILLIAMS, M.D., M.S., F.R.C.S., F.R.C.O.G. (London).

Hon. Secretaries: J. M. BOWEN, M.B., M.R.C.O.G., 9, Edward VII Avenue, Newport, Mon; ALISTAIR L. GUNN, M.D., F.R.C.S.Ed., F.R.C.O.G., 51, Harley Street, London, W.1.

The following programme has been arranged:

Wednesday, July 15 (Room 56).—10 a.m., The Place of the Forceps in Present-day Obstetrics. To be opened by Professor T. N. A. JEFFCOATE (Liverpool); followed by Mr. GAVIN BOYD (Belfast), Mr. WILLIAM HUNTER (Newcastle-upon-Tyne), and Mr. E. PARRY JONES (St. Asaph, Flint). *Short Paper:* Professor J. C. MCCLURE BROWNE (London), Placental Circulation in Pre-eclamptic Toxaemia. 2 p.m., The Climacteric. To be opened by Mr. ALECK W. BOURNE (London); followed by Mr. T. N. MACGREGOR (Edinburgh), Professor H. C. McLAREN (Birmingham), and Mr. M. D. ARWYN EVANS (Cardiff). *Short Paper:* Dr. D. MCKAY HART (Glasgow), Dysmenorrhoea.

ANAESTHETICS

President: C. LANGTON HEWER, M.B., B.S., M.R.C.P., D.A., F.F.A.R.C.S. (London).

Vice-Presidents: RONALD JARMAN, D.S.C., M.R.C.S., L.R.C.P., D.A., F.F.A.R.C.S. (London); A. HUGH MUSGROVE, M.R.C.S., L.R.C.P., D.A., F.F.A.R.C.S. (Cardiff); WILLIAM W. MUSHIN, M.A., M.B., B.S., D.A., F.F.A.R.C.S. (Cardiff).

Hon. Secretaries: J. G. BOURNE, M.B., B.Ch., D.A., 37, Marsham Court, Westminster, S.W.1; I. RHYS JONES, M.R.C.S., L.R.C.P., D.A., Cliff Cottage, Radyr, Glamorgan. The following programme has been arranged:

Wednesday, July 15 (Room 116).—10 a.m., A Return to Simplicity? To be opened by Dr. M. D. NOSWORTHY (London); followed by Dr. W. W. MUSHIN (Cardiff). 2 p.m., *Short Paper:* Dr. E. J. DELORME (Edinburgh), Hypothermia and Anaesthesia. The Case Against Hypotension. To be opened by Dr. M. H. ARMSTRONG DAVISON (Newcastle-upon-Tyne); followed by Dr. R. F. WOOLMER (Bristol).

CARDIOLOGY

President: MAURICE CAMPBELL, O.B.E., D.M., F.R.C.P. (London).

Vice-Presidents: A. RAE GILCHRIST, M.D., F.R.C.P. (Edinburgh); Professor C. BRUCE PERRY, M.D., F.R.C.P. (Bristol); WILLIAM PHILLIPS, M.D., F.R.C.P. (Cardiff).

Hon. Secretaries: SHEILA HOWARTH, M.B., B.S., Institute of Cardiology, 35, Wimpole Street, London, W.1; ARTHUR J. THOMAS, M.D., M.R.C.P., D.P.H., Tanoama, Llandough, near Penarth, Glamorgan.

The following programme has been arranged:

Wednesday, July 15 (Room 202).—2 p.m., Pulmonary Heart Disease. To be opened by Dr. A. J. THOMAS (Cardiff) and Professor JETHRO GOUGH (Cardiff); followed by Dr. WILLIAM EVANS (London) and Dr. MAURICE CAMPBELL (London). *Film Demonstration* by Dr. I. McMILLAN (London), The Action of the Aortic Valves.

DISEASES OF THE CHEST

President: Sir CLEMENT PRICE THOMAS, K.C.V.O., F.R.C.S. (London).

Vice-Presidents: A. L. D'ABREU, O.B.E., M.D., Ch.M., F.R.C.S. (Birmingham); Professor FREDERICK HEAF, M.D.,

F.R.C.P. (Cardiff); DILLWYN M. E. THOMAS, M.R.C.S., L.R.C.P. (Sully, Glam).

Hon. Secretaries: H. R. S. HARLEY, M.S., F.R.C.S., 93, Station Road, Llanishen, Cardiff; M. MEREDITH BROWN, B.M., F.R.C.S.Ed., 17, Priory Mansions, Drayton Gardens, London, S.W.10.

The following programme has been arranged:

Friday, July 17 (Room 28).—10 a.m., The Value of Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis. To be opened by Dr. HOWARD NICHOLSON (London) and Dr. C. H. C. TOUSSAINT (London); followed by Mr. R. S. BARCLAY (Newton Mearns, Renfrewshire), Dr. C. S. DARKE (Sheffield), and Dr. PETER EDWARDS (Cheshire Joint Sanatorium). *Short Papers:* Mr. O. S. TUBBS (London), Constrictive Pericarditis; Mr. R. H. FRANKLIN (London), Congenital Atresia of the Oesophagus; Dr. ARCHIE COCHRANE (Cardiff), Radiological Diagnosis of Pneumoconiosis.

CHILD HEALTH

President: Professor A. G. WATKINS, M.D., F.R.C.P. (Cardiff).

Vice-Presidents: V. MARY CROSSE, O.B.E., M.D., D.P.H., D.R.C.O.G. (Birmingham); Professor A. V. NEALE, M.D., F.R.C.P., D.P.H. (Bristol); J. N. O'REILLY, D.M., M.R.C.P. (London).

Hon. Secretaries: P. T. BRAY, M.R.C.P., D.C.H., 28, Park Place, Cardiff; I. A. B. CATHIE, M.D., M.R.C.P., Pathological Department, The Hospital for Sick Children, Great Ormond Street, London, W.C.1.

The following programme has been arranged:

Wednesday, July 15 (Room 28).—2 p.m., Care of the Newborn. To be conducted on a basis of "Any Questions?" The panel consists of Professor W. C. W. NIXON (London), Professor WILFRED GAISFORD (Manchester), Dr. E. NOEL REES (Llanelli), and Dr. DOROTHY H. ALDIS (Cardiff). *Poisoning in Childhood.* To be opened by Dr. D. SWINSCOW (London) and Dr. I. O. CRAIG (Edinburgh).

DERMATOLOGY

President: R. M. B. MCKENNA, M.D., F.R.C.P. (London).

Vice-Presidents: LOUIS FORMAN, M.D., F.R.C.P. (London); GEOFFREY HODGSON, M.B.E., D.M., (Cardiff); BERNARD A. THOMAS, M.D., D.P.H. (Newport, Mon).

Hon. Secretaries: A. J. ROOK, M.D., M.R.C.P., 23, Park Place, Cardiff; D. S. WILKINSON, M.D., M.R.C.P., Whitecroft, Hervines Road, Amersham, Bucks.

The following programme has been arranged:

Wednesday, July 15 (Room 121).—10 a.m., Symposium on Practical Problems in the Management of Disorders of the Skin in General Practice: Dr. LOUIS FORMAN (London), The Management of Pruritus; Professor ARTHUR W. GRACE (New York), The Differential Diagnosis and the Treatment of Ringworm of the Feet; Dr. C. H. WHITTLE (Cambridge), The Problem of Nummular Eczema; Dr. C. S. NICOL (London), Difficulties in the Interpretation of the Serological Tests for Syphilis; Dr. MARTIN BEARE (Belfast), Difficulties in the Diagnosis and Treatment of Scalp Ringworm; Dr. D. S. WILKINSON (Amersham), Management of Hypostatic Conditions of the Lower Leg; Dr. IAN SNEDDON (Sheffield), Over-treatment; Dr. GEOFFREY HODGSON (Cardiff), The Influence of Home Conditions on Skin Diseases.

In connexion with this Section a Clinical Demonstration will be held on the afternoon of Wednesday, July 15, in Cardiff Royal Infirmary. Further details will be available later.

NEUROLOGY

President: W. RITCHIE RUSSELL, C.B.E., M.D., F.R.C.P. (Oxford).

Vice-Presidents: Professor PHILIP C. P. CLOAKE, M.D., F.R.C.P., D.P.M. (Birmingham); T. ROWLAND HILL, M.D., F.R.C.P. (London); W. ESMOND REES, M.D., F.R.C.P. (Swansea).

Hon. Secretaries: CHARLES LANGMAID, M.B., F.R.C.S., 174, Lake Road East, Roath Park, Cardiff; C. W. M.

WHITTY, D.M., M.R.C.P., Department of Neurology, The Radcliffe Infirmary, Oxford.

The following programme has been arranged:

Friday, July 17 (Room 56).—10 a.m., Short Papers: Dr. HONOR SMITH (Oxford), Diagnosis and Treatment of Meningitis; Dr. A. B. KINNIER WILSON (Oxford), Dangers of Bulbar Poliomyelitis; Mr. RICHARD JOHNSON (Manchester), Surgical Treatment of Intracranial Haemorrhage; Mr. MURRAY FALCONER (London), New Trends in the Diagnosis of Spastic Paraplegia.

OCCUPATIONAL HEALTH

President: J. A. L. VAUGHAN JONES, M.B., Ch.B. (Leeds).

Vice-Presidents: Professor R. C. BROWNE, M.A., D.M., M.R.C.P. (Newcastle-upon-Tyne); ANDREW MEIKLEJOHN, M.D., M.R.C.P., F.R.F.P.S. (Glasgow); J. M. ROGAN, M.D., F.R.C.P.Ed., D.P.H. (London); J. S. SPICKETT, M.R.C.S., L.R.C.P. (Bridgend, Glam).

Hon. Secretaries: J. G. BILLINGTON, M.R.C.S., L.R.C.P., 7, Westfield Hall, Hagley Road, Edgbaston, Birmingham, 16; H. L. COULTHARD, M.D., M.R.C.P., D.P.H., 149, Heathwood Road, Cardiff.

The following programme has been arranged:

Friday, July 17 (Room 116).—10 a.m., Symposium on Work and Age. Speakers: Dr. N. T. WELFORD (Cambridge), Dr. W. P. D. LOGAN (London), Dr. D. D. REID (London), and Dr. I. M. RICHARDSON (Aberdeen). *Film:* (London), and Dr. I. M. RICHARDSON (Aberdeen). *Occasional Papers:* Dr. J. GWYNNE MORGAN (Clydach), (1) Carcinoma of the Lung Associated with Certain Industries; (2) Method of Demonstrating Porphyrin in the Urine of Lead Workers.

OPHTHALMOLOGY

President: J. H. DOGGART, M.D., F.R.C.S. (London).

Vice-Presidents: RUPERT J. PARRY, M.B., F.R.C.S.Ed. (Cardiff); ROY THOMAS, M.B., F.R.C.S.Ed., D.O.M.S. (Swansea); EUGENE WOLFF, M.B., F.R.C.S. (London).

Hon. Secretaries: BERNARD GLUCK, M.Ch., F.R.C.S.Ed., D.O.M.S., 76, Cathedral Road, Cardiff; A. J. B. GOLDSMITH, M.B., F.R.C.S., 63, Harley Street, London, W.1.

The following programme has been arranged:

Friday, July 17 (Room 114).—10 a.m., The Ocular Complications of Diabetes. To be opened by Mr. G. I. SCOTT (Edinburgh) and Dr. LEONARD HOWELLS (Cardiff); followed by Mr. A. B. NUTT (Sheffield). *The Scope of Corneal Graft Surgery.* To be opened by Mr. W. B. RYCKOFF (London) and Mr. E. C. ZORAB (Southampton); followed by Mr. J. AYOUB (London) and Mr. A. G. LEIGH (London).

ORTHOPAEDICS

President: A. O. PARKER, M.D., C.M., M.C.P.S., F.R.C.S. (Monmouth).

Vice-Presidents: IAN LAWSON DICK, M.D., Ch.M., F.R.C.S.Ed. (Edinburgh); A. M. HENDRY, M.B., F.R.C.S.Ed. (Birmingham); D. N. ROCYN-JONES, M.D., F.R.C.S.Ed. (Cardiff).

Hon. Secretaries: J. M. P. CLARK, M.B.E., M.B., F.R.C.S., 29, Park Square, Leeds, 1; DILLWYN EVANS, M.B., F.R.C.S.Ed., 25, Cathedral Road, Cardiff.

The following programme has been arranged:

Friday, July 17 (Room 127).—10 a.m., The Injured Hand. To be opened by Mr. WILLIAM GISSANE (Birmingham), Major Injuries of the Hand; Mr. R. J. FURLONG (London), The Cut Tendon; Mr. EMLYN LEWIS (Cardiff), Major Skin Loss and the Vascular Effect of Crush Injuries of the Hand; Mr. L. W. PLEWES (Luton), The Rehabilitation of the Hand; followed by Mr. R. G. PULVERTAFT (Derby), Mr. A. L. EYRE-BROOK (Bristol), Mr. F. C. DURBIN (Exeter), and Mr. MERVYN EVANS (Swansea).

OTO-RHINO-LARYNGOLOGY

President: R. D. OWEN, F.R.C.S. (Cardiff).

Vice-Presidents: C. GILL-CAREY, F.R.C.S. (London); R. R. SIMPSON, M.B., F.R.C.S.Ed. (Cardiff); THOMAS, M.B., F.R.C.S.Ed. (Cardiff).

Hon. Secretaries: ALUN BEYNON THOMAS, M.B., F.R.C.S., D.L.O., 23, Park Place, Cardiff; JOAN WADGE, M.B., F.R.C.S., 15, Devonshire Place, London, W.1.

The following programme has been arranged.

Friday, July 17 (Room 121).—10 a.m., The Management of Otitis Media. To be followed by Mr. I. SIMSON HALL (Edinburgh); followed by Mr. J. I. MUNRO BLACK (Newcastle-upon-Tyne) and Mr. GEOFFREY H. BATEMAN (London). *The Diagnosis and Treatment of Upper Respiratory Tract Infection in Allergic Children.* To be opened by Mr. ANGELL JAMES (Bristol); followed by Mr. T. A. BRAND (Newport, Mon) and Dr. J. PEPYS (London).

PATHOLOGY

President: Professor J. B. DUGUID, M.D. (Newcastle-upon-Tyne).

Vice-Presidents: E. N. ALLOTT, D.M., F.R.C.P. (Beckenham); Professor J. GOUGH, M.D. (Cardiff); Professor R. A. Q. O'MEARA, D.Sc., M.D., D.P.H., F.R.C.P.I., F.T.C.D. (Dublin).

Hon. Secretaries: J. H. O. EARLE, M.D., 12, Hillside, Wimbledon, London, S.W.19; SCOTT THOMSON, M.D., M.R.C.P.Ed., D.P.H., Public Health Laboratory Service, Institute of Pathology, Third Floor, Royal Infirmary, Cardiff.

The following programme has been arranged.

Wednesday, July 15 (Room 127).—10 a.m., Gastro-enteritis in Babies. To be opened by Professor ROBERT CRUIKSHANK (London); followed by Dr. M. T. PARKER (Manchester), Dr. K. B. ROGERS (Birmingham), Dr. JOAN TAYLOR (London), Dr. JOHN SMITH (Aberdeen), and Dr. A. T. RODEN (Salisbury).

PREVENTIVE MEDICINE

President: J. GREENWOOD WILSON, M.D., F.R.C.P., D.P.H. (Cardiff).

Vice-Presidents: A. R. CULLEY, M.D., D.P.H. (Cardiff); Professor I. G. DAVIES, M.D., M.R.C.P., D.P.H. (Leeds); Professor T. FERGUSON, D.Sc., M.D., F.R.C.P.Ed., F.R.F.P.S., D.P.H. (Glasgow).

Hon. Secretaries: R. T. BEVAN, M.B., Ch.B., D.P.H., West Winds, 14, Rhiwbina Hill, Rhiwbina, Cardiff; J. A. STIRLING, D.S.C., M.B., Ch.B., D.P.H., Public Health Department, Town Hall, Chesterfield.

The following programme has been arranged.

Wednesday, July 15 (Room 114).—10 a.m., The Health Visitor and the Family Doctor. To be opened by Dr. LLYWELYN ROBERTS (Sheffield), Dr. STANLEY THOMAS (London), and Dr. D. A. WILLIAMS (Cardiff). 2 p.m., Cancer and the Community. To be opened by Dr. PERCY STOCKS (Rhos-on-Sea) and Mr. RONALD W. RAVEN (London); followed by Dr. E. K. MACDONALD (Leicester).

PSYCHIATRY

President: T. J. HENNELLY, M.D., D.P.M. (Cardiff).

Vice-Presidents: Professor D. R. MACCALMAN, M.D., M.R.C.P.Ed. (Leeds); DORIS M. ODLUM, M.A., M.R.C.S., L.R.C.P., D.P.M. (London); HENRY V. DICKS, M.A., M.D., F.R.C.P. (London).

Hon. Secretaries: KENNETH SODDY, M.D., D.P.M., World Federation for Mental Health, 19, Manchester Street, London, W.1; JOSEPH P. SPILLANE, M.D., D.P.M., Whitchurch Hospital, Cardiff, Glam.

The following programme has been arranged.

Wednesday, July 15 (Room 110).—2 p.m., Interpersonal Relationships and Stresses within the Family. To be opened by Dr. H. V. DICKS (London) and Dr. W. S. MACDONALD (Leeds).

RADIOLOGY

President: PETER KERLEY, C.V.O., C.B.E., M.D., F.R.C.P., D.M.R.E., F.F.R. (London).

Vice-Presidents: J. A. C. FLEMING, M.B., F.R.C.S.Ed., D.M.R.E., F.F.R. (London); ERNEST HANSON, M.B., B.S., D.M.R. (Cardiff); E. ROHAN WILLIAMS, M.D., F.R.C.P., D.M.R.E., F.F.R. (London).

Hon. Secretaries: MARGARET D. SNELLING, M.B., M.R.C.P., F.R.C.S., D.M.R., Meyerstein Institute of Radiotherapy, The Middlesex Hospital, London, W.1; BRYAN WILLIAMS, M.R.C.P., D.M.R.D., 119, Cathedral Road, Cardiff.

The following programme has been arranged.

Wednesday, July 15 (Room 28).—10 a.m., Radiology of Congenital Heart Disease. To be opened by Dr. ROBERT STEINER (London), Congenital Angiocardiography in the Non-cyanotic Congenital Heart Diseases; Dr. THOMAS H. HILLS (London), Angiocardiography in the Cyanotic Congenital Heart Diseases.

SCIENTIFIC EXHIBITION

Sophia Gardens Pavilion, July 13-17, 1953

The Exhibition will be open each day from 9 a.m. to 6 p.m., and the following list gives brief details of the exhibits.

Welsh National School of Medicine, Department of Pathology and Bacteriology. Professor J. Gough and Mr. J. E. Wentworth. A new method of mounting permanent sections of whole organs on paper. This is of particular value in pulmonary conditions, as comparison is possible of the pathological changes with the radiological findings present during life.

Medical Research Council Pneumoconiosis Research Unit, Llandough Hospital, Cardiff. Dr. J. C. Gilson. Pneumoconiosis in coal workers.

National Coal Board, Hobart House, London, S.W.1. Dr. J. Rogan, Chief Medical Officer. Outline of the Board's medical research programme.

Leeds University Medical School and General Infirmary. Departments of Bacteriology and Dermatology. Dr. C. J. La Touche. The role of domestic and farm animals in the epidemiology of human ringworm.

St. David's Hospital, Cardiff, Departments of Obstetrics and Child Health. Professor A. G. Watkins. A breast-milk bank.

Cardiff Royal Infirmary, Departments of Surgery and Radiology. Mr. L. P. Thomas, Mr. R. J. Williams, and Dr. Bryan Williams. Abdominal radiography in the differential diagnosis of atypical appendicitis.

United Cardiff Hospitals. Dr. J. D. Spillane. Heart models. A series of life-sized coloured models illustrating the common congenital and acquired forms of heart disease.

Welsh National School of Medicine, Department of Tuberculosis, Professor F. Heaf; and the City of Cardiff Public Health Department, Dr. J. Greenwood Wilson, Medical Officer of Health. Tuberculosis: prevention, treatment, aftercare, results.

University of Wales Student Health Service. Dr. Graham Grant, Senior Health Officer. Student health.

University of Durham, Nuffield Department of Industrial Health. Professor R. C. Browne and Dr. R. I. MacCallum. (1) Erosion of human teeth in acid atmosphere. (2) Designing the machine to fit the man. (3) Miners' nystagmus.

Liverpool School of Tropical Medicine, Department of Tropical Medicine. Professor B. G. Maegraith. Liver circulation—pathogenesis of hepatic centrilobular lesions in malaria and other diseases. Respiration of the malaria parasite. The effect of milk diet on malaria.

Royal Army Medical College, Millbank, London, S.W.1. Major J. A. H. Brown, R.A.M.C. Progress made in the prevention, diagnosis, and treatment of the enteric group of fevers.

Medical Department of the Navy—Royal Naval Physiological Laboratory. Under-water blast. Oxygen poisoning. Diving problems.

Medical Branch of the Royal Air Force. Aviation medicine and applied physiology. Exposure suits; rations for extreme cold. Casualty air evacuation.

National Association for the Prevention of Tuberculosis, London, W.C.1. Statistics, treatment, and pathology of tuberculosis.

Welsh National School of Medicine, Medical Unit, and Department of Radiology, United Cardiff Hospitals. Radiology in the early diagnosis of upper gastro-intestinal bleeding.

Cardiff Royal Infirmary, Department of Urology. Mr. R. A. Mogg. Congenital abnormalities of the urinary tract.

The Medical Group of the Royal Photographic Society, London. A photographic exhibit of medical illustration techniques and examples of records obtainable.

Manchester Royal Infirmary, Departments of Neurosurgery, Neuro-radiology, and Medical Illustration. Mr. Richard Johnson, Dr. Reginald Reid, and Dr. Robert Ollerenshaw. The anatomy of hydrocephalus.

Guy's Hospital, London, S.E.1, Department of Surgery. Mr. Rex Lawrie. Demonstration of goitre by diagrams, illustrated material, and museum specimens.

The Welsh National School of Medicine, Surgical Unit, Cardiff Royal Infirmary. Professor Lambert Rogers. The carotid circulation.

The Gordon Hospital for Gastro-Intestinal Diseases, London, S.W.1. Mr. Lawrence Abel, Mr. Stanley O. Aylett, Mr. Gordon S. Ramsay, and Mr. H. Gordon Ungley. Diagnosis and treatment of cancer of the rectum.

Royal Cancer Hospital, London, S.W.1. Mr. Lawrence Abel, Dr. J. H. O. Earle, Mr. W. P. Greening, Mr. Michael Harmer. The treatment of cancer of the breast and its complications.

The Ministry of Health and Public Health Laboratory Service. Dr. W. H. Bradley, Dr. F. O. MacCallum, Dr. D. Thomson, and Dr. J. Cockburn. Poliomyelitis: 1947-53.

The Empire Rheumatism Council, London, W.C.1. The natural history and treatment of common types of arthritis.

United Cardiff Hospitals, Department of Physical Medicine. Dr. Kenneth Lloyd. Rehabilitation.

St. Thomas's Hospital, London, S.E.1, Department of Physical Medicine. Dr. P. Bauwens. Electrodiagnosis.

The National Maternity Hospital, Dublin. Master, Dr. A. P. Barry. Ante-partum haemorrhage.

Royal College of Surgeons of England. Professor Kenelm H. Digby. Methods of investigating the functions of the subepithelial lymphatic glands.

Hospital for Sick Children, Great Ormond Street, London, W.C.1. Mr. Denis Browne. Apparatus for orthopaedic treatment by controlled movement.

Rooksdown House, Basingstoke. Plastic and Oral Surgery Unit. Mr. A. J. Evans and Mr. H. C. Skillely. (1) Treatment of severe burns. (2) Treatment of fractures of the facial skeleton.

TIME-TABLE OF MEETINGS

R.—Events available for members of Representative Body and Ladies accompanying them.
L.—Events primarily arranged for Ladies.
U.—Events for all Members and Ladies accompanying them.

*Academic Robes should be worn.

Wednesday, July 8
8.30 to 10.30 p.m.—R. Sherry Party (by invitation of Cardiff Division)—University College, Cathays Park.

Thursday, July 9
9.00 a.m.—A.R.M. Inquiry Office opens at Y.M.C.A. (opposite Queen Street Station).
9.30 a.m.—Ladies' Club opens, University College, Cathays Park.

10.00 a.m.—Annual Representative Meeting, Cory Hall (opposite Queen Street Station).
3.30 p.m.—L. Tea and Bridge at Ladies' Club, and Tennis.

7.30 p.m.—R. Representatives' Dinner, New Continental Café, Queen Street.
8.00 p.m.—L. Representatives' Ladies' Dinner, Whitehall Rooms, Park Hotel.

9.30 p.m.—R. Representatives' Dance, New Continental Café, Queen Street.

Friday, July 10
9.00 a.m.—A.R.M. Inquiry Office open, Marble Hall, City Hall.
9.30 a.m.—Ladies' Club open, University College, City Hall.

9.30 a.m.—Annual Representative Meeting, Assembly Room, City Hall.
10.30 a.m.—L. All-day excursion to the Wye Valley, Usk, lunch at Somerset House.

10.30 a.m.—L. All-day excursion to the Wye Valley, Usk, lunch at Somerset House.

MAY 9, 1953

10.30 a.m.—L. Visit to the Dingle, Cefn On, with coffee.
11.00 a.m.—Welcome by Lord Mayor of Cardiff to A.R.M.
1.00 p.m.—Overseas Luncheon, Angel Hotel.
2.30 p.m.—L. Visit to Caerphilly and Castell Coch. Tea at Taffs Well.

5.30 p.m.—Sherry Party for Women Representatives and medical women accompanying Representatives, B.M.A. House, 195, Newport Road (by invitation of the South Wales Association of the Medical Women's Federation).

7.30 p.m.—Edinburgh Graduates' Dinner, Park Hotel.
7.30 p.m.—Aberdeen Graduates' Dinner, Royal Hotel.
p.m.—R. Evening Visit to Porthkerry House.

8.30 p.m.—R. Dinner-Dance at St. Mellon's County Club for 150.
p.m.—R. Short evening coach tours to be arranged.

Saturday, July 11

9.00 a.m.—Council Meeting, Council Chamber, City Hall.
9.00 a.m.—A.R.M. Inquiry Office open, City Hall.
9.30 a.m.—Ladies' Club open, University College.

10.00 a.m.—Annual Representative Meeting, City Hall.
10.30 a.m.—L. Visit to St. Fagan's Castle, with coffee.
2.30 p.m.—L. Visits to Coedardhyglyn and St. Nicholas, with tea.

p.m.—L. Bridge at the Ladies' Club.
7.30 p.m.—Welsh Dinner, New Continental Café.
7.30 p.m.—Glasgow Graduates' Dinner, Royal Hotel.

p.m.—R. Evening visit to Seabank Hotel, Porthcawl. (Dinner-Dance for 30.)
p.m.—R. Evening visit to St. Mellon's County Club.
p.m.—R. Channel cruise.

Sunday, July 12

10.45 a.m.—R. All-day excursion to St. Donat's Castle, with lunch and tea.
8.30 p.m.—R. Welsh Choral Concert, New Theatre, Park Place.

Monday, July 13

9.00 a.m.—A.R.M. Inquiry Office open, City Hall.
9.00 a.m.—Opening of Scientific and Trade Exhibitions by President-Elect, Sophia Gardens Pavilion.

9.00 a.m.—Reception Room opens at Sophia Gardens Pavilion for registration.
9.30 a.m.—Ladies' Club open, University College.

10.00 a.m.—Annual Representative Meeting, City Hall.
10.00 a.m.—L. All-day excursion to Brecon. Coffee at Tre-fraed forest Estate. Lunch at Brecon and Tea at Llangant-fraed.

10.30 a.m.—L. Visit to Caerleon.
12.30 p.m.—Annual General Meeting, City Hall. (at conclusion of A.R.M.).
p.m.—Council Meeting, Council Chamber, City Hall (at conclusion of A.R.M.).

2.00 p.m.—L. Golf at Radyr.
2.00 p.m.—L. Visit to Crickhowell, with tea by kind invitation of Lady Glanusk.

2.30 p.m.—U. Visit to Guest, Keen, and Nettlefolds Steelworks (for 30-40).
2.30 p.m.—U. Visit to Guest, Keen, and Baldwins Steelworks (for 30-40).

5.00 p.m.—Medical films.
8.30 p.m.—U*. Adjourned Annual General Meeting and President's Address, Park Hall Cinema, Park Place.

9.30 p.m.—U*. President's Reception, National Museum of Wales, Cathays Park.

Tuesday, July 14

8.30 a.m.—Members will robe in Mansion House for Roman Catholic Service.
9.00 a.m.—U*. Roman Catholic Service in St. Peter's Church, followed by Reception and Trade Exhibition open, Sophia Gardens Pavilion.

9.00 a.m.—Reception Room and Trade Exhibition open, Sophia Gardens Pavilion.
9.00 a.m.—Scientific Exhibition open, University College.

9.30 a.m.—Ladies' Club open, University College.
10.00 a.m. to 12.30 p.m.—Scientific Plenary Session ("Coronary Disease") at the Reardon Smith Theatre, Park Place.

10.30 a.m.—L. Visit to Coedardhyglyn, with coffee.
10.30 a.m.—L. Mannequin Parade, St. Mellon's County Club (for 200).

2.30 p.m.—Robing for Religious Service, St. John's Church.

3.00 p.m.—U*. Official Religious Service, St. John's Church.
5.00 p.m.—U. Mannequin Parade, St. Mellon's County Club.
5.00 p.m.—Medical films.
5.30 to 7.00 p.m.—U. Sherry Party (by invitation of Monmouthshire Division), St. Mellon's County Club (limited to 150).
8.30 p.m.—U*. Joint Reception by University College of South Wales and Monmouthshire and Welsh National School of Medicine, University College, Cathays Park (for 1,250).

Wednesday, July 15

8.30 a.m.—U. Annual Breakfast of the Christian Medical Fellowship, New Continental Café.
9.00 a.m.—Reception Room and Trade Exhibition open, Sophia Gardens Pavilion.

9.00 a.m.—Scientific Exhibition open, Sophia Gardens Pavilion.
9.30 a.m.—Ladies' Club open, University College.
10.00 a.m.—Scientific Sections, University College.

10.00 a.m.—L. Notts Ladies' Challenge Cup Golf Competition, Leys Golf Club.
10.00 a.m.—U. Leinster and Childe Cup Golf Competition, Southerndown Golf Club.

a.m.—L. Tennis Tournament.
10.30 a.m.—L. Visit to Barry, Rhose, and Nash Manor, with coffee.

10.30 a.m.—L. Visit to Duffryn Gardens, St. Nicholas, with coffee.
10.30 a.m.—L. Mannequin Parade, St. Mellon's County Club (for 200).

1.00 p.m.—Irish Graduates' Luncheon, Royal Hotel.
2.00 p.m.—Scientific Sections, University College.
2.00 p.m.—U. Visit to the Abbey Steelworks, Margam (limited to 90).

2.30 p.m.—Overseas Conference, Council Chamber, City Hall.
2.30 p.m.—L. Visit to Southerndown, with tea at Quaintways.
2.30 p.m.—Visit to N.C.B. Nantgarw Colliery (for 20 men).

2.30 p.m.—U. Visit to N.C.B. Coke Ovens, Nantgarw (for 30).
5.00 p.m.—"At Home" for Overseas and Foreign Delegates given by the Empire Medical Advisory Bureau, Cardiff Castle.

8.30 p.m.—U*. Civic Reception and Dance, City Hall (for 1,000).

Thursday, July 16

9.00 a.m.—Reception Room and Trade Exhibition open, Sophia Gardens Pavilion.
9.00 a.m.—Scientific Exhibition open, Sophia Gardens Pavilion.

9.30 a.m.—Ladies' Club open, University College.
10.00 a.m. to 12.30 p.m.—Scientific Plenary Session ("Fibrositis") at the Reardon Smith Theatre.

10.00 a.m.—Treasurer's Cup Golf Competition, Royal Porthcawl Golf Club.
10.30 a.m.—L. Conducted Tours—Cardiff Castle and Museum.

10.30 a.m.—L. Visit to Peterston, by kind invitation of Lady Reardon Smith.
10.30 a.m.—L. Conducted Tour of Llandaff Cathedral, with coffee.

2.15 p.m.—U. Garden Party, Margam (by kind invitation of Mr. Evans Bevan) (for 750).
6.30 p.m.—U. Coach Tour to Tintern, with Dinner at Beaufort Arms.

7.30 p.m.—Annual Dinner, Assembly Room, City Hall (limited to 400).
9.00 p.m.—U. Dance at St. Mellon's County Club (for 150).

Friday, July 17

9.00 a.m.—Reception Room and Trade Exhibition open, Sophia Gardens Pavilion.
9.00 a.m.—Scientific Exhibition open, Sophia Gardens Pavilion.

9.30 a.m.—Ladies' Club open, University College.
10.00 a.m.—Scientific Sections, University College.
10.30 a.m.—L. Visit to St. Fagan's Castle.

10.30 a.m.—L. Visit to Barry, with coffee at Llantwit Major.
2.15 to 4 p.m.—Scientific Plenary Session ("Overweight") at the Reardon Smith Theatre.

3.15 p.m.—Congregation of University to award Honorary Degrees, City Hall.
4.00 p.m.—U. Garden Party at Duffryn House (by kind invitation of the Board of Governors of the United Cardiff Hospitals) (for 500).

8.30 p.m.—Popular Lecture by Sir Russell Brain, Reardon Smith Theatre.

INVITATION FROM MONTECATINI

The authorities of Montecatini (Italy) have invited a party of 25 doctors, who may be accompanied by their wives, to spend a week at Montecatini as their guests. Montecatini is about 25 miles north-west of Florence, and is a spa specializing in diseases of the gastro-intestinal tract. The party will be given accommodation and full board for one week, but will be responsible for their own travel to and from Montecatini. Some lectures will be offered by Italian doctors, and there will be excursions to various centres in Tuscany. The date suggested is the week June 28-July 4.

Applications are invited from members interested in the treatment of gastro-intestinal diseases, and should be sent to the Secretary of the Association as soon as possible.

N.O.T.B. ASSOCIATION

The N.O.T.B. Association held its twenty-seventh committee meeting on April 24. It received and welcomed the views of the Ophthalmic Group Committee of the British Medical Association on the future developments in public relations for ophthalmology. A meeting of the appropriate N.O.T.B.A. subcommittee will be held in the near future.

The committee learned with pleasure of the support given by the Ophthalmic Group Committee of the B.M.A. to the recommendations in the N.O.T.B. Association's report concerning the status of the ophthalmic medical practitioner in the supplementary ophthalmic service.

Medical Eye Centres

After a full discussion on the minutes of the last two meetings of the Medical Appointments Subcommittee the committee decided to remind all members of the particular importance of the following rules concerning medical eye centres:

(a) No N.O.T.B. medical eye centre shall be opened, nor shall the medical staff of any existing centre be increased, without the approval of the association.

(c) All appointments to the medical staff of N.O.T.B. medical eye centres shall be subject to the approval of the association, and where there are more applications for any appointments than vacancies the selection shall be made by the association.

Representation on B.M.A. Ophthalmic Group Committee

Dr. R. U. Gillan, the annual retiring member for 1953, was unanimously re-elected to represent the association on the Ophthalmic Group Committee of the B.M.A. for 1953-4.

DINNER TO DR. S. WAND AND
DR. D. P. STEVENSON

Sets of Royal Crown Derby china were presented to Dr. S. Wand and Dr. D. P. Stevenson at a dinner held at the Midland Hotel, Derby, on Sunday, April 12, 1953, by the Derbyshire Local Medical Committee and the Derby Local Medical Committee.

In making the presentations Dr. E. J. Allan (Glossop) and Dr. E. C. Dawson (Derby) stressed the debt owed to Drs. Wand and Stevenson by the profession for their work towards obtaining the Danckwerts award.

In their replies both guests, in thanking the committees for their gifts, drew attention to the continuing need for unity within the profession, which to-day was as great as, if not greater than, during the period leading up to the events which the presentations recognized.

Correspondence

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

The Constitution of the B.M.A.

SIR,—Members should be greatly indebted to you for your series of articles on the constitution of the B.M.A., and particularly for the leading article on the Representative Body (*Journal*, April 25, p. 923). Many members who recognize the importance of a strong and active B.M.A. organized on lines so that it can cope effectively with modern medico-political problems, many indeed who realize that in the B.M.A. there stands the final hope of our survival as one profession, have during the last few years been conscious of an increasing sense of uneasiness. In any truly democratic body reform of its constitution must inevitably follow after the events which lead to the need for reform, and there is, therefore, bound to be a period when the organization is not working at its maximum efficiency (no matter how capably directed), and this danger period is one through which we have been passing during the last five years. An organization that was deemed adequate fifty years ago cannot be expected to keep up with the amount of work required of it to-day in this rapidly changing medical world. This work has doubled and trebled itself even in the last few years, and the speed of events is such that only an up-to-date machine can be expected to deal with it. To resist this modernization is a short-sighted policy. To leave it only partly complete would be disastrous.

It was with these thoughts in mind that the Winchester Division set out on its series of memoranda four years ago. It seemed rational at the start to concentrate on the main executive body—the Council of the Association. To our minds its efficiency was impaired primarily because it was out of touch with the opinions of the individual members of the Association. It will be remembered that there was sufficient support forthcoming for this view for us to be able to put the case to a Special Representative Meeting, and for reform to follow.

What was not seen so clearly at this time, and where we may be considered to have failed in our initial efforts, was the ever-increasing power of those offspring of the Council known then as autonomous bodies, but now as standing committees. The work of reform so successfully carried out by the R.B. has been to a dangerous extent neutralized by these autonomous committees, so that we see an otherwise active parent body held down and, at any rate in part of its work, virtually strangled by the offspring it so wittingly created. Steps so far taken to prevent this slow but steady delegation of power from central control to control by autonomy have amounted to a resolution by the Representative Body that the autonomous powers should be renewed each year, a mere paper transaction of no significance; and an accepted placebo in the Council that "standing committee" sounds better than "autonomous body" (no one has heard of the arrest of malignant disease by changing its name from "carcinoma" to "growth"). Both of these were face-saving and have merely evaded the better. For the rest, we have warning articles and letters in the *Journal*, backed up by the opinions of such men as Dr. Alfred Cox (*Supplement*, April 25, p. 145) and Dr. F. B. Winfield (*Supplement*, April 18, p. 139), but no constructive suggestions or strong, effective action to eradicate the danger.

Continuing this review of the modernization of the machine, it next seemed reasonable that the information service (I think its modern name is "Inter-professional Relations," to distinguish it from "Public Relations")

should be streamlined—and anything smacking of propaganda is a nauseating subject at the best of times to a conservative profession. Having a more active and well-informed Council and, we hoped, a more interested periphery (more must be said about this later), it was essential for efficiency that these two should be more closely knit and better informed of each other's day-to-day activities. This could be done along two lines: To individual members and by means of reports and notices in the *Journal*, and back again via the same medium in the shape of articles and letters from the members themselves; and to the Branches and Divisions through the Secretariat and the Public Relations Officer. The *Supplement* is now full of comprehensive information each week, and there can no longer be any excuse for suggestions that the ordinary member has little or no knowledge of what is going on at Headquarters in the running of his affairs, and the recent articles on the constitution of the Association must have done a great deal of good in rousing and maintaining the interest of members in their own Association. Similarly, the information services available for individual members at B.M.A. House, vices available for individual members at B.M.A. House, together with the increased club facilities, are worthy of high praise.

May we be forgiven if we point to one aspect of this subject in which no progress appears to have been made? I refer to the lamentable lack of interest shown by Headquarters in Divisional activities. It is now no exaggeration to say that until the Annual Report of Council appears in the *Journal* each year these important cogs in the machine are left virtually untended to fend for themselves and to rotate at their own speed, if at all. I say "if at all" advisedly, because even in an active Division such as Winchester attendances at meetings are falling off, so that well-advised meetings, with first-rate and well-known speakers, advertised meetings, with first-rate and well-known speakers, fail to attract more than a handful of members. Very few of the regular attenders at Divisional meetings can any longer be deceived that their views are of any interest centrally, since the number of times they—as Divisions—are asked to express their views during any one year can be counted on fingerless hands. The answers given centrally are that Divisions should be able to find their own means of keeping up the interest of members and not rely on Headquarters to do it for them; that the speed of events is such that there is not time to ask for the opinion of Divisions; that the Annual Report of Council gives Divisions ample material for debate. None of these is acceptable when we are engaged in modernizing the machine, for it primarily depends for its efficiency (indeed for its very existence) on the creation and maintenance of a membership actively interested in its own affairs.

No one doubts the amount of work being done by the committees of the Association and the Secretariat, but they exist to interpret the will of the members by close and to serve, and this they can only do effectively by close and continued contact with the Divisions. If for ten months of the year these latter are left to their own devices, active or inactive according to the whims of the local secretaries, the machine is useless. (Would it be too much to ask, for example, that a bulletin, containing notes by individual members of the Secretariat, the Public Relations Officer, and chairmen of committees, should be circulated to Divisions each month? This small step alone would be of immense help to the hard-working and oft-despairing secretaries of Divisions.)

Weighing up what has been said so far, we find ourselves facing two major weaknesses in our reorganization: an active Council rendered increasingly impotent by its own standing committees—this might fairly be described, I think, as a weakness that has grown up in recent years, and hardly existed when the work of modernization began; and Divisions rendered increasingly impotent through lack of an efficient liaison service with Headquarters—an old weakness which has become more obvious in recent years and has, so far, resisted change.

But one part of the machine has not yet been touched—the Representative Body—and it may well be that in

remodelling this we could succeed also in eliminating the two potentially dangerous elements we have discussed in the last paragraph. Even the most superficial glance at the constitution and activities of the Representative Body reveals that this parliament of the Association is itself being influenced by these same autonomous bodies, and being weakened in its debates by the knowledge that the Divisional meetings, upon whose deliberations it depends in the shaping of the policy of the Association, are more sparsely attended than ever before in their history.

How, then, to modernize the parliament? From the first it is obvious that the Representative Body in future, to be effective, must not only represent active Divisions but each separate section of the profession. We may regret that these sections have developed, but it would be foolish not to recognize their existence (the National Health Service Act, as Dr. H. G. Dain explained to us in his recent Winchester address, divided the profession into three. It is not for us to perpetuate this fragmentation but to eliminate it). Building on this foundation, what changes are necessary in the creation of a new parliament?

(1) To reduce its numbers so that it is of such a size that it can do its work with maximum efficiency.

(2) To cut down its agenda so that each item receives the attention it deserves, from the first page to the last.

(3) To increase its sectional representation so that the major standing committees have a personal interest in its deliberations and decisions. This will encourage them to take more than a superficial glance at motions passed to them from the R.B., and to carry into effect the intentions of their Parliament, not just note them and decide that "no action is necessary at present"—so completely nullifying the activities of the ordinary members in Divisional meetings and the Representatives who successfully present their resolutions.

(4) To ensure that among the elected Representatives such an arrangement exists that no section—for example, the general practitioners—can be accused of swamping the resolutions of interest to its colleagues (the argument against this latter view is that if representatives are elected by Divisions and sent to the R.B. to represent them the R.B. must, verily, be truly representative. Against this is the obvious fact that one section of the profession—the general practitioners—greatly outnumber the other two and must inevitably have a greater number of representatives, irrespective of whether the G.P.s take a more active interest in Divisional affairs than their colleagues or not).

Following on the above, it is common sense to suggest that reform must not be weakened by inadequate consideration, must not be incomplete in any detail, and must not be sterilized by a lack of determination to face and eliminate every existing fault. Old concepts of adequate representation will inevitably have to be discarded, as will also old ideas of representing one profession by one man. None of this can be done in a day, or even in the course of one Annual Representative Meeting, and it would be disastrous if the new parliament were to be built up piecemeal by means of isolated motions designed merely to patch up the present constitution. In reorganizing the Council the R.B. was able to take a comparatively detached and unselfish view of the reforms needed. A different situation arises when the most important body of the Association undertakes to reform itself. Before this can be done it must have a clear view of its own weaknesses and must be prepared to act unselfishly and ruthlessly to eradicate them. A new parliament must be built on firm foundations and not on the ruins of the old.

It is to be hoped, therefore, that the R.B. will, as you have suggested, instruct Council to form a constitution committee of the Association which can devote its time solely to this problem (for no existing committee has the time to deal with this together with all its other business). To do this the committee will have to take evidence from all sources—Branches and Divisions; Council; standing committees; prominent and well-informed individual members of the Association (and we must name Dr. Alfred Cox in this group); and any outside source which may be deemed to have sufficient knowledge of such an organization that it can help usefully the Committee in its work. In

this connexion it will no doubt be noted that Council is already employing a team of experts to reorganize the "office" side of the Association. Such people could undoubtedly give good advice also in the reorganization of the R.B. The Winchester Division hopes to collect reports from as many Divisions as possible by July, to spend some weeks in analysing and grouping them, and then to produce a concise memorandum based on the majority view which, it is hoped, may be accepted as useful evidence.

When the R.B. is reconstituted so that it can regain its lost power, has become truly representative of all Divisions and sections of the profession, and can properly bring to action the wishes of the ordinary member in Divisional meetings, the danger period through which we are passing will be over and we shall be able to go ahead in this jet-propelled age with a machine which is second to none. For the future, many will support Dr. Dain's view that the Association must work for a reorganization at the periphery so that one body in each geographical area represents the interests of all sections of the profession. The increased strength this would give to the framework of the Association is immeasurable, but it will be impossible to achieve until our own reorganization is completed.—I am, etc.,

Winchester.

RONALD GIBSON.

The Cost of Prescribing

SIR,—If your special correspondent (*Journal*, March 28, p. 723) or the writer of your leading article on the Health Service estimates (p. 716) had listened to my remarks at the last A.R.M. on the 1s. charge for prescriptions they would not have expressed the surprise they did at certain figures for pharmaceutical services.

I suggested that so far from acting as a deterrent the prescription charge was quite likely to lead to extravagance and waste—for the following reasons. (1) There would be an inevitable tendency to prescribe larger bottles of medicine or more tablets, etc., for many perfectly good reasons, yet much of the extra medicine would not, in fact, prove necessary or be used. (2) There is a natural human tendency in the circumstances for patients to anticipate their needs, and when coming for a repeat prescription to ask for something which they do not actually need at the time and may never need at all. (3) It was also almost certain—as has happened—that prescriptions for more than one member of the family would be prescribed on one form, and finally that the charge actually weakened the doctor's position, as the patient would reply, "But, Doctor, I'm paying for it now."

For these reasons—and there may be others—it is no surprise to find that the cost of drugs has not diminished or that "the reduction in the estimated yield from the charges in the coming year is not greater than it is." To prevent these evasions of charges extremely heavy penalties are authorized, but I think I also mentioned that the very severity of the penalties would prevent them ever being imposed except in most outrageous cases, and that as both patient and doctor would be equally liable it would be practically impossible to get the necessary evidence to convict either.

Hope for diminution of the drug bill should come, as I suggested in *The Times* of March 10, from a thorough and acceptable revision of the *National Formulary*. I think this might bring it down by five or perhaps even seven or eight million pounds, with actually increased satisfaction to patients as well as doctors. The other, and more immediate, prospect of relief is suggested by the anomalous Scottish figures, which show a reduction of £500,000. This is not, I fear, due to improved prescribing in Scotland, where appreciably more proprietary drugs are ordered than in England. I think it is most probably due to the use in Scotland of E.C.10A so that doctors there are encouraged to keep stocks of some drugs and can give on the spot, say, one pil. col. co. instead of ordering a dozen, of which 11 may not be required. They can also, for example, give a patient with an influenza cold a few febrifuge tablets, one or two sleeping tablets, and prescribe one item instead of three.

If the Minister of Health would sanction the use of E.C.10A in England, and encourage doctors to carry round small supplies of drugs for immediate use, the Scottish

figures suggest that he could immediately cut a million or two off his estimates and make everyone—except the chemists and some manufacturers—much happier in the process, and do something to diminish sickness absence. These two measures I have outlined might well reduce the cost of pharmaceutical services by 10–15% and are vastly preferable to any attempt to interfere with prescribing in the interests of economy.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

The Malayan Medical Service

SIR,—In view of the specious and superficially attractive advertisements of appointments in the Colonial Medical Service which appear weekly in the *Journal*, I think it is necessary that prospective applicants should be informed of certain facts concerning the Service which are not advertised and which the Colonial Office will certainly not pass on to them. I was a member of the Colonial Medical Service for 9½ years, serving in the Gold Coast, Borneo, and Malaya; I resigned a year ago, and the circumstances which led to my resignation are, I think, an example of what any candidate for appointment to the Service should know.

Pre-war, the Malayan Medical Service was almost entirely a European service, local graduates from the medical college in Singapore being appointed to the Assistant Medical Service, although promotion to the Malayan Medical Service was given to a few outstanding Asians. In 1946 a Socialist Government, determined to give self-government to Malaya, announced its intention of combining the Malayan Medical Service and the Assistant Medical Service into a single entity. It was implied that the position of the European medical officers would be safeguarded in some way acceptable to them. After this, however, discussion went on for five years, and it finally became apparent that for any scheme to be acceptable to the European medical officers it must contain an escape clause permitting anyone to whom the new service was not acceptable to retire without financial loss—that is, he would receive a pension or gratuity in recognition of the service he had already given. This the Government refused to accept, for the obvious reason that it feared the collapse of the service if the leavening and stiffening influence of its European members disappeared. Accordingly, early in 1952, the Government announced the nature of the scheme it intended to introduce and make retroactive to January 1, 1947. The European medical officers were given the option of entering the new service or resigning their appointments, but it was made clear that anyone who did resign would forfeit his pension, and no claim to compensation would be considered. With this decision the Secretary of State has declined to interfere.

I was one of the fortunate ones. Being still young, and without dependants, I was able to cut my losses and make a fresh start elsewhere. (Lest it should be thought that this letter is prompted by "sour grapes," may I state that I am now infinitely better off in every way than I ever was in the Colonial Service.) Many of the older men, however, were not so fortunate. A man in the middle or early forties, with children at school in England, and who had already given 15 or 20 years' service, would jeopardize the financial security of his dependants if he resigned. Few were prepared to do this, and consequently most have remained in the service, embittered and resentful, for I have reason to believe that the new proposals are unacceptable to 90% of the European medical officers. The Government obtained what it wanted, and compelled its European medical officers to enter the new service by the familiar application of economic sanction.

Any recent graduate who is considering joining the Colonial Medical Service as a permanent career should think well before putting his head into the noose. The appointments are superficially attractive—good rates of pay, at any rate in the Far East, long periods of home leave on full pay, a pension at 50, etc. But the apparent security is based upon sand. An officer's terms of service can and will be altered if at any time it becomes politically expedient to alter them, and he will have no redress whatsoever. Furthermore, it now seems that promotion to the most senior posts depends not on ability but on politics. A single short contract is to some extent free from these objections. For a recently qualified man a short contract of 2–3 years provides an opportunity to see the world and to gain

experience, professional and otherwise, and he will receive a gratuity at the end. Having seen conditions, it is highly unlikely that he will renew his contract. But I seriously warn any man thinking of joining the permanent service to think hard first.—I am, etc.,

Alberta, Canada.

G. A. MOTT.

The National Formulary

SIR,—I am delighted to have the support of Dr. W. N. Leak and Dr. S. G. Hamilton (*Supplement*, April 25, pp. 155 and 156) in my campaign against the *National Formulary*, but distressed at the reactionary attitude of the General Medical Services Committee, who seem all in favour of Latin and against the idea that any drug could be used for any special condition. This is surely a book for the use of British doctors, so what are these dreadful inter-national repercussions which will happen if we use our own language? I used, too, to be under the illusion that Latin was international, till I tried to get a Latin prescription made up in Italy, and was informed that there they were always written in Italian. Must we all be sacrificed to the very rare foreign doctor who wants to get a prescription dispensed here? It is on all fours with the campaign for the adoption of the metric system, a system designed for those who can only count on their fingers. If the G.M.S. Committee is so very keen to avoid all therapeutic suggestion, why do drops have to have different names according to whether they are poured into the eye, the ear, or the nose? This book must be designed for the person who uses it—the prescriber—and not for academic people who want to air pet theories.

There are, I believe, people who have actually been trained and had long experience at classifying and indexing—librarians, for example. Could not the advice of one such expert be taken on making this book reasonable?—I am, etc.,

W. EDWARDS.

Ashhead, Surrey.

SIR,—The chief weakness of the *National Formulary* is that one cannot rapidly turn up any particular group of preparations. I would suggest, therefore, that consideration be given to the "thumb-nail" method of indexing for easy and rapid reference. One glance down the right-hand side of the volume would be sufficient to locate the group required—e.g., mist., tabs., linct., etc.—and the preparation of choice would then be readily selected.—I am, etc.,

R. DAWSON.

Middleton-in-Teesdale.

The Registrar Problem

SIR,—In our sympathy for the displaced registrar we are in danger of forgetting that there are two distinct problems to be faced; both of these have been created by forces outside the profession, but their solution must concern us all closely. In the great majority of non-teaching hospitals registrars are a fairly new creation, and, viewed merely as pairs of hands, were an addition to those already present. Their presence had many advantages and they had much to offer the various departments, but this does not alter the fact that, to the official eye, there was a certain amount of overstaffing, and this enabled the regional boards to rid themselves in various ways of elements in their hospital staffs which they thought to be unsatisfactory. There followed the dismissal or forced resignation of many who had given years to the hospital service but who were tainted by general practice.

The resignation of the general-practitioner specialists redressed for a time the overstaffing situation. The work they did was taken over by registrars, even more of whom were created, and all might have gone well had it not become necessary to assure a future to the registrars themselves. The failure of this assurance and the forced reduction in the number of registrars have suddenly so reduced the numbers in all departments that we are faced with a breakdown in some of them. General surgical departments are probably the worst hit for obvious reasons, and I know of some

in which list-work is coming to a standstill. If the ranks of the G.P. specialist had not been decimated by official action, the removal of the registrars would have done little more than return us to the situation of a few years ago, but the absence of the former has exposed the bare bones of the Service, and things are little short of desperate. It does appear to me that a little wisdom would have foreseen the present situation, and it is tragic that those thrown up into positions in which they could influence the growth of the new Service should have been proved to be so lacking in sagacity.

It is generally admitted, except amongst the diehards, that there must be a return of the part-time G.P. specialist. We should admit at once that the plan to staff the hospital service from within itself has not been very successful, and the sooner we start to work out the details and get these men back the better. Recent experience has convinced me that the regional boards think this is going to be easy, but I have never known of any process of turning back the clock that was, and I am sure that this is no exception. There are very real problems to be solved.

Many of us have directed the accusation of cheap labour against the registrar system, and Mr. Green-Armytage has recently renewed this charge (*Supplement*, April 25, p. 156). The part-time G.P. specialist cannot hope to take on more than six sessions, and these represent a very large proportion of his working week, and for this he will get about £1,000 a year. The accusation of cheap labour is not going to be met merely by changing the operative's title.—I am, etc.,

Swindon.

GUY ROWORTH.

SIR,—Mr. V. B. Green-Armytage's letter (*Supplement* April 25, p. 157) is timely. His proposals for the utilization of the gynaecological and obstetric registrars might well be applied to registrars in other fields.

In the light of present conditions, however, the majority of registrars can never hope to achieve full consultant status, and will inevitably turn to general practice. They are more likely to obtain openings in their own localities than elsewhere. As general practitioners they could usefully continue some of the work they did as registrars by means of some such appointment as part-time clinical assistant on a sessional (and regular) basis.

The retention of highly trained registrar personnel in this capacity would be of advantage, both on the grounds of common humanity and of expediency. Men who had sacrificed everything for a specialist career would not feel that all was lost nor experience the sense of bitter disappointment and frustration which would otherwise inevitably follow, while at the same time they would be performing a useful service to the community by helping to solve the critical shortage of efficient junior specialist staff which exists in many hospitals to-day.—I am, etc.,

Wolverhampton.

H. W. CHADFIELD.

The Trainee Assistant Scheme

SIR,—I would like to disagree with the impression created by Dr. Tom Russell (*Supplement*, March 28, p. 95) that the trainee assistant merely eases the work of his principal and receives little training in return. We must not forget that the principal takes full responsibility for all the deeds and misdeeds of his trainee, a matter of some importance in these days when patients are all too ready to go to law.

My traineeship started in November and as yet I have done no night work. I have had ample time off to attend clinics, visit hospitals, and study for a postgraduate examination, in spite of its being one of the heaviest winters for the G.P. for many years. My principal informs me that, so far as London is concerned, mine is the usual lot.

Finally, what does Dr. Russell recommend for holidays? Should someone who does not know the patients, and who has probably had less experience in general practice than I have, take my place?—I am, etc.,

London, S.W.10.

ANGELA MANNING.

Association Notices

ANNUAL REPRESENTATIVE MEETING,
CARDIFF, 1953Resolutions by Divisions of which Two Months' Notice
is Given*The Membership Subscription*

Motion by Tunbridge Wells Division: That the membership subscription be modified for members who are assessed under Schedule E so that the net cost of membership may be equitable throughout the profession.

Membership of Divisions and Branches

Motion by Rugby Division: That members of the Association shall ordinarily be allocated, as hitherto, to the various Divisions (and Branches) purely on an address basis, but where by reason of ease of access, professional association, or for any other reason, a member finds it more convenient to attend the meetings of some other Division (or Branch) that member may, on application to Head Office, be transferred to the Division (or Branch) of his choice.

DIVISIONS OF NEW ZEALAND BRANCH

Notice is hereby given by the Council of the formation of a Marlborough Division of the New Zealand Branch, and of the change of name of the North Auckland Division to Northland Division and of the Palmerston North Division to Manawatu Division.

A. MACRAE,
Secretary.

Diary of Central Meetings

MAY

- 13 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m. (*date changed from May 12*).
- 14 Thurs. Central Consultants and Specialists Committee, 12 noon.
- 15 Fri. Glasgow Arrangements Committee, 11 a.m.
- 20 Wed. **Conference of Honorary Secretaries**, 10.45 a.m.
- 21 Thurs. G.M.S. Committee, 10.30 a.m.
- 27 Wed. Alcohol and Road Accidents Committee, 2 p.m.
- 27 Wed. Consultants and G.P.s Liaison Executive Committee, 2 p.m.
- 27 Wed. Film Committee, 2 p.m.
- 28 Thurs. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
- 28 Thurs. Central Ethical Committee, 2 p.m.
- 28 Thurs. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 2 p.m.
- 29 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.

JUNE

- 5 Fri. Library Subcommittee, Science Committee, 12 noon.
- 9 Tues. Joint Conference between Representatives of the Occupational Health, G.M.S., and Central Ethical Committees on Continued Treatment by Industrial Medical Officers, 2.30 p.m.
- 17 Wed. **Annual Conference of Representatives of Local Medical Committees**, 10 a.m.

Branch and Division Meetings to be Held

BATH, BRISTOL, AND SOMERSET BRANCH.—At Bridgwater and District Arts Centre, 11, Castle Street, Bridgwater, Thursday, May 14, 8.30 p.m., meeting. B.M.A. Lecture by Professor E. J. Wayne: "Uses and Abuses of Antibiotics."

BROMLEY DIVISION.—At Wellcome Research Laboratories, Langley Court, Beckenham, Saturday, May 16, 3 p.m. to 6 p.m., garden party. All medical practitioners and their friends in the area of the Division are invited.

BURTON-ON-TRENT DIVISION.—At Burton Golf Club, Ashby Road, Tuesday, May 12, 7.45 p.m., dinner, followed by A.G.M.

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, May 12, 8.30 p.m., annual general meeting. Film show to follow: (1) Some Aspects of Accessible Cancers: (a) Lip, Tongue, and Mouth; (b) Cervix and Uterus; (2) Endocrinology of the Menstrual Cycle.

DORSET DIVISION.—At The Clinic, Glyde Path Road, Dorchester, Friday, May 15, 8.30 p.m., meeting. Annual B.M.A. Lecture by Dr. W. W. Bridgen: "Recent Advances in the Treatment of Cardiovascular Disease."

EAST HERTS DIVISION.—At Gilston Park Hotel, Friday, May 15, 9 p.m. to 1.30 a.m., supper dance.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, May 14, 7.30 p.m., dinner; 8.45 p.m., special general meeting.

ENFIELD AND POTTERS BAR DIVISION.—At St. Michael's Hospital, Chase Side Crescent, Enfield, Friday, May 15, 8.30 p.m., third annual meeting.

LANCASTER DIVISION.—At Alexandra Hotel, Lancaster, Friday, May 15, annual general meeting.

LEEDS DIVISION.—At Queen's Hotel, Leeds, Wednesday, May 13, Jubilee dinner.

LEWISHAM DIVISION.—At Lewisham Hospital, High Street, S.E., Friday, May 8, 8.30 p.m., annual general meeting.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, June 9, 2.30 p.m., annual general meeting. President's address by Dr. J. Arthur Moody: "Founders of the Branch and their Problems."

SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, May 8, 9 p.m., meeting. Dr. J. C. Sawle Thomas will address the Division and invite questions about local difficulties in disposing of and treating cases of mental ill-health.

SOUTH-WEST ESSEX DIVISION.—At Connaught Hospital, Orford Road, Walthamstow, E., Wednesday, May 13, 8.30 p.m., A.G.M.

STIRLING BRANCH.—At Golden Lion Hotel, Stirling, Sunday, May 17, 7 p.m., annual general meeting; 8 p.m., dinner.

SWANSEA DIVISION.—At Pennard Golf Club, Saturday, May 16, annual competition for the Cellan-Jones Golf Trophy.

WANDSWORTH DIVISION.—At St. James' Hospital, Ouseley Road, S.W., Friday, May 15, 8.45 p.m., annual general meeting.

WEST DENBIGH AND FLINT DIVISION.—At Marine Hydro Hotel, Rhyl, Wednesday, May 13, 8 p.m., annual meeting.

WIGAN DIVISION.—At Wrightington Hospital, Thursday, May 14, 2.30 p.m., clinical meeting.

B.M.A. LIBRARY

The following books have been added to the Library:

- Alberti, G.: *Per una Nuova Fisiologia Sociale dell'Alimentazione*. 1952.
- Anderson, W. A. D.: *Synopsis of Pathology*. Third edition. 1952.
- Bailey, P., and von Bonin, G.: *Isocortex of Man*. 1951.
- Barton, E. A.: *A Doctor Remembers*. Second edition. 1950.
- Bett, W. R.: *Infirmities of Genius*. 1952.
- Black, C. P. (Editor): *Problem Families: Five Enquiries*. 1952.
- British Pharmacopoeia, 1953.
- Brotherston, J. H. F.: *Observations on the Early Public Health Movement in Scotland*. 1952.
- Bucher, K.: *Reflektorische Beeinflussbarkeit der Lungenatmung*. 1952.
- Burrows, H., and Horning, E. S.: *Oestrogens and Neoplasia*. 1952.
- Burrows, H., and Raven, R. W.: *Surgical Instruments and Appliances Used in Operations*. Fourteenth edition. 1952.
- Clark-Kennedy, A. E.: *Medicine*. Second edition. Vol. 1. The Patient and His Disease. 1953.
- Clayton, E. B.: *Electrotherapy and Actinotherapy*. Second edition. 1952.
- Colb, S.: *Foundations of Neuropsychiatry*. Fifth edition. 1952.
- Colyer, Sir F.: *Old Instruments Used for Extracting Teeth*. 1952.
- Dodson, A. L., and Gilbert, D. L.: *Synopsis of Genitourinary Diseases*. Fifth edition. 1952.
- Drake, D.: *Practical Essays on Medical Education and the Medical Profession in the United States, 1832*. 1952.
- Dubos, R., and Dubos, J.: *The White Plague: Tuberculosis, Man, and Society*. 1953.
- Duncan, C. G. (Editor): *Diseases of Metabolism*. Third edition. 1952.
- Edwards, H.: *Evidence for Spirit Healing*. 1953.
- Fanconi and Wallgren's Textbook of Paediatrics. Edited by W. R. F. Collis. 1952.
- Ford, F. R.: *Diseases of the Nervous System in Infancy, Childhood, and Adolescence*. Third edition. 1952.
- Franklin, R. H.: *Surgery of the Oesophagus*. 1952.
- French, C. N.: *The Story of St. Luke's Hospital*. 1951.
- Garrod, Batten, and Thursfield's *Diseases of Children*. Fifth edition edited by A. Moncrieff and P. Evans. Two volumes. 1953.
- Glasser, O., et al.: *Physical Foundations of Radiology*. Second edition. 1952.
- Graybiel, A., et al.: *Electrocardiography in Practice*. Third edition. 1952.
- Grulee, C. G., and Eley, R. C.: *The Child in Health and Disease*. Second edition. 1952.
- Gualberto de Oliveira, O.: *Cirurgia do Rim en Ferradura: Tese*. 1950.
- International Tuberculosis Campaign: *Mass B.C.G. Vaccination in Poland, 1948-9*. 1950.
- Jaeger, F.: *Der Bandscheibenvorfall*. 1951.
- Jones, M.: *Social Psychiatry*. 1952.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 23 1953

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British Medical Association

SUPPLEMENTARY ANNUAL REPORT OF COUNCIL, 1952-3

Every member is asked to keep this Supplement, with the earlier one of April 4, until the subjects have been discussed by his Division.

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PRELIMINARY

Death of Her Majesty Queen Mary

205. On behalf of the members of the Association an Address signed by the Officers of the Association was submitted through the Home Secretary to Her Majesty the Queen on the occasion of the death of Her Majesty Queen Mary.

Arrangements for Future Annual Meetings
(Continuation of para. 7 of Annual Report)

206. The Council is suggesting to the Canadian Medical Association that the proposed Joint Meeting of the two Associations in the British Isles should take place in 1959.

Extraordinary General Meeting
(Continuation of para. 8 of Annual Report)

207. The Extraordinary General Meeting referred to in para. 8 of the Annual Report was held on May 5, when some 800 members were present. A report of the meeting was published in the *Supplement to the British Medical Journal* of May 9 (p. 205).

Delegate to Annual Meeting of the Canadian Medical Association

208. Dr. Robert Forbes (London), who will be visiting Canada at the time, has been appointed as the Association's delegate to the Annual Meeting of the Canadian Medical Association, to be held in Winnipeg in June, 1953.

Purchase of Silver Tray which belonged to Sir Charles Hastings

209. The Association has acquired by purchase a large silver tray which was presented to Sir Charles Hastings on his retirement from the staff of the Worcester Infirmary. The tray bears the following inscription:

"Presented to Sir Charles Hastings, M.D., D.C.L., F.G.S., on his retirement from the office of Honorary Physician to the Worcester Infirmary in acknowledgment of his unwearied and important services to that Institution for a period of forty-nine years, of his unceasing efforts to promote the scientific and social interests of his native City and County, and to unite in cordial co-operation the feelings and energies of the Provincial Medical Practitioners.

"Jan. 9th, 1862."

Cricket Match against the Law Society

210. In response to a challenge from the Law Society Cricket Club, arrangements are being made for a team representing the Association to play against this club. According to present arrangements the match will be played at Hurlingham on Sunday, July 5.

GENERAL MEDICAL SERVICES**Model Distribution Scheme**

(Continuation of para. 25 of Annual Report)

211. Regulations have now been made to give effect to the Working Party's proposals. They include a model distribution scheme which covers payments to be made by executive councils by way of capitation payments, loadings, fees for emergency treatment, anaesthetics, and temporary residents, and the supplementary distribution to be made by executive councils after the end of each year. Unfortunately, there has been insufficient time for local executive councils and local medical committees to consider and secure the approval of the Minister to any local variations which they wish to introduce, and, in consequence, the model scheme will operate without modification for the year beginning April 1, 1953. It is open to local medical committees to consider whether they wish to suggest any modifications in the model scheme for subsequent years.

The Danckwerts Award and the Small-list Practitioner

(Continuation of para. 27 of Annual Report)

212. Following the Committee's decision to invite the full Working Party to carry out an investigation into the number and categories of practitioners who might suffer injustice under the new distribution scheme, a meeting of the Working Party has now been held. Arrangements have been made to proceed immediately with the investigation.

Assistance for Elderly Practitioners

(Continuation of para. 28 of Annual Report)

213. Following discussions with the Committee, the Ministry has now issued instructions to executive councils which implement the recommendation of the Working Party for the relief of any cases of hardship among elderly practitioners resulting from the new distribution scheme. Generally, financial help will be given to doctors who were aged 65 or over when the scheme came into operation, or who subsequently attain that age, and are actively engaged in single-handed practice in the National Health Service. For this purpose, a list of 500 persons will normally be taken as an indication that a doctor is so engaged, but, particularly in rural areas, executive councils have discretion to accept claims from doctors with smaller lists if they are satisfied that it is reasonable to do so.

For the year 1953-4 the maximum rate of payment will be £350 per annum, decreasing in proportion to the number of patients on the doctor's list in excess of 500. Subject to the maximum of £350, the payment will be sufficient to bring the doctor's income from all professional sources to £1,250, and it will be subject to reduction by the amount of any special payment made in accordance with the Working Party's Report to a practitioner who had previously been in receipt of a fixed annual payment for three years or more.

Payment of Partners on the Basis of Notional Lists

214. The Ministry has agreed that new partnerships which were entered into on April 1, 1953, would be effective for the purpose of payment on the basis of notional lists as from that date, although confirmation of the inclusion of the new partner in the medical list might not have been received from the Medical Practices Committee until a somewhat later date.

Provisional Inclusion in the Medical List

(Continuation of para. 31 of Annual Report)

215. Following discussions with the Medical Practices Committee, it has now been agreed that, where a practitioner applies for provisional inclusion in the list, such an application will be granted for a period of at least one month, without the applicant having to show that he has acquired practice premises. If at the end of that time another practitioner, who is already in possession of premises, is seeking inclusion in the list, then the period of provisional inclusion will not be extended. If, however, no other applications have been received from practitioners who have premises available, then the period of provisional inclusion may be extended by a further period not exceeding two months.

Committee on General Practice of the Central Health Services Council

(Continuation of para. 33 of Annual Report)

216. The Council's memorandum of evidence has now been completed and submitted to the Committee on General Practice of the Central Health Services Council. The memorandum appears as Appendix B to the Report of the General Medical Services Committee to the Annual Conference of Local Medical Committees, published in the Supplement to the *British Medical Journal* of May 2, 1953 (p. 180). A reprint of the memorandum will be issued to Representatives with the agenda of the A.R.M.

Medical Services Committee Procedure

(Continuation of para. 43 of Annual Report)

217. The Report of the Special Subcommittee which has been reviewing the functions of the Tribunal and Service Committees has now been completed, and its conclusions, which have been approved by the parent Committee, are set out in Appendix IV.

Throughout its deliberations the Subcommittee was assisted in its task by representatives of the British Dental Association and the National Pharmaceutical Union, and its conclusions represent the views of the representatives of all three professions.

Responsibility of a Partner for the Acts or Omissions of his Deputy or Assistant

218. The Committee has considered carefully the position of a member of a partnership in relation to his responsibility for the acts or omissions of a second practitioner acting as his deputy or assistant.

Under his terms of service, a practitioner is held responsible for his deputy's acts or omissions, and, while the Committee

appreciates that this provision may be equitable in the case of assistants and locums, it holds that where a partnership exists each partner should be held fully responsible for his own actions. Moreover, in this respect the terms of service appear to be at variance with the provisions of the Partnership Act. The Committee is therefore initiating discussions with the Ministry with a view to securing an appropriate amendment of the terms of service.

National Formulary

219. The Committee's views were sought by the Joint Formulary Committee on the "lay-out" which would be most useful to prescribers should it be necessary to publish two editions of the *Formulary*, preserving the alphabetical classification in the edition used mainly by pharmacists, which may be predominantly in Latin. It had been suggested that with a gradual change in the use of English nomenclature there should also be a change to a pharmacological rather than an alphabetical classification.

After careful consideration, the Committee feels that the majority of prescribers would not welcome a *Formulary* compiled in this way, and the Joint Formulary Committee has been so informed. The Committee, for its part, also holds that there are many advantages in reverting to the use of Latin throughout.

COMPENSATION AND SUPERANNUATION
Superannuation Contributions on Notional Lists

220. Following the introduction of the revised Distribution Scheme, which gives practitioners the option to be paid on notional lists, the Council has asked the Ministry of Health to reverse the procedure laid down in Regulation 46 (2) (b) of the National Health Service (Superannuation) Regulations, 1952, for assessing superannuation contributions.

Under the present regulations partners pay contributions based on the numbers on their respective lists unless they notify the executive council that they wish their deductions to be made in proportion to their partnership shares. The suggested amendment will provide that, ordinarily, contributions will be based on the partnership shares and that only if all partners assent by notice in writing to the executive council will payment be made in accordance with individual lists. Thus, before contributions can be related to lists, a positive step, agreed by all partners, will have to be taken. This, in the opinion of Council, will safeguard the superannuation position of all members of a partnership.

REVIEW OF GENERAL PRACTICE

(Continuation of para. 61 of Annual Report)

221. The editing of the report of the General Practice Review Committee has now been completed and the Council has decided to publish the report as a special number of the *British Medical Journal* in September.

HOSPITAL AND CONSULTANT SERVICES
Hospital Medical Staffing

(Continuation of para. 64 of Annual Report)

222. Although the recent instructions issued by the Ministry on hospital staffing economies do not involve any reduction in medical staffs, the Joint Committee has called the attention of the Ministry to the possible effect of a reduction in technical staff on the efficiency of the medical services. In reply, the Ministry has stated that the 5% reduction of staff called for applies to a wide category of posts of which medical auxiliaries form only a small part, and that the reduction would not necessarily involve technical staff. In any event, the 5% reduction was a target figure and boards were not expected to reduce staff to an extent that would interfere with efficiency.

The Ministry has again assured the Joint Committee that it will discuss with it the results of the hospital medical staffing survey as soon as the survey is complete and before any final steps are taken by the Department.

Review of Remuneration of Hospital Medical Staff

(Continuation of para. 65 of Annual Report)

223. It is regretted that the Council is unable to report any developments in connexion with the claim for a review of the remuneration of hospital medical staff, as the Staff Side of Committee "B" of the Medical Whitley Council is still awaiting the answer of the Management Side.

Security of Tenure

(Continuation of para. 66 of Annual Report)

224. As stated in paragraph 66 of the Annual Report, the Ministry has now agreed that paragraph 16 of the Terms and Conditions of Service gives consultants and S.H.M.O.s a right of appeal where hospital boards threaten to terminate their contracts in order to offer new contracts for a reduced number of sessions.

The Joint Committee has impressed upon the Ministry the desirability of securing that any review of part-time contracts is carried out in full consultation with the consultant or S.H.M.O. concerned, and that the views of the hospital medical committee are sought. The Ministry understands that this is the normal practice, and has asked the Joint Committee for instances where the review is not carried out in this manner.

At the request of the Staff Side of Committee "B" of the Medical Whitley Council, the Management Side recently agreed that paragraph 16 of the Terms and Conditions of Service should be amended in order to extend the right of appeal against dismissal to S.H.M.O.s. The Committee has now asked the Staff Side to urge that the moral obligation placed upon hospital boards by paragraph 16 to try to find alternative employment for a consultant whose appointment is terminated or whose sessions are reduced as a result of a hospital reorganization should similarly be extended to cover S.H.M.O.s.

Senior Registrars

(Continuation of para. 67 of Annual Report)

225. It appears from figures recently supplied by the Ministry that the number of senior registrars has now been reduced to a figure not greatly in excess of the agreed establishment of 960, but unfortunately this does not mean that the problem of displacement has been resolved. A high proportion of the senior registrars in their fourth or subsequent year, who may expect their appointments to be terminated during the course of the present year, are in general medicine or surgery, and it is in these specialties that there are the fewest consultant vacancies. Moreover, it is undoubtedly true that many of these senior registrars are engaged for a large part of their time in consultant work, and their dismissal will be likely to create a serious staffing problem, since, even where their posts are not to be abolished, it is unlikely that newly appointed senior registrars will be able satisfactorily to replace them.

These facts have been presented to the Ministry, and it has again been urged that the ultimate solution of the problem lies in an expansion of the consultant establishment, particularly in medicine and surgery. In order to meet the immediate difficulties of the existing senior registrars it has also been urged that they should be allowed, on completion of their appointments, to reapply in open competition for their own posts, and to be reappointed for a further period of two years, or to apply for other posts in the same specialty. The Ministry has now agreed to this proposal.

Junior Hospital Staffing Difficulties*(Continuation of para. 68 of Annual Report)*

226. Owing to the shortage of junior medical staff in many hospitals, house officers are not infrequently asked to undertake the burden of additional duties, and staffing difficulties are often aggravated because house officers are required to take their leave during their six months' appointment.

These problems are now under discussion in Committee "B" of the Medical Whitley Council.

Employment of General Practitioners in Hospitals*(Continuation of para. 69 of Annual Report)*

227. In consultation with representatives of the General Medical Services Committee, the Joint Committee has continued its discussions with the Ministry on the question of the employment of general practitioners in hospitals. The terms of a draft circular advising hospital authorities on the subject have been agreed with the Ministry, and the only question now outstanding is that of remuneration. Under the Terms and Conditions of Service the rate of remuneration for a general practitioner employed part-time on the staff of a hospital, where no other rate is appropriate, is £175 per annum per weekly half-day (paragraph 10(b)). In agreement with the General Medical Services Committee, the Joint Committee has urged that except for honorary clinical assistantships, purely educational in character, all general practitioners employed in hospitals (other than those graded as consultants or S.H.M.O.s) should continue to be remunerated at this rate. It is possible that proposals for an alternative rate of remuneration for certain posts will be put forward by the Management Side of Committee "B" of the Medical Whitley Council. The Joint Committee has therefore made it clear to the Ministry that its agreement on points of general policy is without prejudice to any subsequent discussions on remuneration in Committee "B," and cannot be taken as implying that the Joint Committee or the Staff Side agrees that any group of general practitioners employed in hospitals should be remunerated at less than £175 per annum per session.

Review of S.H.M.O.s*(Continuation of para. 71 of Annual Report)*

228. The Committee has made a careful examination of the claims to consultant status of those S.H.M.O.s who, following the last review, have expressed their dissatisfaction with their grading, and it is satisfied that in some cases there is prima facie evidence for suggesting that an injustice has been done and that practitioners have been wrongly graded. The Committee has accordingly brought these cases to the notice of the Ministry, urging the need for a re-examination of the grading of these S.H.M.O.s.

Reference was made in the Annual Report to the fact that those S.H.M.O.s holding consultant posts who were upgraded to consultant status at the last review had been placed at the minimum point in the consultant salary scale. Some of these practitioners have occupied the same posts and have carried out the same duties for many years, and it would have appeared reasonable that hospital boards should have exercised their discretionary power to advance the starting salary. Acting on the advice of the Ministry, however, they have not done so, and approaches to the Ministry have proved unsuccessful. The Committee has decided, therefore, to advise certain of these practitioners—where the non-exercise of the Board's discretionary power appears particularly harsh and unreasonable—to appeal against the Board's decision under the Whitley regional appeals machinery.

Whole-time Officers' Allowances*(Continuation of para. 72 of Annual Report)*

229. Discussions have now been reopened in Committee "B" of the Medical Whitley Council on the question of

whole-time officers' allowances, and representatives of whole-time officers have been invited to take part in the negotiations.

Private Hospital Beds and Pay-bed Regulations*(Continuation of paras. 73 and 74 of Annual Report)*

230. Following protracted discussions between the Joint Committee and the Ministry, revised Pay-bed Regulations have now been introduced with effect from April 1. The new regulations, which follow the same pattern as the previous regulations, deal broadly with two matters: (a) the manner in which the charges for private beds shall be assessed, and (b) the maximum professional fees to be charged to patients electing to receive hospital treatment privately.

In accordance with the provisions of Section 5 of the National Health Service Act, 1946, the new regulations are still designed to secure that the charges for private beds shall represent the whole cost of the accommodation and services provided, but there are certain changes in the method of calculating the charges that will in many cases result in a reduction. Thus, in hospitals where the total cost of the pay block cannot be determined separately from the cost of the public wards, the percentage increases which are added to the average daily in-patient cost to arrive at the private-bed charge are reduced from 25% (single room), 15% (double room), or 5% (multiple-bedded room) to 15%, 10%, and 5% respectively. Furthermore, these percentage increases are to be added to the net daily in-patient cost before the addition of the salaries of the medical and dental staff instead of after the addition of these salaries as hitherto; and the cost of any service from which the private patient receives no benefit—such as the almoner's and medical records departments—is excluded from the maintenance charge.

There are also certain improvements in the Schedules to the Regulations, setting out the maximum professional fees, although, as previously reported, the Minister has insisted on retaining the detailed classification of operations. The maximum fee that may be charged by a physician is increased from 25 to 40 guineas, with a similar increase for a surgeon in cases not involving an operation. There are also changes in the maximum fees in other specialties, and the scale for radiotherapists has been completely revised. The maximum fee payable to a general practitioner attending a patient privately in hospital has been increased from 15 to 20 guineas.

The overall fee of 75 guineas to be charged by all the practitioners concerned in the patient's treatment is retained as the normal maximum, but provision is now made for this maximum to be increased to not more than 125 guineas (at the discretion of the hospital board or committee) in the following circumstances:

(a) When the treatment of the patient in accommodation provided under Section 5 of the Act has lasted four months; or

(b) when the patient needs at least two major operations or at least three major or intermediate operations as part of the same course of treatment during the same stay in hospital; or

(c) when the patient requires excision of the lung, an operation on the heart or oesophagus, or the excision of a tumour of the brain or spinal cord, or otherwise requires specialized operative technique involving complicated team-work.

Provision is retained for the maximum charges laid down in the regulations to be exceeded in cases where the patient so agrees, provided that not more than 15% of the pay-beds are occupied at any one time by patients who have made such an agreement with the consultants concerned.

The Ministry has sent an explanatory circular on the new regulations to hospital boards and committees, and this also was discussed beforehand with the Joint Committee.

The Committee has been endeavouring to obtain evidence to place before the Minister to show that the high level of

private-bed charges is deterring patients from seeking hospital treatment as private patients, and that this is leading to a loss of hospital revenue. The Committee is therefore waiting with interest to see whether the reduction in charges anticipated as a result of the new regulations has the effect of increasing the demand for private treatment.

Legal Actions*(Continuation of para. 75 of Annual Report)*

231. The profession has become increasingly disturbed over the number of actions for alleged negligence brought by patients against hospital authorities and members of their medical staffs. There is no doubt that since the inception of the National Health Service these cases have increased considerably in number. The public is apparently becoming more litigious. This may be due, among a number of causes, to the ownership of the hospitals by the State and a lessening of local regard for the hospital and its staff, to the extension of legal aid, and to the present tendency of the public to expect compensation wherever damage is suffered, whether there is negligence or not. Whatever the causes, the frequency with which cases are brought is most disturbing, particularly as it is recognized that a far larger number are settled out of court.

It should be emphasized, however, that although the present tendency towards litigation may have serious implications for hospital medical staffs, the law of negligence has not changed. The principle still holds that a medical practitioner owes to his patient the duty of exercising reasonable care and skill, and it is a breach of this duty which usually supports an action for negligence. The words "reasonable care and skill" have to be interpreted in the light of the circumstances of each case, and a house-officer, for example, is not *ipso facto* negligent because someone of greater knowledge and skill would have acted differently.

Neither is the risk of litigation a new one. It is, and always has been, open to a patient to sue a hospital authority and/or members of the medical staff concerned. Although it is well established in English law (Scottish law differs from that of England and Wales in this matter) that a hospital authority is liable for the acts or omissions of medical staff at least up to the level of registrar, this does not mean that the hospital is prevented from asking the Court to apportion the blame. This, indeed, is where a change has taken place, for it is the present policy of the Ministry that, where it is sought to make a hospital authority liable for the alleged negligence of one of its medical staff, the authority should seek a contribution or indemnity from the member of its staff concerned in respect of any damages awarded against it. This means that where a hospital and a member of its medical staff are joined in an action for alleged negligence the hospital authority asks the Court to apportion the damages between the co-defendants. As stated in the Annual Report, paragraph 75, this aspect of the matter is already under discussion between the Ministry of Health and the Joint Consultants Committee, and early agreement is expected which will mitigate possible dangers to members of hospital staffs.

Many members of the profession have been particularly disturbed by the judgments given in recent cases, notably that of "Payne v. St. Helier Group Hospital Management Committee and Another." It is extremely difficult, however, to assess the merits of a case without all the available evidence, and reports published in the medical and lay press are at best incomplete. The Council is advised that this case has not established any new principles. For example, it does not follow from the judgment that an error in diagnosis necessarily amounts to negligence. When conflicting evidence is given by expert witnesses the Judge is at liberty to decide which witness is the more acceptable. Even when the judgment appears harsh there is nothing to be gained by taking a case of this kind to the Court of Appeal, since that court, having had no opportunity of hearing the evidence and observing the witnesses, would be bound to uphold the judgment unless it were clearly one at which

no reasonable person could possibly have arrived in the light of the evidence.

It was held in Payne's case that a patient with an abdominal injury who had been examined by a casualty officer should have been referred by him to a consultant. In this respect also the judgment is not to be regarded as of general application. It has reference only to the "facts" of this particular case as found by the Judge. It is clear, however, that consultants must give the junior members of their staffs ample guidance as to the type of case that should always be referred to them, and must hold themselves ready at all times to give advice and assistance. Junior staffs should exercise the greatest care in seeking the assistance of their chiefs in any puzzling or unusual cases.

The foregoing statement has the full support of the Joint Consultants Committee.

Mileage Allowances for Hospital Medical Staff*(Continuation of para. 76 of Annual Report)*

232. The Committee is suggesting to the Staff Side of Committee "B" of the Medical Whitley Council that in the interests of economy it should consider the possibility of compounding mileage allowance as a lump sum payment based on the officer's average mileage, in order to save the administrative expense associated with individual and detailed claims.

Domiciliary Consultation Arrangements*(Continuation of para. 83 of Annual Report)*

233. The Joint Committee has taken note of the Representative Body's objection to the inclusion of the diagnosis in the model form of domiciliary consultation certificate, and has decided to reopen the matter with the Ministry.

The Committee has asked the Joint Committee to reopen with the Ministry the desirability of extending the domiciliary consultation arrangements to permit the attendance of a consultant in any specialty in an emergency upon a baby born in a private maternity home.

The Committee has also given further consideration to the claim of whole-time consultants to receive additional payment for domiciliary consultations. It will be remembered that when the Terms and Conditions of Service were introduced it was agreed with the Ministry that whole-time consultants should be free to delete from their contracts the obligation to undertake domiciliary consultations, except that where it was the only way of providing a service the board might insist on a whole-time officer undertaking this work. Boards were also advised by the Ministry that, where a whole-time consultant was required to accept a liability for domiciliary consultations, his whole-time duties should be suitably adjusted so that no extra burden was placed upon him by the domiciliary work.

Bearing these facts in mind, the Committee does not consider that it is practicable to press for additional payment to whole-time consultants in respect of domiciliary consultations where the board has followed the Ministry's instructions and set aside time in the officer's hours of duty for the performance of this work. Where, however, a whole-time consultant is required to undertake domiciliary consultations as an additional commitment over and above the normal duties of a whole-time appointment, the committee feels that there is a case for additional payment.

The Committee has passed the foregoing views to the Staff Side of Committee "B."

Disclosure of Information Regarding Tuberculous Persons to the Ministry of Labour

234. The Committee has asked the Joint Committee to protest to the Ministry at the Department's request to hospital authorities to furnish to the Ministry of Labour and National Service information from the records of chest clinics regarding tuberculous patients called up for military service, in the absence of statutory authority and without the patient's consent.

on February 26 the members of the Association in the Gold Coast formed themselves into a Branch. Rules were adopted and officers elected, and a Branch Council was set up which met on March 5. Consideration was given by the Branch Council to various matters, and in particular a resolution was passed deprecating the apparent intention of the Government that the work of the Chief Medical Officer and other professional officers should be subject to the supervision of the Permanent Secretary to the Ministry of Health. This is a reversal of the policy so far followed, which was founded on the accepted recommendations of the "Maude" Commission. The Branch Council is also endeavouring to initiate action to restrain persons who are not qualified registered medical practitioners from using the title of "Doctor." A General Meeting of the Branch was addressed by Mr. Fraser on March 6.

Arrangements have been made for future meetings of the Branch biennially and of the Branch Council at monthly intervals, and for regular clinical meetings, and it is hoped that the Branch will consolidate its position in spite of the many difficulties which hindered its inception.

Colonial Research Service

251. Many projects on which the Colonial Research Service is engaged are dependent on funds provided by the United Kingdom Government under the Colonial Development and Welfare Acts of 1945 and 1950, which expire in 1956, and some concern has been felt as to the prospects of officers engaged in this service.

It appears from discussions with Colonial Office officials that, so far as can be ascertained, funds will be made available after 1956 for the continuation of research projects, and there is every prospect of employment for existing Colonial research officers for many years to come. The Colonial Office has stated that confirmed appointments will be terminated only for specific reasons, and in such cases six months' notice will be given. If the officer has qualified for a pension he will be entitled to one proportionate to his years of service or, if he has not so qualified, he will be entitled to the return of his superannuation contributions with interest. There is reciprocity between the Colonial superannuation scheme and the various Colonial pension schemes.

MEDICAL BENEVOLENCE

252. The sum of £10,966 was received during 1952 by the Charities Trust Fund of the Association for medical charities, which is £1,516 more than that received during 1951. The following statement shows the amounts collected and distributed during the twelve months:

To subscriptions and donations collected for:	1952	£
(a) Distribution at the discretion of B.M.A. Charities Trust Fund	4,513	
(b) Royal Medical Benevolent Fund	4,254	
(c) Royal Medical Foundation of Epsom College	899	
(d) Royal Medical Benevolent Fund Society of Ireland	103	
Bequests received and allocated to existing medical charities	350	
Subscriptions and donations in respect of 1953, paid in advance	847	
	£10,966	
By amounts distributed to:	1952	£
(a) Royal Medical Benevolent Fund:		
(i) Allocation from B.M.A. Charities Trust Fund for General Fund	£2,123	
(ii) Earmarked for Fund	4,254	
(b) Royal Medical Foundation of Epsom College:		
(i) Allocated from B.M.A. Charities Trust Fund for General Fund	£2,123	
(ii) Allocated from bequests for General Fund	350	
(iii) Earmarked for General Fund	866	
(iv) Earmarked for Sherman Bigg Fund	34	
(c) Royal Medical Benevolent Fund Society of Ireland:		
Earmarked for Fund	3,373	
(d) Dain Fund:		
Allocated from B.M.A. Charities Trust Fund	103	
Payments in advance carried forward	266	
	£10,966	

Other Benevolent Funds

253. The Council has received with interest reports of the work of the Dain Fund and the Sir Charles Hastings Fund. It is clear that these funds are giving much needed assistance in many cases, and the Council would urge members to give their continued support. The Dain Fund is devoted solely to giving financial assistance for educational purposes to the sons and daughters of medical practitioners. The Sir Charles Hastings Fund assists doctors who, through no fault of their own, are in financial difficulty of a purely temporary nature.

Flood Relief Fund

254. Since the publication of paragraph 14 of the Council's Annual Report, additional help has been given to victims of the flood disaster. The total amount spent is £4,070. In all, twenty-two doctors have been helped, including fifteen general-practitioner principals, two assistants in general practice, three consultants, one medical officer serving with the R.A.M.C., and one retired practitioner.

OTHER ASSOCIATION ACTIVITIES

Remuneration of Civil Service Medical Officers

(Continuation of para. 203 of Annual Report)

255. Further correspondence has taken place between the Civil Service Medical Officers' Joint Committee and the Financial Secretary to the Treasury, and a deputation had further discussions with the Financial Secretary on March 25.

The Financial Secretary is prepared to agree to the question of the salaries of Civil Service medical officers being a matter for direct negotiation between the Treasury and the Joint Committee. He insists, however, that before such negotiations take place there shall be a trial period during which vacancies in the service will be advertised freely at salaries recommended in the Howitt Report. The Joint Committee is opposed to this suggestion and the Council supports the Joint Committee's attitude. The Council is therefore continuing to refuse to publish advertisements in the *British Medical Journal* for medical appointments in the Civil Service.

The Law in Relation to the Adoption of Children

(Continuation of para. 204 of Annual Report)

256. As reported in paragraph 204 of the Annual Report, the Council formed a small committee to prepare a memorandum of evidence for submission to the Interdepartmental Committee on the Adoption of Children. The memorandum has now been submitted to the Committee and is reproduced in Appendix VI.

Joint B.M.A. and T.U.C. Committee

257. Matters connected with industrial chest diseases and the National Insurance (Industrial Injuries) Act are under discussion in the Association's Joint Committee with the Trades Union Congress.

Fever Nursing Register

258. The Society of Medical Officers of Health has called the Council's attention to a serious shortage of nursing recruits to infectious diseases hospitals, which the Society suggests is the result of a proposal by the General Nursing Council to close the fever nursing register—i.e., a supplementary register of nurses recruited and specially trained at infectious diseases hospitals. The Society has asked for the Council's support in its representations that the closing of the register is not at present practicable.

It is understood to be the policy of the General Nursing Council, that, in the interests of those entering the nursing profession, supplementary registers should be abolished so that all recruits receive their basic general training before specializing.

The Council has considered the matter in consultation with the Royal College of Nursing through the standing liaison arrangements with the Royal College, but it is not clear whether the problem is caused by the proposal to close the register or, as has also been suggested, by a preference on the part of nursing recruits to enter a general hospital and receive their basic training as soon as possible so as to be in a more favourable position for advancement in the profession.

The Council is endeavouring to obtain evidence to show whether or not the closing of the register is likely materially to affect the nursing position at infectious diseases hospitals, and has asked the Ministry in the meantime not to confirm any proposal which may have been made for closing the register.

Committee to Review Cost of National Health Service

259. The Minister of Health announced in the House of Commons on April 1 the appointment of a small independent committee, under the chairmanship of Mr. C. W. Guillebaud, with the following terms of reference:

To review the present and prospective cost of the National Health Service; to suggest means, whether by modifications in organization or otherwise, of ensuring the most effective control and efficient use of such Exchequer funds as may be made available; to advise how, in view of the burdens on Exchequer, a rising charge upon it can be avoided, while providing for the maintenance of an adequate Service; and to make recommendations.

The Ministry of Health has been informed that the Association is willing to assist this committee and has been asked for guidance as to the kind of help that would be welcomed.

E. A. GREGG,
Chairman of Council.

APPENDIX IV REPORT OF SUBCOMMITTEE ON SERVICE COMMITTEES AND TRIBUNAL REGULATIONS PRELIMINARY

1. The Subcommittee was appointed in November, 1951, with the following reference and personnel:

Reference: That a Subcommittee be appointed to carry out a full investigation of the status, composition, procedure, and functioning of the Tribunal and Medical Service Committees, to hear evidence, to take legal advice, and to prepare a full report with recommendations as a preliminary step to securing amending legislation.

Personnel: S. Wand, A. C. E. Breach, A. Campbell, H. Guy Dain, F. Gray, Kate Harrower, D. F. Hutchinson, C. F. R. Killick, W. M. Knox, F. Lishman, A. N. Mathias, A. T. Rogers, and H. H. D. Sutherland, together with three representatives of the dentists and one representative of the pharmacists when matters of common interest are under discussion.

2. Subsequently, when reappointing the Subcommittee for the session 1952-3, the parent Committee modified both the terms of reference and the personnel of the Subcommittee in the following manner:

Reference: That a Subcommittee be appointed to review the constitution and procedure of Medical Service Committees and to report with recommendations to the parent Committee.

Personnel: A. Talbot Rogers, B. Cardew, H. Guy Dain, J. A. Gorsky, F. Gray, R. C. Hamilton, Kate Harrower, D. F. Hutchinson, W. M. Knox, A. N. Mathias, F. A. Smorffitt, and H. H. D. Sutherland, together with three representatives of the dentists and one representative of the pharmacists when matters of common interest are under discussion.

3. At the outset it was agreed that, as most of the provisions of the Service Committees and Tribunal Regulations affected general practitioners, dentists, and pharmacists alike, it would be to the mutual advantage of the three professions if the representatives of the dentists and pharmacists were present throughout the Subcommittee's deliberations. The British Dental Association and the National Pharmaceutical Union accepted the Subcommittee's invitation to send representatives, and the following were appointed:

British Dental Association:

Mr. L. E. Balding (Hove).

Mr. A. Smith (Hull).

Mr. C. W. Spendelow (Grimsby).

Mr. G. M. Hickley (London) (in place of Mr. Spendelow, who subsequently resigned).

National Pharmaceutical Union:

Mr. H. Noble (London).

CHAIRMAN

4. H. Guy Dain was appointed Chairman of the Subcommittee.

EARLIER DISCUSSIONS

5. The Subcommittee wishes to point out that the review of the Service Committees and Tribunal Regulations procedure dealt with in this report is not the first which has taken place since the introduction of the National Health Service. In 1949 the General Medical Services Committee appointed a similar subcommittee which carried out an extensive review of the regulations and recommended changes where it was considered that the existing machinery was defective or was not working smoothly. A statement containing a number of proposals requiring amendment of the regulations was prepared and discussed with the Ministry of Health. The Ministry made it clear at that time that, whilst it was necessary to set out the framework and general procedure in regulations, it was the Ministry's policy to discourage the promulgation of additional regulations except where the need for them was clearly established. The Ministry held the view that present and future improvements in the machinery for considering complaints could best be secured by issuing a handbook of guidance to all concerned. Much of the Subcommittee's time was occupied subsequently in discussions with the Ministry on the text of the handbook, which was issued to executive councils and Service Committees in April, 1952. The Subcommittee is, however, by no means satisfied that this handbook goes far enough, and holds strongly to the view that changes in the Act and its regulations will be necessary to eliminate a number of faults in the present arrangements which experience has brought to light.

CONSULTATION WITH LOCAL MEDICAL COMMITTEES

6. Although local medical committees had previously been asked to review the present Medical Service Committee procedure, it was again decided to invite them to consider the subject and to submit their views. This was done in the early autumn of 1951, when local medical committees were sent a memorandum setting out in detail the provisions of the Service Committees and Tribunal Regulations.

7. Previously the Kent and Canterbury Local Medical Committee had issued to every local medical committee a

memorandum containing recommendations for a more "legal" procedure for the hearing of complaints. The changes proposed were:

- (1) That the Medical Service Committee should be abolished.
- (2) That "local courts" should be set up in each county.
- (3) That local medical committees should continue to hear complaints of alleged over-prescribing, failure to keep records, and faulty certification.
- (4) That England and Wales should be divided into three judicial regions, each region being served by a "regional circuit" court holding sessions in the county towns of its region as may be convenient.
- (5) That there should be no other special courts, committees, or tribunals.
- (6) That the Minister and the executive council, being interested parties, should have no right of intervention at any stage except as complainant or respondent.

8. The General Medical Services Committee accordingly invited local medical committees, when sending in suggestions for any modifications of the present procedure, to indicate whether they wished to have substituted for the present informal procedure any other scheme providing, for example, for the appointment of a lawyer as chairman of the Medical Service Committee, legal representation of parties, the giving of evidence on oath, and, generally speaking, a more legal procedure than obtains at present.

9. The following is a summary of the replies received:

Total No. of Committees in England and Wales	
circularized	138
Total No. of replies received	101
23 Committees specifically stated that they did not wish to have the general framework of Service Committee and Tribunal procedure superseded by a more formal judicial machinery.	

30 Committees, without commenting generally on the present procedure, put forward small but important suggestions for its revision.

17 Committees were satisfied with the present Regulations and did not wish to put forward any suggestions for their modification.

1 Committee was not satisfied with the present Regulations, but made no suggestions for their modification.

15 Committees supported the Kent proposals without modification.

15 Committees supported the Kent proposals with some modification.

10. The above analysis of the replies received shows that there is a substantial majority among local medical committees in favour of the present Service Committee procedure, modified in the light of experience gained since the appointed day. Although only a minority of local medical committees supported the Kent proposals for a more formal procedure, representatives of the Kent Local Medical Committee were invited to meet the Subcommittee to put their point of view. *The Subcommittee, in view of the lack of support among local medical committees, and having heard the Kent representatives, is satisfied that it would not be in the profession's interest to press for an entirely new and more legal set-up.* It is convinced that the General Medical Services Committee's efforts would most usefully be concentrated on securing such modifications of the present machinery as will ensure an improvement in its efficiency.

It is of interest to record that the dental and pharmaceutical representatives on the Subcommittee report that among their constituents there has been no demand for a radical alteration of Service Committee procedure on the lines suggested by Kent and Canterbury.

REVIEW OF SERVICE COMMITTEES PROCEDURE

11. The Service Committees and Tribunal Regulations have been examined section by section in the light of the observations from local medical committees, and the conclusions reached by the Subcommittee are given below.

Constitution of Service Committees

12. Absence of criticism of the present constitution of the Service Committees, as laid down in the regulations, leads to the conclusion that there is general satisfaction under this heading, and no change is recommended.

Appointment of Chairman and Deputy Chairman

13. At present, Regulation 3 (3) stipulates that only the lay members of the executive council are eligible for appointment as chairman or deputy chairman of a Service Committee in the first instance. It is felt that this unnecessarily restricts the field of selection, and the Subcommittee recommends:

Recommendation A: That Regulation 3 (3) should be modified so as to leave the field open to non-members of the executive council, it being understood that, notwithstanding the wider field of selection envisaged, the person appointed should be acceptable to both parties represented on the Service Committee.

14. A number of local medical committees have suggested that the chairman should hold a legal qualification. Among the reasons given were that such a chairman would be able to advise the committee upon the legal aspects of the matter under inquiry and that the presence of a trained legal mind at the Service Committee stage of any investigation would provide some safeguard against the possibility of a serious miscarriage of justice.

15. The Subcommittee recognizes that there are advantages in having a lawyer in the chair, but feels that such an appointment should not be an obligation on the committee, which should be free to exercise discretion upon the point.

Position of an Interested Person who is a Member of the Service Committee

16. The Subcommittee considers that it is of vital importance that every member of a Service Committee should be uninfluenced in his judgment of the case under consideration by any personal association with either party. For this reason the Subcommittee recommends:

Recommendation B: That provision should be made in the Regulations for a requirement that a member of a Service Committee who is an interested party in the matter under consideration shall be required to disclose his interest either to the chairman before the meeting or at the commencement of the proceedings.

17. The Subcommittee is satisfied with the present arrangements for appointing the deputy chairman, but recommends:

Recommendation C: That consideration be given to the practicability of appointing a deputy chairman for a defined group of executive council areas adjacent to each other.

Investigation by Service Committee

18. At present, Regulation 4 requires the Service Committee to investigate "any complaint made by a person against a medical practitioner in respect of an alleged failure to comply with the terms of service." This regulation is so wide as to give complete freedom to anyone who feels disposed to lodge a complaint against a doctor. Although there are certain safeguards against frivolous or vexatious complaints, it is felt that the right to lodge a complaint should be restricted (i) to a patient of the doctor concerned or someone who is acting on his or her behalf because of the inability of the patient to make the complaint, and (ii) in appropriate cases to a representative of the Ministry of National Insurance. It is therefore recommended:

Recommendation D: (1) That the following proviso be inserted after Regulation 4 (1):

Provided that no such complaint shall be investigated as aforesaid unless made by a person for whose treatment the

medical practitioner is responsible in respect of treatment afforded to him by such medical practitioner or person authorized by him in writing to make such complaint or his spouse or in the case of an infant his parent or guardian or in the case of a person unable to make such complaint owing to mental infirmity a close relative or in the case of a deceased person his personal representative(s), or in the case of the Ministry of National Insurance a responsible official of that Department.

(2) that the following be inserted in place of Regulation 4 (3):

Subject as hereinafter provided the Dental Service Committee shall investigate any complaint that a dental practitioner has failed to comply with the terms of service made by a person for whom the dental practitioner has undertaken or agreed to undertake treatment.

Any complaint made under this regulation shall be made by the person for whom the dental practitioner has undertaken or agreed to undertake treatment: provided that he being satisfied that any such person is deceased or that he is unable through age, infirmity, or other reasonable cause himself to make the complaint the committee may investigate a complaint made by some other person on his behalf.

Time Limit for Making Complaints

19. As a general rule complaints against a medical practitioner or pharmacist are required to be lodged with the clerk to the executive council within six weeks of the event giving rise to the complaint. This is considered to be an unnecessarily long period. In addition, in the event of an application being made to the Minister for permission to investigate a complaint, the application need not at present be supported by a majority vote of the members of the Service Committee. Indeed, in the Minister's view, it may be made on the decision of the chairman alone. Similar considerations apply to the dental profession.

The Subcommittee recommends:

Recommendation E:

- (i) That the period of six weeks referred to in Regulation 4 (4) (a) be reduced to four weeks;
- (ii) that the period of two months referred to in 4 (4) (c) (i) be reduced to six weeks;
- (iii) That any application to the Minister for permission to investigate a complaint, notice of which is received more than six weeks after the event, should be supported by a majority vote of the members of the Service Committee;
- (iv) That the following be substituted for Regulation 4 (4) (b):

The person desiring to make a complaint under this Regulation against a dental practitioner shall within six months after the completion of treatment, or within four weeks after the event which gave rise to the complaint, whichever is the sooner, give written notice to the clerk of the council stating the substance of the matter which it is desired to have investigated.

(v) That the following be substituted for Regulation 4 (4) (c) (ii):

(ii) in the case of a complaint against a dental practitioner the complaint is made within six months after the completion of the treatment or within six weeks after the said event, whichever is the sooner, or

(vi) That Regulation 4 (4) (c) (iv) be modified so as to make it clear that the practitioner's representations relate solely to the question of the departure from the time limit for making the complaint.

20. The Subcommittee also agrees with the views of its dental members that there should be an overall time limit outside which the Minister should have no power to authorize the hearing of a complaint in those cases which relate to the fit and efficiency of dentures. Under the new and simplified procedure which is shortly to be introduced, the executive council will deal with such complaints, and it is felt that the Minister should have no power to authorize a hearing of a complaint of this nature if more than twelve

months have elapsed since the completion of treatment. Any evidence relating to the adequacy of treatment which consists in the provision of dentures necessarily deteriorates rapidly in value as time passes, and it can reasonably be said that after twelve months have elapsed from the original provision of a denture it is extremely difficult, and in many cases impossible, to decide whether the treatment provided was in fact satisfactory. For these reasons the Subcommittee supports its dental colleagues in seeking the early introduction of an overall time limit of twelve months.

21. The Subcommittee recommends:

Recommendation F: That the substance of the following paragraph of the Handbook on Service Committee Procedure should be incorporated in the Regulations:

7. Similarly if a practitioner's observations on alleged acts of omission or commission are sought by the executive council prior to possible reference of a case to a Service Committee under Regulation 4 (5) the source from which the information has come should be indicated and also any provisions in the terms of service alleged to have been broken. If no term of service is affected the reason why the conduct of the practitioner is being investigated should be clearly set out.

Procedure of Service Committee

22. Several local medical committees have suggested that the chairman of the Medical Service Committee should not be the sole judge as to whether the statement made by a complainant discloses prima facie ground of complaint. The Subcommittee is in general agreement with this view, and recommends:

Recommendation G: That the chairman of a Service Committee should confer with a professional adviser who is not a member or a deputy member of the Service Committee but selected by the Service Committee from a panel nominated by the local professional committee, when deciding whether a statement made by a complainant discloses prima facie ground of complaint.

Rules of Procedure for Service Committees under Regulation 5

23. Rule 1 (1) (a) requires the clerk of the executive council, when informing the complainant that his statement discloses no prima facie ground of complaint or is frivolous or vexatious, to invite the complainant to submit a further statement within seven days. The Subcommittee is of opinion that the rule goes unnecessarily far, and recommends:

Recommendation H: That the clerk should be required only to inform the complainant of the procedure which will be followed if a further statement is not received within seven days—namely, that the case will be brought before the Service Committee, which has power to dispense with the hearing.

24. Under Rule 1 (1) (e) the documents of a case must be sent to each member of the Service Committee three clear days before the meeting of the Service Committee. This period is thought to be too short, and it is recommended:

Recommendation I: That the period of three days referred to in Rule 1 (1) (e) be extended to seven days and a further requirement of the clerk be added to ensure that copies of the documents are sent to the secretary of the local professional committee.

25. Rule 1 (1) (f) states that "either party shall be entitled to be present at the hearing and to give or call such evidence as the committee may think relevant to the matters at issue." The Subcommittee feels this rule is unnecessarily all-embracing, as the issue of relevancy should be one of fact. It therefore recommends:

Recommendation J: That the words "such" and "as the committee may think" be deleted from Rule 1 (1) (f) so that it reads:

Either party shall be entitled to be present at the hearing and to give and call evidence relevant to the matters at issue.

and may put questions relevant to the matter in dispute to the other party or to any witness called by him, either directly, or, if the committee so direct, through the chairman of the committee. Subject as aforesaid, the procedure at the hearing shall be such as the committee may determine.

26. Rule 1 (1) (h) provides that, if in the course of a hearing any new issue is introduced by the complainant, the chairman has discretion to admit or exclude such issues as he thinks fit, but if it is admitted the respondent may ask for an adjournment, which shall be granted. The Subcommittee feels that this is unsatisfactory, and recommends:

Recommendation K: That Rule 1 (1) (h) be amended so as to make it obligatory to adjourn the committee if a new issue is admitted.

Report of Service Committee

27. At present, a Service Committee is required to report on every case brought before it, including cases in which the chairman has decided that there is no prima facie ground of complaint. It is felt that it should not be necessary to report in detail to the executive council on this type of case, and the Subcommittee recommends:

Recommendation L: That the rules of procedure should be amended so that a Service Committee is not required to report in detail on those cases where there is no prima facie ground of complaint.

28. In giving the Service Committee discretion in its report to draw the attention of the executive council to any previous reports made by the committee in connexion with the practitioner whose conduct has been under consideration, no distinction is made between cases in which the complaint has been proved and cases in which it is not proved. The Subcommittee therefore recommends:

Recommendation M: That an amendment be sought to Regulation 5 (4) so as to ensure that reference to previous cases should be made only when failure to comply with the terms of service was found in those cases and is also found in the present case.

Representation of Executive Council to Tribunal

29. Regulation 8 states that if an executive council decides to make representations to the Tribunal with regard to the continued inclusion in any list of the name of any practitioner, and an appeal is made to the Minister against the executive council's decision on other matters, the Minister may treat as conclusive for the purpose of the appeal any relevant findings of the Tribunal. The Subcommittee recommends:

Recommendation N: That the words "any relevant findings" in Regulation 8 be amended to read "any relevant findings of fact."

Procedure on Appeal

30. Regulation 9 (5) provides that, in the event of an oral hearing following an appeal, and where one of the parties is a medical or dental practitioner and the decision of the executive council involves the finding that he has been guilty of a breach of certain of the terms of service, the persons appointed to hear the oral representations shall include a medical or dental practitioner, as the case may be, selected from the panel of practitioners referred to in Regulation 11. There is no similar provision, however, when the practitioner has been found not guilty of a breach of those terms of service and the patient then appeals against the decision of the executive council. The Subcommittee feels that proper provision should be made for this contingency, and recommends:

Recommendation O: That, in cases where the practitioner has been found not guilty of a breach of the terms of service and a patient then appeals against the decision of the executive council, the persons appointed to hear

the oral representations shall include a medical or dental practitioner, as the case may be, selected from the panel of practitioners referred to in Regulation 11.

Appeal to the Courts

31. Eighteen local medical committees have recommended that there should be a right of appeal to the courts, or some other judicial body, against decisions of the Minister and/or the Tribunal.

32. The Subcommittee, bearing in mind the original controversy on this point, has given very careful consideration to the issues involved and has reached the following conclusions:

(a) That the Minister's responsibility to Parliament "to provide or secure the effective provision of services" in accordance with the National Health Service Act and its Regulations is indisputable and in accord with democratic procedure.

(b) That there are advantages in having a right of appeal to the Minister of Health and not to the Courts, in that—

(i) the Minister has power to reinstate a practitioner's name in the appropriate list at any time after the decision to remove the name from the list; no such power rests with the Court, and it would be a more difficult procedure to reinstate the practitioner.

(ii) an appeal to the Courts if granted would normally be held in public. This applies at present to hearings by the Tribunal if the respondent wishes it, but not otherwise.

(iii) if the Minister is not satisfied on appeal that a practitioner's name should be deleted from the list he has the option of imposing the lesser penalty of a fine. If the appeal lies to the Court, the Court has not that alternative.

(c) If representations are made to the Court against a decision of the Tribunal, it follows that the Minister and also the patient would have the right to be heard. Under the present system only the defendant has the right of appeal to the Minister, and any change might therefore not be in the defendant's best interests, as it would mean that the present one-way channel of appeal would be capable of being used in the opposite direction. At the same time, while the Minister is limited to revoking the direction of the Tribunal in favour of the doctor, dentist, or pharmacist, the Court would not be so limited and might, in fact, impose a heavier sentence.

33. The Subcommittee feels that, on balance, it would not be to the advantage of the profession to press for a right of appeal to the Courts, but believes that some modification of the present procedure is desirable. It therefore recommends:

Recommendation P: That the present appeals machinery be amended so as to provide that the person appointed under Section 42 of S.I. 507 (1948) to hear the appeal should be appointed by the Lord Chancellor, and should be a practising barrister or solicitor of not less than ten years' standing, not being a member of the staff of the Ministry of Health.

Procedure on Withholding Money

34. The Subcommittee has sought legal advice on the powers of the Minister under Regulation 11 (1) to impose a fine following a hearing which results in a verdict favourable to a practitioner. It appears that the present Regulations do permit the imposition of a monetary penalty in such circumstances, and, whilst the Subcommittee appreciates that such a power may be equitable in the case of the Tribunal, it is certainly not in the case of Service Committee proceedings. The Tribunal is concerned only with whether a practitioner should be removed from the list following representations by an executive council. To prevent the Minister imposing a fine would mean that a practitioner who was

guilty of misconduct which, although not serious enough to justify his removal from the list, had nevertheless resulted in a breach of his terms of service would suffer no penalty at all, whereas another practitioner found guilty of a lesser offence by a Service Committee could have money withheld from his remuneration. A verdict favourable to the practitioner having been reached by the Service Committee, the appeals body, however, clearly vindicates the practitioner against the charges which have been brought against him, and the Minister should certainly have no power to impose a fine in such circumstances. The Subcommittee therefore recommends:

Recommendation Q: That Regulation 11 (1) be amended to provide that the Minister should not be empowered to impose a fine following either a hearing by a Service Committee, or an appeal against the findings of a Service Committee, which results in a verdict favourable to a practitioner.

35. Similarly, the Subcommittee is strongly of the opinion that the Minister should not be empowered to impose a fine following consideration of the report of either a medical or dental officer under Regulation 14, which deals with the investigation of record-keeping, nor should the power to impose a monetary penalty exist where a case of this nature is referred to the local medical committee or local dental committee for consideration and a verdict favourable to the practitioner is reached either by the local committee concerned or, on appeal, by the appeals body. The amendment to Regulation 11 (1) recommended in Recommendation Q above should make specific provision to this end.

36. Regulation 11 also provides for the constitution of advisory committees to assist the Minister in discharging his duties under the Regulation when he decides that a sum of money shall be recovered from the remuneration of the practitioner whose conduct has been the subject of an investigation. In the case of the medical advisory committee, the selection of medical practitioners to serve on it is required to be made in rotation from the panel of practitioners nominated for this purpose, but in the case of the dental advisory committee no mention is made of the selection being made in rotation. The Subcommittee recommends:

Recommendation R: That Regulation 11 (6) be amended by:

- the addition of the words "so far as may be in rotation" after the word "Minister" in line 4;
- the insertion of the words "for that purpose" after the word "nominated" in line 6.

Appeals from Dental Estimates Board

37. It is recommended:

Recommendation S:

- That Regulation 18 (2) be amended by the addition of the following:

The Minister may, on the application of any person desiring to appeal, extend the time for giving notice of appeal and may do so although the application is not made until after the expiration of one month from the date on which notice of the Board's decision was received.

- That the following be substituted for Regulation 18 (3):

The Minister shall appoint two dental practitioners, of whom one shall be selected from a panel of dental practitioners who are or have been engaged in the provision of general dental services nominated for that purpose by organizations which are, in the Minister's opinion, representative of the dental profession. The practitioners so appointed shall hear the representations of the appellant and the Dental Estimates Board and determine the appeal.

Investigation of Alleged Excessive Prescribing

38. It is not clear from the Regulations whether, at the investigation by the local medical committee, a practitioner

may be represented by counsel or other paid advocate, or may call witnesses. The Subcommittee recommends:

Recommendation T: That Regulations 12, 13, 14, 15, and 16 be amended so as to make it clear that the decision as to whether a practitioner may be represented by counsel or other paid advocate, or may call witnesses, rests with the local medical committee.

Determination of Question Whether a Substance was a Drug

39. At present there is no time limit within which a question as to whether a substance ordered by a practitioner was a drug or not may be raised. In practice, the absence of any time limit has led to considerable inconvenience, and busy practitioners cannot be expected to remember the clinical details of a case for which a prescription was ordered and which is the subject of investigation often eighteen months or more later. Similarly, the Subcommittee feels that there are good grounds for imposing a time limit within which a practitioner must be informed of the result of any appeal. Experience has shown that in a number of cases even after the appeal has been heard a considerable time elapses before the practitioner is informed of the outcome of his appeal. It is manifestly unfair that, even when a decision has been reached, there should be a long delay before it is communicated to the respondent. The Subcommittee therefore recommends:

Recommendation U: That any question under Regulations 16 and 17 as to whether a substance ordered by a practitioner was a drug or not may only be investigated within a period of six months subsequent to the date of issue of the prescription, and that in the event of the practitioner appealing against the decision of the local medical committee the results of such appeal shall be notified to the practitioner within one month from the date of the appeal.

The Tribunal

40. The Subcommittee has no suggestions to make for the amendment of the Regulations relating to inquiries by the Tribunal. It is felt that, having regard to the safeguards laid down in the Regulations, it would be undesirable to interfere with the right of any person or executive council who believes that a practitioner's name should be removed from the appropriate list, to make representations to that effect direct to the Tribunal.

41. One local medical committee suggests that the period of fourteen days within which an appeal against the decision of the Tribunal must be lodged should be extended. The position is safeguarded, however, by the Ministry being given discretion to extend this period.

Notices to be Given under the Regulations

42. The Subcommittee recommends:

Recommendation V: That all documents required or authorized by the Regulations to be sent to persons concerned with the hearing should be sent by registered post.

Complaints Against Patients

43. The Subcommittee endorses the policy of the General Medical Services Committee that there should be provision for the investigation of a complaint by a doctor against a patient on account of frivolous and unreasonable demands on the doctor's services.

"Code of Behaviour" for Patients

44. At the request of the Annual Conference, the Ministry of Health is being pressed to draw up a "code of behaviour" for patients which would be brought to their notice on appropriate occasions. It is recognized that such a code would not necessarily be enforceable, but it is believed that it would be helpful to medical practitioners in the National Health Service.

Appendix V—Financial Statement
Balance Sheet—December 31, 1952

	1952 £	1951 £
Accumulated Fund (formerly Surplus Account)—(See account annexed) Balance at December 31, 1952	406,458	379,479
Reserve for Development of Regional Offices (after charging £1,743 costs of development during year)	29,737	31,480
	<u>436,195</u>	<u>410,959</u>
Liabilities and Provisions:		
Loans	32,100	97,100
Bank Overdraft	118,588	99,948
Creditors and accruing expenses	65,547	113,601
Amounts received in advance (including subscriptions)	68,581	23,431
Current Taxation	7,639	3,989
Provisions for:		
Dilapidations and redecoration of premises	43,201	43,535
Pensions	6,904	5,764
	<u>310,460</u>	<u>290,268</u>

Note.—The Association is a company limited by guarantee, the liability of members being limited (except as provided in paragraph 6 of the Memorandum of Association) to 1 guinea each.

Fixed Assets at net book amount at January 1, 1947, of assets acquired before that date, with additions since at cost, less Sales, Depreciation, and Sinking Fund instalments—

	1952 Net Book Amount etc. £	1952 Depreciation and Sinking Fund Instalments £	1951 Net Book Amount etc. £	1951 Depreciation and Sinking Fund Instalments £
Leasehold Premises—Tavistock Square and Woburn Place	444,884	59,930	443,379	51,442
Premises held by feu charter, Nos. 6 and 7, Drumsheugh Gardens, Edinburgh	2,720	1,800	2,720	1,500
Leasehold premises—195, Newport Road, Cardiff	7,393	529	7,393	265
Furniture and office equipment	41,892	14,568	39,729	11,046
Library	12,577	3,000	10,393	2,500
	<u>508,966</u>	<u>79,825</u>	<u>503,614</u>	<u>66,753</u>
Investments at cost—				
(a) Government and other securities (Market value at December 31, 1952, £133,066)				
(b) Sinking Fund Policies (Surrender value at December 31, 1952, £87,473)				
(c) Life Assurance Policies (Surrender value at December 31, 1952, £1,701)				
		<u>228,569</u>		<u>227,441</u>
Loan to Irish Medical Association:				
Balance at January 1, 1952		8,500		
Less: Repaid during year		500		
		<u>8,000</u>		<u>8,500</u>
Current Assets—				
Stocks of paper for publications, stationery, etc.		17,659		24,569
Payments in advance		3,061		2,188
Debtors (including unpaid subscriptions), less provision for losses		91,482		98,047
Cash in hand		843		721
		<u>113,045</u>		<u>125,525</u>
	<u>£778,755</u>		<u>£798,327</u>	

A. M. A. MOORE, Treasurer.

E. A. GREGG, Chairman of Council.

ANGUS MACRAE, Secretary.

AUDITORS' REPORT TO THE MEMBERS OF THE BRITISH MEDICAL ASSOCIATION

In our opinion and to the best of our information and according to the explanations given to us the above balance sheet and the annexed income and expenditure account give a true and fair view of the state of the Association's affairs as at 31st December, 1952, and of its income and expenditure for the year ended on that date. We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for our audit. In our opinion the Association has kept proper books of account and received proper branch returns, and the above-mentioned accounts, which are in agreement with them, give in the prescribed manner the information required by the Companies Act, 1948.

3, Frederick's Place, Old Jewry, London, E.C.4.

15th May, 1953.

PRICE WATERHOUSE & Co.,
Chartered Accountants.

Income and Expenditure Account for the Year ended December 31, 1952

	1952 £	1951 £
Central Meetings Expenses	17,158	22,459
General Expenses, including Auditors' Remuneration £735 (1951-£735) and Interest on Loans £1,168 (1951-£909)	46,191	45,090
Premises Expenses	34,179	37,266
Capitation Grants, Regional Offices and Direct Expenditure on Local Organization	81,892	37,192
Library Expenses	6,902	7,129
Central Staff Expenses	76,704	71,509
Printings, Postages, and Stationery	9,757	14,652
Bad Debts and Allowances	208	317
	<u>223,545</u>	<u>235,614</u>
Less: Grant towards cost of Central Medical Recruitment Committee	13,000	
	<u>2,683</u>	<u>15,683</u>
Surplus on Publications	206,862	349,814
	<u>8,883</u>	<u>3,269</u>
Taxation—		
Income Tax based on net income for the year	7,200	
Corporation Duty	1,189	
	<u>8,389</u>	<u>3,269</u>
Surplus for 1952 carried to Accumulated Fund (earmarked for Loan Redemption)	18,289	—
	<u>223,533</u>	<u>£355,083</u>

(Note.—Depreciation (including Sinking Fund instalment) amounting to £12,184 (1951-£12,312) has been allocated to the appropriate headings of expenses)

Surplus for 1952 carried to Accumulated Fund (earmarked for Loan Redemption)

Adjustments in respect of previous years:

Advertisement Manager's Commission	2,668
Family Doctor—Credits allowed	711
Auditors' Remuneration	735
	<u>4,114</u>

Provision for depreciation of paper stocks—Family Doctor Balance carried forward to 1953

£413,572

Accumulated Fund Account
(formerly Surplus Account)

	1952 £	1951 £
Balance brought forward—January 1, 1952		379,479
Income Tax recovered in respect of previous years		13,471
Further grant towards cost of Central Medical Recruitment Committee in respect of 1951		2,333
Surplus for 1952 brought down from Income and Expenditure Account		18,289
		<u>£413,572</u>

APPENDIX VI

MEMORANDUM OF EVIDENCE SUBMITTED
TO INTERDEPARTMENTAL COMMITTEE
ON THE ADOPTION OF CHILDREN

I. PREFACE

1. The British Medical Association is a voluntary organization representing over 65,000 medical practitioners resident in the United Kingdom and overseas and engaged in all branches of medicine. For the purpose of preparing evidence in response to the invitation from the Interdepartmental Committee on Child Adoption, the Council appointed a special committee composed of the following persons:

Annis Gillie, M.B., B.S., M.R.C.P., General Practitioner, London (Chairman).

T. Y. Finlay, M.D., F.R.C.P.Ed., Honorary Treasurer, Scottish Association for the Adoption of Children.

Miriam Florentin, M.B., Ch.B., D.P.H., Senior Medical Officer, Maternity and Child Welfare, County Borough of West Ham.

J. B. S. Morgan, B.Sc., M.B., B.Ch., D.P.H., County Medical Officer of Health and School Medical Officer, Derbyshire County Council.

T. W. Morgan, M.B., B.S., General Practitioner, New Malden, Surrey.

Kenneth Soddy, M.D., D.P.M., Physician, Department of Psychological Medicine, University College Hospital, and Assistant Director, World Federation for Mental Health.

H. P. Tait, M.D., F.R.C.P.Ed., D.P.H., Maternity and Child Welfare Medical Officer, City of Edinburgh.

2. The Council is grateful for the opportunity to make a contribution to the present inquiry, for medical practitioners, especially those in general practice, often have close personal experience of the circumstances which necessitate adoption and of the difficulties and anxieties of parents and adopters. This memorandum of evidence is based on the views of medical practitioners who have given much thought to the subject. It is believed that the recommendations, if put into effect, could result in a still higher proportion of successful adoptions, success being measured by the achievement of happy family life and eventually by well-balanced adult personalities in the adopted children.

II. THE IMPORTANCE OF PERSONALITY

3. Child adoption, regarded as a special aspect of child care, gives an opportunity for providing integrated family life for both the child and the adopting parents. Investigation and formal process are essential, but they need to be conducted with a higher degree of sympathy and human understanding than is usual in the majority of legal procedures. The Council wishes to emphasize the importance of recognizing the human attributes and needs of all concerned, and it will be seen that most of its recommendations for the improvement of the present system are based on this.

4. This method of approach may be summarized here before the Council proceeds to more detailed recommendations. The mode of investigation and legal procedure should be kept as flexible as possible in order to meet varying circumstances, and to balance the flexibility there should be corresponding protection against abuse and failure. All investigation and assessment of those concerned should be carried out only by persons specially selected for their possession of suitable qualities and experience. The situation of the natural parents and their emotional conflict in deciding whether to give up the child need wise and sympathetic handling by experienced advisers. It should not be forgotten that the adopters, too, are undergoing emotional stress and may be feeling very uncertain of their capacity to act as adopting parents. The matching of child and adopters should be carried out with a full sense of the seriousness of the step and its effect upon their future lives.

5. Adoption can be successful whatever the age of the child at the time of the placing, but the Council believes that the earlier the arrangements for adoption are proposed the better will be the emotional adjustment of all concerned.

It is known that some of the most successful adoptions have been initiated before the birth of the baby. It may be difficult, when placing a child in the early weeks of life, to provide for the adopters an adequate forecast of his physical and mental development, but the risk is no greater than that which must be accepted by natural parents.

6. When the adoption is arranged for before the birth of the child the natural mother is relieved of that part of her emotional conflict which is concerned with parting from her living baby, a conflict which increases the longer the baby remains with her. Anticipation of the birth also stirs the parental feelings of the adopters, and the eagerness with which the baby is awaited is a powerful factor in promoting family unity.

7. The responsibility of all concerned with prenatal adoptions or with the placing of a child in the early weeks or months of his life is very great. This difficulty could be met by giving the court power to require a longer period of probation without the need of an interim order.

8. The Council believes that adequate preliminary investigation, based in all cases as much on personal qualities as on material considerations, could reduce the number of unsuccessful adoptions and remove the desire occasionally expressed for power to rescind an adoption order. Such power would, indeed, undermine the very spirit of the system, which aims at giving the adopted child as full status in his family as any other child. Adopters, if they are to succeed as parents, have to accept the risks of disappointment in the development of their child in the same way that natural parents accept them. Medical practitioners are well aware that, in spite of very careful examination of the child before adoption, physical or mental defect may later emerge, and they know the acute unhappiness and disappointment this may cause the adopters. This element of risk should be fully explained to the adopters both at the time of the placing of the child and when the adoption order is made.

9. The reception of the child by the adopters is an important event in their lives. The Council would like to see more appreciation of the sense of the occasion by those concerned with the arrangements. Efforts should be made to arrange that the physical transfer of the child to the adopters shall take place in suitable surroundings and without undue haste. The court also, when hearing the case at a later date, has a great opportunity for impressing on the adopters the importance of the step they are taking.

III. THE METHODS OF ADOPTION

10. Adoptions arranged through a local authority or a registered adoption society are controlled by statute and, with certain reservations to be mentioned later, are considered reasonably satisfactory. Direct and third-party adoptions are open to most abuse, and it is towards them that general criticism is directed.

11. Although the Council is aware that with the direct method there is a greater chance of commercial exploitation, it considers that direct adoption should remain available.

12. It has been suggested that all third-party adoptions should be prohibited and that the local authority and the registered adoption society should be the only channels permitted. The Council admits that there is a greater risk of failure in third-party adoptions. This may often be due either to the short time left for the investigation of all concerned or to the lack of such supervision, during the probationary period, as is required in local authority adoptions. On the other hand, many third-party adoptions are successful for the very reason that they are informal. For example, when a general practitioner who arranges for an adoption knows both the parents and the adopters he is in a specially favourable position to estimate the chances of success. Many similar arrangements have been made with the agreement of all concerned, including notification to the local authority. It must be admitted, however, that on occasion the information is received too late for any effective action to be taken if the circumstances are found to be unsuitable.

The Unmarried Mother

20. One of the most difficult tasks in the investigations may lie in the handling of an unmarried mother. At present too little sympathy or understanding may be shown towards her while she is endeavouring to decide upon her child's future. It is true that some of these mothers have little conscious intention of keeping their babies and would experience small sense of loss, but many undergo a severe emotional ordeal during which they deserve every possible consideration. A woman faced with this problem should not be unduly pressed to make an early decision on whether to offer her baby for adoption. The Council recommends that the medical officer of health should select some person to be available to give advice to any unmarried mother who is contemplating offering her child for adoption. It appears that there are cases where adoption of the child at a very early age is the best solution, and it is here that the responsibility of the adviser is greatest. The adequate provision of homes for mothers and babies would help to solve some of the difficulties encountered. As previously suggested, an obligation on the mother to make a request to the local authority for permission to place the child for adoption would be some safeguard against making a decision that she might later regret.

Period of Probation

21. The Adoption Act, 1950, provides that the consent of the mother to adoption of her child shall not be admissible until he is at least 6 weeks old, and an adoption order shall not be made unless the child has been with the prospective adopters for at least three consecutive months. As has already been stated, the Council favours the placing of the child at a very early age in certain suitable cases, but it suggests that the courts should be empowered to make a probationary period of more than the statutory three months, according to the problems of the particular case, and that this period should not begin until the child has reached the age of 6 weeks. This would give a fuller opportunity for the settlement of any doubts about the child's future health or capacity for development, or about the suitability of the adopters.

Medical Examination of the Child

22. A medical examination of the child to be adopted is already included in the procedure of both local authorities and registered societies. The Council is of the opinion that two medical examinations are desirable in every case. The first should be undertaken at the time of the placement and the second at the time of the adoption order. The second should be carried out by a medical practitioner with special experience of child health and development.

Medical Examination of Adopters

23. The guardian *ad litem* is required under the Summary Jurisdiction Rules to collect information about the material circumstances of the adopters, but there is no requirement for the medical examination of the adopters. The Council considers that there should be a standard comprehensive medical examination of the adopters, together with an opinion on their personality, probable adaptability to family life, and reasonable expectation of survival. This examination and report should be made by the family doctor of the adopters, where desired, and submitted to a medical referee appointed for each area. If necessary, the referee should obtain information from suitable official sources, such as child guidance clinics and local health authorities, with prior consent of the persons involved. Only the decision of the referee would be communicated to the case committee. It is important that all investigations should be completed, whenever possible, before the child is placed with the prospective adopters.

Registered Societies

24. Registered societies will make their own arrangements for medical examinations, but the Council recommends that the forms of report used should be adequate. It is also

13. There is something of such great personal value in the best type of third-party placing that the Council would wish this method to be preserved, but more safeguards against the risk of hasty uninformed placing need to be introduced. These should include notification to the local authority, and full investigation before the placing of the child with the prospective adopters. It will be obvious that adequate time must be allowed to elapse between the notification and the placing to permit of satisfactory investigation.

IV. ADMINISTRATIVE AND LEGAL PROCEDURE

14. The Council considers that, while a choice of methods of adoption should remain, it is desirable that a substantial degree of uniformity in procedure and standards should be required by statute and regulation in all cases, however responsible may have been the introduction by third-party or the personal direct transfer. The recommendations below are intended to apply to local authority, third-party, and direct procedures, and a paragraph on registered societies is included.

Adoption Authorities

15. The Council has given careful consideration to the suitability of the present administrative arrangements, which fall within the sphere of the Home Office. It is of the opinion that there are so many medical aspects in successful adoption that the subject falls more naturally within the range of activities of the Ministry of Health than of the Ministry of Home Affairs. If control were transferred to the Ministry of Health the responsibility for the care of mothers and of children in connexion with adoption would fall within the powers of local health authorities under Sections 22 and 28 of the National Health Service Act for England and Wales, of the National Health Service Act for Scotland. It is realized with corresponding arrangements for Scotland. It is realized that active co-operation with the local children's committee would still be essential.

16. The Council suggests that the Health Committee of the local health authority should appoint a special Adoption Subcommittee to which it would delegate the responsibility for investigating cases. It is thought that this subcommittee would function most effectively if its membership were limited to four to six experts representing public health officers, the Children's Committee, the local medical profession, and local voluntary associations. The local health authority in a small area might co-operate with its neighbours in order to make a wider selection of personnel available.

Applications

17. An obligation should be laid upon the natural parents or the guardian to request permission from the local authority to place a child for adoption. It is essential that the giving up of a child for adoption should be an active decision and not a matter of indifference or resignation.

Investigation of Cases

18. The success of an adoption depends to a large extent upon the completeness of the investigation of all factors concerned. Failure to make a satisfactory investigation may result in bad matching of child with adopters or hardship to the natural parents. It is therefore important that the investigation should be carried out with a full sense of the importance of the task. The Council recommends that when an application is received for the placing of a child it should be referred to the Adoption Committee already mentioned, which would be responsible for investigating the case and reporting to its parent committee or authority. It would also organize the collection of the information detailed in the Adoption of Children (Summary Jurisdiction) Rules, 1949-52. Such a committee would not supersede the guardian *ad litem* in representing the infant in court, but would be a source of information in protecting the child's interests.

19. The investigation should be begun at the earliest opportunity, if necessary before the birth of the child. All medical reports must be regarded as confidential.

essential that societies should avail themselves, to a greater degree than is usually the case at the present time, of the sources of medical information about the individual which are available under the National Health Service, with the prior consent of those concerned. The Council suggests that they should also set up their own machinery, parallel to that recommended above for local authority adoptions, for the investigation of individual cases. The smaller societies could no doubt take advantage of the adoption machinery available in their areas under the appropriate authority.

The Court

25. If all the circumstances were properly and fully investigated by the Adoption Committee as suggested above, the main function of the court would be to ensure that the legal procedure had been duly followed, and the need for interviewing in court with regard to medical matters would be small.

26. When an adoption case is heard in a juvenile court there are advantages, from a psychological standpoint, in ensuring that children brought for adoption are kept separate from those attending for other reasons. Similarly, the need for a different mode of approach will be recognized by the magistrates, and it may be that separate sessions will be thought preferable. As suggested in paragraph 9, the proceedings will provide an occasion for the magistrates to impress upon the adopters the importance of the responsibility they are accepting.

Identities

27. Although the problem of the disclosure of identities might appear to be outside the medical aspects of adoption, it has some psychological implications. The Council considers that, in the adoption procedure, there are advantages in giving each child a serial number which is linked with the confidential information kept by the court. For example, subject to suitable and adequate safeguards, a child who wished in adult life to ascertain the identity of his parents, whether to satisfy legitimate curiosity about his origin or to protect his legal rights in respect of inheritance and title, could apply to the court which made the original adoption order.

28. The problem of whether the adopters should know the identity of the natural parents is more complex. On the whole, the Council is of the opinion that, while the name and address of the natural parents should usually be concealed, the adopters would be helped later in answering the child's questions if they knew something of the personality and social and economic status of his parents. For practical reasons the identity of the adopters should not, in the majority of cases, be revealed to the natural parents.

SUMMARY OF RECOMMENDATIONS

1. In the arrangement of adoptions full recognition should be given to the human attributes and needs of all concerned (paras. 3-8).
2. Fuller appreciation should be shown of the sense of the occasion when the child is transferred to the adopters (paras. 9 and 26).
3. The system of third-party adoptions and direct transfers should be preserved, with additional protection of the interests of all concerned (paras. 10-13).
4. These safeguards should include:
 - (i) notification to the local authority of a proposed placing (para. 13);
 - (ii) full investigation before the placing of the child with the prospective adopters (para. 13);
 - (iii) a requirement that the natural parents or the guardian should seek from the local authority permission to place the child with a view to adoption (para. 17);
 - (iv) the provision of advisers to the natural parents (para. 20).
5. A substantial degree of uniformity in the standards and procedure should be required by statute and regulations in all cases of adoption (para. 14).

6. In view of the many medical aspects in successful adoption, it is considered that the subject falls more naturally within the range of the Ministry of Health than of the Home Office (para. 15).

7. The Health Committee of a local health authority should delegate to a special Adoption Subcommittee the responsibility of investigating cases (para. 16).

8. All applications for placing should be referred for investigation to the Adoption Committee (para. 18).

9. The investigation should be begun at the earliest possible opportunity (para. 19).

10. All medical reports must be regarded as confidential (para. 19).

11. More consideration should be shown to the unmarried mother in her difficulties (para. 20).

12. The placing of the child should take place at the age most suitable for each case, but the courts should be empowered to make a probationary period of more than the statutory three months, according to the problems of the particular case; this period should not begin until the child has reached the age of 6 weeks (para. 21).

13. Two medical examinations of the child should be required, one at the time of placement and the other at the time of the adoption order (para. 22).

14. A comprehensive medical examination of the adopters should be required in all cases, subject to the final decision of a medical referee (para. 23).

15. The forms of medical certificate and report used by registered adoption societies should be adequate (para. 24).

16. Registered societies should set up machinery parallel to that recommended for local authority adoptions (para. 24).

17. Care should be taken in the procedure of juvenile courts to ensure that children brought for adoption are kept separate from those attending for other reasons (para. 26).

18. Consideration should be given to the suggestion that each child should be given a serial number which is linked with the confidential information kept by the court (para. 27).

PRESCRIBING APPEAL

The following is a report of an appeal to the Ministry by a doctor against the decision of a local medical committee upholding an executive council's decision that gin contained in a mixture was not a drug which it was bound to supply.

The Doctor's Case

The doctor had prescribed for his patient, who was suffering from secondary carcinomatosis, a mixture containing in each ½ oz. (15 ml.): morphine 1 gr. (65 mg.), cocaine ½ gr. (32 mg.), honey 1 dr. (4 g.), and gin 2 dr. (8 ml.). The patient had had this mixture in hospital and the doctor continued to prescribe it. He stopped the mixture for one week, and the result convinced him that without it the patient's life was unbearable. The executive council decided after six months that the gin in the mixture was not a drug, and thereafter he prescribed the mixture without the gin. The doctor considered that rectified spirit would not have the same effect in counteracting depression caused by pain and opiates.

No argument was offered for the executive council.

Findings of the Referees

The referees appointed by the Ministry to hear the case were divided in their views. The majority were satisfied that the gin was included in the mixture for a pharmacological purpose, and that it was a doctor's duty to alleviate physical and mental distress. The doctor disregarded the advice of the Joint Subcommittee of the Standing Medical, Pharmaceutical, and General Practitioner Committees, who recommended that alcoholic beverages should never be classed as drugs and that the place of gin should be taken by spirit can be a drug, so can gin, and they could not say that the doctor's view that rectified spirit did not produce the same effect as gin was unreasonable. The referees decided by a majority that gin was a drug.

MINISTER OF HEALTH TO ADDRESS ANNUAL CONFERENCE OF LOCAL MEDICAL COMMITTEES

The Minister of Health, the Rt. Hon. Iain Macleod, M.P., P.C., has accepted an invitation from the General Medical Services Committee to address the Annual Conference of Local Medical Committees on Wednesday, June 17. The Minister will address the Conference at 12.30 p.m., and it is understood that he intends to make his views known on a number of important matters of policy.

The Minister will afterwards be the guest of the Committee at a fork luncheon.

SURPLUS SENIOR REGISTRARS

MINISTER'S PROPOSALS

The Joint Consultants Committee has been pressing the Minister of Health to take action to avert the crisis which threatened with the expiry shortly of the appointments of many senior registrars. As a result the following statement has been issued by the Minister and the Joint Committee.

The Minister of Health and the Joint Committee for Consultants and Specialists as representing the medical profession have been discussing the position of those senior registrars in England and Wales whose appointments will soon be ending in accordance with the arrangements made in 1951 for reducing the number of senior registrar posts to bring it more into line with the estimated number of vacancies for consultants and senior hospital medical officers in the various specialties. The Joint Committee has represented to the Minister that to avoid undue hardship a longer time should be allowed for this adjustment to be brought about so that in suitable cases these senior registrars and about so that in suitable cases these senior registrars and former senior registrars may have longer to seek the higher hospital appointments for which they have been training or to obtain other medical posts outside the hospital service. The Minister has come to the conclusion that transition to the senior registrar complement envisaged by the plan of 1951 may be smoothed in that way without detriment to the hospital service.

Accordingly the Minister has authorized hospital boards to retain senior registrar posts in excess of those covered by the plan of 1951 for a period not extending beyond the end of 1955 at the latest where this will avoid extra staff having to be employed in other grades and fully suitable candidates are forthcoming for the retained posts. As the engagements of the present holders will be advertised, applications will be entertained from the present holders, from other senior registrars whose appointments will end in the near future, and, in certain circumstances, from former senior registrars. The term of these posts will be one year, but boards will be free to allow a second year where other employment has not been obtained by the end of the first year.

Though the holders of these posts will continue to be free to compete for higher hospital appointments they will do so in competition with other candidates, and their retention as senior registrars will not give them any special claim or constitute any guarantee that they will be successful in the competition.

In addition, there will still, of course, be nothing to prevent a retiring senior registrar from applying for and being appointed to a post within the training establishment. If, however, he is reappointed to the same post, the term of his reappointment will be limited to two years. The Joint Committee has expressed its agreement with these arrangements.

The above announcement relates only to England and Wales. Discussions on the Scottish position are still in progress between the Department of Health and the medical profession in Scotland.

SCOTTISH MEDICAL PRACTICES COMMITTEE

REVISED LIST OF UNDER-DOCTORED AREAS

The following revision to the list of areas needing more family doctors (*Supplement*, November 1, 1952, p. 177) has been prepared by the Scottish Medical Practices Committee, and is being issued to executive councils through Scotland.

County of Ayr: Kilmarnock; County of Caithness: Wick; County of Dunbarton: Dumbarton, Vale of Leven, Clydebank, Kirkintilloch; County of Fife: Lochgelly, Cardenden and Crossgates, Burntisland, Dunfermline, Rosyth and Inverkeithing; County of Lanark: Airdrie, Bellshill, Larkhall, Motherwell, Shotts, Coatbridge; Lothians and Peebles: Bathgate, Linlithgow and Bo'ness, Gorebridge and Newtongrange, West Calder; County of Orkney: Kirkwall; County of Renfrew: Johnstone, Renfrew; Stirling and Clackmannan: Falkirk, Polmont, Grange-mouth, Alloa.

In an accompanying circular the Department of Health for Scotland states that in areas included in the revised list it can be assumed that an initial practice allowance will be payable for a doctor setting up in single-handed practice, so long as conditions remained unchanged. Applications for initial practice allowances in areas not appearing on the list will be considered by the Medical Practices Committee in the light of circumstances in the area. Initial practice allowances, which were among the changes recommended by the Working Party on remuneration of doctors, range up to £600 and took effect from April 1 of this year. They are designed to produce an income in the range of £600 to £1,100 over a period of three years for a doctor genuinely building up a practice in an area where it is needed.

REGIONAL CONSULTANTS AND SPECIALISTS COMMITTEES

CONFERENCE OF HONORARY SECRETARIES

Fifteen honorary secretaries of regional consultants and specialists committees attended a conference held at B.M.A. House on April 23. After a welcome by the Secretary of the Association, Dr. T. ROWLAND HILL, Chairman of the Central Consultants and Specialists Committee, who took the chair in the morning, reported on the present medico-political position in the hospital field.

Organization Discussed

In the afternoon Dr. A. H. IMRIE presided over a discussion on the work of the Consultants and Specialists Organization. The discussion covered the present structure of the organization, the need for possible modifications and improvements, and the question of increased secretarial and clerical assistance. Particular attention was paid to the links between B.M.A. Headquarters and the regional committees and between these committees and hospital groups and individual consultants. Relationships between the central organization of consultants and specialists and the Ministry were examined, together with those between the peripheral organization and hospital boards, with reference to the principle of joint consultation. The relationship between the Consultants and Specialists Organization and the rest of the British Medical Association was also discussed, together with its problems and possibilities. The desirability of increased liaison and co-operation with general practitioners and the public health organizations was stressed.

Refreshing Contact

The small conference provided an excellent opportunity for informal exchanges of opinion and for presenting information about prevailing conditions. The members departed refreshed by contact with their opposite numbers and perhaps feeling that, though the lot of regional honorary secretaries is not always a happy one, the work is nevertheless worth while. It is hoped that there will be more of these conferences.

NATIONAL HEALTH SERVICE

APPOINTMENTS TO REGIONAL HOSPITAL BOARDS

Appointments, mainly to fill vacancies caused by the retirement in rotation of one-third of the members of the 14 regional hospital boards set up under the National Health Service Act in England and Wales, have been made by the Minister of Health, Mr. Iain Macleod. Out of a total of 124 appointments, 89 are reappointments of retiring members; 6 appointments are still outstanding. Among those reappointed 13 are women, and of the new appointments 4 are women.

Tenure of office will be for three years—until March 31, 1956. Another one-third of the members will retire on March 31, 1954. Total membership of the boards, excluding chairmen, is 364.

Those reappointed or newly appointed for each board are as follows:

Newcastle.—Reappointed: Mr. Edward Crowther; Dr. S. WHATELEY DAVIDSON; Professor R. BRAMBLE GREEN; Mr. Arthur Kay; Dr. JOHN RAYMOND MURRAY; Mr. John Lisle; Viscountess Ridley; Dr. R. GORDON RUSSELL. New Members: Mr. James Thomas Fletcher (Redcar); Miss Barbara Carmichael (South Shields).

Leeds.—Reappointed: Alderman D. Beevers; Mr. H. J. Edwards; Mr. B. Hazell; Mr. W. Louis Lawton; Mr. C. R. Morris; Mr. F. Watkinson. New Member: Dr. R. WATSON (Beverley, Yorks). One appointment outstanding.

Sheffield.—Reappointed: Dr. H. BARBER; Mr. A. R. Martin; Alderman A. E. McVie; Mr. T. Pearson; Professor G. L. ROBERTS; Mr. E. W. Scorer; Councillor J. S. Worrall. New Members: Mr. R. LODGE (Leicester); Dr. D. MACMILLAN (Nottingham); Mr. A. H. Whiteley (Mansfield).

Oxford.—Reappointed: Mr. A. R. BANHAM; Mr. J. W. W. Cripps; Captain F. Gardiner; Colonel C. B. Krabbe; Professor T. POMFRET KILNER; Miss Rosemary Spooner; Professor J. A. STALLWORTHY. One appointment outstanding.

South-western.—Reappointed: Mrs. Margaret Ball; Mrs. K. A. Goddard; Alderman V. J. Ross; Colonel H. Bland Stokes. New Members: Mr. E. C. F. Bird (Lyme Regis); Professor J. A. Coutts (Bristol); Mr. H. M. Scott (Frome); Mr. P. N. Washbourn (Plymouth); Dr. L. W. HALE (Camborne). Miss M. H. Cordiner (Bristol) has been appointed until March 31, 1955.

East Anglian.—Reappointed: Mr. M. W. B. BULMAN; Mr. J. Grantham; Mr. H. S. Matthes; Mr. G. T. Vawser. New Members: Sir Stephen Green, Bt. (Snettisham, King's Lynn); Dr. STEPHEN MACKEITH (Norwich); Captain E. Murray-Harvey (Old Hunstanton). One appointment outstanding.

North-west Metropolitan.—Reappointed: Professor S. J. COWELL; Alderman Lieutenant-Colonel G. B. Goad; Mr. A. STAVELEY GOUGH; Dr. D. F. HUTCHINSON; Mr. H. Lesser; Miss M. Marriott; Mr. J. M. Oakey; Miss E. RICKARDS. New Members: Lord Hacking (London); Professor A. Bradford Hill (Great Missenden, Bucks).

North-east Metropolitan.—Reappointed: Dr. LOUIS COMYNS; Lieutenant Commander H. Denton; Professor V. W. DIX; Mr. Thomas R. Haggerty; Mrs. Ruth Rees-Thomas; Major R. P. Woodhouse.

South-east Metropolitan.—Reappointed: Mr. E. R. Bolland; Rt. Hon. Lord Cunliffe; Mr. R. J. Mellish, M.P.; Dr. A. TALBOT ROGERS. New Members: Miss D. M. Smith (London); Mr. H. J. Lester (Orpington). One appointment outstanding.

South-west Metropolitan.—Reappointed: Mrs. E. Hailstone; Dr. LOUIS MINSKI; Mr. M. F. NICHOLLS; Mr. S. R. Thorowgood; Mrs. H. Feiling. New Members: Dr. CHARLES GROSCHE (London); Mr. H. H. LANGSTON (near Winchester); Miss D. Morris (London); Mr. H. T. Townsend (Salisbury). Surgeon Lieutenant-Commander REGINALD BENNETT (London) has been appointed until March 31, 1955.

Wales.—Reappointed: Mr. William Berriman; Alderman William Casey; Alderman Thomas P. Davies; Alderman Walter C. Davies; Councillor Eddie Jones; Alderman James J. Panes; Dr. DYFRIG H. PENNANT; Sir Ivor Broadbent Thomas; Professor Owen H. Williams. New Member: Alderman Robert Dyson Briercliffe (Anglesey) has been appointed until March 31, 1954.

Birmingham.—Reappointed: Mr. J. E. Roberts; Mrs. V. Evershed; Alderman H. Barber; Professor C. F. V. SMOUT; Alderman P. Williams; Alderman L. Whitehouse; Mrs. S. A.

Ward; Mr. Everard P. Major. New Member: Mr. David Rhydderch (Worcs). One appointment outstanding.

Manchester.—Reappointed: Mr. Walter Barnes; Alderman G. D. Hastwell; Professor A. D. MACDONALD; Alderman W. Onions; Sir JOHN STOPFORD, F.R.S.; Mr. J. T. Waite; Mrs. E. A. Watson. New Members: Dr. H. PIGOTT (Manchester); Dr. A. POOLE (Oldham). One appointment outstanding.

Liverpool.—Reappointed: Miss A. L. Bulley; Professor Sir HENRY COHEN; Mr. G. N. Fullagar; Mr. A. A. GEMMELL; Mr. T. W. Harley; Alderman H. Platt. New Member: Dr. STEPHEN BARTON HALL (Liverpool).

TEACHING HOSPITAL APPOINTMENTS

Appointments, mainly to fill vacancies caused by the retirement in rotation of one-third of the members, have been made to the boards of governors of the 10 provincial teaching hospitals in England and Wales by the Minister of Health, Mr. Iain Macleod. Out of a total of 92 appointments 61 are reappointments of retiring members; two appointments are still outstanding. There are two new women members and nine have been reappointed.

Members of these boards serve in a voluntary capacity. Tenure of office will be for three years—until March 31, 1956. Another one-third of the members will retire on March 31, 1954. Total membership of the 10 boards, excluding chairmen, is 280.

Those reappointed or newly appointed for each board are as follows:

United Newcastle-upon-Tyne Hospitals.—Reappointed: Professor ROBERT VIVIAN BRADLAW; Mr. Edward Foyle Collingwood; Professor R. BRAMBLE GREEN; Professor F. JOHN NATTRASS; Mr. Edward Colgan. New Members: Mr. NORMAN HODGAM (Newcastle-upon-Tyne); Rev. R. E. Robson (Prudhoe, Northumberland); Miss A. M. Truesdale (Forest Hall, Northumberland); Mr. G. Hodnett (Newcastle-upon-Tyne); Dr. JAMES HENDRY, L.R.C.P. (Jarrow).

United Leeds Hospitals.—Reappointed: Alderman D. Beevers; Professor A. M. CLAYE; Councillor W. Maldwyn Jones; Mr. J. E. Rusby; Miss E. G. Lupton; Professor T. TALMAGE READ; Mr. D. WATSON. New Member: Professor P. J. MOIR (Leeds).

United Sheffield Hospitals.—Reappointed: Mr. A. R. Martin; Mr. T. Pearson; Dr. H. R. VICKERS; Professor E. J. WAYNE; Mr. J. M. Whittaker, F.R.S.; Mr. J. Madin; Mr. P. Malby; Councillor A. Wilde; Mr. A. O'Connor Fenton. New Member: Dr. C. S. O'FLYNN (Sheffield).

United Cambridge Hospitals.—Reappointed: Professor A. LESLIE BANKS; Lady Elizabeth Rook; Mr. T. C. Wyatt; Lady Bragg; Mrs. E. Hepner; Mr. E. C. Webb. New Member: Mr. T. J. FAIRBANK (Cambridge).

United Oxford Hospitals.—Reappointed: Dr. C. W. CARTER; Colonel C. B. Krabbe; Mr. J. G. Robinson; Miss Rosemary Spooner; Mr. R. E. Warrell. New Members: Mr. A. W. Dent (Oxford); Mr. A. S. TILL (Eynsham); Dr. W. RITCHIE RUSSELL (Oxford). One vacancy to be filled.

United Bristol Hospitals.—Reappointed: Mrs. Helen Bloom; Mr. H. K. Campbell; Professor A. I. DARLING; Miss Iris M. Lobb; Alderman J. J. Milton; Sir Philip Morris; Lady Mary Sinclair; Colonel H. Bland Stokes. New Member: Dr. G. K. MCGOWAN (Bristol).

United Cardiff Hospitals.—Reappointed: Mr. Alec Johnson; Mr. Edward E. Tompkins; Dr. JAMES WALKER. New Members: Professor LAMBERT C. ROGERS (Cardiff); Mr. JAMES TUDOR THOMAS (Cardiff); Professor FRED GRUNDY (Radyr, Glam.); Mr. Eddi Jones (Tredegar); Mr. Harold M. Meredith (Penarth); Mr. W. J. Canton (Merthyr Tydfil).

United Birmingham Hospitals.—Reappointed: Alderman A. F. Bradbeer; Dr. E. BULMER; Mr. W. J. G. Sperry; Mr. D. Bulgin; Mr. J. F. Crowder. New Members: Mr. W. L. Barrows Humphrey Humphreys (Birmingham); Vice Chancellor, Birmingham University (until September 30, 1953). One vacancy to be filled.

United Manchester Hospitals.—Reappointed: Mr. L. G. M. Crick; Mr. OGILVIE M. DUTHIE; Mr. Graham Halbert; Professor Mansfield Cooper; Mr. H. E. Newbold; Sir JOHN STOPFORD, F.R.S.; Mr. G. C. Sumner. New Members: Professor Horace Gray Radden (Manchester); Colonel F. J. Gidlow Jackson (Bowdon, Cheshire); Lady Stopford (Manchester) (until

March 31, 1954); Mr. Charles A. Miller (Knutsford) (until March 31, 1954); Professor WALTER SCHLAPP (Cheadle) (until March 31, 1955).

United Liverpool Hospitals.—Reappointed: Mr. J. H. Bromfield; Professor Sir HENRY COHEN; Mr. Richard Davies; Councillor H. S. Dickson; Miss Mary Jones; Mr. George Leather. New Members: Dr. P. E. GORST (Liverpool); Mr. R. R. P. Roberts (Heswall); Dr. P. H. WHITAKER (Liverpool).

MEDICAL PRACTICES COMMITTEE

AMENDMENTS OF CLASSIFICATION OF AREAS

The following amendments to the classification of areas have been issued by the Medical Practices Committee:

ENGLAND: COUNTIES

Bedfordshire.—Barford, Eaton Socon, Sandy and Potton, Intermediate from *Designated.

Berkshire.—Rural District of Hungerford, Restricted from Intermediate.

Buckinghamshire.—Burnham and Taplow, Chesham, Slough and Cippenham, Intermediate from *Designated.

Cheshire.—Chester District (sub-area of Ellesmere Port and Whitby), Intermediate from *Designated; Mid-Cheshire District (sub-area of Great Budworth), Restricted from Intermediate.

Cumberland.—Egremont District, Intermediate from *Designated.

Durham.—Urban District of Shildon, Intermediate from *Designated.

Essex.—Urban District of Waltham Holy Cross, Intermediate from *Designated.

Kent and Canterbury.—Borough of Gillingham, Urban District of Sittingbourne and Milton Regis, Intermediate from *Designated; Rural District of Bridge Blean (except Sturry), Restricted from Intermediate.

Lancashire.—Huyton-with-Roby, Ince-in-Makerfield, Lancaster, Padiham, Intermediate from *Designated.

London.—Borough of Battersea: Nine Elms and Park Ward (South of Battersea Park Road), Shaftesbury Ward, Intermediate from *Designated. Borough of Greenwich: Charlton and Kidbrooke Ward, Intermediate from *Designated.

Middlesex.—Borough of Acton, Borough of Brentford and Chiswick, Borough of Hornsey (South Haringey Ward), Borough of Willesden (Church End Ward), Urban District of Yiewsley and West Drayton, Intermediate from *Designated.

Nottingham County and City.—Mansfield Woodhouse, Nottingham City District No. 1, Intermediate from *Designated.

Oxford County and City.—Dorchester-on-Thames, Restricted from Intermediate.

Staffordshire.—Borough of Newcastle, Intermediate from *Designated.

Surrey.—Urban District of Haslemere, Restricted from Intermediate.

Warwickshire.—Urban District of Bedworth, Rural District of Atherstone, Rural District of Stratford-on-Avon, Restricted from Intermediate.

Worcestershire.—Bewdley, Restricted from Intermediate.

Yorkshire (East Riding).—Haltemprice, Intermediate from *Designated.

Yorkshire (North Riding).—Borough of Thornaby-on-Tees, Urban District of Skelton and Brotton, Intermediate from *Designated.

Yorkshire (West Riding).—Urban Districts of Normanton, Rawmarsh, Stocksbridge, Wombwell, Intermediate from *Designated.

COUNTY BOROUGHES

Birmingham.—Erdington Ward, Northfield Ward, Sheldon Ward, Stechford Ward, Weoley Ward, Intermediate from *Designated.

Bristol.—District No. 1 St. George, District No. 3 Bedminster, Intermediate from *Designated.

Darlington.—Whole of County Borough, Intermediate from *Designated.

*Areas in which the position is finely balanced and the admission of only one or two doctors may result in reclassification.

Huddersfield.—District of Fartown and Sheepridge, District of Moldgreen, Dalton and Almondbury, Intermediate from *Designated.

Ipswich.—Whole of County Borough, Intermediate from *Designated.

Liverpool.—Postal District No. 19, Intermediate from *Designated.

Newcastle-upon-Tyne.—West Area, Intermediate from *Designated.

Plymouth.—Northern Section, Intermediate from *Designated.

Stoke-on-Trent.—Fenton and Blorton, Stoke and Hanford, Intermediate from *Designated.

York.—Whole of County Borough, Intermediate from *Designated.

WALES: COUNTIES

Cardiganshire.—Aberystwyth, Restricted from Intermediate; St. Dogmaels (classified with Cardigan), Restricted.

Denbighshire and Flintshire.—Ffynnongroew, Intermediate from Restricted; Hawarden Rural District (practice area already restricted), Restricted from Intermediate.

Glamorganshire.—Taffs Well Ward (Caerphilly U.D.), Intermediate; Llantrisant and Llantwit Fardre, Intermediate from *Designated.

Monmouthshire and Newport.—Urban District of Abercarn, Intermediate from *Designated; Municipal Borough and Rural District of Monmouth, Restricted from Intermediate.

Pembrokeshire.—St. Dogmaels (classified with Cardigan), Restricted.

NEW AMERICAN DEPARTMENT OF HEALTH

Mrs. Oveta Culp Hobby has been appointed Secretary of the United States Federal Government's new Department of Health, Education, and Welfare. The post carries cabinet rank. According to the *New York Times*, Mrs. Hobby has said it is her "personal philosophy" that adequate medical care for all Americans could be achieved by "expanding and perfecting the system of voluntary, non-profit, privately operated health insurance programmes." Her views, which are in full agreement with those of the President, are opposed to socialized medicine and the compulsory health insurance policy suggested during the Roosevelt and Truman administrations.

The reorganization will include a new post—that of special Assistant for Health and Medical Affairs. This official will represent private medical practice and will "review the health and medical programmes of the Department and advise the Secretary with respect to necessary legislation." It would seem that the occupier of the post will be an adviser to the Secretary additional to the Surgeon-General of the Public Health Service.

COST OF PRESCRIBING

The Minister of Health, when asked in Parliament the number and cost of prescriptions issued for which charges were imposed under the National Health Service Act, 1952, for the months of January, February, and March, 1953, as compared with the figures for the same months in 1952, gave the following figures for England and Wales:

	No. of Prescriptions	Average Cost per Prescription	Total Cost
January, 1952 ..	21,115,577	46.51d.	£4,092,083
February, 1952 ..	21,189,421	47.27d.	£4,173,386
March, 1952 ..	20,758,051	47.12d.	£4,075,277
January, 1953 ..	23,764,000	Declared by chemists } Not yet available	
February, 1953 ..	21,635,000		
March, 1953 ..	21,131,000		

These figures include prescriptions for appliances ordered by general practitioners and dispensed by chemists and prescriptions given by hospital out-patient departments and dispensed by chemists. No figures are available to show the number of prescriptions dispensed at hospitals to out-patients.

ADMISSIONS TO THE MEDICAL LIST
COMPARATIVE FIGURES

The following Table, supplied by the Medical Practices Committee, gives comparative totals of admissions to the medical lists of executive councils during March and April, 1952, with those during March and April, 1953. Cases where new entrants joined the list of two executive councils are counted as only one admission in the figures given. The main practice area is taken in each case, and therefore there is no inflation by duplication.

Date	Partnerships		New Practices	Advertised Vacancies	Limited List	Maternity Medical Services Only	Total
	New Partner	With Former Principal					
1952: March	10	5	9	11	10	—	45
April	60	29	23	17	20	1	150
Total	70	34	32	28	30	1	195
1953: March	87	133	26	20	28	4	298
April	67	105	11	4	12	—	199
Total	154	238	37	24	40	4	497

MEDICAL WHITLEY COUNCIL
COMMITTEE "C"

ASSISTANT MEDICAL OFFICER ARBITRATION

The hearing of the claim put forward by the Staff Side of the Medical Whitley Council Committee "C" for an adjustment in the remuneration of assistant medical officers came before the Industrial Court on Wednesday, May 13. The Staff Side claim was presented by Mr. H. B. H. Hylton-Foster, Q.C., accompanied by Mr. S. B. R. Cooke. The case for the Management Side was presented by Mr. H. B. Williams, Q.C., accompanied by Mr. E. H. Blain. The hearing took the whole day, and the finding of the Court will be announced in due course.

Notes and News

A Refreshing Occasion.—Much has been said about the need for co-operation between the various health agencies which deal with patients in their homes. There is news from a Lancastrian and an East Anglian borough of pleasant efforts to translate words into deeds. In Cambridge a general practitioner entertained his colleagues and public health medical officers, nurses, midwives, and health visitors to sherry. In Preston, the local branch of the Association of Public Health Nurses, independently inspired with the same thought, regaled the local practitioners with a similar beverage. In both cases short talks and exchanges of ideas were added to the business of the evening. From both places it is reported that a greater feeling of partnership has developed between those present and that they are no longer strangers in a common field.

Excluded Hospital's Finances.—The *Daily Herald* reports that the finances and administration of the Industrial Orthopaedic Society and Manor House Hospital are to be considered by a committee appointed by the Society, most of whose 330,000 members are trade unionists. The Society and its hospital had deficits of £18,449 in 1952, £12,000 in 1951, and £23,000 in 1950. Increased costs are blamed for the loss.

Essex County Health Handbook.—A third edition of the *Essex County Health Handbook* has now appeared. Although primarily for the information of the public, it should

prove as useful to the doctors and nurses concerned as its predecessors. First there is a ready reference summary in alphabetical order of all the Health Service facilities available in the county. This is followed by a more detailed description of the preventive and curative services, what they are and how they work. Concise information about various matters of administration together with helpful lists of names and addresses is given in the appendices. A good index rounds off a good booklet.

Correspondence

Tuberculosis and Diseases of the Chest Group
Committee

SIR,—We, the undersigned, whilst acknowledging that this Committee has done good work, deplore its unrepresentative nature. If the present method of election is continued it is almost inevitable that the Committee will consist of its present members, or others living in the South and Midlands, and the large number of members living in the North of England will continue to be inadequately represented.

We therefore suggest that the country be divided up into areas, and that each area votes separately for its representative. If the areas are made large enough the Committee thus elected would be a little bigger than at present, but would be representative of the whole country. We suggest that the following divisions based on regional hospital board areas would be suitable, and hope that the annual meeting of the Group will agree to recommend this change to the Council of the British Medical Association: (1) Newcastle and Leeds Regions. (2) Sheffield and East Anglia Regions. (3) North-west and North-east Metropolitan Regions. (4) South-east and South-west Metropolitan Regions. (5) South-western Region. (6) Birmingham and Oxford Regions. (7) Manchester and Liverpool Regions. (8) Wales. (9) Scotland. (10) Northern Ireland. It is appreciated that the population of the South-western Region is less than that of the other regional groups, but it is geographically large, relatively isolated, rural in nature, and so has a case for its own representative.—We are, etc.,

A. FLEMING,
Knutsford.
M. J. GREENBERG,
Manchester.
O. F. THOMAS,
Liverpool.
H. G. TRAYER,
Manchester.
HENRY VILLIERS,
Southport.
V. COTTON-CORNWALL,
Liverpool.
D. OSBORNE HUGHES,
Birkenhead.
WILLIAM D. GRAY,
Liverpool.

A. GRAHAM BRYCE,
Manchester.
W. FETTES,
St. Annes-on-Sea.
G. LISSANT COX,
Church Stretton.
D. P. SUTHERLAND,
Llandudno.
W. GRIFFEL,
Preston.
E. R. SMITH,
Stockport.
GEORGE FLETCHER,
Manchester.
G. BARKER CHARNOCK,
Preston.

The Constitution of the B.M.A.

SIR,—The place of origin, "Winchester," and the name, "Ronald Gibson," encouraged me to read the long letter in the *Supplement* of May 9 (p. 214) headed "The Constitution of the B.M.A." As I read I found that, considering the ground covered and the number of nails hit truly on the head, the letter was actually very short.

Before the Representative Body can be persuaded to call for an investigation into the best way of achieving its own reform it must be established that such reform is necessary, and this Dr. Gibson has done. I have attended the last dozen Representative Meetings and my personal view is that, though the agenda gets longer and longer, the actual achievement of each meeting is less and less. It is a most regrettable fact that the R.B. is no longer the parliament of the Association, and no good will come out of pretend-

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CORRESPONDENCE

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ing that it is. Even when it refers a matter to Council, believing that that body, acting as the executive of the R.B., will put its wishes into operation, it merely refers something to another body as hamstrung as itself. Both the R.B. and the Council still do some useful work, but all their efforts produce only a fraction of the good to the profession that they would if they were unfettered by the autonomous bodies.

Dr. Gibson says: "A new parliament must be built on firm foundations and not on the ruins of the old." The keystone of those foundations must be unity. Autonomous bodies and unity cannot exist together. The first step therefore will be to devise a form of Representative Body that will render autonomy of committees as unnecessary as it is undesirable.—I am, etc.,

R. HALE-WHITE.

London, N.W.1.

Temporary Residents

SIR,—Whilst agreeing that in the past it was quite absurd to pay 15s. for the hundreds of cases that only required a single consultation each for some trivial complaint, and that the new rate of 5s. is a just and fair one, it is far from adequate for cases requiring more attention than this—for example, suturing lacerations, night visits, and cases that require constant attention. Surely the profession cannot contemplate allowing some of its members to work for such inadequate remuneration.

In my own town the population is about 9,000 in the winter, growing to about 18,000 in the summer. Most of the visitors stay at organized holiday camps, and, unlike one's regular patients, have no hesitation in calling one out at all hours of the day and night, thus creating chaos in the organization of one's practice. It is essential for me to have an assistant to cope with the extra work in the summer, and, quite naturally, I have to maintain him all the year round. The reduction from 15s. per patient to 5s. has therefore placed me in a very difficult position. I have written to the clerk of the local executive council. This I did, and he was most sympathetic, but said that the matter was one for the doctors to settle amongst themselves, suggesting that I wrote to the hon. secretary of the local medical committee, as it would have powers to see that I was fairly treated. The committee's reaction appears to be that holiday camps are exactly what the new regulation was aimed at, and that it could not alter the new scale. It felt that cases where a fee of more than 5s. was justified should be sent to hospital, which I think indicates the complete lack of appreciation of the problems facing seaside doctors, most of the committee having practices in inland or industrial areas. This fee of 5s. does not bear comparison with fees paid for emergency work, or the same work done in private practice prior to the National Health Act. Is it not therefore possible for practitioners in seaside resorts—who are very much in the minority, taking the profession as a whole—to have this problem adequately investigated and fairly dealt with? I should be interested to learn if other seaside practitioners feel as I do about this and whether they think that some method should be found by the B.M.A. of giving due consideration and weight to our peculiar problems.—I am, etc.,

JOHN GRIFFITHS.

Prestatyn.

Specialization and General Practice

SIR,—Two of the many problems awaiting solution since the inception of the N.H.S. are, first, a method of bridging the gap between the hospital service and general practice, and, secondly, the evolution of a satisfactory training-scheme for aspiring specialists and general practitioners. Though the first may only be solved by clinical appointments and/or general-practice hospitals or wards and the second by the wider and so far unfaced issue of a realistic revision of undergraduate and postgraduate training, a partial solution might be sought along the following lines.

The first-year registrar post and the trainee assistant scheme could be abolished and replaced by a joint hospital/general practice appointment of S.H.O. status, the post being part-time, half-day in hospital, half-day with a selected general practitioner (or day about). In hospital the appointee would hold a series of posts—e.g., three months each in surgery (including anaesthesia), medicine (including fevers), midwifery and gynaecology (including paediatrics), and the remaining three months in special departments. In general practice he would sit in on consultations and accompany the general practitioner on his rounds, later undertaking some of the duties on his own. This appointment would be held after the period of National Service, when maximum benefit would be derived.

Such an appointment would give a broad basic training useful in either general practice or specialization, and give time for appraisal of several possible candidates for training as specialists by several members of the staff, so reducing the chance of discard when fully embarked on specialist training. Conversely the "holder," who is at the stage when he has to decide his future, would have an opportunity to view the various fields of medical endeavour. The appointment would not add to the already lengthy training in medicine, and would form a link between general practice and the hospital service. The holder would keep the particular problems of general practice before the hospital staff and at the same time help the general practitioner to keep abreast of hospital practice. He would also avoid the stigma of being a "failed" registrar if from choice or necessity he decided to enter general practice, and avoid the sisyphus task of specialization without experience of general practice. The arrangement would abolish the trainee assistant scheme.

Direct entry to general practice need not be barred. The posts could be largely financed by pooling the moneys expended on first-year registrars and trainees (the latter alone in Scotland cost £83,000 per annum).—I am, etc.,

NORMAN J. LOGIE.

Aberdeen.

The Trainee Assistant Scheme.

SIR,—I was interested to read the views of Dr. Angela Manning (*Supplement*, May 9, p. 217) concerning my letter on the trainee assistant scheme (*Supplement*, March 28, p. 95). Unhappily she has misconstrued my comments as an attack upon the scheme itself, whereas it was, in reality, an attempt to provide destructive criticism of its abuses, and constructive advice on its remedy.

I must reiterate that I am in support of the proposals for a trainee scheme on the lines approved by the G.M.S. Committee of the B.M.A. last year. Theoretically, the whole idea is admirable; but it is one which, I fear, is open to exploitation and abuse by those few trainers who take advantage of a procession of trainees to fill the gap which would normally be filled by a permanent assistant or a junior partner. Further, I would add (for her edification) that, while I myself am a junior partner (and have no axe to grind in the matter whatever), I have served for a year as a trainee, as have no fewer than seven of my personal friends and contemporaries. It was the result of many long and enjoyable (and often unanimous) conversations about the scheme over the past two years that led me to put pen to paper to suggest so simple, so obvious, and so effective a solution for the more obvious disadvantages of the scheme.—I am, etc.,

TOM RUSSELL.

Hayes, Middlesex.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

B.M.A. LIBRARY

The following books have been added to the Library:

- Macdonald, O. J. S.: Small Sewage Disposal Systems. 1952.
Maingot, R. (Editor): Management of Abdominal Operations. 1953.
Mozley, A.: Molluscicides. 1952.
Parry, S. C.: Polyglot Medical Questionnaire. 1953.
Scott, J. A.: Allergy and Seborrhoea. 1952.
Semon, H. C. G.: Atlas of the Commoner Skin Diseases. Fourth edition. 1953.
Stern, D. M., and Burnett, C. W. F.: Modern Practice of Obstetrics. 1952.
Stewart, H. J.: Cardiac Therapy. 1952.
Stuart-Harris, C. H.: Influenza and Other Virus Infections of the Respiratory Tract. 1953.
Tintometer Ltd.: Handbook of Colorimetric Chemical Analytical Methods for Industrial Research. 1953.
Victor, F.: Handwriting: A Personality Projection. 1952.
Vogt, H., and Amelung, W.: Einführung in die Balneologie und medizinische Klimatologie. Zweite Auflage. 1952.
Weber, F. P.: On Naevi and Miscellaneous Subjects. 1952.
Wolff, C.: The Hand in Psychological Diagnosis. 1951.
Worster-Drought, C. (Editor): Residential Speech Therapy. 1952.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel J. L. O'Neill has retired on retired pay on account of disability, and has been granted the honorary rank of Colonel. (Substituted for the notification in a Supplement to the *London Gazette* dated June 22, 1951.)

Lieutenant-Colonel C. A. de Candole has retired on retired pay.
Lieutenant-Colonel G. C. Dansey-Browning has retired with a gratuity.

Major H. R. Hartnell, M.B.E., has retired with a gratuity.
Captain J. K. Sugden, T.D., to be Major.

Short Service Commissions.—Captains (War Substantive Majors) T. Griffiths, A. W. O. Taylor, and A. MacD. Maiden have relinquished their commissions, and have been granted the honorary rank of Lieutenant-Colonel. Captain S. J. T. Merryfield to be Major. Captain F. J. Brown-Douglas has retired with a gratuity, and has been granted the honorary rank of Major.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major (Honorary Lieutenant-Colonel) J. M. Lockie, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

Major A. W. Davidson, M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, and has been granted the honorary rank of Lieutenant-Colonel.

TERRITORIAL ARMY

Lieutenant-Colonels (acting Colonels) A. G. Flemming, O.B.E., T.D., and R. Mowbray, from R.A.M.C., to be Colonels.

REGULAR ARMY: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

Lieutenants (War Substantive Majors) H. G. H. Houghton, B. H. Smith, and H. I. Maister have relinquished their commissions, and have been granted the honorary rank of Lieutenant-Colonel.

Lieutenant (Acting Lieutenant-Colonel) D. N. Parfitt has relinquished his commission (without pay and allowances), and has been granted the honorary rank of Lieutenant-Colonel.

ROYAL AIR FORCE

Group Captain A. Dickson has retired.
Wing Commander B. F. Haythornthwaite has retired.
Flight Lieutenant T. A. Evershed to be Squadron Leader.
Flight Lieutenants W. R. Lee and D. A. Good have reverted to the Reserve of Officers, retaining the rank of Squadron Leader.
Flight Lieutenant C. W. J. Usher has retired at his own request, retaining the rank of Squadron Leader.

Woman Officer Employed with the Medical Branch of the R.A.F.—Flight Lieutenant E. M. McKechnie to be Squadron Leader.

ROYAL AIR FORCE RESERVE OF OFFICERS

Flight Lieutenant J. G. Field to be Squadron Leader.
Flight Lieutenant A. V. Price has relinquished his commission on account of medical unfitness for Air Force service, retaining the rank of Squadron Leader.

ROYAL AUXILIARY AIR FORCE

Flight Lieutenants R. J. S. Wilson and D. Turner to be Squadron Leaders

Association Notices

FORMATION OF A GOLD COAST BRANCH

Notice is hereby given that the Council has formed a Gold Coast Branch comprising the Gold Coast Colony, Ashanti, the Protectorate of the Northern Territories of the Gold Coast, and Togoland under United Kingdom Trusteeship.

A. MACRAE,
Secretary.

Diary of Central Meetings

MAY

- 27 Wed. Local Arrangements Committee, First World Conference on Medical Education, 11 a.m.
27 Wed. Alcohol and Road Accidents Committee, 2 p.m.
27 Wed. Consultants and G.P.s Liaison Executive Committee, 2 p.m.
27 Wed. Film Committee, 2 p.m.
28 Thurs. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
28 Thurs. Central Ethical Committee, 2 p.m.
28 Thurs. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 2 p.m.
29 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.

JUNE

- 5 Fri. Library Subcommittee, Science Committee, 12 noon.
9 Tues. Joint Conference between Representatives of the Occupational Health, G.M.S., and Central Ethical Committees on Continued Treatment by Industrial Medical Officers, 2.30 p.m.
10 Wed. Compensation and Superannuation Committee, 2 p.m.
10 Wed. Public Relations Committee, 2 p.m.
17 Wed. Annual Conference of Representatives of Local Medical Committees, 10 a.m.

Branch and Division Meetings to be Held

CHELSEA AND FULHAM DIVISION.—At Fulham Town Hall, S.W., Friday, May 29, 8.30 p.m., general meeting.

EAST NORFOLK DIVISION.—At Norfolk and Norwich Hospital, Wednesday, May 27, 2.30 p.m., annual general meeting.

FURNESS DIVISION.—At Duke of Edinburgh Hotel, Barrow, Tuesday, May 26, 8 p.m., annual general meeting.

GLASGOW DIVISION.—At Glasgow Regional Office, 234, St. Vincent Street, Glasgow, Friday, May 29, 8.30 p.m., meeting.

HARROW DIVISION.—At Rayners Hotel, Rayners Lane, Tuesday, May 26, 8.30 p.m., annual general meeting.

KINGSTON-ON-THAMES DIVISION.—At Kingston Hospital, Wolverton Avenue, Kingston, Tuesday, May 26, 8.30 p.m., annual general meeting.

LEICESTERSHIRE AND RUTLAND BRANCH.—At Leicester Royal Infirmary, Thursday, May 28, 8.45 p.m., annual general meeting.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, June 9, 2.30 p.m., annual general meeting. President's address by Dr. J. Arthur Moody: "Founders of the Branch and their Problems."

MIDLAND BRANCH.—At Nuffield House, Queen Elizabeth Hospital, Birmingham, Thursday, May 28, 8 p.m., address by Dr. E. E. Claxton to consultants and specialists of the Birmingham Region. General practitioners are welcome.

OXFORD DIVISION.—At Maternity Department Lecture Theatre, Radcliffe Infirmary, Oxford, Wednesday, May 27, 8.15 p.m., meeting. Dr. W. R. Bett: "Medical Aspects of the Tudor Period."

WEMBLEY DIVISION.—At Wembley Hospital, Tuesday, May 26, 8.30 p.m., clinical meeting.

WEST HERTS DIVISION.—At Ashridge Golf Club, Little Gaddesden, Herts, Wednesday, May 27, Treasurer's Cup Golf Competition.

WEST SUFFOLK DIVISION.—At Everards Hotel, Bury St. Edmunds, Tuesday, May 26, 8.30 p.m., meeting.

WIGAN DIVISION.—At Wrightington Hospital, Appley Bridge, near Wigan, Thursday, May 28, 2.30 p.m., clinical meeting. Clinical demonstration by Mr. J. Dobson and Dr. E. H. W. Deane.

WILLESDEN DIVISION.—At Physical Medicine Department, Willesden General Hospital, Harlesden Road, N.W., Tuesday, May 26, 9 p.m., annual general meeting.

ANNUAL MEETING: CARDIFF, JULY 9-17

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 6 1953

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The B.M.A. in Committee

GENERAL MEDICAL SERVICES

The General Medical Services Committee, which consists of 61 members, is not in itself a statutory body, but it is a recognized one—that is to say, it is recognized by the Ministry of Health as the mouthpiece of all practitioners, whether members of the British Medical Association or not, who are providing general medical services under the National Health Service Acts. Moreover, it is the executive of the Conference of Local Medical Committees. Local medical committees, again, are recognized bodies as representing the doctors in their areas, and each of them in Great Britain and Northern Ireland has a voice at the conference.

The majority of the members of the G.M.S. Committee are elected from 24 groups of local medical committees in such a way as to secure geographical cover all over the kingdom. The rest of the membership is made up in various ways. Six members are sent to the Committee by the "informed electorate" of the Annual Conference, a further six by the Representative Body. The sister committees representing consultants and specialists and public health medical officers nominate members, as do the Society of Medical Officers of Health, the Medical Women's Federation, and the Medical Practitioners' Union. Pains have been taken to ensure that every kind of practice is represented—the dispensing doctor, the general practitioner not in the service, the general practitioner employed also in a part-time capacity, and so on.

The amount of travel which a single meeting of the Committee entails is, in total, enormous. If every member of the Committee attends the meeting (and there are very few absentees), the distances travelled, outward and return, must amount to something like 8,000 miles, or an average of 130 miles for each member. The willingness of the members to give journeying time, which in many cases is longer than the time spent in the Committee, is one of the best tributes to their enthusiasm. On one wintry day when trains in some parts of the country were snowbound, a member from the North of Scotland arrived at four o'clock in the afternoon for the last 10 minutes of the meeting, having travelled for 18 hours—but that was exceptional.

The Minister of Health, the Rt. Hon. Iain Macleod, M.P., P.C., has accepted an invitation extended to him by the General Medical Services Committee to address the Annual Conference. The Minister's address will commence at 12.30 p.m.

Wide Experience

In the forefront of the Committee at every meeting are half a dozen strong and (mostly) silent Scots, the first to come and the last to go, for two nights in a sleeper is part of the routine of their attendance. Scotland, by the way, has its own subcommittee, which works very hard up in the North. The back row has about the same number of the North. There are emphatic Lancastrians and other Northerners. There are seven from the Midlands, four from Yorkshire and Durham, three from Wales, and two from Northern Ireland. There are rural, semi-rural, suburban, and urban practitioners. The rural practitioners also have their own subcommittee. The Committee includes the veteran whose experience goes back to the early days of National Health Insurance, and the assistant and young practitioner is also there, with the certainty of being heard on any subject which concerns him. There are men from industrial practices and from practices in genteel watering-places. In-town practice in London is represented, and so are the various outer fringes.

The Committee normally sits from half-past ten until about six, but the actual sitting is only part of the labours of the Committee man. A week or a fortnight before the meeting a pile of documents reaches him, sometimes an inch thickness of foolscap. Other documents arrive by later posts, and when he gets to the meeting still others will be distributed. Agenda have been known to run to 90 items, with reports from half a dozen subcommittees or other sources. Here is no neat programme of business, beginning with the minutes of the last meeting, and ending six lines down with, "Any other relevant matter." The agenda means for the conscientious member a discipline of hours of reading if he is to take an intelligent part in the discussions. There are no preliminaries wasted in explaining what it is all about. Agenda of public bodies can rarely make such demands on the intelligence and understanding of their members.

The outside observer would probably vote the meeting confused. So it is, but it is not the confusion of the ill-informed; it is the confusion of a body in which every member is an expert on the details of general practice, to which every member can bring his own experience. Every member assumes in his neighbour the same acquaintance with detail as he himself possesses. In the result, without any pedantic regard for rules of debate, resolutions are taken, recommendations are framed for the conference, a whole tangle of matters are noted for discussion with the Ministry, replies are decided on points raised by local medical committees and others, subcommittee reports are dissected, and sometimes amended or referred back. And all this takes place normally every month, and even, in times of exigency, at shorter intervals.

No Mean Heritage

The G.M.S. Committee, which held its first meeting in December, 1948, is the successor of the Insurance Acts Committee, inheriting its constitution, its responsibilities, and its reputation—the last no mean heritage. The Insurance Acts Committee, in the 35 years or so of its existence, made a great name for itself. It was fortunate in its successive chairmen—Sir Henry Brackenbury, who brought to its work his incisive logic and skilled advocacy; Dr. Guy Dain, a persuasive and adroit leader, as able to keep his own side in rein as to lash the "enemy"; Dr. H. C. Jonas, who was unfortunately prevented by ill-health from continuing; and Dr. E. A. Gregg, with his unrivalled capacity for "cutting the cackle and getting to the 'osses." Three times has the chair of the Insurance Acts Committee been a stepping-stone to the chair of the Council.

When the title of the Committee was changed and its scope enlarged in 1948 the first chairman was Dr. Wand. He brought to the office the qualities exactly needed at a time of transition and controversy. Perhaps his greatest quality was his pertinacity. The Ministry has more than once found it difficult to maintain its "No" in the face of his persistence. His able successor, Dr. A. Talbot Rogers, has just completed his first year of office. To conduct an orderly meeting is the least of the jobs for the chairman. It is for him to lead the Committee, to give it voice, to interpret its decisions, sometimes to forecast them, at any time to influence them. The Committee's labours in connexion with the recent adjudication are fresh in the memory, but in many other fields its work has been of immense benefit.

Variety of Problems

It is not the purpose of these articles to catalogue the past achievements of committees, but to describe their present constitution and activities. The matters which in various forms and relationships come continually before the G.M.S. Committee include questions concerning assistants and partners and locumtenents, certification, mileage payments, emergency fees, protection of practices, temporary residents, inflation of lists, refresher courses, the general-practitioner specialist, health centres, the doctor in hospital, medical service committee inquiries—the list could be indefinitely extended. A valuable feature of the Committee is its liaison with dentists and pharmacists. A representative of the British Dental Association attends its meetings.

So impersonal is a committee that it can hardly be expected to evoke affection, yet its members often speak of it in affectionate terms, and a former secretary of the Association, the late Dr. G. C. Anderson, retained the secretaryship of the Insurance Acts Committee after his promotion to full office because, he said, he loved it. The writer of these paragraphs happens to have attended almost every meeting of the successive committees for 20 years, and in all that time, while there have been sharp divisions of opinion, he cannot recall one single disagreeable incident; which is a great thing to say.

GENERAL MEDICAL SERVICES COMMITTEE

A meeting of the General Medical Services Committee was held on May 21, with Dr. A. TALBOT ROGERS in the chair.

A report was made to the Committee of the proceedings of the recent Special Conference and of the Extraordinary General Meeting, and the chairman was congratulated on his speeches on those occasions. The Committee had before it an office note of a previous meeting of the Working Party at which a general discussion took place on the scope, methods, and intentions of the promised inquiry into the problems of the small-list practitioners. It was agreed that the Ministry should go ahead as quickly as possible, and that the chairman should include an account of the progress made in his address to the Annual Conference on June 17.

Future of Occupational Health Services

Dr. J. A. L. VAUGHAN JONES, chairman of the Occupational Health Committee, attended for a discussion on the memorandum on the future of occupational health services which his committee has prepared for submission to the Minister of Labour and National Service. Dr. Vaughan Jones said that the memorandum was really a compromise document, as his committee included members with somewhat sharply differing points of view. But the committee had had very real regard for the position of the general practitioner, and he thought the document as a whole was in line with Association policy. He answered various points of question or objection.

Dr. H. D. CHALKE said that in his view the whole of occupational health should be part and parcel of the National Health Service, not independent of the Service (though co-ordinated with it) as the document proposed.

One member gave instances of interference with his own practice by factory doctors.

One point mentioned in a detailed discussion was that managements did not seem to realize that early passes-out were not necessary in order that a man might see his doctor. All doctors in industrial areas kept their surgeries open late. Dr. GRAY thought it important that every industrial medical officer should make contact with the general practitioners in his neighbourhood; the medical officer of health also should be brought in. That should be a cardinal principle of any service.

The CHAIRMAN said that those of them who were members of the Council would, after this discussion, be better able to take part in the final discussions when the memorandum, after its reference to the interested committees, came forward. Dr. Vaughan Jones was thanked for coming.

Appeals Procedure

The agreed arrangements for the payment of partners on the basis of notional lists, the payment of initial practice allowances, and the granting of "hardship" payments include provision for an appeal by a dissatisfied practitioner to the Minister. The advisory body to the Minister is differently constituted in the first two of these classes from what it is in the third, and the Ministry now suggests that the same procedure should be adopted for all three classes of appeals—a committee of, perhaps, three representatives of the department and of three practitioners selected from a panel nominated by the General Medical Services Committee. The Ministry also suggested that when Welsh cases were concerned a representative from the Welsh Board of Health should be brought in, together with a representative of the practitioners in Wales.

The proposal was in general agreed to by the Committee. Another communication from the Ministry stated that it had recently been criticized for supplying regulations to individual medical practitioners, and asked whether the circulation of regulations could be restricted. If new regulations contained no substantial amendment would it be sufficient to make them known by E.C.N.? Dr. WAND insisted

that all regulations should be supplied automatically to every doctor. An E.C.N. was not at all the same thing. This appeared to be the general view of the Committee.

Various Matters

A draft circular on cancer education proposed to be sent by the Ministry to local health authorities was considered. Some concern was expressed lest it should encourage cancerphobia. The view of the Committee was that if the scheme did go forward general practitioners should be represented on any local committees set up for the purpose, and the scheme should be exploratory and reviewed after a time.

The Committee agreed to a request from the Middlesex Local Medical Committee that the Minister be approached for authority for the supply of the combined diphtheria and whooping-cough vaccine to practitioners by local health authorities on request. The combined vaccine has been used by local authority clinics following the completion of an experimental survey initiated by the Medical Research Council.

Dr. A. BEAUCHAMP submitted a memorandum in connexion with the proposed scheme for combined date and place of birth registration numbers relating to identification of general-practitioner patients. The advantages and disadvantages of the scheme were fully set out. It was agreed to discuss the matter with representatives of the clerks of executive councils.

The Committee agreed to a recommendation from the Assistants and Young Practitioners Subcommittee that, in future, principals, including partners, predominantly engaged in general practice, in receipt of a total gross professional income not exceeding £1,500 should be eligible for inclusion on the electoral roll of unestablished principals.

It was agreed, on the suggestion of the Northamptonshire Local Medical Committee, to take up a request to the Ministry for "butazolidin" to be added to the list of specially expensive drugs.

The Committee began its sitting at 10.30 a.m., and did not complete its business until 6 p.m. It was agreed to hold a further meeting on the day after the forthcoming Annual Conference.

GENERAL MEDICAL COUNCIL MEDICAL DISCIPLINARY COMMITTEE

The Medical Disciplinary Committee of the General Medical Council sat from May 20 to 23 and considered 16 penal cases. Professor David Campbell presided.

Restorations

The Committee heard six applications from practitioners for restoration of their names under Section 21 of the Medical Act, 1950. The names of Brendan O'Carroll and James A. Seavers were restored to the Register. In the case of another application, the Solicitor to the Council reported that several of the testimonials sent in were from persons whose identity was unverifiable, and apparently they were spurious. The Committee refused the application and considered *in camera* what further action should be taken. Three other applications were not granted.

Alleged Improper Behaviour and Adultery

The Committee considered a charge against Sidney Linton, registered as of Meanwood, Leeds, M.R.C.S.Eng., 1945; L.R.C.P.Lond., 1945, that he had been guilty of infamous conduct in a professional respect in that on numerous occasions beginning in or about April, 1949, and ending in November or December, 1951, he had behaved improperly to and committed adultery with Miss Myra Metcalfe, with whom he stood in professional relationship at the material times. Dr. Linton, who attended, was represented by Mr. Norman Richards, counsel, instructed by Messrs. Le Brasseur

and Oakley, solicitors to the Medical Protection Society, and Miss Metcalfe was represented by Mr. J. D. Walker, solicitor.

At the outset of the hearing it was submitted on behalf of Dr. Linton that as the allegation involved a charge of felony at law, in respect of which no action had been taken against the doctor in the courts, the Committee had no jurisdiction. After a legal argument, this submission, together with one by complainant's counsel that the case be heard *in camera*, was rejected.

Miss Metcalfe, of Tong Lane, Bradford, testified that she first got to know Dr. Linton in April, 1949, when she consulted him about her daughter, aged 5. Some time later she herself became Dr. Linton's patient, and at about the fifth visit he recommended hypnosis. She was hypnotized on four occasions, and on each occasion except the first the doctor behaved improperly to her. After the course had ceased she was accustomed to meet him, and go out with him in his car, which she did practically every Friday evening for two and a half years. They went to a spot near a disused airfield seven miles from Leeds, and on each occasion intimacy took place in the back of the car. She was never a willing party; though not under hypnosis she was very much under the doctor's influence, and he more or less made her continue the association. On each occasion when they got to the place he would cover over the B.M.A. badge on his car radiator. Finally she broke off the association in 1951, when she learned that his wife was pregnant. Evidence was also given by Miss Metcalfe's fiancé, who said that in April, 1952, when Miss Metcalfe appeared unhappy and depressed, he saw Dr. Linton, who admitted that he had given her hypnotic treatment, and said that he was pleased that marriage between the two was contemplated as it would be a very good thing for her.

At the close of complainant's case Mr. Norman Richards submitted that in the absence of corroboration there was nothing to answer, but the Committee rejected that submission.

The first witness for the respondent was a night sister at St. James's Hospital, Leeds, who testified that on a particular date and hour, when it had been alleged that Dr. Linton was with a lady in his car seven miles from Leeds, he was in fact at the hospital attending a patient who had had an operation the previous day. Another witness stated that at the time mentioned Dr. Linton's car was in his garage for repairs.

Dr. Linton, in evidence, said that he had a National Health list of 2,100 and many private patients. He lived happily with his wife, and had two children. He strongly denied that he had ever hypnotized Miss Metcalfe or had sexual relations with her. It was true that he had on a few occasions practised hypnosis, chiefly for anxiety neurosis, and this fact was known locally. He also strongly denied that he had taken Miss Metcalfe out in his car. Friday evenings, when it was alleged that these excursions took place, were invariably social occasions at home, except for an emergency call. The allegations in the complaint were completely malicious and a lie.

Mr. Walker, on behalf of Miss Metcalfe, called Dr. Linton's attention to three medical certificates which he said had been issued by him to her, and asked why he had instructed his solicitor that Miss Metcalfe had never been a patient of his. Dr. Linton replied that he had no record card for Miss Metcalfe; the only card he had was for the child.

Corroborative evidence was given by Mrs. Linton, who testified to a happy married relationship. It was ridiculous to suggest that Dr. Linton was out every Friday evening during the long period mentioned in the charge. He was at home on Friday evenings except for an occasional brief call on a patient.

After other evidence had been given, the Legal Assessor (Mr. C. P. Harvey, Q.C.) pointed out to the Committee that there was no evidence that Miss Metcalfe made any complaint of Dr. Linton's behaviour to any person close to her. She was a woman of 23 and she had a mother,

and one might have expected that if she had been hypnotized in the doctor's surgery and raped she would have gone home and complained to her mother about it, but she had not done so.

The Committee deliberated in private for 15 minutes, and the President then announced that the charge against Dr. Linton had not been proved, and the case was dismissed.

Drug Offences

The Committee considered the case of Joseph Henry Bentley, registered as of Limsfield, Surrey, L.M.S.S.A.Lond., 1935, who appeared on the charge that he had been convicted at Portsmouth, after pleading guilty, of procuring for himself, when not duly authorized or otherwise than in accordance with the terms and conditions of his authority, on four occasions in September, 1952, of 20 one-quarter grains of morphine, contrary to the provisions of the Dangerous Drugs Regulations. He had also been convicted of not keeping a register in the form set out in the second schedule of the regulations. In respect of each of the convictions he had been fined £50, and in respect of the first conviction ordered to pay £5 5s. costs.

Mr. F. P. Winterbotham, solicitor to the Committee, said that Dr. Bentley first came under the notice of the Home Office in 1946-7, when he was acting as a locumtenent and his use of morphine appeared to be excessive. In June, 1950, when acting as an assistant, he was admitted to hospital with morphine poisoning. There was a long history of morphine addiction.

Dr. Bentley, when asked by the President what he had been doing since his conviction in November, 1952, said that he had been rehabilitating himself. He had not taken any morphine for seven months. He had now no desire to take morphine. Certain testimonials were put in stating that he had made a gallant fight to overcome his addiction.

The Committee, in order to assist Dr. Bentley to overcome his tendency to take drugs, postponed judgment for one year.

The Committee considered a charge against Thomas Leven, registered as of Irvine, Ayrshire, L.R.C.P.Ed., 1945; L.R.C.S.Ed., 1945; L.R.F.P.S.Glas., 1945, that in June, 1952, he was convicted, at the Sheriff Court of Ayr and Bute, after pleading guilty, of contravening the regulations by procuring for himself in *cumulo* 567 grains of morphine sulphate by presenting, in the name of his patients, prescriptions therefor to chemists. He had been "admonished" by the Court, which, the Committee's solicitor said, was equivalent to conviction.

It was stated that the prescriptions had been made out in the names of nine patients, seven of whom strongly denied ever having had morphine; the other two had had four injections which might have been morphine, and a total of 125 grains had been prescribed on their behalf. In April, 1952, a rapid increase in the practitioner's prescribing of morphine was noted. One chemist supplied him with 95 grains of morphine sulphate, and similar supplies were probably made by other chemists.

Dr. Leven said that he had had hospital treatment for a month or six weeks. It was four or five months since he came out of hospital, and he had entirely given up drugs.

In this case also judgment was postponed for a year in order to give the practitioner an opportunity of completely overcoming his tendency.

Drunkenness and Cognate Offences

The Committee considered the case of Florence Joseph O'Driscoll, registered as of Orrell Park, Liverpool, against whom convictions were proved, at Liverpool in February, 1949, of being guilty, while drunk, of disorderly behaviour, and twice in March, 1953, of being found drunk. Mr. C. Leigh Taylor, of Messrs. Hempsons, solicitors to the Medical Defence Union, agreed that Dr. O'Driscoll's record was a bad one. He had previously been before the General Medical Council following similar offences, but in the ten years

from 1939, when he previously appeared, to 1949 he was in no trouble whatever, and he had built up a practice and had now about 1,200 patients on his list. These were isolated occasions and not part of a general habit. Dr. O'Driscoll gave an undertaking never again to take alcohol.

The Committee warned Dr. O'Driscoll, but, in order to give him one further opportunity, postponed judgment for one year.

The case of Patrick Aloysius Gallen, registered as of Garscube Road, Glasgow, was next heard. He had been convicted in 1940 at Glasgow of being in charge of a motor vehicle whilst under the influence of drink; in 1946 of a similar offence; in February, 1952, of driving a car without due care and attention, and in October, 1952, of driving a motor vehicle recklessly and of driving and being in charge of a motor vehicle while under the influence of drink.

It was pleaded on behalf of Dr. Gallen that he had a good record in general practice in Glasgow for 24 years, and that on each of these occasions he was not seeing patients or engaged in medical work of any kind. As a result of medical treatment he had not touched alcohol for the last two months.

Judgment was postponed for one year.

Roger Keith Hayden, registered as of Graham Road, Hendon, appeared on the charge that in November, 1952, at Chelmsford, he had been convicted of driving a motor vehicle when under the influence of drink, also of driving a motor vehicle in a manner dangerous to the public, of assaulting two police constables, and of committing wilful damage to cell windows. In December, 1952, again at Chelmsford, he had been convicted of 13 offences in September and October of obtaining certain drugs by false pretences. The offences related to obtaining in all some hundreds of tablets of cyclobarbitone, amphetamine, and codeine.

Mr. Norman Richards, counsel, read a number of testimonials on Dr. Hayden's behalf. He had been under unusual anxiety and stress in building up a practice, and had now succeeded in building up a small one, but with the opening of a new estate at the end of this year it was hoped that it might be enlarged. It was in his anxiety state that he had yielded to temptation and taken the drugs. It was apparent that he was being cured. Mr. Richards pointed out that he had not only been on trial before the court of summary jurisdiction but had also had to appear before the National Health Service tribunal, and these proceedings before the Disciplinary Committee had been hanging over him for many months.

In this case also judgment was postponed for one year.

The next case was that of Patrick Laurence Lyons, registered as of Kilkelly, Co. Mayo, who appeared following convictions in 1951 at Loughborough of driving or attempting to drive or being in charge of a motor vehicle while under the influence of drink; and in December, 1952, at Manchester, of driving a motor vehicle when under the influence of drink, and driving in a manner dangerous to the public, and, on the same date, of being found drunk in a highway.

Mr. Norman Richards, counsel, on behalf of Messrs. Le Brasseur and Oakley, solicitors to the Medical Protection Society, said that this was a young man aged 34. He had now given up alcohol. Testimonials were read on his behalf.

The Committee postponed judgment for a period of one year.

Cases Adjourned from Previous Sessions

The following practitioners, against whom convictions for misdemeanours had been found proved at previous sessions, when judgment had been postponed, came before the Committee and produced testimonials as to their satisfactory conduct in the interval:

Daniel Topping Gemmell, registered as of Ward End, Birmingham; Thomas Patrick Smyth, registered as of Atherton, Manchester; Alan McKerlie, registered as of Upper Chorlton Road, Manchester.

In each of these cases the Committee accepted the testimonials, resolved not to direct the Registrar to erase the name, and closed the proceedings.

In the case of Patrick Kennedy, registered as of East Dulwich Road, London, the testimonials produced covered a period of only ten weeks, during which he had been acting as locumtenent, and the Council postponed judgment for a further six months, and impressed on Dr. Kennedy the importance of satisfying the Committee by the production of adequate testimonials.

[The conclusion of the business of the General Medical Council will be reported in next week's Supplement.]

AGENDA OF ANNUAL CONFERENCE OF REPRESENTATIVES OF LOCAL MEDICAL COMMITTEES, JUNE 17, 1953, 10 A.M., AT B.M.A. HOUSE, LONDON

Chairman: Dr. W. M. KNOX (Glasgow)

In this Agenda are printed all Notices of Motion received up to and including May 27, 1953. The printing of these does not affect the position of relevant Amendments or Motions subsequently received, which, must, however, in order to secure consideration, be sent to the Secretary prior to the Conference, or handed in *in writing* at as early a stage of the Conference as possible.

PRELIMINARY BUSINESS

Items 1 to 6 relate to preliminary business.

ANNUAL REPORT OF GENERAL MEDICAL SERVICES COMMITTEE

7. Motion by the Chairman of the General Medical Services Committee: That the Annual Report of the General Medical Services Committee (M.9) be received.

Remuneration: Reduction of the Maximum Number of Patients whom a General Practitioner may Accept under the Service
(Paras. 30-3 of Report)

8. Motion by the Chairman of the General Medical Services Committee: That paragraphs 30-3 of the Report of the General Medical Services Committee be approved.

9. Motion by GATESHEAD: That the attention of local medical committees be drawn to the fact that most Allocation Schemes as at present adopted do not truly represent the Working Party's Report in that they do not permit of an unremunerative excess beyond the nominal remunerative maxima.

Model Distribution Scheme
(Paras. 62-4 of Report)

10. Motion by the Chairman of the General Medical Services Committee: That paragraphs 62-4 of the Report of the General Medical Services Committee be approved.

11. Motion by NEWCASTLE-UPON-TYNE: That the Distribution Scheme should provide for a monthly payment to all general medical practitioners without individual application.

Removal of a Practitioner's Name from the Medical List
(Paras. 69 and 70 of Report)

12. Motion by the Chairman of the General Medical Services Committee: That paragraphs 69 and 70 of the Report of the General Medical Services Committee be approved.

13. Amendment by BIRKENHEAD: That this Conference strongly deprecates the Minister's interpretation in E.C.L. 93/52, of the National Health Service (General Medical and Pharmaceutical Services) Amendment (No. 2) Regulations, 1952 (S.R. & O., 1952, No. 2135), regarding the removal of medical practitioners from a Council's list in

certain circumstances. (Such circumstances for the removal of a practitioner from a Council's list include, according to Paragraph 3 (c) of E.C.L. 93/52: "Where the practitioner has absented himself from his practice for a period of 12 months or more, even if he has informed the Council and made adequate deputizing arrangements, but where there is no apparent likelihood of his returning within the immediate future.")

Succession to Vacant Medical Practice by a Partner
(Para. 75 of Report)

14. Motion by the Chairman of the General Medical Services Committee: That paragraph 75 of the Report of the General Medical Services Committee be approved.

15. Amendment by WOLVERHAMPTON: That as Local Medical Committees may render themselves liable to be mulcted by legal damages on the suit of an aggrieved doctor if they advised Local Executive Councils in the conditions envisaged in para. 75 of the report, para. 75 be not approved.

Machinery for Filling Practice Vacancies
(Para. 79 of Report)

16. Motion by the Chairman of the General Medical Services Committee: That steps be taken to secure that:

- (i) the Executive Council should be responsible for appointing a successor;
- (ii) the decision as to whether a practice should be dispersed or a vacancy is to be declared and advertised should remain with the Executive Council-in consultation with the Local Medical Committee;
- (iii) the Medical Practices Committee should act as an appeals body, and in hearing an appeal should be required to review all the applications originally submitted and not merely that of the appellant.

17. Amendment by BERKSHIRE: That Recommendation (i) should be amended to read "the Executive Council after consultation with the Local Medical Committee should be responsible for appointing a successor."

18. Amendment by BERKSHIRE: That Recommendation (iii) be amended by the addition of the words "when an appeal is being heard representatives of the Executive Council concerned should be in attendance."

19. Amendment by WESTMORLAND: That, if an appeal is heard, the Local Executive Council of the area concerned should be entitled to be represented at the meeting of the Medical Practices Committee.

Elimination of Inflation from Doctors' Lists
(Paras. 81-87 of Report)

20. Motion by the Chairman of the General Medical Services Committee: That paragraphs 81 to 87 of the Report of the General Medical Services Committee be approved.

21. Motion by CITY OF WORCESTER: That, in order to assist in avoiding a recurrence of the recent inflation in doctors' lists, instructions be printed on the medical card stating that patients must notify to the Executive Council any change of address even within the same Council area.

Reinstatement of Demobilized Services Personnel on Doctors' Lists
(Paras. 89 and 90 of Report)

22. Motion by the Chairman of the General Medical Services Committee: That paragraphs 89 and 90 of the Report of the General Medical Services Committee be approved.

23. Amendment by NORFOLK: That demobilized National Service men should automatically be replaced on their former doctor's list and issued with a medical card with the original doctor's name, as it is the experience of the members of this Conference that demobilized men do not trouble to reregister.

Allocation of Patients to General Practitioners

(Para. 92 of Report)

24. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 92 of the Report of the General Medical Services Committee be approved.

25. **Motion** by CITY OF WORCESTER: That a practitioner under contract with an Executive Council should not, by reason of his terms of service, be compelled to take or to retain on his list a patient who is accepting treatment from an unregistered practitioner or from another registered practitioner with whom he is not acting in consultation.

Treatment of Services Personnel on Leave

(Paras. 101-3 of Report)

26. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 101-3 of the Report of the General Medical Services Committee be approved.

27. **Amendment** by OXFORD COUNTY AND CITY: That all Services personnel on leave should come on the lists of National Health Service doctors as temporary residents.

28. **Amendment** by NORTHAMPTON: That Services personnel on leave should be treated as temporary residents, and that Service Departments make contribution of a round sum to the Central Pool to cover such cases.

Mileage

(Paras. 104-6 of Report)

29. **Motion** by the Chairman of the General Medical Services Committee: that paragraphs 104-6 of the Report of the General Medical Services Committee be approved.

30. **Motion** by GATESHEAD: That mileage payments be based on the difficulty of access of the individual patient rather than upon any broad classification of types of practice.

Service Committees Procedure

(Paras. 108, 109, and 113 of Report)

31. **Motion** by the Chairman of the General Medical Services Committee: That the Report of the Subcommittee on Service Committees and Tribunal Regulations (Appendix "C") be received.

32. **Motion** by the Chairman of the General Medical Services Committee: That the following Recommendation be approved:

Recommendation A: That Regulation 3(3) should be modified so as to leave the field open to non-members of the Executive Council, it being understood that, notwithstanding the wider field of selection envisaged, the person appointed should be acceptable to both parties represented on the Service Committee.

33. **Amendment** by HASTINGS: That Regulation 3(3) be amended to provide for the chairman to be a barrister or solicitor of not less than seven years' standing, and that he need not be a member of the Executive Council, but should be acceptable to both the lay and medical parties on the Service Committee.

34. **Motion** by the Chairman of the General Medical Services Committee: That the following Recommendation be approved:

Recommendation B: That provision should be made in the Regulations for a requirement that a member of a Service Committee who is an interested party in the matter under consideration shall be required to disclose his interest either to the Chairman before the meeting or at the commencement of the proceedings.

35. **Amendment** by HASTINGS: That the words "and shall, if the majority of the Committee require it, withdraw" be added to Recommendation B.

36. **Motion** by the Chairman of the General Medical Services Committee: That the following Recommendation be approved:

Recommendation E:

(i) That the period of six weeks referred to in Regulation 4(4)(a) be reduced to four weeks.

(ii) That the period of two months referred to in 4(4)(c)(i) be reduced to six weeks.

(iii) That any application to the Minister for permission to investigate a complaint, notice of which is received more than six weeks after the event, should be supported by a majority vote of the members of the Service Committee.

(iv) That the following be substituted for Regulation 4(4)(b):

"The person desiring to make a complaint under this Regulation against a dental practitioner shall within six months after the completion of treatment, or within four weeks after the event which gave rise to the complaint, whichever is the sooner, give written notice to the Clerk of the Council stating the substance of the matter which it is desired to have investigated."

(v) That the following be substituted for Regulation 4(4)(c)(ii):

"(ii) In the case of a complaint against a dental practitioner the complaint is made within six months after the completion of the treatment or within six weeks after the said event, whichever is the sooner, or".

(vi) That Regulation 4(4)(c)(iv) be modified so as to make it clear that the practitioner's representations relate solely to the question of the departure from the time limit for making the complaint.

37. **Amendment** by KENT AND CANTERBURY: That the following words be added to paragraph (iii) of Recommendation E:

"and that in the event of a decision to refer the case the Minister should be advised by a committee having a similar constitution to that of the medical advisory committee constituted under Regulation 11(4).

38. **Motion** by the Chairman of the General Medical Services Committee: That the following Recommendation be approved:

Recommendation G: That the Chairman of a Service Committee should confer with a professional adviser who is not a member or a deputy member of the Service Committee but selected by the Service Committee from a panel nominated by the local professional committee, when deciding whether a statement made by a complainant discloses prima facie ground of complaint.

39. **Amendment** by OXFORD COUNTY AND CITY: That Recommendation G be deleted altogether.

40. **Motion** by the Chairman of the General Medical Services Committee: That the following Recommendation be approved:

Recommendation I: That the period of three days referred to in Rule 1(1)(e) be extended to seven days and that copies of the documents are sent to the secretary of the local professional committee.

41. **Amendment** by OXFORD COUNTY AND CITY: That all words after "seven days" in Recommendation I should be deleted, so that Recommendation I should read:

"That the period of three days referred to in Rule 1(1)(e) be extended to seven days."

42. **Motion** by the Chairman of the General Medical Services Committee: That the following Recommendation be approved:

Recommendation T: That Regulations 12, 13, 14, 15, and 16 be amended so as to make it clear that the decision as to whether a practitioner may be represented by counsel or other paid advocate, or may call witnesses, rests with the Local Medical Committee.

43. **Amendment** by HASTINGS: That the words "decision as to whether a" and the words "rests with the Local Medical Committee" be deleted from Recommendation T.

44. **Motion** by the Chairman of the General Medical Services Committee: That the remainder of the Report and Recommendations C, D, F, H, J, K, L, M, N, O, P, Q, R, S, U, and V of the Subcommittee on Service Committees and Tribunal Regulations be approved.

45. **Motion** by WEST BROMWICH: That any communication from an Executive Council to a doctor informing him that a complaint has been lodged against him by or on behalf of a patient, and inviting his comments thereon, should embody a clear warning that his reply will be produced at any inquiry which might follow, and that its contents might there be used to his disadvantage.

46. **Motion** by HASTINGS: That Regulation 37 of Statutory Instrument 507 of 1948 (which gives the tribunal, *inter alia*, the power of subpoena and imposing penalties for non-compliance therewith) be amended to apply it to proceedings before the Service Committee except in so far as it relates to costs.

47. **Motion** by KENT AND CANTERBURY: That provision be made in the Regulations whereby a complaint from a person or body shall not be considered by the Medical Service Committee unless and until it is presented in the form of a statutory declaration sworn before a Commissioner of Oaths.

48. **Motion** by KENT AND CANTERBURY: That under the Rules of Procedure it be made clear that a copy of the question or matter with which the complaint is concerned should be sent to the practitioner at the same time as it is sent to the Chairman, with an appropriate explanatory letter.

49. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 113 of the Report of the General Medical Services Committee be approved.

50. **Amendment** by HASTINGS: That the terms of service be amended so that a practitioner who has arranged for the temporary treatment of a patient or patients by partner, deputy, assistant, or locum shall not be responsible for the default of his partner, deputy, assistant, or locum.

Discount on Drugs

(Paras. 115 and 116 of Report)

51. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 115 and 116 of the Report of the General Medical Services Committee be approved.

52. **Motion** by EAST SUSSEX: That this Conference expresses concern that, despite the representations of the General Medical Services Committee, dispensing doctors paid on the basis of the Drug Tariff should continue to sustain financial loss when supplying a number of proprietary preparations, and requests the General Medical Services Committee to take the strongest possible action without delay to remedy the present inequitable position.

Economy in Prescribing

(Paras. 117-119 of Report)

53. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 117-19 of the Report of the General Medical Services Committee be approved.

54. **Motion** by BIRMINGHAM: That this Conference of Local Medical Committees is anxious to co-operate in reducing the cost of pharmaceutical services consistent with the right of the doctor to prescribe whatever is necessary for the proper treatment of the patient, and urges that: (1) Economical prescribing be taught to students at all appropriate stages in the curriculum. (2) All house officers shall be similarly instructed. (3) Investigation of excessive and extravagant prescribing be accelerated so that at the

earliest moment individual doctors may be notified and the usual steps taken. (4) All consultants be kept fully informed on this subject and the actions to be taken.

55. **Motion** by LINES (LINDSEY): That, in view of the high cost of prescribing within the National Health Service, this Conference agrees that the Minister should make full use of his powers to impose financial penalties on doctors who persistently prescribe at a cost grossly above the area average.

Investigation of Prescribing

(Paras. 121 and 122 of Report)

56. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 121 and 122 of the Report of the General Medical Services Committee be approved.

57. **Motion** by BERKSHIRE: That in future all investigations into the prescribing of food and drugs should cease forthwith.

58. **Motion** by BUCKINGHAMSHIRE: That this Conference considers the present extensive use of investigations on irregular prescribing under Regulations 16 and 17 (Service Committee and Tribunal Regulations) 1948 is wasteful and undesirable, and since it does not effect any material economy in prescribing should be abandoned.

59. **Motion** by BUCKINGHAMSHIRE: That it is considered that real economy in prescribing would result from investigations by the Local Medical Committee into the prescribing of those practitioners whose prescribing costs have been reported to the Committee to be consistently above the average for their area.

60. **Motion** by BERKSHIRE: That practitioners whose prescribing costs were found to be above the local average should be investigated by the Local Medical Committee.

Prescribing of Cod-liver Oil and Malt and Glucose

(Paras. 125 and 126 of Report)

61. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 125 and 126 of the Report of the General Medical Services Committee be approved.

62. **Amendment** by GATESHEAD: That the necessary steps be taken to secure that in prescriptions for cod-liver oil and malt only quantities in excess of 4 lb. be liable to investigation and possible surcharge.

Prescribing of Disinfectants

(Para. 127 of Report)

63. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 127 of the Report of the General Medical Services Committee be approved.

64. **Motion** by SUNDERLAND: That this Conference protests against the inference which appears to be drawn by the Newcastle-upon-Tyne Pricing Bureau that "dettol" and other antiseptics are being used by patients as disinfectants for general hygienic purposes with the knowledge of the prescriber, and considers that the onus of proving that such antiseptics are being so used should not rest with the prescriber, as would appear to be the case at present, by reason of his being called upon to justify the quantities prescribed.

Charges for Prescriptions

(Paras. 128 and 129 of Report)

65. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 128 and 129 of the Report of the General Medical Services Committee be approved.

66. **Motion** by LEICESTERSHIRE AND RUTLAND: That this Conference is of the opinion that the 1s. charge on prescriptions should be abolished.

67. **Motion** by LEICESTERSHIRE AND RUTLAND: That the 1s. charge on prescriptions be limited to proprietary preparations.

68. **Motion** by GATESHEAD: That the prescription fee be greater for proprietary than for non-proprietary drugs.

National Formulary

(Paras. 136 and 137 of Report)

69. **Motion** by the Chairman of the General Medical Services Committee: that paragraphs 136 and 137 of the Report of the General Medical Services Committee be approved.

70. **Motion** by BUCKINGHAMSHIRE: That a return to the Latin system of headings of the editions of the *National Formulary* prior to 1952 should be made at an early date, and that it is unnecessary and undesirable that an alternative edition with English headings be published.

71. **Motion** by BRISTOL: That this Conference welcomes wholeheartedly the decision of the General Medical Services Committee to press for a return to Latin throughout future editions of the *National Formulary*.

72. **Motion** by BERKSHIRE: That the *National Formulary* should revert to the original Latin headings.

73. **Motion** by BRISTOL: That this Conference emphasizes the need for more consideration and imagination to be given to the flavouring of *National Formulary* mixtures.

The Obstetric List

(Paras. 138-40 of Report)

74. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 138-40 of the Report of the General Medical Services Committee be approved.

75. **Motion** by DORSET: That in the opinion of this Conference the official list of general-practitioner obstetricians should be abolished.

Assistants and Young Practitioners Subcommittee

(Paras. 144-46 of Report)

76. **Motion** by the Chairman of the General Medical Services Committee: That Local Medical Committees be asked to take such steps as will ensure that assistants in their areas are, wherever possible, represented on each Local Medical Committee by at least one assistant.

Maternity Medical Services

(Para. 147 of Report)

77. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 147 of the Report of the General Medical Services Committee be approved.

78. **Motion** by MIDDLESEX: That this Conference instructs the General Medical Services Committee to review the whole question of the Maternity Medical Service with particular reference to the relation of fees to the work done.

Sale of Goodwill

(Paras. 155-67 of Report)

79. **Motion** by the Chairman of the General Medical Services Committee: That the Conference of Local Medical Committees, representing National Health Service practitioners throughout the country, having considered the memorandum prepared by the Amending Acts Committee and the comments of the General Medical Services Committee and the Compensation and Superannuation Committee upon it, is not in favour of the optional return of the right to buy and sell goodwill of practices, which it believes to be impracticable.

80. **Amendment** by NORFOLK: That, in view of the damage done to the tone and keenness of general medical services, and the increasing difficulties of entering and changing practices caused by the loss of goodwill, the so-called impracticability of its retention should be overcome for the sake of a certain gain in the efficiency of the Health Service.

81. **Amendment** by SURREY: That the following words be added to the Recommendation contained in Paragraph 167 of the Report of the G.M.S. Committee dealing with goodwill: "but desires the subject to be reviewed from time to time."

Co-operation between Hospital, Local Authority, and General-practitioner Services

(Paras. 174-7 and 179 of Report)

82. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 174 to 177 and 179 of the Report of the General Medical Services Committee be approved.

83. **Motion** by HERTFORDSHIRE: That this Conference, believing that the preservation of the status of general practice is of supreme importance, to this end instructs the General Medical Services Committee more vigorously to pursue the full implementation of its policy in respect of: (1) General-practitioner hospital beds. (2) Direct access to special investigations. (3) Association of general practitioners with hospital administration.

Notification of Discharge from Hospital

(Paras. 183 and 184 of Report)

84. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 183 and 184 of the Report of the General Medical Services Committee be approved.

85. **Motion** by DERBYSHIRE: That a standard size and form of hospital report sheet be adopted by all Regional Hospital Boards to fit the standard medical record envelope.

86. **Motion** by CITY OF WORCESTER: That hospitals be requested to issue reports, letters, etc., to general practitioners regarding patients on paper of a standard size which can be inserted into the medical card (Form E.C.5 and E.C.6) without folding.

Vaccination and Immunization

(Paras. 187 and 188 of Report)

87. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 187 and 188 of the Report of the General Medical Services Committee be approved.

88. **Motion** by BRISTOL: That this Conference deplores the apparent breach of the vaccination arrangements by some local authorities in that they have notified general practitioners that they will no longer pay for reports on successful vaccination of certain adults.

Civil Defence

(Para. 213-14 of Report)

89. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 213-14 of the Report of the General Medical Services Committee be approved.

90. **Amendment** by CITY OF WORCESTER: That the stand-by duties which are to be expected from general practitioners at static first aid posts while there is no local emergency are unacceptable and are uneconomic to the general medical necessities of the community and to the acute civilian sick.

Propriety of Disclosing Clinical Details to Local Medical Committees or Executive Councils

(Paras. 215 and 216 of Report)

91. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 215 and 216 of the Report of the General Medical Services Committee be approved.

92. **Motion** by DEVON AND EXETER: That the words "or Chairman" be inserted immediately following the words "Medical Secretary" where they occur in paragraph 216 of the Report.

Remainder of Report of General Medical Services Committee

93. **Motion** by the Chairman of the General Medical Services Committee: That the remainder of the Report of the General Medical Services Committee be approved.

MATTERS NOT REFERRED TO IN THE ANNUAL REPORT**Classification of Areas**

94. **Motion** by WOLVERHAMPTON: That as the Medical Practices Committee has no statutory right to ask for particulars of any medical work a doctor "on the list" performs outside his general medical service duties, this Conference objects to any such inquiry.

Nursing Service

95. **Motion** by IPSWICH: That, as some of the work at present done by fully trained district nurses could be done by assistant nurses, the General Medical Services Committee be instructed to explore the possibility of employing assistant nurses to alleviate the present shortage of home nursing facilities.

Income Tax

96. **Motion** by READING: That the General Medical Services Committee be instructed to explore the possibilities of general practitioners who opt to do so paying their income tax assessments on the basis of P.A.Y.E.

Bulk Prescribing

97. **Motion** by EASTBOURNE: That bulk prescribing of other than *National Formulary* prescriptions should be permitted in schools and other similar institutions.

Compensation

98. **Motion** by NEWCASTLE-UPON-TYNE: That the General Medical Services Committee press for repayment of compensation at an early date.

THE DEFENCE TRUSTS

99. **Motion** by the Chairman of the Trustees: That the Report of the Trustees of the National Insurance Defence Trust and G.M.S. Defence Trust, as to action taken since the last report to the Conference (paragraph 224 of Report), be received and approved.

100. **Motion** by the Chairman of the Trustees: That the report of contributions received from Local Medical Committees up to April 10, 1953 (Doc. M.7), be received and approved.

CHAIRMAN OF CONFERENCE

101. **Elect:** Chairman of Conference for Session 1953-4 (see *Standing Order 14—Nominations to be handed in not later than 11 a.m. on the day of the Conference*).

CONFERENCE AGENDA COMMITTEE

102. **Elect:** Three members of the Conference Agenda Committee (see *Standing Order 17—Nominations to be handed in not later than 1 p.m. on the day of the Conference*).

ELECTION OF SIX MEMBERS OF GENERAL MEDICAL SERVICES COMMITTEE

103. **Elect:** Six members of the General Medical Services Committee (see *Standing Order 15—Nominations to be handed in not later than 1 p.m. on the day of the Conference*).

THE CLAIRE WAND FUND

104. **Receive:** Report by the Chairman of Conference on the progress of the Claire Wand Fund.

THE DAIN FUND

105. **Receive:** Annual Report of the Trustees of the Dain Fund.

DINNER COMMITTEE

106. **Motion** by the Chairman: That five members of the Conference be appointed the Dinner Committee under *Standing Order 18*.

GENERAL MEDICAL SERVICES COMMITTEE**ELECTION OF DIRECT REPRESENTATIVES, 1953-4**

The following direct representatives upon the General Medical Services Committee have been elected unopposed for the Groups mentioned:

Group A1

Dr. W. Neil Darling (Edinburgh).

Group A2

Dr. C. J. Swanson (Aberfeldy, Perthshire).

Group A3

Dr. J. R. Langmuir (Glasgow).

Group A4

Dr. R. C. Hamilton (Kilmarnock).

Group C

Dr. H. F. Hollis (Leeds).

Dr. H. Thorp (Todmorden).

Group D

Dr. A. Campbell (Accrington).

Dr. F. S. Catto (Manchester).

Dr. P. J. Gibbons (Liverpool).

Group E

Dr. Miles Parkes (Crewe).

Group F

Dr. T. J. Hargest (Clydach, Swansea).

Dr. G. P. Williams (Holyhead).

Group H

Dr. A. B. Davies (Walsall).

Group I

Dr. F. A. Smoritt (Southam, Warwick).

Group J

Dr. C. F. R. Killick (Williton, Somerset).

Group K

Dr. R. W. McConnel (Aylesbury, Bucks).

Group L

Dr. J. D. R. Murray (Exmouth).

Group M

Dr. K. S. Maurice-Smith (Ely).

Group N

Dr. H. S. Howie Wood (Shanklin, Isle of Wight).

Group O

Dr. D. F. Whitaker (Guildford).

Group P

Dr. A. W. Gardner (Lewes, Sussex).

Group Q

Dr. A. T. Rogers (Bromley, Kent).

Group R

Dr. D. F. Hutchinson (Middlesex).

Dr. A. N. Mathias (London, N.W.2).

Group S

Dr. C. M. Scott (New Barnet).

Dr. J. L. McK. Brown (London, E.18).

Group T

Dr. H. H. D. Sutherland (London, W.10).

Dr. M. Sorsby (London, E.5).

Group U

Dr. J. B. Young (Belfast).

In the contested Groups—namely, B and G—the results were as follows:

Group BDr. D. T. MacDonald (Belford). *Elected.*Dr. F. Lishman (Bishop Auckland). *Elected.*

Dr. F. J. Stevenson (Carlisle).

Group GDr. E. W. Goodwin (Leicester). *Elected.*Dr. A. S. Wilson (Gosberton, Lincolnshire). *Elected.*

Dr. A. D. Stoker (Winstar, Derbyshire).

Dr. D. F. Menzies (Skegness).

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

without delay so that the stones comprising the base may be inscribed before they are placed in position.

The following have already been considered by the War Memorial Committee:

"They died that others might be healed."
"Greater love hath no man than this . . ."
"They died in the service of others."
"There need be no war were all lives so dedicated."
"They fought with Death. Themselves they could not save."
"They chose rather to suffer the utmost than to win life by weakness." (From Pericles' funeral oration.)
"My sword I give to him that shall succeed me, . . . my courage and skill to him that can get it." (Bunyan, *Pilgrim's Progress*.)
"Courage, Loyalty, Skill, Selflessness, Faithfulness, Duty."
"Peace to their ashes, honour to their memory, long may the cause of freedom shine."

Anyone wishing to make suggestions should communicate with me at B.M.A. House, Tavistock Square, W.C.1.—I am, etc.,

H. GUY DAIN,
Chairman,
War Memorial Committee.

POINTS FROM LETTERS

Temporary Residents

Dr. J. D. CONDON (Blackburn) writes: I entirely agree with Dr. John Griffiths (*Supplement*, May 23, p. 247) that it was quite absurd to pay 15s. for the hundreds of cases that only required a single consultation, each for some trivial complaint, and that the new rate of 5s. is a just and fair one. . . . It is in holiday camps and such establishments that one mainly gets these single trivial consultations, as those who are really ill are sent either to hospital or back to their own homes, whichever is deemed best in the patient's own interests. The local medical committee is, no doubt, fully aware of this and in my opinion has dealt with the matter in a fair and just manner.

B.M.A. LIBRARY

The following books have been added to the Library:

Archiv der internationalen Freien Akademie. Der I. Kongress der internationalen Freien Akademie Bad Munster am Stein 1950. Vorträge und Referate. 1951.
Aschkenasy, A.: *Maladies des Globules Rouges et Désordres Endocriniens*. 1952.
Barcroft, H., and Swan, H. J. C.: *Sympathetic Control of Human Blood Vessels*. 1953.
Beckman, H.: *Pharmacology in Clinical Practice*. 1952.
Block, R. J., LeStrange, R., and Zweig, G.: *Paper Chromatography: A Laboratory Manual*. 1952.
Blum, H. F.: *Time's Arrow and Evolution*. 1951.
Bracco, L. L.: *Sindromi Dolorose dopo Interventi Gastrici e Loro Terapia Chirurgica*. 1952.
Bulgarelli, R.: *L'Angiopneumografia*. 1952.
Burlingham, D.: *Twins: A Study of Three Pairs of Identical Twins*. 1952.
Bychowskim, G., and Despert, J. L.: *Specialized Techniques in Psychotherapy*. 1952.
Cairney, J.: *Surgery for Students of Nursing*. 1952.
Ciba Foundation Symposium: *Visceral Circulation*. 1952.
Copeman, W. S. C. (Editor): *Cortisone and A.C.T.H. in Clinical Practice*. 1953.
Corkill, T. F.: *Lectures on Midwifery and Infant Care: A New Zealand Course*. Fourth edition. 1951.
Dautrebande, L.: *L'Aérostologie*. 1951.
Dennig, H. (Editor): *Lehrbuch der inneren Medizin*. Zweite Auflage. Erster Band. 1952.
Drummond-Jackson, S. L.: *Intravenous Anaesthesia in Dentistry*. 1952.
Frazer's Manual of Embryology: *The Development of the Human Body*. Third edition by J. S. Baxter. 1953.
Friedenwald, J. S., et al.: *Ophthalmic Pathology: An Atlas and Textbook*. 1952.
Gambigliani Zoccoli, A., and Franzini, C.: *La Diagnostica Funzionale delle Epatopatie*. 1952.
Gifford's Textbook of Ophthalmology. Fifth edition by Francis Heed Adler. 1953.
Good, F. L., and Kelly, O. F.: *Marriage, Morals, and Medical Ethics*. 1952.
Keers, R. Y., and Rigden, B. G.: *Pulmonary Tuberculosis*. Third edition. 1953.
Koller, L. R.: *Ultraviolet Radiation*. 1952.
McCall, J. O., and Wald, S. S.: *Clinical Dental Roentgenology*. Third edition. 1952.
March of Medicine. 1950: *Frontiers in Medicine*. 1951.
Martius, H.: *Lehrbuch der Geburtshilfe*. Zweite Auflage. 1952.

Mitchell, H. H., and Edman, M.: *Nutrition and Climatic Stress: With Particular Reference to Man*. 1951.
Novak, E., and Novak, E. K.: *Textbook of Gynecology*. Fourth edition. 1952.
Ponzo, M., and Sacerdote, G.: *Ultrasoni in Medicina*. 1952.
Progress in Ophthalmology and Otolaryngology. Edited by Meyer Wiener et al. Volume 1. 1952.
Ranson, S. W.: *Anatomy of the Nervous System*. Ninth edition revised by S. L. Clark. 1953.
Scartozzi, C., Passera, G., and Gazzera, G.: *La Creatina in Campo Chirurgico*. 1952.
Seif, L.: *Wege der Erziehungshilfe*. Zweite Auflage. 1952.
Shepard, W. P.: *Essentials of Public Health*. Second edition. 1952.
Stallworthy, J., et al.: *Problems of Fertility in General Practice*. 1953.
Starck, H.: *Die Krankheiten der Speiseröhre*. 1952.
Stoeckel, W.: *Ansprechen*. 1952.
Teld, W.: *Esami di Laboratorio*. 1952.
Trenaman, J.: *Out of Step: A Study of Young Delinquent Soldiers in Wartime*. 1952.
Von Urban, R.: *Sex Perfection*. 1952.
Winslow, C.-E. A.: *Man and Epidemics*. 1952.
Wolff, E.: *Diseases of the Eye*. Fourth edition. 1953.
Wright, Sir A. E.: *Bibliography of the Published Writings of: compiled by Leonard Colebrook*. 1952.
Zollinger, H. U.: *Anurie bei Chromoproteinurie*. 1952.

Association Notices

Diary of Central Meetings

JUNE	
9 Tues.	Arrangements Committee (Toronto, 1955), 10.30 a.m.
9 Tues.	Joint Conference between Representatives of the Occupational Health, G.M.S., and Central Ethical Committees on Continued Treatment by Industrial Medical Officers, 2.30 p.m.
10 Wed.	Compensation and Superannuation Committee, 2 p.m.
10 Wed.	Public Relations Committee, 2 p.m.
16 Tues.	A.R.M. Agenda Committee, 3 p.m.
17 Wed.	Annual Conference of Representatives of Local Medical Committees, 10 a.m.
19 Fri.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
24 Wed.	Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
JULY	
9 Thurs.	Annual Representative Meeting (at Cardiff), 10 a.m.
10 Fri.	Annual Representative Meeting (at Cardiff), 9.30 a.m.
11 Sat.	Council (at Cardiff), 9 a.m.
11 Sat.	Annual Representative Meeting (at Cardiff), 10 a.m.
13 Mon.	Annual Representative Meeting (at Cardiff), 10 a.m.
13 Mon.	Annual General Meeting (at Cardiff), 12.30 p.m.
13 Mon.	Council (at Cardiff) at conclusion of A.R.M.
13 Mon.	Adjournd Annual General Meeting and President's Address (at Cardiff), 8.30 p.m.
22 Wed.	Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.

Branch and Division Meetings to be Held

ENFIELD AND POTTERS BAR DIVISION.—Thursday, June 11, summer social meeting. Visit to Hatfield House, Hatfield, Hertfordshire. Meet at Hatfield House 3.15 p.m.
GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, June 11, 8.30 p.m., annual general meeting.
HOLLAND DIVISION.—At Peacock and Royal Hotel, Boston, Sunday, June 7, 4 p.m., annual general meeting.
LINCOLN DIVISION.—At Lincoln County Hospital, Monday, June 8, 8 p.m., annual general meeting.
METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, June 9, 2.30 p.m., annual general meeting. President's address by Dr. J. Arthur Moody: "Founders of the Branch and Their Problems."
SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, June 12, 9 p.m., annual general meeting.
SOUTH LANCASHIRE AND EAST CHESHIRE BRANCH.—At Exhibition Hall, Belle Vue, Manchester, Wednesday, June 10, 12.30 p.m., annual meeting.
SOUTH MIDDLESEX DIVISION.—At Anchor Hotel, Shepperton, Monday, June 8, 8.45 p.m., meeting.
STRATFORD DIVISION.—At Queen Mary's Hospital, Stratford, Tuesday, June 9, 9 p.m., general meeting.

ANNUAL MEETING: CARDIFF, JULY 9—17

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 13 1953

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CARDIFF AND ITS ENVIRONS

BY
ROBERT D. OWEN, F.R.C.S.

The last Annual Meeting of the British Medical Association held in Cardiff was in 1928, under the presidency of Sir Ewen Maclean; the first was in 1885. It is fitting that this year's annual meeting should be held in Wales, as the Association is celebrating the jubilee of the representative meeting. The first was held in Swansea on July 28, 1903, and, as all members know, the occasion marked a revolution in the history of the B.M.A. It is a pity that Swansea found it difficult to extend an invitation this summer, the sole reason being the impossibility of acquiring the necessary hotel accommodation. Swansea suffered severely from air raids during the war, and many hotels were destroyed.

The 1928 meeting in Cardiff was a great success. Hospitality was offered freely. The great houses that sprang up in the nineteenth century—the hall-mark of prosperity that oozed out of the coalfields and Cardiff docks—are no longer available to extend a welcome, yet warm hearts continue to beat in Cardiff.

Early Cardiff

The origin of Cardiff, like that of most mediaeval towns, is wrapped in obscurity. There is no doubt about the ruins of a Roman fortress on the left bank of the River Taff. This is the site on which Cardiff Castle has been built. It was, however, in Norman times that the name Caer-dyf first came into the light of day, when the Norman Robert Fitzhamon seized Glamorgan in 1081. He made Cardiff the caput or head of his lordship, and in 1106 it was referred to as a borough.

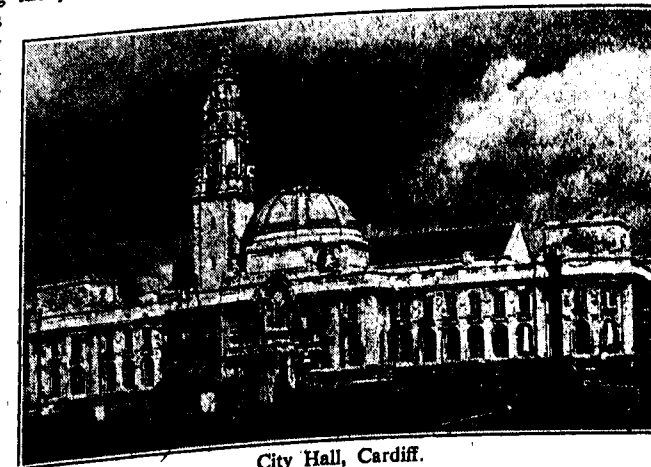
The Welsh name for Cardiff as used in Wales is Caerdydd. Early Welsh writers always used Caer Dyf, but Welsh scholars are agreed that the ending "dydd" is due to sounds like "dd" and "f" being confused as the result of everyday use. The modern name of Cardiff is really a hybrid of Welsh and Scandinavian elements, and simply means "the fort mound." The imposing proportions of this mound or keep are to be seen to this day within the Cardiff Castle grounds. This powerful stone keep was raised about 1081 when the Normans came to Glamorgan and entered into occupation of the ruined Roman defences and then remodelled them to meet their own requirements.

The Development of Cardiff

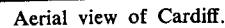
The centuries passed, and even in 1801 the population of Cardiff was under two thousand. Then came the industrial development of South Wales, with the city showing an abnormally rapid growth. By 1940 the population had reached a quarter of a million, with two million within a radius of 30 miles.

The eighteenth century saw a large-scale immigration which was to change the face of the county of Glamorgan. It began by arrivals from the English midlands to exploit the mineral wealth of the surrounding hills and valleys. The discovery of the previous century that iron ore could be smelted by mineral fuel gave an impetus to the iron industry. Works were established along the northern boundary of the county, such as at Merthyr Tydfil, where coal and ironstone and carboniferous limestone were abundant. The iron trade became for a time the important industry of the district. The iron was at first carried down on the backs of mules to be shipped from the mouth of the Taff, and later the Glamorgan Canal was constructed to replace this primitive form of transport. With the increased demand for coal for steam-raising purposes,

2525



City Hall, Cardiff.



Caerphilly Castle

The photographs illustrating this article were supplied by H. Tempest, Ltd., Cardiff.

The B.M.A. in Committee

ORGANIZATION FOR CONSULTANTS

The two autonomous bodies within the ambit of the Association are the General Medical Services Committee and the Central Consultants and Specialists Committee. The latter is empowered to consider and act upon all matters affecting those engaged in consultant and specialist and hospital practice, including terms and conditions under Part II of the National Health Service Acts.

This is a very large committee, larger even than the Council. It is inevitably large because of the requirement to make it representative not only territorially but professionally. Rather more than half the members are representative of regions, but nearly one-quarter are on the Committee because they are engaged in a particular branch of specialist work or type of practice. No representative body can be exactly adjusted to its constituency, but it is difficult to think of a more completely balanced representation, including every type of experience and viewpoint, than the constitution of the Central Consultants and Specialists Committee.

Representative Membership

The largest group in its membership consists of two members from each of the 16 Regional Consultant and Specialist Committees in England, Wales, and Northern Ireland, to which are added up to 10 appointed by the Central Consultants and Specialists Committee (Scotland). Then four members are elected by the Representative Body, two by English and Welsh representatives, one by Scottish, and one by Northern Irish. Two others are appointed by the Council.

The registrars, too, have their representation—two members, who are full members of the Committee, and contribute very usefully to its discussions. Certain of the other standing committees of the Association are represented, occupying five seats, and each of the 13 Group Committees is assigned one seat. These Group Committees represent distinctive professional interests which, either because of paucity of numbers or their local distribution, could not depend upon adequate representation through the normal machinery. The Group Committees are the following:

Anaesthetists, consulting pathologists, dermatologists, ophthalmologists, orthopaedists, otolaryngologists, practitioners of physical medicine, practitioners of psychological medicine, radiologists, spa practitioners, those engaged predominantly in the field of tuberculosis and diseases of the chest, and venereologists.

Finally, the membership is reinforced by four *ex-officio* members—namely, the chief officers of the Association—and there is a limited power of co-optation.

For many years a Hospitals Committee of the Association worked out a hospitals policy. Later there was a Special Practice Committee. These have been replaced by this large body which takes all hospital medical service as its province. It was formed on the coming into force of the National Health Service Acts, and its first meeting was held towards the end of 1948. It arose out of the necessity that hospital staffs should have their views represented to the Ministry and other authorities and should have a planned policy of national extent. In each region Consultants and Specialists Committees were set up, their members being elected from the hospitals and hospital groups in the region, and from each of these regional bodies two representatives, usually one on the teaching and the other on the non-teaching side, go to the Central Committee.

This is a standing committee of the Association, and its chairman is *ex officio* a member of the Council; but its membership is not limited to the B.M.A., and in its own field it is autonomous. In practice this arrangement has so far worked without difficulty, as it has also done in the field of general medical services.

Relation with Joint Consultants Committee

A matter which gave rise to some questioning at first, even in the Committee itself, was the apparent subordination of this body, representing consultants as a whole, to what is known as the Joint Consultants Committee, comprising representatives of the Royal Colleges and Scottish Royal Corporations as well as the B.M.A. members. Six members of the Central Consultants and Specialists Committee are on the Joint Committee, with 11 representatives of the Colleges and Corporations. The Joint Committee represents hospital medical staffs in discussions with the Ministry of Health and also appoints the staff side of Committee "B" of the Medical Whitley Council. It is the only official negotiating body in the hospital medical service.

The success of the Joint Committee has been due in no small measure to the able chairmanship, in the early years, of Sir Lionel Whitby and, more recently, of Sir Russell Brain, P.R.C.P., the present chairman. Experience has shown that there is never any serious conflict of opinion between the B.M.A. representatives and the others. It is not a question of counting numbers as if it were a lobby of the House of Commons. Here there is neither left nor right, or, if there is, the demarcation does not follow the lines of representation. The whole committee works harmoniously as a team, working out policy, negotiating at the highest level, and dealing with matters in the Service as they arise. But should a conflict arise—an unlikely event—any of the bodies represented on the Joint Committee is entitled to have its views represented to the Government.

The consultants' organization within the B.M.A. owed much during the transitional period to Mr. A. M. A. Moore, the present Treasurer of the Association, who was the "mid-wife" at the birth of the Committee, and to Mr. R. L. Newell, of Manchester, during the early period of its existence. It is now led by Dr. T. Rowland Hill, whose quiet mastery of its huge agenda and complicated business is always a pleasure to watch. The meetings generally last from midday until early evening, and the documentary assimilation preparatory to each of them is no mean task for the conscientious member.

It is not the purpose of this article to recite the achievements of the Committee during the first five years of its existence. These are recorded in the reports of its meetings, the successive Annual Reports of Council, and the debates in the Representative Body. It has already much good work to its credit, and will achieve much more, with its unrivalled opportunity for focusing consultant opinion and making it effective through the Joint Consultants Committee and in other ways.

Is Specialist Necessary?

Perhaps the one drawback to the Committee is its cumbersome name. One wonders whether the word "specialists" need be retained in its title. After all, a consultant may or may not specialize, but a specialist is surely one to be consulted on matters within his specialty, and thus the word "consultants" might stand for both. "Consultant" is a word of tradition and dignity, well understood and accepted in medicine.

The B.M.A. has sometimes been regarded as a body of general practitioners, with a few consultants thrown in as a make-weight. A glance at the Association's history would dispel any such notion. From the very beginning, in the days of the Provincial Medical and Surgical Association, it represented, in the provinces at least, all physicians and surgeons, who were as much consultants as any in London. In all its 120 years it has enlisted distinguished consultants on its Council and in its chief offices. Some of them, like Victor Horsley for example, have had marked influence on Association affairs. Bishop Harman guided the Hospitals Committee for many years. Through the Central Consultants and Specialists Committee the Association is enabled to do for consultants what it endeavours to do for every other branch in a profession united under its leadership.

Reference will be made in a future article to the organization for consultants in Scotland.

THE WINCHESTER ADDRESS

DR. DAIN SPEAKS

The Winchester Address was given this year by Dr. H. Guy Dain. Dr. Ronald Gibson, chairman of the Winchester Division of the B.M.A., presided over an invited audience which included lay people. The subject of the address was "John Citizen and his doctor—where do we go from here?"

Development of General Medical Services

Tracing the development of provided medical services, Dr. Dain called attention to the acceptance by the medical profession of the insurance method of payment from the early days of clubs and friendly societies to the capitation fee method of to-day. At the inauguration of the National Health Insurance Service in 1911 the profession's experiences with friendly societies and the development of local authority clinics led to the establishment of insurance committees to which doctors taking part in the service were elected by doctors. For a person employed in a public service to take a full part in its administration established a precedent, said Dr. Dain. This position had been further improved in the executive councils of the National Health Service, where the professional members outnumbered the lay. The executive councils, like the insurance committees before them, took their professional advice from the members actually doing the work and not from a paid whole-time officer of the council. In Dr. Dain's view a great measure of the success of these bodies could be attributed to this factor.

Birth of Specialization

In a little more than half a century the hospital service had evolved from a position in which all the members of a teaching hospital staff were general practitioners as well as physicians and surgeons. Then the G.P. began to disappear from the hospital, the places being occupied by physicians and surgeons. With the great increase in specialization the general surgeon and physician were now being eliminated by the fragmentation going on into what the speaker called "the modern 'ology' and 'ologist'." In the public health field similar specialization had taken place. The G.P. medical officer of health was almost gone in favour of the whole-time medical officer of health.

All this, Dr. Dain observed, had meant progress in every department of medicine, but it had given rise to a major problem to-day. Fifty years or so ago all medical practitioners were "doctors." Gradually they had been separated into groups with different problems and interests.

Different Administrations

When the N.H.S. proposals came forward it was hoped that the groups would be brought together in one service, but in fact the groups were made more isolated by setting up three services all differently administered.

The State ownership of all hospitals, with direction from above and the appointment to various administrative bodies by the Minister, practically took away the local interest which had been the great factor in the hospital service. After five years' experience numbers of attempts were being made to co-ordinate the three services without great success but with much multiplication of committees.

Suggested Reform

Coming to the point "Where do we go from here?" Dr. Dain held the view that the first and most important step would be to make the administrative area of all three services the same, possibly a revised local authority area, where a real health administration could be set up. The hospital service of this area could be administered by a body constituted and elected similarly to the present executive council, which would continue to administer the G.P. service. If the hospitals were administered by locally

elected people many economies would be effected. Regional hospital boards could continue with a supervising function, and with the distribution of centrally provided moneys.

The Position of the B.M.A.

When the N.H.S. was reorganized as a single service the important position of the British Medical Association as the mouthpiece of the profession would be enhanced, said Dr. Dain. It was the only body able to speak for the whole profession, with all its groups and differing interests, and it seemed to him that the Association must give some thought to bringing the problems of each section to the consideration of the rest. Each group must learn to consider its own difficulties in relation to those who practise in a different way, and be prepared to act as an association of doctors. Fifty years ago the B.M.A. did this easily. To-day the subdivisions of medicine are making it more difficult, but a unified service working with, and advised by, a strong B.M.A. should, Dr. Dain thought, be able to ensure that John Citizen had the best health service in the world.

GENERAL MEDICAL COUNCIL

THE PUBLIC HEALTH DIPLOMA

The Council had before it the annual returns of examinations for the certificate and the diploma in public health and a summary of information from licensing bodies concerning the extent to which persons who have obtained a certificate proceed to a diploma. The President remarked that a number of licensing bodies held no examinations last year. Except at University College, Dublin, it appeared that in general those who had taken the certificate did go on to take the diploma.

Professor WALTER SCHLAPP said that discussions with his colleagues had suggested to him that the rules for the examinations were not fulfilling the purpose for which they had been drawn up. He wondered whether the division into certificate and diploma courses was in the best educational interest. The rules were somewhat too precise in the way they laid down methods of teaching.

Sir ANDREW DAVIDSON reminded the Council that the D.P.H. rules came into force in 1944. They followed upon the Goodenough report and upon a report of the Society of Medical Officers of Health, which was of great value to the committee drafting the rules. He was anxious to know whether the certificate was fulfilling the intentions of its advocates. It seemed that the certificate was no better than the old Part I of the D.P.H. rules. The medical officer of health had been caught up in the changes which had taken place since the introduction of the National Health Service, and was anxious to find out what functions he was to undertake in the future. A case could be made out for another revision of the rules. The setting up of a committee for the purpose might seem at the moment a little premature; on the other hand it might act as a stimulus towards bringing the rules into line with present-day trends.

Professor F. M. R. PICKEN agreed that the case for setting up a committee was a strong one. He himself had been teaching for the D.P.H. for many years, but had never been satisfied with any of the numerous courses prescribed by the Council. The course was a mixture of incompatibles. A number of people were taking the course who would never need it statutorily. That, indeed, was one of the reasons why the certificate was introduced, and in Wales there were always far more C.P.H. than D.P.H. students. In Wales it was made clear to an intending student that if he would not need the diploma statutorily it would be better if he took something else—the Diploma in Child Health or in Obstetrics, for example.

After some further discussion the President said that the Council was charged with the supervision of the diploma and must carry out its duty. In view of the difficulties, a change in the law was unlikely. The course in public health

varied considerably in different universities, and in some could hardly be considered to exist.

The Council agreed to set up a special committee on the lines indicated by Sir Andrew Davidson, the committee to consist of Dr. Clark, Dr. Morley, Professor Picken, Professor Schlapp, Mr. Ireland, Dr. Tulloch, Dr. Boyd, Dr. Biggart, and Sir Andrew Davidson, with power to co-opt and to consult any other members or bodies.

Provisional Registration

The Council considered a report from its special committee on provisional and full registration. This included a letter from the British Medical Association which raised the question of what appeal there was in the case of an individual who during or at the end of his period of service did not get a certificate of satisfactory service from the authority with which he had been working. The PRESIDENT said that this was a matter for the licensing bodies rather than for the Council. The letter had been circulated to the deans, and a number of them were not sure how to answer it. It would be difficult to go behind an unsatisfactory certificate and impossible to hold anything like a legal inquiry.

Dr. BIGGART suggested that, although dissatisfaction might be expressed by an authority, if the dissatisfaction was not such as to have led the authority to dispense with the services of the individual the licensing body might disregard an "unsatisfactory" certificate. The PRESIDENT replied that that would be a matter for the licensing body.

A revised form of certificate of satisfactory service, bearing the name of a member of the consultant or specialist staff under whom the individual had worked, was approved by the Council, which authorized the President to sign the necessary order.

Reciprocal registration arrangements with the Province of Alberta under sect. 1 (b) of the Medical Act, 1950, were approved.

Election of Medical Disciplinary Committee

The Council re-elected the Medical Disciplinary Committee with the same personnel for a further year. It consists of 16 members, with the President of the Council as Chairman.

MEDICAL DISCIPLINARY COMMITTEE

Directions to Erase

The Committee on May 21 considered the case of Charles Kingsley Colwill, registered as of Aldenham Road, Bushey, Herts, who appeared on the charge that he had committed adultery with Violet Elizabeth Alabaster, a married woman, of which adultery he had been found guilty by the decree of the Divorce Court dated April 4, 1952, and made absolute on June 3, 1952, in the case of Alabaster v. Alabaster and Colwill, in which he was the co-respondent, and that he had stood in professional relationship with the said Mrs. Alabaster at all material times.

Dr. Colwill was present, and admitted the charge, which the Committee found proved. In a letter he stated that at the time he had been suffering from financial and domestic strain. He threw himself on the mercy of the Committee, and asked that judgment be postponed rather than that the penalty of erasure should be imposed.

The Committee directed the Registrar to erase the name of Charles Kingsley Colwill.

The next case was that of Nicholas Lupkovics, registered as of Higher Compton, Plymouth, M.D. U.Chile, 1938, who was summoned on the charge of having been convicted at Bow Street on November 19, 1952, of unlawfully making an untrue statement to procure a passport. He was also charged with having committed adultery with a married woman, of which adultery he had been found guilty by decree of the Divorce Court, November 26, 1952, in the case of Paterson v. Paterson and Lupkovics, and that he had stood in professional relationship to the woman in question.

Dr. Lupkovics did not appear, and it was stated that he could not be traced and was believed to be abroad.

Evidence was given by Mr. Paterson, who said that his wife had consulted Dr. Lupkovics about her asthma, and subsequently told him (the husband) that she was leaving him.

In this case also the Registrar was directed to erase the name.

The decisions in both these cases leave it open to the respondents to appeal to the Privy Council within 28 days.

In the case of John Howard Crawford, registered as of Wimborne Road, Bournemouth, against whom at a previous session certain irregularities regarding forms for temporary residents under the N.H.S. had been found proved, the Committee, after consideration of testimonials now produced, decided not to instruct the Registrar to erase the name, and closed the case.

ANNUAL MEETING

IRISH GRADUATES' LUNCHEON

The Irish Graduates' Luncheon will be held on Wednesday, July 15, at 12.30 for 1 p.m. at the Royal Hotel, Cardiff, at a cost of 10s. per person (excluding wine). This luncheon is open to all Irish graduates and their ladies attending the Annual Meeting, and those intending to be present are asked to notify in advance the Honorary Secretary, Irish Graduates' Luncheon, B.M.A. House, 195, Newport Road, Cardiff, or to give in their names at the Registration Office, Sophia Gardens Pavilion, Cardiff, on arrival at the meeting. No tickets will be issued, and payment will be made at the Royal Hotel.

PUBLIC HEALTH AWARD

SALARY INCREASES FOR A.M.O.s

Assistant medical officers or medical officers in departments have their salary scales increased by an award of the Industrial Court. It takes effect from June 1. (See annotation in *Journal* at p. 1323.) The award is as follows:

(a) The salary scale of assistant medical officers or medical officers in departments shall be £950 by £50 to £1,300.

(b) Paragraph 13c of Award No. 2321 shall apply as before, the scale for assistant medical officers being adjusted to £950 by £50 to £1,300.*

(c) The new scale shall be applied to the present holders of such appointments, assimilation being at the point on the new scale corresponding with the medical officer's position on the old scale. A medical officer now at the maximum (£1,150) of the old scale shall be placed at the sixth point (£1,250) of the new scale and shall thereafter proceed to the new maximum (£1,300).

(d) The operation of the new scale shall not in any circumstances result in reducing the salary of any medical officer in post.

The following Table compares old and new salaries:

	Minimum £	Increments £	Maximum £
Under earlier award	850	50 (6)	1,150
Claimed by Staff Side	1,000	50 (8)	1,400
Offered by Management Side	875	50 (3)+45 (1)	1,150
Under new award	950	+40 (2) 50 (5)	1,300

*Paragraph 13c reads: Medical officers, being assistant medical officers or divisional or area medical officers under a county council, acting as district medical officers of health (either for single or combined districts) for a definite proportion of their time shall receive as regards the salary relating to county council work the appropriate proportion (calculated in accordance with the Spens formula in respect of the consultants) of their salary as assistant medical officers, divisional or area medical officers, as the case may be, plus the appropriate proportion of the salary fixed for county district medical officers of health under Award No. 2285, and a similar proportion of £100.

LIAISON BETWEEN CONSULTANTS AND GENERAL PRACTITIONERS

The Consultants and General Practitioners Committee is a liaison committee between the Central Consultants and Specialists and General Medical Services Committees, and it met on May 27 under the chairmanship of Dr. A. TALBOT ROGERS to consider problems common to the two parent committees.

The main topics discussed were the junior staffing of hospitals and entry into general practice. Representatives of the Registrars Group attended, and with their lively appreciation of the young doctor's difficulties they brought a fresh and realistic approach to the problem.

In the old days a young doctor was well aware that not only were a few years spent in hospital posts of great benefit to him clinically in whatever sphere of medicine he intended to practise, but that they often helped him to find a good opening in general practice, particularly one which he might combine with a medical or surgical appointment on the staff of the local hospital. Things are different now. Competition for the higher hospital appointment is extremely keen and "wastage" is high, while the doctor who continues in hospital after his house appointments finds that he has been left behind in the race for general-practice vacancies. Moreover, he is beginning to doubt whether the extra years in hospital are of any advantage if he seeks employment outside the hospital service. The difficulties in recruiting junior hospital staff and entry into general practice are therefore closely related, and it is more than likely that the failure so far to implement the Consultants Spens Report (following the Danckwerts award) is increasing the hospital staffing problem. This was discussed by the Liaison Committee, and suggestions were made for integrating the general-practitioner and hospital services to a far greater degree.

The Committee also discussed the domiciliary consultation arrangements, out-patient appointment forms, and other matters of interest to both general practitioners and consultants.

THE SMALL-LIST PRACTITIONER

A meeting of the full Working Party has been held, and it discussed the scope, methods, and intentions of the promised inquiry into the problem of the small-list practitioner. It was agreed that the inquiry should proceed with all possible speed, and details will be published in the *Supplement* from time to time. The chairman of the G.M.S. Committee also hopes to make a statement on the inquiry when the Annual Conference of Local Medical Committees takes place on June 17.

Correspondence

The Registrar Problem

SIR,—We have been glad to note in your columns (*Supplement*, May 23, p. 243) that the Ministry of Health has now taken action in an attempt to alleviate the present senior registrar problem. We would like, however, to emphasize the point made by the Ministry that, while the new regulations may offer a breathing-space to many whose future appeared uncertain, the likelihood of any individual reaching specialist status will only be increased if the consultant service is expanded. No one can predict the probable extent of such expansion, and each doctor who now seeks to prolong his registrarship must do so with this situation in mind.

Apart from the effect on the immediate personal problems of senior registrars, the most important implication of the Ministry's action is the final rejection of the rigid

training programme imposed in 1949. Now registrars of whatever status may apply for further posts in the same grade and specialty. The duration of a specialist's training has thus come to depend, as it did in the past, upon the ability of the individual and upon the needs of his particular specialty. The flexibility of the new arrangements will benefit both the individual doctors and the hospital service, since the best of the registrars will be allowed to continue to work in their specialties until consultant posts are available for them.—We are, etc.,

R. M. FORRESTER, J. N. WALTON,
Late Chairman, Chairman,
Registrars' Group, B.M.A.

Newcastle-upon-Tyne.

The Extraordinary General Meeting

SIR,—The Extraordinary General Meeting was instructive and should be studied carefully by all who care for the freedom of medicine.

If I heard aright, the signatories made three major points: no one must be worse off as a result of the Working Party's plan than he was before; no one must be forced by economic necessity to move from his present address; and any special treatment of the small-list man is his natural right and not charity. The first two propositions mean in effect that the basic salary or its equivalent must be carried on in perpetuity. In other words, everyone with a medical qualification is automatically entitled to a living at the expense of the State (or his fellows) irrespective of the number of patients he may attract. Even if work exists elsewhere he must be free to stay where he is and draw his pay.

It would be interesting to know the philosophical—or political—basis for this astonishing claim. Nothing in the revolutionary writings of the last 150 years has approached it. A section of a particular profession is to be held aloof, unique in the sweating, toiling millions of the world, from hardship, competition, and all the material difficulties in life, and moreover demands it as a right, as a "liberty."

The whole situation was perfectly put by one of the complainants, a young man. He explained that the coming of the N.H.S. had necessitated his application for the basic salary, which had been granted. Even so, he had found it necessary to work for other doctors to make ends meet. This, we were told, was the monstrous state of affairs which must be remedied at once. It must no longer be necessary for him to do outside work. A sufficient slice of the award must be allotted to enable him to exist without doing anything in his ample spare time. We have heard of equality of opportunity. A new phrase will have to be coined for this claim. I hope these views are not widely held.

There is one way in which for a time all could be secure, and that is in a salaried service, but in that case a man would go where he was told, like a soldier. The present scheme with its loading has moved in that direction. The loading of the first 1,000 would be a step, probably decisive, in the same direction. The advocates of a salaried service are not idle. They will never admit defeat. The correspondence columns of the *Journal* are filled with their disguised propaganda. Their organization appears to be first-class. They are a menace to the profession.

Finally, the calling of the meeting itself. Readers of Mr. Bullock's book on Hitler will fully understand the technique of revolution by legality. Here was an example of it. The signatories, some of whom were not even members of the Association, called a meeting of 67,905 people in a hall capable of holding 775, by a dubious use of the rules, in an attempt to upset the policy of the Association, and then complained that the meeting had been packed against them. They were entitled to use the rules—the G.M.S. Committee evidently was not. Thank heaven the G.M.S. Committee had the courage to do it. Not often does true democracy find itself with a ready weapon against the legal revolutionaries. The rights of minorities are sacred. Dr. Grant seemed to think that they extended to the right to govern. Here then, Sir, I say that there is food for serious thought.

Nothing in this letter must be taken as meaning that the older men who find themselves in difficulties owing to the advent of the health service must be left to their fate. On the contrary they must, and, I am sure, they will, be looked after. That is only a temporary and passing problem, and has nothing to do with the deadly implications of the resolution presented to the Extraordinary General Meeting.—I am, etc.,

London, N.W.4.

R. W. COCKSHUT.

The G.P. and the Industrial Medical Officer

SIR,—My Division has had under consideration for many months the question of proper liaison between the general practitioner and the industrial medical officer. It has felt well qualified to examine this problem, as the area, covering four suburban boroughs, is densely populated and a very considerable proportion of the patients are employed in industrial undertakings of varying size and type.

A number of examples of lack of proper liaison have come to light, some of which could well have been made the subject of complaint on ethical grounds, but my executive committee takes the view that the situation is unlikely to be purely a local one or that its experience is unique. We are well aware of the good services that the industrial medical officer is providing, and fully appreciate that this work is in the interest of the patient, his employer, and the general practitioner; but at the same time we feel that a closer contact between the two branches of the profession would be beneficial to all concerned, and on occasion avoid misunderstanding and sometimes ill-feeling or embarrassment. We feel, however, that a situation has arisen which seriously endangers the integration of the two groups and is causing a developing antagonism between them. At the same time, this can interfere with continuity of treatment, confuse the patient, reduce his confidence in his medical advisers, and involve unnecessary or duplicated investigations at hospital.

It had not passed unnoticed that during the time that this matter was under examination there was a move to modify the Association's Ethical Rules for Industrial Medical Officers, approved by the Annual Representative Meeting as recently as 1949. The Stratford Division felt, therefore, that the problem warranted discussion on a high level and in general terms, and to this end a meeting has recently been held at which the Occupational Health Committee of the Council, the Association of Industrial Medical Officers, and the Division were represented. We feel this question to be an important one which warrants a full and early examination, as the situation would appear to be deteriorating since the advent of the National Health Service.

It would be interesting to know whether other areas are faced with a similar problem.—I am, etc.,

Ilford, Essex.

RONALD PETERS,
Secretary, Stratford Division.**Association Notices****ANNUAL GENERAL MEETING**

Notice is hereby given that the Annual General Meeting of the Association will be held in the City Hall, Cardiff, on Monday, July 13, 1953, at 12.30 p.m. Business: (1) Minutes of the last meeting, held on July 7, 1952. (2) Induction of President, 1953-4. (3) Balance-sheet and income and expenditure account for the year ending December 31, 1952. (4) Appointment of auditors.

A. MACRAE,
Secretary.**EXTRAORDINARY GENERAL MEETING**

Notice is hereby given that an Extraordinary General Meeting of the British Medical Association will be held in the City Hall, Cardiff, at 12.30 in the afternoon of Monday, July 13, 1953, or as soon thereafter as the Annual General

Meeting of the Association shall be terminated, when the following resolution will be proposed as a Special Resolution:

RESOLUTION

That Article 39(2) be altered in the following manner:
By the substitution of "six weeks" for "two months" in line 8, and "three weeks" for "one month" in line 9.

By order of the Council.

A. MACRAE,
Secretary.**Diary of Central Meetings**

JUNE	
16 Tues.	A.R.M. Agenda Committee, 3 p.m.
17 Wed.	Annual Conference of Representatives of Local Medical Committees, 10 a.m.
18 Thurs.	G.M.S. Committee, 10.30 a.m.
18 Thurs.	Central Consultants and Specialists Committee, 12.15 p.m.
19 Fri.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
24 Wed.	Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
24 Wed.	Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
30 Tues.	Joint Committee of Psychological Medicine Group and R.M.P.A., 2 p.m.
JULY	
3 Fri.	Ophthalmic Qualifications Committee, 1.45 p.m.
3 Fri.	Ophthalmic Group Committee, 2 p.m.
6 Mon.	Registrars Group Executive Committee, 2 p.m.
9 Thurs.	Annual Representative Meeting (at Cardiff), 10 a.m.
10 Fri.	Annual Representative Meeting (at Cardiff), 9.30 a.m.
11 Sat.	Council (at Cardiff), 9 a.m.
11 Sat.	Annual Representative Meeting (at Cardiff), 10 a.m.
13 Mon.	Annual Representative Meeting (at Cardiff), 10 a.m.
13 Mon.	Annual General Meeting (at Cardiff), 12.30 p.m.
13 Mon.	Extraordinary General Meeting (at Cardiff), at conclusion of A.G.M.
13 Mon.	Council (at Cardiff) at conclusion of A.R.M.
13 Mon.	Adjourned Annual General Meeting and President's Address (at Cardiff), 8.30 p.m.
22 Wed.	Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Aldershot Civil Infectious Diseases Hospital, Tuesday, June 16, 8.30 p.m., inaugural meeting of Division followed by special meeting.

DORSET DIVISION.—At Langleat House, near Warminster, Sunday, June 21, 3.30 p.m., social meeting.

LINCOLNSHIRE BRANCH.—At George Hotel, Grantham, Thursday, June 18, 12.15 for 12.45 p.m., lunch; 2 p.m., annual meeting.

NORTH MIDDLESEX DIVISION.—At Hornsey Central Hospital, Park Road, Crouch End, N., Tuesday, June 16, 8.45 p.m., meeting. Short papers.

NORTH OF ENGLAND BRANCH.—At Holy Island, Thursday, June 18, 12 noon, annual meeting.

PADDINGTON DIVISION.—At Paddington Hospital, Harrow Road, W., Wednesday, June 17, 2.30 p.m., clinical meeting in conjunction with London County Medical Society.

SUFFOLK BRANCH.—At Everard's Hotel, Bury St. Edmunds, Thursday, June 18, 12.30 p.m., annual general meeting.

SURREY BRANCH.—At The Star and Garter Home, Richmond, Wednesday, June 17, 2.30 p.m., annual meeting.

WEMBLEY DIVISION.—Thursday, June 18, 2.30 p.m., tour of Messrs. Glaxo Ltd., Greenford.

Meetings of Branches and Divisions**GLASGOW DIVISION**

A meeting was held in the Glasgow Regional Office, on April 2, 1953. With Dr. James R. Langmuir in the chair, there were 24 members present. The following officers were elected for 1953-4: Chairman.—Dr. W. D. Anderson.

Vice-chairman.—Mr. John Dunbar, Dr. J. S. McL. Ord, and Dr. Wm. Gardner.

Honorary Secretary.—Dr. J. Inglis Cameron.

Honorary Treasurer.—Dr. J. Baird Forrester.

DORSET DIVISION

A meeting was held at the Clinic, Dorchester, on April 10, 1953. There were 23 members present. Dr. Vera Walker gave a lecture on allergy in general medicine.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 20 1953

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DRUG BILL IN GENERAL PRACTICE MINISTER'S APPEAL TO CONFERENCE

Addressing the Annual Conference of Local Medical Committees on June 17, the Minister of Health, Mr. IAN MACLEOD, said that the rising cost of the drug bill was one of the gravest and most urgent problems which confronted the National Health Service. He therefore made an urgent appeal to general practitioners to ponder on the figures and to pause to consider each time they prescribed what and how much was justified on clinical grounds. We could not afford to ask the Exchequer to go on paying an annual bill of something like £40m. for drugs prescribed by general practitioners unless they were in fact all essential for the proper treatment of patients—a point on which as a general proposition he believed medical opinion to be more than doubtful. In addition, the 1s. charge paid by patients was expected to contribute about £6½m.

Reasons for Higher Costs

Apart from the effects of the influenza in 1950-1 and 1952-3, and the fog of last December, the Minister thought there were some important reasons for the increase in the drug bill (from £31½m. in 1949-50 to an estimated figure of £46½m. in 1953-4). First there had been some increase in the total number of prescriptions dispensed (the total was still over 200 million a year). Secondly, the average cost of prescriptions had risen from 2s. 9d. in 1948-9 to an estimated 4s. 3d. in 1953-4. This was because of the introduction of useful but expensive drugs, and the rise in ingredient prices until this year (though some drugs were cheaper—for example, some of the antibiotics). In addition an increased proportion of proprietary drugs had been prescribed. (In 1952 proprietaries represented 26% of the total number of prescriptions, 52% of their total ingredient costs, and 44.5% of their total cost.)

Quoting from "Prescribers' Notes" examples of the savings that might have resulted from the use of standard preparations, the Minister mentioned a proprietary slimming preparation which, if prescribed by its standard name, would have produced a saving of about £242,000 in 1951. Then there were proprietary tablets containing as their main ingredients aspirin, phenacetin, and codeine (with some additional ingredients) which cost 6s. 3½d. for 50. The same number of tablets of their comparable standard preparation cost 2s. 11d., and their use would have meant a saving of more than 50%. Again, proprietary asthma inhalants might cost four to nearly six times as much as a standard inhalant, yet the *British Medical Journal* had reported an investigation of some of these which found little to choose between them and the standard preparation. The indications were that savings of £48,000 and £54,000 respectively might re-

sult from the use of comparable standard preparations for certain proprietary prescriptions for the treatment of peptic ulcer and heart trouble.

How Doctors Could Help

It was necessary and only fair to say that many preparations had, of course, no exact official equivalents, and that some important preparations—such as many of the antibiotics—were in fact made up only in proprietary form. But, having acknowledged this, there were many ways in which doctors could help, and the Minister felt confident that he would not appeal to them in vain. For instance, doctors could make careful use of *National Formulary* preparations. They could refer to the two tables of proprietary preparations in the *Formulary* which showed those for which an identical preparation in the *Formulary* was available and those for which there was a *Formulary* preparation substantially the same or reputed to have an analogous therapeutic effect, and they could prescribe the *Formulary* preparation in both these cases unless there was a special reason to do otherwise.

In this connexion the Minister particularly wished to emphasize that, while *Formulary* preparations might be cheaper, there was no reason on this account to regard them as being inferior. They were recommended by the experts of the medical and pharmaceutical profession (quite independently of the Ministry of Health), and the great majority of them or their ingredients conformed to standards laid down by the *British Pharmacopoeia* or the *British Pharmaceutical Codex*. These standards were generally accepted as standards of quality, purity, and potency.

Doctors could also satisfy themselves, before prescribing a proprietary preparation not included in the two *Formulary* lists, that there were adequate grounds for accepting its therapeutic value in treating the particular condition for which it was proposed to prescribe it. And they could help by resisting pressure from patients to prescribe particular preparations which they had had recommended to them or which they had seen advertised.

Other ways in which doctors could help were by refraining from prescribing unreasonably large quantities of a drug or dressing, and by not prescribing anything unless they were fully satisfied that it was required at the time for the patient's treatment.

There was nothing in these suggestions, the Minister continued, with which he believed doctors would not agree—in general. The difficulty was of course to apply the suggestions in practice. But difficult as it was, he felt sure he could rely on their help.

Guidance from Ministry

For their part the Ministry would do all they could to assist and guide doctors in these matters. A prescribing investigation unit had been established and had for three years been examining prescriptions in cases where there was reason to believe that there was extravagant prescribing. The Department's regional medical officers were ready to help with advice in these matters, and if necessary local medical committees must be brought in.

Useful advice and information was also available to general practitioners in "Prescribers' Notes," copies of which were distributed to all general practitioners on executive council lists. To assist doctors, the Ministry also proposed to issue a "price list" of *Formulary* preparations and proprietary preparations listed in the *Formulary* or occupying a high place on the basis of frequency of prescribing. Doctors should thus be made fully aware of the cost of what they were prescribing.

Finally, the recommendations of the Cohen Committee had already given a clear lead. The Committee would shortly have completed its initial classification of proprietary preparations. This would enable doctors to be told the names of preparations in the two "doubtful" categories covering drugs which were not of proved therapeutic value and ought not to be prescribed. Simultaneously the Department was proceeding in consultation with the manufacturers to investigate the production costs of selected proprietary preparations in the categories which the Cohen Committee considered prescribable subject to satisfactory price arrangements; those initially selected were naturally preparations which were frequently prescribed or at first sight seemed unduly expensive.

HELP IN STABILIZING COSTS

Dr. Rogers's Reply to Minister's Address

Dr. TALBOT ROGERS, Chairman of the General Medical Services Committee, thanked the Minister for sparing the time to address the Conference. He felt that the Minister's words would be carefully studied by every general practitioner present and through the *British Medical Journal* by general practitioners throughout the country. He said that he would not like the Minister to think that the G.M.S. Committee had been unmindful of the mounting costs of the drug bill. Indeed there had been constant discussions with the Ministry over the past few years on this subject. As long ago as 1948 his Committee had asked the Ministry to institute a system of stock order forms for general practitioners in line with the procedure which had been adopted so successfully in Scotland. It was not the Committee's fault that this scheme had not been introduced, and he was certain that this one single step would have materially reduced present costs. Again, the Committee had urged the Ministry to reintroduce the system of "area averages" whereby the prescribing costs of a doctor can be compared with the average for the area. This system had worked well under the National Health Insurance Act and he hoped that everything possible would be done to reintroduce it in the present Service.

Dr. Rogers assured the Minister that his Committee during the coming season would do all it could, in co-operation with his officers, to assist in stabilizing the cost of the pharmaceutical service, provided this was not incompatible with the essential needs of the patient.

[See leading article at p. 1380. A report of the meeting will be published next week.]

British Medical Association

ANNUAL MEETING—CARDIFF, JULY 9-17, 1953

President-Elect: J. W. TUDOR THOMAS, D.Sc., M.D., M.S., F.R.C.S.

General Secretary: JOHN D. SPILLANE, M.D., F.R.C.P.

Science Secretary: PROFESSOR GILBERT I. STRACHAN, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G.

Executive Officer: G. A. PECK, B.Sc., B.M.A. House, 195, Newport Road, Cardiff.

PROGRAMME

The 121st Annual Meeting of the British Medical Association will be held in Cardiff from Thursday, July 9, to Friday, July 17, 1953, inclusive.

On the evening of Wednesday, July 8, there will be a Sherry Party for Representatives and their Ladies, arranged by the Cardiff Division.

The first part of the Meeting—the Annual Representative Meeting—will begin on Thursday, July 9, and continue on Friday, Saturday, and Monday, July 10, 11, and 13.

In view of the visit of Her Majesty the Queen to Cardiff on July 9, the Representative Meeting will be held that day in the Cory Hall, Station Terrace, with the A.R.M. Inquiry Office in the adjoining Y.M.C.A. centre. On the following day, Friday, July 10, the Annual Representative Meeting will transfer to the City Hall, where it will remain until the conclusion of the meeting on July 13.

The Representatives' Dinner and Ladies' Dinner take place on Thursday, July 9, followed by a dance.

The Overseas Luncheon is arranged for Friday, July 10. On Sunday, July 12, a visit has been arranged for Representatives and their Ladies to St. Donat's Castle, and that evening there will be a Welsh Choral Concert.

The second part of the Meeting—the Annual Meeting proper—occupies the period from the conclusion of the A.R.M. on Monday, July 13, to the evening of Friday, July 17.

The adjourned Annual General Meeting and President's Address will take place in the Park Hall Cinema on the evening of Monday, July 13, and the President's Reception which follows will be at the National Museum of Wales.

Three Plenary Scientific Sessions are arranged as follows: Tuesday morning, July 14, "Coronary Disease"; Thursday morning, July 16, "Fibrositis"; Friday afternoon, July 17, "Overweight."

Seventeen Scientific Sections have been arranged, the meetings to take place on Wednesday morning and Wednesday afternoon, July 15, and Friday morning, July 17 (details are given below).

The Official Religious Service will be held in St. John's Church, Cardiff, on the afternoon of Tuesday, July 14.

A Roman Catholic Service will be held in St. Peter's Church, Cardiff, on the morning of July 14.

The Popular Lecture will be given by Sir Russell Brain, P.R.C.P., on the evening of Friday, July 17.

There will be a Joint Reception by the University College of South Wales and Monmouthshire and the Welsh National School of Medicine on Tuesday evening, July 14, and a Civic Reception on the following evening.

The Annual Dinner of the Association will be held in the City Hall on Thursday, July 16.

Two large Garden Parties have been arranged—on Thursday, July 16, at Margam, by invitation of Mr. Evans Bevan, and on Friday, July 17, at Duffryn House, by invitation of the Board of Governors of the United Cardiff Hospitals.

The Monmouthshire Division is giving a Sherry Party on Tuesday, July 14.

An attractive social programme has been drawn up, including many functions specially arranged for the ladies accompanying members. There are also a number of visits to Welsh industrial concerns, including one to the Abbey Steel Works, Margam, the largest of its kind in the world.

JUNE 20, 1953

The South Wales Association of the Medical Women's Federation is giving a Sherry Party on July 10 for medical women visitors.

The usual golf competitions will take place, and there will also be facilities for bridge, bowls, and tennis. Various sports and social clubs have offered honorary membership to B.M.A. Members throughout the Meeting.

The Overseas Conference will be held on Wednesday afternoon, July 15, followed by an "At Home" for Overseas Delegates given by the Empire Medical Advisory Bureau. The Overseas League is giving a reception for Overseas Delegates on Tuesday afternoon, July 14.

The Christian Medical Fellowship is holding its Annual Breakfast (formerly known as the Medical Missionary Breakfast) on July 15, and the usual graduate luncheons and dinners have been arranged.

The Reception Room for registration in the Sophia Gardens Pavilion will be opened on Monday, July 13, at 9 a.m. The Ladies' Club will be situated in the University College and will be open throughout the Meeting.

The Annual Trade Exhibition of Surgical Appliances, Foods, Drugs, and Books will be housed in the Sophia Gardens Pavilion. The official opening will take place on Monday, July 13, at 9 a.m., and the Exhibition will remain open on July 14, 15, 16, and 17 from 9 a.m. to 6 p.m.

The Scientific Exhibition will also be held in the Sophia Gardens Pavilion and will be open daily from July 13 to 17. Demonstrations will be given at fixed times. There will be a showing of the three-dimensional colour film "Mediastinal Tumours," by Ethicon Suture Laboratories Ltd., on July 13, 14, 15, and 17, at 5 p.m.

HOTEL ACCOMMODATION

Hotel accommodation in and around Cardiff is now very fully booked up. Those who have difficulty in making arrangements are advised to write direct to *The Executive Officer, B.M.A. House, 195, Newport Road, Cardiff*, stating their exact requirements.

It is regretted that, owing to a wages agreement applicable to all the hotels in the Cardiff area, an increase has been made in charges for accommodation. A single room formerly 22s. 6d. for bed and breakfast is now 25s., and similar increases apply for other charges.

REGULATIONS REGARDING DRESS

Academic Dress should be worn at the President's Address, the President's Reception, the Official Religious Service, the Roman Catholic Service, the University Reception, and the Civic Reception.

Robes may be hired from Messrs. Ede and Ravenscroft, Ltd., 93, Chancery Lane, London, W.C.2, who request that the gowns be sent to the home address of the individual concerned. Early application is advised, as the supply of gowns is limited.

Evening Dress (Tails or Dinner Jacket), with Decorations, is to be worn at the President's Reception, University Reception, Civic Reception, and Annual Dinner. Evening Dress without Decorations should be worn at the Representatives' Dinner and the Representatives' Dance.

REGISTRATION FEE

Members attending the Annual Meeting (other than members of the Representative Body and overseas visitors) are required to pay a fee of one guinea towards the expenses of the Meeting. The fee will be payable when members register at the Reception Office.

TICKETS

No tickets for functions or excursions can be issued in advance.

All tickets for functions up to Sunday, July 12, will be available at the A.R.M. Inquiry Office at the Y.M.C.A. on July 9 and at the City Hall on July 10 and 11, or at the Ladies' Club, University College.

Tickets for all other functions will be available from Monday, July 13, at the Reception Office, Sophia Gardens Pavilion, or at the Ladies' Club.

BADGES

Members will not be admitted to the Plenary Sessions, Scientific Sections, or Scientific Exhibition unless wearing badges. They should therefore make a point of visiting the Reception Office, Sophia Gardens Pavilion, on the first day of their attendance at the Annual Meeting to obtain their handbook, badge, registration card, and tickets.

Officers of Scientific Sections and other office-holders should inquire for special badges at the Reception Office.

CAR-PARKING

Windscreen labels may be obtained at the Reception Offices, and members bringing their own cars are advised to use these labels to facilitate car-parking.

Only limited covered accommodation is available for cars in Cardiff, but open-air accommodation is available at Messrs. E. R. Forse & Co., Kingsway, and The Friary, Cardiff.

REPRESENTATIVES' EXCURSION

There will be an all-day excursion for Representatives and their Ladies to St. Donat's Castle on Sunday, July 12. Lunch and tea will be provided, and there will be facilities for bathing in the swimming pool in the grounds.

The inclusive price for lunch, wines, tea, and admission to the grounds is 30s., with transport by bus 4s. extra.

ABERDEEN GRADUATES' DINNER

A dinner arranged by the South Wales and West of England Branch of the Aberdeen University Graduates' Association will be held in the Royal Hotel, Cardiff, on Friday, July 10, at 7.30 p.m. Tickets will be one guinea each, excluding wine.

This dinner is open to all Aberdeen graduates and their wives attending the Annual Meeting, and those intending to be present are asked to notify the local secretary, Mrs. Scott Thomson, Glasfryn, Lower Cwrt-y-vil Road, Penarth, Glam. Tickets will be available at the A.R.M. Inquiry Office, Y.M.C.A. (opposite Queen Street Station), on July 9.

EDINBURGH GRADUATES' DINNER

The Edinburgh Graduates' Dinner will be held in the Park Hotel, Cardiff, on Friday, July 10, at 7.30 p.m. The dinner is open to all Edinburgh graduates and their ladies attending the A.R.M. or resident in the area.

Those intending to be present are asked to notify Dr. Angus Weston, Edinburgh House, Greenford, Middlesex, as soon as possible, enclosing remittances for tickets, the cost of which is 25s. each, including aperitifs.

GLASGOW GRADUATES' DINNER

The Glasgow Graduates' Dinner will be held in the Royal Hotel, Cardiff, on Saturday, July 11, at 7 for 7.30 p.m. This dinner is open to all Glasgow graduates and their ladies attending the A.R.M. or resident in the area.

Tickets, at a cost of 25s. including aperitifs, are obtainable from Dr. Robert Forbes, Tavistock House South, Tavistock Square, London, W.C.1.

IRISH GRADUATES' LUNCHEON

The Irish Graduates' Luncheon will be held on Wednesday, July 15, at 12.30 for 1 p.m. at the Royal Hotel, Cardiff, at a cost of 10s. per person (excluding wine). This luncheon is open to all Irish graduates and their ladies attending the Annual Meeting, and those intending to be present are asked to notify in advance the Honorary Secretary, Irish Graduates' Luncheon, B.M.A. House, 195, Newport Road, Cardiff, or to give in their names at the Registration Office, Sophia Gardens Pavilion, Cardiff, on arrival at the meeting. No tickets will be issued, and payment will be made at the Royal Hotel.

WELSH DINNER

A dinner open to all doctors with Welsh associations and their wives attending the Annual Meeting will be held in the New Continental Café, Cardiff, on Saturday, July 11, at 7.30 p.m. Tickets will be one guinea each, and those wishing to attend are asked to apply for tickets, with remittances, to the Hon. Secretary, Welsh Dinner, B.M.A. House, 195, Newport Road, Cardiff.

CHRISTIAN MEDICAL FELLOWSHIP ANNUAL BREAKFAST

The Annual Breakfast of the Christian Medical Fellowship (formerly known as the Medical Missionary Breakfast) will be held at the New Continental Café, Cardiff, on Wednesday, July 15, at 8.30 a.m. The chairman will be Mr. J. W. Tudor Thomas, and the speaker Dr. D. Martin Lloyd-Jones. The proceedings will terminate at 9.40 a.m. Those intending to be present are asked to notify the local secretary: Mr. A. S. Aldis, F.R.C.S., 3, Heol Don, Whitchurch, Cardiff.

SCIENTIFIC MEETING

PLENARY SESSIONS

All sessions will be held in the Reardon Smith Theatre, Park Place.

Tuesday, July 14, 10 a.m.: "Coronary Disease"

Chairman: Professor H. SCARBOROUGH (Cardiff).
Speakers: Dr. D. EVAN BEDFORD (London), Dr. WILLIAM PHILLIPS (Cardiff), Professor G. W. PICKERING (London), Dr. CLIFFORD G. PARSONS (Birmingham), Dr. A. RAE GILCHRIST (Edinburgh), Dr. JOHN H. HUNT (London).

Thursday, July 16, 10 a.m.: "Fibrositis"

Chairman: Mr. A. LAWRENCE ABEL (London).
Speakers: Dr. A. TALBOT ROGERS (Bromley), Dr. A. H. DOUTHWAITE (London), Dr. JOSEPH P. SPILLANE (Cardiff), Mr. J. S. BATCHELOR (London), Mr. LESLIE H. W. WILLIAMS (London), Dr. J. H. CYRIAX (London), Dr. G. D. KERSLEY (Bath).

Friday, July 17, 2.15 p.m.: "Overweight"

Chairman: Right Hon. LORD HORDER (London).
Speakers: Dr. J. H. SHELDON (Wolverhampton), Professor R. A. MCCANCE, F.R.S. (Cambridge), Dr. ARNOLD P. MEIKLEJOHN (Edinburgh), Dr. H. M. SINCLAIR (Oxford), Dr. LEONARD H. HOWELLS (Cardiff), Dr. EMRYS WILLIAMS (Cardiff).

SCIENTIFIC SECTIONS

All sessions will be held in University College, Cathays Park.

MEDICINE

President: Professor A. M. KENNEDY, M.D., F.R.C.P. (Cardiff).

Vice-Presidents: Professor W. MELVILLE ARNOTT, B.Sc., M.D., F.R.C.P. (Birmingham); Sir DANIEL DAVIES, K.C.V.O., M.D., F.R.C.P. (London); LEONARD H. HOWELLS, M.D., F.R.C.P. (Cardiff); and Professor W. J. E. JESSOP, M.Sc., M.D., F.R.C.P.I., D.P.H., F.R.I.C. (Dublin).

Hon. Secretaries: BYRON EVANS, M.D., M.R.C.P., 59, Cathedral Road, Cardiff; JOHN RICHARDSON, M.V.O., M.D., F.R.C.P., 33, Devonshire Place, London, W.1.

The following programme has been arranged:

Wednesday, July 15 (Room 103).—10 a.m., The Use and Abuse of Antibiotics. To be opened by Dr. R. W. FAIRBROTHER (Manchester), Dr. THOMAS ANDERSON (Glasgow), and Mr. J. S. JEFFREY (Edinburgh); followed by Dr. KENNETH S. MACLEAN (London), Dr. H. M. FOREMAN (Sully, Glam), and Dr. F. A. WHITLOCK (Truro). 2 p.m., The Early

Diagnosis of Intrathoracic New Growths. To be opened by Sir GEOFFREY MARSHALL (London), Mr. VERNON THOMPSON (London), and Dr. PETER KERLEY (London); followed by Dr. BRIAN TAYLOR (Birmingham) and Mr. DILLWYN THOMAS (Cardiff).

Official Reporter: Dr. THOMAS PARKINSON.

SURGERY

President: Professor LAMBERT C. ROGERS, V.R.D., M.Sc., M.D., F.R.C.S., F.A.C.S., F.R.A.C.S. (Cardiff).

Vice-Presidents: D. J. HARRIES, M.D., F.R.C.S. (Cardiff); J. B. HAYCRAFT, M.C., M.B., F.R.C.S. (Cardiff); D. IOAN-JONES, M.B., F.R.C.S. (Cardiff); C. JENNINGS MARSHALL, M.D., M.S., F.R.C.S. (London); A. DICKSON WRIGHT, M.S., F.R.C.S. (London).

Hon. Secretaries: STANLEY AYLETT, M.B.E., M.B., F.R.C.S., 114, Harley Street, London, W.1; D. B. E. FOSTER, M.B., F.R.C.S.Ed., Hillboro, Llandough, Penarth, Glamorgan.

The following programme has been arranged:

Wednesday, July 15 (Room 129).—10 a.m., The Treatment of Toxic Goitre. To be opened by Mr. R. V. COOKE (Bristol). The Treatment of Diseases of the Gall-bladder and Bile Ducts. To be opened by Mr. R. J. MCNEILL LOVE (London). 2 p.m., The Relief of Pain of Vascular Disease in the Lower Limb. To be opened by Sir JAMES PATERSON ROSS (London) and Mr. J. B. OLDHAM (Liverpool); followed by Mr. HAROLD DODD (London), Professor C. G. ROB (London), and Mr. S. M. COHEN (London).
Official Reporter: Mr. R. S. MURLEY.

OBSTETRICS AND GYNAECOLOGY

President: Professor G. I. STRACHAN, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G. (Cardiff).

Vice-Presidents: M. D. ARWYN EVANS, M.D., F.R.C.S.Ed., F.R.C.O.G. (Cardiff); Professor H. HARVEY EVERS, M.B., M.S., F.R.C.S., F.R.C.O.G. (Newcastle-upon-Tyne); R. G. MALIPHANT, M.D., M.R.C.P., F.R.C.S., F.R.C.O.G. (Cardiff); H. K. PACEY, M.D., F.R.C.S., F.R.A.C.S., F.R.C.O.G. (Wellington, New Zealand); LESLIE H. W. WILLIAMS, M.D., M.S., F.R.C.S., F.R.C.O.G. (London).

Hon. Secretaries: J. M. BOWEN, M.B., M.R.C.O.G., 9, Edward VII Avenue, Newport, Mon; ALISTAIR L. GUNN, M.D., F.R.C.S.Ed., F.R.C.O.G., 51, Harley Street, London, W.1.

The following programme has been arranged:

Wednesday, July 15 (Room 56).—10 a.m., The Place of the Forceps in Present-day Obstetrics. To be opened by Professor T. N. A. JEFFCOATE (Liverpool); followed by Mr. GAVIN BOYD (Belfast), Mr. WILLIAM HUNTER (Newcastle-upon-Tyne), and Mr. E. PARRY JONES (St. Asaph, Flint). *Short Paper:* Professor J. C. MCCLURE BROWNE (London). Placental Circulation in Pre-eclamptic Toxaemia. 2 p.m., The Climacteric. To be opened by Mr. ALECK W. BOURNE (London); followed by Mr. T. N. MACGREGOR (Edinburgh), Professor H. C. McLAREN (Birmingham), and Mr. M. D. ARWYN EVANS (Cardiff). *Short Paper:* Dr. D. MCKAY HART (Glasgow), Dysmenorrhoea.
Official Reporter: Mr. S. BENDER.

ANAESTHETICS

President: C. LANGTON HEWER, M.B., B.S., M.R.C.P., D.A., F.F.A.R.C.S. (London).

Vice-Presidents: RONALD JARMAN, D.S.C., M.R.C.S., L.R.C.P., D.A., F.F.A.R.C.S. (London); A. HUGH MUSGROVE, M.R.C.S., L.R.C.P., D.A., F.F.A.R.C.S. (Cardiff); WILLIAM W. MUSHIN, M.A., M.B., B.S., D.A., F.F.A.R.C.S. (Cardiff).

Hon. Secretaries: J. G. BOURNE, M.B., B.Ch., D.A., 37, Marsham Court, Westminster, S.W.1; I. RHYS JONES, M.R.C.S., L.R.C.P., D.A., Cliff Cottage, Radyr, Glamorgan.

The following programme has been arranged:

Wednesday, July 15 (Room 116).—10 a.m., A Return to Simplicity? To be opened by Dr. M. D. NOSWORTHY

(London); followed by Dr. W. W. MUSHIN (Cardiff). 2 p.m., *Short Paper:* Dr. E. J. DELORME (Edinburgh), Hypothermia and Anaesthesia. The Case Against Hypotension. To be opened by Dr. M. H. ARMSTRONG DAVISON (Newcastle-upon-Tyne); followed by Dr. R. F. WOOLMER (Bristol).
Official Reporter: Dr. MARY OSTLER.

CARDIOLOGY

President: MAURICE CAMPBELL, O.B.E., D.M., F.R.C.P. (London).

Vice-Presidents: A. RAE GILCHRIST, M.D., F.R.C.P. (Edinburgh); Professor C. BRUCE PERRY, M.D., F.R.C.P. (Cardiff); WILLIAM PHILLIPS, M.D., F.R.C.P. (Cardiff).

Hon. Secretaries: SHEILA HOWARTH, M.B., B.S., Institute of Cardiology, 35, Wimpole Street, London, W.1; ARTHUR J. THOMAS, M.D., M.R.C.P., D.P.H., Tanooma, Llandough, near Penarth, Glamorgan.

The following programme has been arranged:

Wednesday, July 15 (Room 202).—2 p.m., Pulmonary Heart Disease. To be opened by Dr. A. J. THOMAS (Cardiff) and Professor JETHRO GOUGH (Cardiff); followed by Dr. WILLIAM EVANS (London) and Dr. MAURICE CAMPBELL (London). *Film Demonstration* by Dr. I. McMILLAN (London), The Action of the Aortic Valves.
Official Reporter: Dr. G. W. HAYWARD.

DISEASES OF THE CHEST

President: Sir CLEMENT PRICE THOMAS, K.C.V.O., F.R.C.S. (London).

Vice-Presidents: A. L. D'ABREU, O.B.E., M.D., Ch.M., F.R.C.S. (Birmingham); Professor FREDERICK HEAF, M.D., F.R.C.P. (Cardiff); DILLWYN M. E. THOMAS, M.R.C.S., L.R.C.P. (Sully, Glam).

Hon. Secretaries: H. R. S. HARLEY, M.S., F.R.C.S., 93, Station Road, Llanishen, Cardiff; M. MEREDITH BROWN, B.M., F.R.C.S.Ed., 17, Priory Mansions, Drayton Gardens, London S.W.10.

The following programme has been arranged:

Friday, July 17 (Room 28).—10 a.m., The Value of Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis. To be opened by Dr. HOWARD NICHOLSON (London) and Dr. C. H. C. TOUSSAINT (London); followed by Mr. R. S. BARCLAY (Newton Mearns, Renfrewshire), Dr. C. S. DARKE (Sheffield), and Dr. PETER EDWARDS (Cheshire Joint Sanatorium). *Short Papers:* Mr. O. S. TUBBS (London), Constrictive Pericarditis; Mr. R. H. FRANKLIN (London), Congenital Atresia of the Oesophagus; Dr. ARCHIE COCHRANE (Cardiff), Radiological Diagnosis of Pneumoconiosis.
Official Reporter: Dr. THOMAS PARKINSON.

CHILD HEALTH

President: Professor A. G. WATKINS, M.D., F.R.C.P. (Cardiff).

Vice-Presidents: V. MARY CROSSE, O.B.E., M.D., D.P.H., D.Obst.R.C.O.G. (Birmingham); Professor A. V. NEALE, M.D., F.R.C.P., D.P.H. (Bristol); J. N. O'REILLY, D.M., M.R.C.P. (London).

Hon. Secretaries: P. T. BRAY, M.R.C.P., D.C.H., 28, Park Place, Cardiff; I. A. B. CATHIE, M.D., M.R.C.P., Pathological Department, The Hospital for Sick Children, Great Ormond Street, London, W.C.1.

The following programme has been arranged:

Wednesday, July 15 (Room 28).—2 p.m., Care of the Newborn. To be conducted on a basis of "Any Questions?" The panel consists of Professor W. C. W. NIXON (London), Professor WILFRED GAISFORD (Manchester), Dr. E. NOEL REES (Llanelly), and Dr. DOROTHY H. ALDIS (Cardiff). Poisoning in Childhood. To be opened by Dr. D. SWINSCOW (London) and Dr. J. O. CRAIG (Edinburgh).
Official Reporter: Dr. I. A. B. CATHIE.

DERMATOLOGY

President: R. M. B. MCKENNA, M.D., F.R.C.P. (London).
Vice-Presidents: LOUIS FORMAN, M.D., F.R.C.P. (London); GEOFFREY HODGSON, M.B.E., D.M. (Cardiff); BERNARD A. THOMAS, M.D., D.P.H. (Newport, Mon).

Hon. Secretaries: A. J. ROOK, M.D., M.R.C.P., 23, Park Place, Cardiff; D. S. WILKINSON, M.D., M.R.C.P., Whitecroft, Hervines Road, Amersham, Bucks.

The following programme has been arranged:

Wednesday, July 15 (Room 121).—10 a.m., Symposium on Practical Problems in the Management of Disorders of the Skin in General Practice: Dr. LOUIS FORMAN (London), The Management of Pruritus; Professor ARTHUR W. GRACE (New York), The Differential Diagnosis and the Treatment of Ringworm of the Feet; Dr. C. H. WHITTLE (Cambridge), The Problem of Nummular Eczema; Dr. C. S. NICOL (London), Difficulties in the Interpretation of the Serological Tests for Syphilis; Dr. MARTIN BEARE (Belfast), Difficulties in the Diagnosis and Treatment of Scalp Ringworm; Dr. D. S. WILKINSON (Amersham), Management of Hypostatic Conditions of the Lower Leg; Dr. IAN SNEDDON (Sheffield), Over-treatment; Dr. GEOFFREY HODGSON (Cardiff), The Influence of Home Conditions on Skin Diseases.

In connexion with this Section a Clinical Demonstration will be held on the afternoon of Wednesday, July 15, in Cardiff Royal Infirmary. Further details will be available later.

Official Reporter: Dr. J. T. INGRAM.

NEUROLOGY

President: W. RITCHIE RUSSELL, C.B.E., M.D., F.R.C.P. (Oxford).

Vice-Presidents: Professor PHILIP C. P. CLOAKE, M.D., F.R.C.P., D.P.M. (Birmingham); T. ROWLAND HILL, M.D., F.R.C.P. (London); W. ESMOND REES, M.D., F.R.C.P. (Swansea).

Hon. Secretaries: CHARLES LANGMAID, M.B., F.R.C.S., 174, Lake Road East, Roath Park, Cardiff; C. W. M. WHITTY, D.M., M.R.C.P., Department of Neurology, The Radcliffe Infirmary, Oxford.

The following programme has been arranged:

Friday, July 17 (Room 56).—10 a.m., Short Papers: Dr. HONOR SMITH (Oxford), Diagnosis and Treatment of Meningitis; Dr. A. B. KINNIER WILSON (Oxford), Dangers of Bulbar Poliomyelitis; Mr. RICHARD JOHNSON (Manchester), Surgical Treatment of Intracranial Haemorrhage; Mr. MURRAY FALCONER (London), New Trends in the Diagnosis of Spastic Paraplegia.
Official Reporter: Dr. C. W. M. WHITTY.

OCCUPATIONAL HEALTH

President: J. A. L. VAUGHAN JONES, M.B., Ch.B. (Leeds).

Vice-Presidents: Professor R. C. BROWNE, M.A., D.M., M.R.C.P. (Newcastle-upon-Tyne); ANDREW MEIKLEJOHN, M.D., M.R.C.P., F.R.F.P.S. (Glasgow); J. M. ROGAN, M.D., F.R.C.P.Ed., D.P.H. (London); J. S. SPICKETT, M.R.C.S., L.R.C.P. (Bridgend, Glam).

Hon. Secretaries: J. G. BILLINGTON, M.R.C.S., L.R.C.P., 7, Westfield Hall, Hagley Road, Edgbaston, Birmingham, 16; H. L. COULTHARD, M.D., M.R.C.P., D.P.H., 149, Heathwood Road, Cardiff.

The following programme has been arranged:

Friday, July 17 (Room 116).—10 a.m., Symposium on Work and Age. Speakers: Dr. N. T. WELFORD (Cambridge), Dr. W. P. D. LOGAN (London), Dr. D. D. REID (London), and Dr. I. M. RICHARDSON (Aberdeen). *Film:* (London), and Dr. I. M. RICHARDSON (Aberdeen). *Film:* Date of Birth. *Occasional Papers:* Dr. J. GWYNNE MORGAN (Clydach), (1) Carcinoma of the Lung Associated with Certain Industries; (2) Method of Demonstrating Porphyrin in the Urine of Lead Workers.

Official Reporter: Dr. ANDREW MEIKLEJOHN.

OPHTHALMOLOGY

President: J. H. DOGGART, M.D., F.R.C.S. (London).
Vice-Presidents: RUPERT J. PARRY, M.B., F.R.C.S.Ed. (Cardiff); ROY THOMAS, M.B., F.R.C.S.Ed., D.O.M.S. (Swansea); EUGENE WOLFF, M.B., F.R.C.S. (London).

Hon. Secretaries: BERNARD GLUCK, M.Ch., F.R.C.S.Ed., D.O.M.S., 76, Cathedral Road, Cardiff; A. J. B. GOLDSMITH, M.B., F.R.C.S., 63, Harley Street, London, W.1.

The following programme has been arranged:

Friday, July 17 (Room 103).—10 a.m., The Ocular Complications of Diabetes. To be opened by Mr. G. I. SCOTT (Edinburgh) and Dr. LEONARD HOWELLS (Cardiff); followed by Mr. A. B. NUTT (Sheffield). The Scope of Corneal Graft Surgery. To be opened by Mr. W. B. RYCROFT (London) and Mr. E. C. ZORAB (Southampton); followed by Mr. J. AYOUB (London) and Mr. A. G. LEIGH (London).

Official Reporter: Mr. A. J. B. GOLDSMITH.

ORTHOPAEDICS

President: A. O. PARKER, M.D., C.M., M.C.P.S., F.R.C.S. (Monmouth).

Vice-Presidents: IAN LAWSON DICK, M.D., Ch.M., F.R.C.S.Ed. (Edinburgh); A. M. HENDRY, M.B., F.R.C.S.Ed. (Birmingham); D. N. ROCYN-JONES, M.D., F.R.C.S.Ed. (Cardiff).

Hon. Secretaries: J. M. P. CLARK, M.B.E., M.B., F.R.C.S., 29, Park Square, Leeds, 1; DILLWYN EVANS, M.B., F.R.C.S.Ed., 25, Cathedral Road, Cardiff.

The following programme has been arranged:

Friday, July 17 (Room 127).—10 a.m., The Injured Hand. To be opened by Mr. WILLIAM GISSANE (Birmingham), Major Injuries of the Hand; Mr. R. J. FURLONG (London), The Cut Tendon; Mr. EMLYN LEWIS (Cardiff), Major Skin Loss and the Vascular Effect of Crush Injuries of the Hand; Mr. L. W. PLEWES (Luton), The Rehabilitation of the Hand; followed by Mr. R. G. PULVERTAFT (Derby), Mr. A. L. EYRE-BROOK (Bristol), Mr. F. C. DURBIN (Exeter), and Mr. MERVYN EVANS (Swansea).

Official Reporter: Mr. W. D. COLTART.

OTO-RHINO-LARYNGOLOGY

President: R. D. OWEN, F.R.C.S. (Cardiff).
Vice-Presidents: C. GILL-CAREY, F.R.C.S. (London); R. R. SIMPSON, M.B., F.R.C.S.Ed. (Hull); HECTOR A. THOMAS, M.B., F.R.C.S.Ed. (Cardiff).

Hon. Secretaries: ALUN BEYNON THOMAS, M.B., F.R.C.S., D.L.O., 23, Park Place, Cardiff; JOAN WADGE, M.B., F.R.C.S., 15, Devonshire Place, London W.1.

The following programme has been arranged:

Friday, July 17 (Room 121).—10 a.m., The Management of Otitis Media. To be opened by Mr. I. SIMSON HALL (Edinburgh); followed by Mr. J. I. MUNRO BLACK (Newcastle-upon-Tyne) and Mr. GEOFFREY H. BATEMAN (London). The Diagnosis and Treatment of Upper Respiratory Tract Infection in Allergic Children. To be opened by Mr. ANGELL JAMES (Bristol); followed by Dr. T. A. BRAND (Newport, Mon) and Dr. J. PEPYS (London).

Official Reporter: Mr. N. A. JORY.

PATHOLOGY

President: Professor J. B. DUGUID, M.D. (Newcastle-upon-Tyne).

Vice-Presidents: E. N. ALLOTT, D.M., F.R.C.P. (Beckenham); Professor J. GOUGH, M.D. (Cardiff); Professor R. A. Q. O'MEARA, D.Sc., M.D., D.P.H., F.R.C.P.I., F.T.C.D. (Dublin).

Hon. Secretaries: J. H. O. EARLE, M.D., 12, Hillside, Wimbledon, London, S.W.19; SCOTT THOMSON, M.D.,

M.R.C.P.Ed., D.P.H., Public Health Laboratory Service, Institute of Pathology, Third Floor, Royal Infirmary, Cardiff. The following programme has been arranged:

Wednesday, July 15 (Room 127).—10 a.m., Gastro-enteritis in Babies. To be opened by Professor ROBERT CRUKSHANK (London); followed by Dr. M. T. PARKER (Manchester), Dr. K. B. ROGERS (Birmingham), Dr. JOAN TAYLOR (London), Dr. JOHN SMITH (Aberdeen), and Dr. A. T. RODEN (Salisbury).

Official Reporter: Dr. JOYCE WRIGHT.

PREVENTIVE MEDICINE

President: J. GREENWOOD WILSON, M.D., F.R.C.P., D.P.H. (Cardiff).

Vice-Presidents: A. R. CULLEY, M.D., D.P.H. (Cardiff); Professor I. G. DAVIES, M.D., M.R.C.P., D.P.H. (Leeds); Professor T. FERGUSON, D.Sc., M.D., F.R.C.P.Ed., F.R.F.P.S., D.P.H. (Glasgow).

Hon. Secretaries: R. T. BEVAN, M.B., Ch.B., D.P.H., West Winds, 14, Rhiwbina Hill, Rhiwbina, Cardiff; J. A. STIRLING, D.Sc., M.B., Ch.B., D.P.H., Public Health Department, Town Hall, Chesterfield.

The following programme has been arranged:

Wednesday, July 15 (Room 122).—10 a.m., The Health Visitor and the Family Doctor. To be opened by Dr. LLYWELYN ROBERTS (Sheffield), Dr. STANLEY THOMAS (London), and Dr. D. A. WILLIAMS (Cardiff). 2 p.m., Cancer and the Community. To be opened by Dr. PERCY STOCKS (Rhos-on-Sea) and Mr. RONALD W. RAVEN (London); followed by Dr. E. K. MACDONALD (Leicester).

Official Reporter: Dr. J. F. WARIN.

PSYCHIATRY

President: T. J. HENNELLY, M.D., D.P.M. (Cardiff).

Vice-Presidents: Professor D. R. MACCALMAN, M.D., M.R.C.P.Ed. (Leeds); DORIS M. ODLUM, M.A., M.R.C.S., L.R.C.P., D.P.M. (London); HENRY V. DICKS, M.A., M.D., F.R.C.P. (London).

Hon. Secretaries: KENNETH SODDY, M.D., D.P.M., World Federation for Mental Health, 19, Manchester Street, London, W.1; JOSEPH P. SPILLANE, M.D., D.P.M., Whitchurch Hospital, Cardiff, Glam.

The following programme has been arranged:

Wednesday, July 15 (Room 110).—2 p.m., Interpersonal Relationships and Stresses within the Family. To be opened by Dr. H. V. DICKS (London) and Dr. W. S. MACDONALD (Leeds).

Official Reporter: Dr. KENNETH SODDY.

RADIOLOGY

President: PETER KERLEY, C.V.O., C.B.E., M.D., F.R.C.P., D.M.R.E., F.F.R. (London).

Vice-Presidents: J. A. C. FLEMING, M.B., F.R.C.S.Ed., D.M.R.E., F.F.R. (London); ERNEST HANSON, M.B., B.S., D.M.R. (Cardiff); E. ROHAN WILLIAMS, M.D., F.R.C.P., D.M.R.E., F.F.R. (London).

Hon. Secretaries: MARGARET D. SNELLING, M.B., M.R.C.P., F.R.C.S., D.M.R., Meyerstein Institute of Radiotherapy, The Middlesex Hospital, London, W.1; BRYAN WILLIAMS, M.R.C.P., D.M.R.D., 119, Cathedral Road, Cardiff.

The following programme has been arranged:

Wednesday, July 15 (Room 28).—10 a.m., Radiology of Congenital Heart Disease. To be opened by Dr. ROBERT STEINER (London), Angiocardiography in the Non-cyanotic Congenital Heart Diseases; Dr. THOMAS H. HILLS (London), Angiocardiography in the Cyanotic Congenital Heart Diseases.

Official Reporter: Dr. BRYAN WILLIAMS.

SCIENTIFIC EXHIBITION

Sophia Gardens Pavilion, July 13-17, 1953

The Exhibition will be open each day from 9 a.m. to 6 p.m., and the following list gives brief details of the exhibits.

Stand No.

- 1.—Welsh National School of Medicine, Department of Pathology and Bacteriology. Professor J. Gough and Mr. J. E. Wentworth. A new method of mounting permanent sections of whole organs on paper. This is of particular value in pulmonary conditions, as comparison is possible of the pathological changes with the radiological findings present during life.
- 2.—Medical Research Council Pneumoconiosis Research Unit, Llandough Hospital, Cardiff. Dr. J. C. Gilson. Coal workers' pneumoconiosis.
- 3.—National Coal Board. Outline of the Board's medical research programme.
- 4.—Leeds University Medical School and General Infirmary. Departments of Bacteriology and Dermatology. Dr. C. J. La Touche. The role of domestic and farm animals in the epidemiology of human ringworm.
- 5.—St. David's Hospital, Cardiff, Departments of Obstetrics and Child Health. Professor A. G. Watkins. A breast-milk bank.
- 6.—Cardiff Royal Infirmary, Departments of Surgery and Radiology. Mr. L. P. Thomas, Mr. R. J. Williams, and Dr. Bryan Williams. Abdominal radiography in the differential diagnosis of atypical appendicitis.
- 7.—Section of Preventive Medicine, Cardiff City Health Department. Dr. J. Greenwood Wilson. Care and Aftercare: hospital follow-up through health visitors.
- 8.—Welsh National School of Medicine, Department of Tuberculosis, Professor F. Heat; and the City of Cardiff Public Health Department. Dr. J. Greenwood Wilson. Medical Officer of Health. Tuberculosis: prevention, treatment, aftercare, results.
- 9.—University of Wales Student Health Service. Dr. Graham Grant, Senior Health Officer. Student health.
- 10.—University of Durham, Nuffield Department of Industrial Health, Professor R. C. Browne and Dr. R. I. MacCallum. (1) Acid Decalcification of Human Teeth. (2) Designing the machine to fit the man. (3) Miners' nystagmus.
- 11.—Liverpool School of Tropical Medicine, Department of Tropical Medicine. Professor B. G. Macgregor. Liver circulation—pathogenesis of hepatic centrilobular lesions in malaria and other diseases. Respiration of the malaria parasite. The effect of milk diet on malaria.
- 12.—Royal Army Medical College, Millbank. Methods of prevention, diagnosis, and treatment of the enteric group of fevers in the Army.
- 13.—Medical Department of the Navy—Royal Naval Physiological Laboratory. Under-water blast. Oxygen poisoning. Diving problems.
- 14.—Medical Branch of the Royal Air Force. Aviation medicine and applied physiology. Exposure suits; rations for extreme cold. Casualty air evacuation.
- 15.—National Association for the Prevention of Tuberculosis. Statistics, treatment, and pathology of tuberculosis.
- 16.—Welsh National School of Medicine, Medical Unit, and Department of Radiology, United Cardiff Hospitals. Early radiological diagnosis in haematemesis and melaena.
- 17.—United Cardiff Hospitals, Department of Urology. Mr. D. G. Morris and Mr. R. A. Mogg. Significance of congenital abnormalities in infection of the urinary tract.
- 18.—The Medical Group of the Royal Photographic Society. genital abnormalities in infection of the urinary tract.
- 19.—The Medical Group of the Royal Photographic Society. London. Medical illustration techniques and examples of records obtainable.
- 20.—Guy's Hospital, London, Department of Surgery. Mr. Rex hydrocephalus.
- 21.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 22.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 23.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 24.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 25.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 26.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 27.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 28.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 29.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 30.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 31.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.
- 32.—The Welsh National School of Medicine, Surgical Unit, material, and museum specimens.

- 23.—Royal Cancer Hospital, London. Mr. Lawrence Abel, Dr. J. H. O. Earle, Mr. W. P. Greening, and Mr. Michael Harmer. The early diagnosis of malignant disease.
- 24.—The Ministry of Health and Public Health Laboratory Service. Dr. W. H. Bradley, Dr. W. C. Cockburn, Dr. A. P. Goffe, Dr. F. O. MacCallum, and Dr. D. Thomson. Poliomyelitis in England and Wales.
- 25.—The Empire Rheumatism Council, London. Common types of arthritis and their treatment.
- 26.—United Cardiff Hospitals, Department of Physical Medicine. Dr. Kenneth Lloyd. Rehabilitation of the Hemiplegic.
- 27.—St. Thomas's Hospital, London. Department of Physical Medicine. Dr. P. Bauwens. Electrodiagnosis.
- 28.—United Cardiff Hospitals. Dr. John D. Spillane. Heart models. A series of life-size coloured models illustrating the common congenital and acquired forms of heart disease.
- 29.—The National Maternity Hospital, Dublin. Dr. A. P. Barry. Accidental antepartum haemorrhage.
- 30.—Royal College of Surgeons of England. Professor Kenelm H. Digby. Methods of investigating the function of the sub-epithelial lymphatic glands.
- 31.—Hospital for Sick Children, Great Ormond Street, London. Mr. Denis Browne. Various forms of apparatus for orthopaedic treatment by controlled movement.
- 32.—Rooksdown House, Basingstoke. Plastic and Oral Surgery Unit. Mr. A. J. Evans and Mr. H. C. Killely. (1) Treatment of severe burns. (2) Treatment of fractures of the facial skeleton.

Pharmaceutical Society of Great Britain

Exhibition in Entrance Hall of University College, Cathays Park: "Aspects of Pharmaceutical History in Relation to Medicine." July 15-17.

TIME-TABLE OF MEETINGS

R.—Events available for members of Representative Body and Ladies accompanying them.
L.—Events primarily arranged for Ladies.
U.—Events for all Members and Ladies accompanying them.
*Academic Robes should be worn.

Wednesday, July 8

8.30 to 10.30 p.m.—R. Sherry Party (by invitation of Cardiff Division), University College, Cathays Park.

Thursday, July 9

9.00 a.m.—A.R.M. Inquiry Office opens at Y.M.C.A. (opposite Queen Street Station).
9.00 a.m.—Ladies' Club opens, University College, Cathays Park.
9.30 a.m.—Annual Representative Meeting, Cory Hall (opposite Queen Street Station).
1.30 p.m.—L. "At Home," with Bridge, at Ladies' Club, University College.
7.30 p.m.—R. Representatives' Dinner, New Continental Café, Queen Street. Ticket 20s., including wines, but including Dance.
8.00 p.m.—L. Representatives' Ladies' Dinner, Whitehall Rooms, Park Hotel. Ticket 25s., including wines.
9.30 p.m.—R. Representatives' Dance, New Continental Café, Queen Street. Ticket 5s. 6d., including buffet (for all ladies and for Representatives not attending their Dinner).

Friday, July 10

9.00 a.m.—A.R.M. Inquiry Office open, Marble Hall, City Hall.
9.30 a.m.—Ladies' Club open, University College.
9.30 a.m.—Annual Representative Meeting, Assembly Rooms, City Hall.
9.30 a.m.—L. All-day excursion to the Wye Valley. Coffee at Usk, lunch at Symonds Yat, tea at Tintern. Transport ticket 7s. (for 40).
10.30 a.m.—L. Visit to the Dingle, Cefn On, with coffee by kind invitation of Mrs. A. G. Watkins (for 30). Transport 1s. 9d.
11.00 a.m.—Welcome by Lord Mayor of Cardiff to A.R.M.
1.00 p.m.—Overseas Luncheon, Angel Hotel.
1.00 p.m.—Luncheon by Mr. R. G. M. Street (for 30) (by invitation only).
2.30 p.m.—L. Visit to Caerphilly and Castell Coch. Tea by invitation of Mrs. D. G. Williams. Transport 2s. 6d. (for 30).

- 5.30 p.m.—Sherry Party for Women Representatives and medical women accompanying Representatives, B.M.A. House, 195, Newport Road (by invitation of the South Wales Association of the Medical Women's Federation).
- 7.30 p.m.—Edinburgh Graduates' Dinner, Park Hotel. Ticket 25s., including aperitifs.
- 7.30 p.m.—Aberdeen Graduates' Dinner, Royal Hotel. Ticket 21s., excluding wines.
- 8.30 p.m.—Evening visit to Porthkerry House, by kind invitation of Mrs. M. V. Roberts (for 40). Transport 2s. 6d.
- 8.30 p.m.—R. Dinner-Dance at St. Mellon's County Club for 150. Coaches call at Park, Royal, and Angel Hotels, leaving at 8 p.m. and returning at midnight. Ticket 16s., including transport.
- p.m.—Short evening coach tours to be arranged, if required.

Saturday, July 11

- 9.00 a.m.—Council Meeting, Council Chamber, City Hall.
- 9.00 a.m.—A.R.M. Inquiry Office open, City Hall.
- 9.30 a.m.—Ladies' Club open, University College.
- 10.00 a.m.—Annual Representative Meeting, City Hall.
- 10.30 a.m.—L. Visit to St. Fagan's Castle, with coffee (for 80). Ticket, including transport and coffee, 2s. 6d.
- 2.30 p.m.—L. Visit to Coedardhyglyn, with tea by kind invitation of Mrs. C. G. Traherne (for 35). Transport 1s. 6d.
- 2.30 p.m.—L. Visit to the Manor House, St. Nicholas, with tea by kind invitation of Mrs. John Davies (for 35). Transport 1s. 6d.
- 7.30 p.m.—Welsh Dinner, New Continental Café. Ticket 21s., excluding wines.
- 7.30 p.m.—Glasgow Graduates' Dinner, Royal Hotel. Ticket 25s., including aperitifs.
- 7.30 p.m.—R. Evening visit to Seabank Hotel, Porthcawl. (Dinner-Dance for 30). Ticket, including transport, 20s.

Sunday, July 12

- 10.30 a.m.—R. All-day excursion to St. Donat's Castle, with lunch and tea. Coaches leave University College from 10.30 to 11 a.m., returning 5.15 to 5.45 p.m. Short religious service in Castle grounds at 12.15 p.m. Ticket 30s., inclusive of lunch, wine, tea, and admission to Castle grounds. (Transport 4s. extra.)
- 8.30 p.m.—R. Welsh Choral Concert, New Theatre, Park Place.

Monday, July 13

- 9.00 a.m.—A.R.M. Inquiry Office open, City Hall.
- 9.00 a.m.—Opening of Scientific and Trade Exhibitions by President-Elect, Sophia Gardens Pavilion.
- 9.00 a.m.—Reception Room opens at Sophia Gardens Pavilion for registration.
- 9.30 a.m.—Ladies' Club open, University College.
- 10.00 a.m.—Annual Representative Meeting, City Hall.
- 10.00 a.m.—L. All-day excursion to Brecon. Coffee at Treforest Estate. Lunch at Brecon and tea at Llantrissant. Transport ticket 7s. (for 40).
- 10.30 a.m.—L. Visit to Caerleon. Transport ticket 2s. 6d. (for 40).
- 12.30 p.m.—Annual General Meeting, City Hall, followed by an Extraordinary General Meeting.
- p.m.—Council Meeting, Council Chamber, City Hall (at conclusion of A.R.M.).
- 2.00 p.m.—L. Golf at Radyr Golf Club (by kind invitation of Mrs. D. G. Williams—Ladies' captain).
- 2.00 p.m.—L. Visit to Crickhowell, with tea by kind invitation of Lady Glanusk (for 30). Transport 6s.
- 2.15 p.m.—U. Visit to Guest, Keen, and Nettlefolds Steelworks (for 30-40). Transport ticket 2s.
- 2.15 p.m.—U. Visit to Guest, Keen, and Baldwins Steelworks (for 30-40). Transport ticket 2s.
- 5.00 p.m.—Three-dimensional Colour Film "Mediastinal Tumours," at the Reardon Smith Theatre, Park Place.
- 8.15 p.m.—U*. Adjourned Annual General Meeting and President's Address, Park Hall Cinema.
- 9.30 p.m.—U*. President's Reception, National Museum of Wales, Cathays Park (for 1,250).

Tuesday, July 14

- 8.30 a.m.—Members will robe in the Mansion House for Roman Catholic Service.
- 9.00 a.m.—U*. Roman Catholic Service in St. Peter's Church, followed by Reception at Mansion House.

- 9.00 a.m.—Reception Room and Trade Exhibition open, Sophia Gardens Pavilion.
- 9.00 a.m.—Scientific Exhibition open, Sophia Gardens Pavilion.
- 9.30 a.m.—Ladies' Club open, University College.
- 10.00 a.m. to 12.30 p.m.—Scientific Plenary Session ("Coronary Disease") at the Reardon Smith Theatre, Park Place.
- 10.30 a.m.—L. Visit to Coedardhyglyn, with coffee by kind invitation of Mrs. C. G. Traherne (for 35). Transport 1s. 6d.
- 10.30 a.m.—L. Mannequin Parade, St. Mellon's County Club (for 200). Coffee by invitation of Mrs. J. Lewis Walters. Transport 2s. 6d.
- 12.45 p.m.—Luncheon, Park Hotel. Sir Robert Webber (by invitation only) (for 120).
- 2.30 p.m.—Robing for Religious Service, City Hall.
- 2.45 p.m.—Procession leaves City Hall for St. John's Church.
- 3.15 p.m.—U*. Official Religious Service, St. John's Church.
- 5.00 p.m.—Three-dimensional Colour Film "Mediastinal Tumours," at the Reardon Smith Theatre, Park Place.
- 5.30 to 7.00 p.m.—Reception for Overseas Delegates, by invitation of Overseas League, 37, Park Place, Cardiff.
- 5.30 to 7.00 p.m.—Monmouthshire Division Sherry Party, St. Mellon's County Club (by invitation only).
- 6.00 p.m.—Cocktail Party, Sir Herbert Merrett, Cwrt-yr-ala, Dinas Powis (for 35).
- 8.30 p.m.—U*. Joint Reception by University College of South Wales and Monmouthshire and Welsh National School of Medicine, University College, Cathays Park (for 1,000).

Wednesday, July 15

- 8.30 a.m.—U. Annual Breakfast of the Christian Medical Fellowship, New Continental Café.
- 9.00 a.m.—Reception Room and Trade Exhibition open, Sophia Gardens Pavilion.
- 9.00 a.m.—Scientific Exhibition open, Sophia Gardens Pavilion.
- 9.30 a.m.—Ladies' Club open, University College.
- 10.00 a.m.—Scientific Sections, University College.
- 10.00 a.m.—L. Notts Ladies Challenge Cup Golf Competition, Barry Golf Club (The Leys).
- 10.00 a.m.—U. Leinster and Childe Cup Golf Competition, Southerndown Golf Club.
- 10.30 a.m.—L. Visit to Nash Manor, with coffee by invitation of Mrs. Charles Llewellyn (for 30). Transport 3s.
- 10.30 a.m.—L. Visit to Duffryn Gardens, St. Nicholas, with coffee (for 60). Inclusive ticket 2s. 6d.
- 10.30 a.m.—Mannequin Parade, St. Mellon's County Club, for 200. Transport 2s. 6d.
- 1.00 p.m.—Irish Graduates' Luncheon, Royal Hotel. Ticket 10s., excluding wines.
- 2.00 p.m.—Scientific Sections, University College.
- 2.00 p.m.—U. Visit to the Abbey Steelworks, Margam (limited to 90). Transport ticket 5s. 6d. (Admission by coach only.)
- 2.15 p.m.—Visit to N.C.B. Nantgarw Colliery (for 20 men). Transport ticket 2s. 6d.
- 2.15 p.m.—U. Visit to N.C.B. Coke Ovens, Nantgarw (for 30). Transport ticket 2s. 6d.
- 2.30 p.m.—Overseas Conference, Council Chamber, City Hall. (for 40). Inclusive ticket 6s.
- 2.30 p.m.—L. Visit to Southerndown, with tea at Quaintways.
- 5.00 p.m.—"At Home" for Overseas Delegates given by the Empire Medical Advisory Bureau, Cardiff Castle.
- 5.00 p.m.—Three-dimensional Colour Film "Mediastinal Tumours," Reardon Smith Theatre.
- 8.30 p.m.—U*. Civic Reception and Dance, City Hall (for 1,000).

Thursday, July 16

- 9.00 a.m.—Reception Room and Trade Exhibition open, Sophia Gardens Pavilion.
- 9.00 a.m.—Scientific Exhibition open, Sophia Gardens Pavilion.
- 9.30 a.m.—Ladies' Club open, University College.
- 10.00 a.m. to 12.30 p.m.—Scientific Plenary Session ("Fibrositis") at the Reardon Smith Theatre.
- 10.00 a.m.—Treasurers' Cup Golf Competition, Royal Porthcawl Golf Club (transport leaves University College 9 a.m.).
- 10.30 a.m.—L. Conducted Tours—Cardiff Castle and Museum.
- 10.30 a.m.—L. Visit to Peterston, by kind invitation of Elizabeth Lady Reardon Smith. Coffee (for 30). Transport 2s. 6d.

- 10.30 a.m.—L. Conducted Tour of Llandaff Cathedral, with coffee, by invitation of Mrs. F. Campbell (for 30). Transport 1s. 9d.
- 12.00 noon to 2.00 p.m.—Visit to Brains Brewery, including lunch (for 30). Men only. (By invitation only.)
- 2.15 p.m.—U. Garden Party at Margam (by kind invitation of Mr. and Mrs. Evans Bevan) (for 750). Transport 4s. 6d.
- 6.30 p.m.—U. Coach Tour to Tintern, with dinner at Beaufort Arms (for 30). Ticket 15s., including dinner and transport.
- 7.30 p.m.—Annual Dinner, Assembly Room, City Hall (for 500). Ticket £2 5s., including wines.
- 8.30 p.m.—U. Dance at St. Mellon's County Club (for 150). Coaches leave University College, Cathays Park, at 8 p.m., calling at Park, Royal, and Angel Hotels, and returning at 12 midnight. Ticket, including dinner, dance, and transport, 16s.

Friday, July 17

- 9.00 a.m.—Reception Room and Trade Exhibition open, Sophia Gardens Pavilion.
- 9.00 a.m.—Scientific Exhibition open, Sophia Gardens Pavilion.
- 9.30 a.m.—Ladies' Club open, University College.
- 10.00 a.m.—Scientific Sections, University College.
- 10.30 a.m.—L. Visit to St. Fagan's Castle. Transport 1s. 6d. (for 30).
- 10.30 a.m.—L. Visit to Barry, with coffee at Llantwit Major (for 40). Inclusive ticket 4s.
- 2.15 to 4 p.m.—Scientific Plenary Session ("Overweight") at the Reardon Smith Theatre.
- 3.15 p.m.—Congregation of University to award Honorary Degrees, City Hall.
- 4.00 p.m.—U. Garden Party at Duffryn House (by kind invitation of the Board of Governors of the United Cardiff Hospitals) (for 500). Transport 2s. Leaving at 6 p.m.
- 5.00 p.m.—Three-dimensional Colour Film "Mediastinal Tumours," at Reardon Smith Lecture Theatre.
- 8.15 p.m.—U. Popular Lecture by Sir Russell Brain, P.R.C.P., at Reardon Smith Theatre. "Dr. Johnson as Scientist and Patient."
- 9.00 p.m. to 2 a.m.—U. B.M.A. Summer Ball, in aid of the Ladies' Guild of the Royal Medical Benevolent Fund, Cardiff Castle. Ticket 20s., including buffet.

The B.M.A. in Committee

PUBLIC HEALTH

Many have supposed that the British Medical Association is devoted almost entirely to the interests of the private practitioner. A study of the history of the Association from the very beginning, even before any medical officer of health was appointed in this country, would dispose of that notion. It would show what an astonishing amount of constructive work the Association has done in the field of public health. Many of the developments which have been embodied in legislation during the last hundred years have been no time initiative. This is not to say that there has been no time lag between the original proposals put forward by the Association and the acceptance of them by the Government and the legislature. In all its work, in fact, the Association has been in advance of public opinion, and its proposals have received the sanction of legislation usually only after the lapse of years. But it can be said that all the general public health measures which have been put forward since the charter of public health administration, the Public Health Act of 1875, owe something, and often a great deal, to the constructive criticism of the Association, based as it has been upon a considered public health policy.

Thus the Association quite early—in the middle of the last century—was occupied with the problem of the notification of infectious diseases. It joined with the Poor Law Reform Medical Officers Association in promoting the reform of the Poor Law—a co-operation which existed for about half a century. From the early 'seventies onwards it

interested itself in the qualifications and conditions of service of public health medical officers. The gradual improvement in the powers and status of such officers and in their consequent usefulness to the public was a matter of careful consideration from the very first, and it was through the Association that minimum scales of salaries came to be established and generally accepted. The movement for the registration of midwives was largely promoted by the Association. A great contribution was made towards the present organization for the care of maternity, infancy, and childhood. It was the Association, for example, which secured effective action leading to the elimination of ophthalmia neonatorum. It devoted itself to the problem of the supply of qualified midwives and the elimination of the shadows of domiciliary midwifery. In the early part of this century the Act which prohibited unqualified practice owed most of its amendments—which were its principal good points—to the intervention of the Association, and the Association exerted a similar influence on the subsequent Acts which eventually resulted in the existing system of maternity and infant welfare clinics.

Even more remarkable was the work of the Association in the development of the school medical service. Forty years ago it presented to the Government of the day a complete scheme for school clinics in the metropolitan area. It ensured that the officers employed in this service were suitably qualified for their work and had adequate status and remuneration, and with every expansion of the service it kept closely in touch. The Association insisted from the very beginning that the local education authority should not establish a general domiciliary scheme of treatment by medical practitioners for children or young persons, but should consider how far it could avail itself of the services of private medical practitioners.

Many of the achievements of the Association in the public health field have been brought about as a result of the reports of special committees set up by the Council for a specific purpose, or have emerged as a result of representations from the Section of Public Health and State Medicine at Annual Meetings. Public health matters for many years were the sphere of the Parliamentary Bills Committee of the Association, and afterwards of the old Medico-Political Committee, which took all proposed legislation as its province.

The Public Health Committee, which is now a standing committee, has a more continuous and specific reference. Its duty is to consider and report upon questions relating to the Public Health Service. It deals with the problems, however local and individual, of those engaged in that service, and does its best to ensure that their remuneration and conditions are in line with those of practitioners engaged in other branches of the National Health Service. With the Society of Medical Officers of Health it has for many years worked in closest co-operation. The object of that society is to promote the advancement of preventive medicine and efficient health administration. By a long-standing agreement medico-political activities in this field are undertaken by the Association, and the agreement has worked extremely well.

The Committee consists, in addition to the Association's principal officers, of the two members of Council who are elected by the Public Health Service members of the Association, five others elected by the Council itself, five elected by the Representative Body, two nominated by the Society of Medical Officers of Health, one appointed by the Private Practice Committee, and another by the Central Consultants and Specialists Committee. In addition, the Committee itself has power to co-opt three members "to secure representation of a particular class of experience not otherwise represented on the Committee." The Committee sends representatives to the Central Consultants and Specialists Committee, the Private Practice, and the Occupational Health Committees, and to complete the liaison with the General Medical Services Committee is nominated by the Public Health Committee and the Society to represent the Public

Health Service interests. A further link is the nomination by the Council of the Association of two members who sit on the Council of the Society of Medical Officers of Health.

The result is a committee which, although relatively small as compared with the two others representing those working in the National Health Service (for it comprises not more than 23 members, including those who are members *ex officio*), nevertheless covers the field very thoroughly. It is able to bring to bear upon the many matters submitted to it the experience of men engaged all the time in the public health services in their various functions and grades, and also that of those who touch the services at various points from outside. It includes the whole-time and the part-time officer, the officer whose work is mainly clinical and he whose work is mainly administrative, and the general practitioner whose association with the public health services is sessional or occasional. All types of experience are pooled in an excellent working arrangement.

Like other committees of the Association, it has been very fortunate in securing a succession of able chairmen, who have brought to their task the experience and judgment which they are daily accustomed to exercise in their own important authorities. In the most recent years the Committee has had the great advantage of the leadership of H. K. Cowan, the present Chairman, and C. Metcalfe Brown, of Manchester, and preceding them, James Fenton, of Kensington, and R. M. F. Picken, of Cardiff. The recollections of some of us go back to earlier chairmen, such as that able Welshman E. Lewys-Lloyd. Many distinguished public health officers have given their services to the Committee—E. H. T. Nash, of Heston and Isleworth; G. Clark Trotter, of Islington; George Buchan, of Willesden; E. H. Snell, of Coventry; W. G. Willoughby, of Eastbourne, the last-named the only public health medical officer to be President of the Association, to name only a few. Many others not themselves associated with public health work have contributed their point of view.

It is not the purpose of these articles to record the achievements of committees, but only their set-up and functions. The achievements can be read in successive annual reports of Council. But mention may be made of the part which the Committee and particularly its two Chairmen, Dr. K. Cowan and Dr. Metcalfe Brown, have taken in recent years in the leadership of the Staff Side of Committee "C" of the Medical Whitley Council, the reference to arbitration of the disputes concerning remuneration and conditions of service of medical practitioners employed by local authorities, and the proceedings in 1950 and 1951 before the Industrial Court. The awards were accepted by Committee "C," and local authorities were recommended to put them into operation. Then came the long and patient task of ensuring that the local authorities implemented the awards, and now this has been done, leaving only a very small residuum of cases. The awards were disappointing in some respects, but they have meant that many medical officers of health have received a long overdue increase of salary. In recent weeks a further dispute regarding the remuneration of Assistant Medical Officers has been before the Industrial Court, and its ruling was published in our last issue.

The prompt action of the Committee and particularly the part played by its present Chairman, as Chairman of the Joint Emergency Committee of the Professions, in what has come to be known as the Durham "closed shop" is within everyone's recollection. The question of dual appointments—both under local authorities and hospital authorities—is another matter which has lately received much consideration. The securing of harmonious relations between the school medical service and general practitioners has exercised the Committee, which has called conferences with that objective in view. Various questions in connexion with the notification of infectious diseases and with propaganda for vaccination and immunization have come for-

ward. The position with regard to equality of status and salary for medical men and women in the Public Health Service is now fully accepted, but it should be remembered that it is a result of the direct action of this Committee of the Association that this battle, which lasted for many years, can now be considered won for all time. The Committee has plenty of work to do even though the National Health Service has shorn local authorities of certain of their health functions. It should be remembered, however, that the same Act has added other duties, particularly in the fields of welfare, care, and aftercare.

Scottish News

CENTRAL CONSULTANTS COMMITTEE

The Central Consultants and Specialists Committee (Scotland) met on May 11 at B.M.A. House, Edinburgh, under the chairmanship of Dr. J. G. M. HAMILTON.

In connexion with the Finance Subcommittee's report it was intimated that about 70% of the consultants and specialists in Scotland were now contributing to the Central Committee's fund. Owing to this satisfactory response it had been possible to extend the use of the fund considerably from its original purpose, which had been to defray the travelling expenses of members attending meetings of Regional Consultants and Specialists Committees. Modest subsistence allowances were added where appropriate, and the fund now covers the following: Regional Committee travelling and subsistence; Regional Committee office costs (stationery, postage, etc.); travelling and subsistence expenses of members attending meetings of the Central Committee and its subcommittees; and a substantial proportion of the central office costs, including stationery, postage, and printing of the annual report.

The present annual income was between £800 and £900, and the fund had a balance of over £1,500. The Committee unanimously approved a recommendation of the Finance Subcommittee that the fund should be maintained on its present basis and be the medium for contribution to any United Kingdom fund which might be instituted. It was also agreed that those not now contributing should be invited to do so, including whole-time members of university staffs who, holding honorary appointments with regional boards, could not make use of the method of mandatory deduction from regional hospital board remuneration.

Review of S.H.M.O.s

The Committee gave further consideration to the arrangements for the review of S.H.M.O.s in Scotland contained in the Department of Health's memorandum R.H.B. (53) 10. The CHAIRMAN undertook that at the next meeting of the Joint Committee he would put forward the proposal that one of the three members of the Review Committee, who are to be appointed by the Secretary of State, should be the holder of a whole-time appointment.

A proposal that the Scottish Joint Committee should be asked to reopen the question of the date from which remuneration would apply was rejected on a vote by a substantial majority.

The Committee unanimously approved a recommendation of the Radiological Services Subcommittee for amendment of the Subcommittee's constitution, designed to secure more or less equal representation of radiodiagnosis and radiotherapy.

A proposal from the N.E. Regional Committee was also accepted which will allow of the three northern regions, which have only two representatives on the Central Committee, to appoint deputies for these representatives.

Specimen samples of the domiciliary visit claim forms in use in the five regions were considered by the Committee. These showed considerable variation in the amount of information required. Some required signature by the

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family doctor, others did not. After discussion it was decided not to press for a uniform national form.

The Committee accepted a recommendation from the Chairman's Subcommittee that a Subcommittee representing the Diseases of the Chest and Tuberculosis physicians in Scotland be set up. It was remitted to the Chairman's Subcommittee, in consultation with the physicians concerned, to make the necessary arrangements.

METROPOLITAN COUNTIES BRANCH 95th ANNUAL GENERAL MEETING

The Metropolitan Counties Branch, which has just passed its centenary, held its 95th annual general meeting at B.M.A. House, London, on June 9. In the absence of the retiring President, Dr. R. Forbes, who was attending the meeting of the Canadian Medical Association, the chair was taken by Mr. LAWRENCE ABEL.

The report of the Branch Council, which was adopted, showed the membership of the Branch to be 7,162. The financial position was said to be extremely satisfactory, and the Divisions to be holding regular meetings. A series of addresses to senior medical students had been organized during the year. A centenary ball on January 8 resulted in £300 for medical charities.

For the session 1953-4 the following officers were elected: president-elect, Dr. D. F. Hutchinson; vice-presidents, Drs. H. Alexander, J. W. McCarthy, H. Vickers, and C. Leonard Williams; hon. treasurer, Dr. Angus Weston; hon. secretaries, Drs. H. Barbara Woodhouse and Annis Gillie.

Mr. Abel then inducted Dr. J. ARTHUR MOODY as President of the Branch for the session 1953-4, and Dr. Moody delivered an address on "Founders of the Branch and their Problems." We hope to publish it in a future issue. Finally, a vote of thanks was accorded to Dr. Moody on the proposition of Dr. H. H. D. SUTHERLAND, seconded by Dr. J. W. MCCARTHY.

G.M.S. COMMITTEE

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

Elections will be held in July to appoint representatives of assistants and unestablished principals to the Assistants and Young Practitioners Subcommittee of the General Medical Services Committee for the session 1953-4. The newly appointed Subcommittee will come into office on September 1, 1953.

For the purposes of election, England and Wales is divided into five regions: (1) South-west and Wales, (2) South-east, (3) North-west and Midlands, (4) North-east, and (5) London and Home Counties. The General Medical Services Subcommittee (Scotland) appoints two representatives for that country as a whole.

Each region is based upon a regional office of the Association and elects two direct representatives to the Subcommittee—one assistant and one unestablished principal. The G.M.S. Subcommittee appoints six of its members to serve on the Subcommittee. One assistant and one unestablished principal from the Subcommittee are co-opted to the G.M.S. Committee.

The electorate and membership of the Subcommittee, apart from the representatives of the G.M.S. Committee, are restricted to the following classes of practitioner:

- Assistants in general practice.
- Practitioners engaged predominantly in general practice as principals (including those in partnership) whose total gross professional income does not exceed £1,500 per annum.

Assistants

The electoral roll for assistants is compiled from the Association's records, and each eligible assistant should by now have received a letter from the secretary of the Committee advising him that unless he signifies to the contrary

his name will automatically be included in the new roll. Any assistant who has not received such a letter but believes himself to be eligible for inclusion in the roll should communicate with the Secretary, B.M.A. House, Tavistock Square, London, W.C.1, not later than Monday, June 29.

Unestablished Principals

The income limit for inclusion in the roll of unestablished principals has been increased from £1,250 per annum to £1,500 per annum in the light of changed circumstances since the roll was first compiled. This will necessarily admit a number of principals previously excluded, and application for inclusion should be made not later than Monday, June 29, on the form set out below by any practitioner who considers himself to be eligible but who is not already included in the roll.

Nominations

Electoral rolls will, as indicated above, be closed on June 29. On July 3 a copy of the revised roll for his area will be sent to each eligible assistant or unestablished principal, asking for the submission of nominations not later than July 20. If there is a contest in any particular area voting papers will then be issued.

For the use of unestablished principals only

General Medical Services Committee Assistants and Young Practitioners Subcommittee UNESTABLISHED PRINCIPALS

I
(Block letters, please)

of
hereby apply for inclusion in the electoral roll of unestablished principals.

I declare that I am engaged predominantly in general practice as a principal with a total gross professional income not exceeding £1,500 per annum,

and I undertake to inform the Secretary of the Committee, at B.M.A. House, of any change in my status which affects my eligibility for membership of the electorate.

Signed

Date

To be returned not later than first post on June 29, 1953.

Correspondence

The Extraordinary General Meeting

SIR,—As I was the speaker at the Extraordinary General Meeting who gave the main pleading on behalf of the small-list practitioner, and as Dr. R. W. Cockshut (*Supplement*, June 13, p. 279) does me the dubious honour of mentioning me by name, I would deal with the three points which Dr. Cockshut wrongly imagines were the major points.

(1) I nowhere contended that "no one should be worse off after the Working Party's plan than before it." It is obvious that if a practitioner's list falls under a capitation method of payment his income also falls. What I did say was that "100 persons on anyone's list will require the same average yearly attendance," and asked that, "with consideration to the number on his list and the legitimate expense he incurs in giving them yearly attendance, he (the small-list practitioner) receive an increase of remuneration in some way proportionate to that accorded his better-placed colleagues." Will Dr. Cockshut deny the justice of this?

(2) I did not say no one must be forced by "economic necessity" to move from his present address. I said that the discriminatory withholding of increased remuneration applied to some practitioners has been applied in order to force them to

Association Notices

ASSAM BRANCH

Notice is hereby given by the Council of the dissolution of the Assam Valley and Surma Valley Divisions of the Assam Branch, and the reconstitution of the Branch into one without Divisions.

A. MACRAE,
Secretary.

Diary of Central Meetings

JUNE

- 24 Wed. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
24 Wed. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
30 Tues. Joint Committee of Psychological Medicine Group and R.M.P.A., 2 p.m.

JULY

- 1 Wed. Local Arrangements Committee, First World Conference on Medical Education, 11 a.m.
2 Thurs. Radiologists Group Committee, 2 p.m.
3 Fri. Ophthalmic Qualifications Committee, 1.45 p.m.
6 Mon. Ophthalmic Group Committee, 2 p.m.
9 Thurs. Registrars Group Executive Committee, 2 p.m.
10 Fri. Annual Representative Meeting (at Cardiff), 10 a.m.
11 Sat. Annual Representative Meeting (at Cardiff), 9.30 a.m.
11 Sat. Council (at Cardiff), 9 a.m.
13 Mon. Annual Representative Meeting (at Cardiff), 10 a.m.
13 Mon. Annual General Meeting (at Cardiff), 12.30 p.m.
13 Mon. Extraordinary General Meeting (at Cardiff), at conclusion of A.G.M.
13 Mon. Council (at Cardiff) at conclusion of A.R.M.
13 Mon. Adjourned Annual General Meeting and President's Address (at Cardiff), 8.30 p.m.
22 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.

OCTOBER

- 2 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.

Branch and Division Meetings to be Held

- CAMBRIDGE AND HUNTINGDON BRANCH.—At Dujon Restaurant, Market Place, Peterborough, Thursday, June 25, 12.15 p.m., annual general meeting; 1 p.m., lunch; address by Dr. W. Marshall: "A Medical Paradox."
DORSET AND WEST HANTS BRANCH.—At Linden Hall, Boscombe, Tuesday, June 23, 3 p.m., annual general meeting. Presidential address by Dr. W. B. McQueen: "Medicine East of Suez."
HEREFORD DIVISION.—At General Hospital, Hereford, Friday, June 26, 3.45 p.m., annual meeting.
KENT BRANCH.—At Bearsted, Thursday, June 25, 12 noon, annual general meeting.
LEICESTERSHIRE AND RUTLAND BRANCH.—At Nurses Home, Leicester Royal Infirmary, Wednesday, June 24, 8.45 p.m., meeting and its Hospitals.
NORTH WALES BRANCH.—At Grand Hotel, Penmaenmawr, Thursday, June 25, 3 p.m., annual meeting. Address by Dr. J. Glyn Jones: "The Chemotherapy of Pulmonary Tuberculosis."
OXFORD DIVISION.—At Horton General Hospital, Banbury, Wednesday, June 24, 8.15 p.m., clinical meeting.
SOUTH WALES AND MONMOUTHSHIRE BRANCH.—At The Priory, Caerleon, Mon., Thursday, June 25, 3.30 to 5.30 p.m., Garden Party.
WEST HERTS DIVISION.—At Peace Memorial Hospital, Watford, Wednesday, June 24, 9 p.m., annual general meeting.

Meetings of Branches and Divisions

SOUTH-EASTERN COUNTIES DIVISION
The annual meeting was held at the Buccleuch Arms Hotel, St. Boswells, on April 19. With Dr. Davidson in the chair, there were 22 members present. The following officers were elected for the ensuing year:

Chairman.—Dr. H. J. C. C. Smith.
Vice-chairman.—Dr. E. Clark.
Secretary and Treasurer.—Dr. E. H. Duff.

abandon their present practices and move to other areas. It is one thing for a man to move voluntarily to another area, if there be prospect of bettering his position. But the distribution scheme nowhere makes this possible. But by departing from the principle of "equal pay for equal work," and by giving to some practices an increase of remuneration of £35 per annum per hundred patients and a paltry increase of only £2 to other practices, it has continued the small-list man on an uneconomic rate of payment with the deliberate intention of forcing him to move. That is *direction by economic discrimination*. Does Dr. Cockshut agree with this monstrous plot?

(3) I nowhere advocated "special treatment for the small-list man." My whole speech was a protest that he had been singled out for "special treatment" of a most unjust and inequitable nature. If 1,500 patients are to draw a "bonus" of £500 per year to their practitioner, why not at least £250 "bonus" for the practitioner with a 750 list? If not, will Dr. Cockshut tell us why? And, if remuneration of a bare 17s. per caput is an uneconomic rate of payment for a 3,000 list without the £500 "load" accorded it, is not a bare 17s. capitation rate (with no "load") the more uneconomic and insufficient for a 500 list? If not, again will Dr. Cockshut resolve the economic conundrum?

These, however, are not, as Dr. Cockshut imagines, the "major points" in the argument for the small-list man. The basic point is that he has shamefully been denied his due share in the £10m. increase placed in the central pool by the Danckwerts award. He has been given little or no increase of remuneration under the award, despite the fact that the present Health Minister asserted in the House of Commons "that the doctors had an unanswerable case for increased remuneration" and despite the declaration of the G.M.S. Committee that "the Danckwerts award made it clear that general practitioners had been substantially underpaid since the Health Service began." Moreover, the some 3,000 small-list men each attract to the central pool the sum of £2,500 by their very presence in the Service. Yet they have been denied any increase of remuneration in proportion to numbers on their lists proportionate to the increase given their "more-favourably placed colleagues," in direct contravention of the terms of reference given the Working Party. Denied their rightful increase of remuneration and after a "means test," they are offered "charity" scheme, yet Dr. Cockshut has the temerity to defend it.

I will not follow Dr. Cockshut in the paths of bemused philosophical platitudes. His assumption that I think either a minority or majority should override the canons of right and equity and right morals is as false as are his "three points" dealt with above. It is, I believe, the tactic of dictators of right and left to accuse their victims of evils they are themselves in the course of perpetrating and defending. I trust Dr. Cockshut is not following this technique in defending the distribution scheme.—I am, etc.,

Shrewsbury.

W. J. GRANT.

Absence from Work

SIR,—I have found from personal experience one reason why patients rarely "sign on" for work at the end of a short illness; this seems to be a likely contributory cause for an increase in absence from work. A person taken ill on Tuesday who resumes work on the Wednesday a week later draws a full week's sickness benefit, but has to contribute for stamps on his insurance card for both weeks—that is, he receives no credit for a full week off work—due to the complicated working of the Insurance Acts. Surely it is logical and right that seven days off work should excuse one stamp, whether the illness starts on a Monday or not.

So long as this sort of thing persists our patients will continue to see the week out "on the club."—I am, etc.,

Brixham, Devon.

KENNETH INMAN.

Registrars' Meeting.—A general meeting of the North-east Region Registrars Group will be held in the New Lecture Theatre, Royal Victoria Infirmary, Newcastle-upon-Tyne, on Wednesday, June 24, at 6 p.m.

SUPPLEMENT TO THE
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ANNUAL CONFERENCE OF LOCAL
MEDICAL COMMITTEES

A YEAR OF VARIED ACTIVITY

The Annual Conference of Representatives of Local Medical Committees was held in the Great Hall of B.M.A. House, London, on Wednesday, June 17. Dr. W. M. KNOX (Glasgow) was in the Chair, supported by Dr. A. Talbot Rogers, chairman of the General Medical Services Committee. Nearly all the 100 motions and amendments on the agenda related to the report of the Committee, published in the *Supplement* of May 2. As already reported in last week's *Supplement* (p. 281), the Minister of Health (Rt. Hon. Iain Macleod, M.P.) attended by invitation and delivered an address, further details of which are given on another page of this issue.

Chairman's Progress Report

Dr. TALBOT ROGERS, in moving the reception of the Annual Report, said that some of them might be surprised at its length and the variety of subjects it covered. Many had anticipated a lull after the successful termination of the adjudication, but, on the contrary, this had been one of their busiest years. He proceeded to review the more important matters which had been taken up in discussions with the Ministry on the application of the principles established by the Danckwerts award. These covered questions of payment of arrears, assessment of tax on arrears, size of pool, etc. The tasks of the Working Party had involved complicated discussions. They had taken the opportunity of dealing with two problems which were giving rise to some difficulties in certain areas—one the question of the premises of a deceased doctor and the rights of his successor, and the other the succession by a partner to a small-list practice. Then there was the question of the small-list doctor. There was no need for him to enlarge upon the steps they had taken to facilitate the rider passed at last year's Conference. Although the profession seemed to be satisfied with the action taken by the Committee and were willing to await the result of the Working Party inquiry, there were some who were still dissatisfied. What he had said at the Special Conference was that they would, through inquiry of the Ministry, the executive councils, and the local medical committees, find the number of doctors concerned and their categories, and in the case of doctors whom they found suffering from injustice they would set themselves to discover means of meeting their

grievance. It was known that some small-list practitioners had enjoyed a much higher capitation rate than normally—a capitation rate which they could not justly allow to continue. What they had to do was to find whether there were single-handed practitioners actively engaged whose lists through no fault of their own remained too small to meet the benefits of the loading enjoyed by their colleagues with larger lists. It was for this group that the Working Party was looking. They would have to eliminate those consideration doctors in partnership, doctors with lists of over 1,200, those in practices recently established (who should be helped in other ways), and practitioners who held other remunerative and time-consuming appointments. When these were eliminated they would be able to consider those that remained and to devise ways of helping them to remedy any injustices from which they suffered. At the proper time the Working Party's suggestions would be submitted for approval.

Among other matters which figured in the Report was the question of medical service committee and tribunal procedure. This had been reported on by a subcommittee ably led by Dr. H. Guy Dain. A committee also had been set up by the Council to review general practice, and the Report of that committee had now been edited and would be published in the early autumn. Another committee on general practice (the Cohen Committee) had been set up by the Central Health Services Council, and his Committee had prepared a memorandum for that body. The memorandum covered a considerable field, including, he believed, all the controversial points about general practice on which the Cohen Committee wanted to have advice, and the memorandum had been supported by oral evidence.

On the question of restoration of goodwill, his Committee had given consideration to the matter, but had eventually decided that the scheme put forward was not practicable; nevertheless it had sent the scheme with its comments to local medical committees for their examination.

There had been considerable co-operation between the G.M.S. Committee and the other committees of the Association and outside bodies, such as the Medical Practices Commission and the British Dental Association. In all their negotiations this year they had found the Ministries most co-operative. They had never known a time when Government departments had listened more attentively to the arguments put forward. That there was a better atmosphere was shown by the fact that the Committee had been able to invite the Minister of Health to address the Conference that day; there had been times when they would not have thought

of doing so. The Minister himself had shown considerable understanding of the position of the general practitioner.

With reference to the question of hospitals, Dr. Talbot Rogers mentioned that in the 14 regional boards in England and Wales there was now only one which had not got a general practitioner as a member of the board. They had had conversations with representatives of the new College of General Practitioners, and the conversations showed a full understanding of the position, and there was no wish on the part of the College to take away from that Conference or the Committee the full rights of negotiation on behalf of general practitioners.

He looked forward to a still busier year. There would have to be further agreements about the Mileage Fund and its method of distribution. They had been asked to discuss with the Ministry the one remaining topic in the Working Party Report not yet tackled—namely, the use of the money set aside for the encouragement of group practice. Long-term policy concerned the proper number of practitioners in the community and the number of medical students being trained. He also referred to the Guillebaud Committee set up by the Government to inquire into the cost of the health services. The last thing they wanted to do as an association was to have any sectional presentation of findings to a committee like that.

In conclusion Dr. Talbot Rogers said that in recent months voices had been raised in some quarters criticizing the powers and actions of the G.M.S. Committee. He knew that the Committee enjoyed the confidence of the Conference, but they had to take notice of those critical voices. If they did not do so it might interfere eventually with their strength in negotiation. He thought he had said enough to show the need for a well-chosen, well-informed, and hard-working Committee with power to act when new problems demanded attention. It would work to the best of its ability to carry out the policies laid down by the Conference and the Association. (Applause.)

Remuneration

Dr. J. C. ARTHUR (Gateshead) moved to draw the attention of local medical committees to the fact that most allocation schemes as at present adopted did not truly represent the Working Party's report in that they did not permit of an unremunerative excess beyond the normal remunerative maxima. This motion was an attempt to clear up an ambiguity as between the Working Party position and the position as stated in the allocation scheme. This ambiguity had existed for some considerable time. Gateshead preferred the Working Party position. They suggested that the practitioner should be allowed to take these patients on his list, but not in any circumstances to be paid for more patients than his accepted maximum.

Dr. TALBOT ROGERS said that the Working Party had tried to make it easier for young practitioners to come into areas where they were most needed and where the lists were biggest. It was for that reason that it had established the initial practice allowance. If they were going to send young men into areas like that it was going to make it very difficult for them to build up a practice in the way they would expect if practitioners who were in excess of the maximum were told that there was no need for any alteration. He hoped the Conference would not accept the resolution of Gateshead.

The Gateshead resolution was lost.

Economy in Prescribing

Dr. F. E. GOULD (Birmingham) moved:

That this Conference is anxious to co-operate in reducing the cost of pharmaceutical services consistent with the right of the doctor to prescribe whatever is necessary for the proper treatment of the patient, and urges that: (1) economical prescribing be taught to students at all appropriate stages in the curriculum; (2) all house officers shall be similarly instructed; (3) investigation of excessive and extravagant prescribing be accelerated so that at the earliest moment individual doctors may be notified and the usual steps taken; and (4) all consultants be kept fully informed on this subject and the actions to be taken.

The trouble came from young practitioners who had not yet learned what prescribing meant in the N.H.S. The tendency in teaching was to teach students about the more complicated drugs, and in their medical schools they often heard little or nothing of the simple drugs on which older practitioners had been brought up and which were frequently the basis of proper prescribing.

Dr. J. A. BROWN and Dr. A. BEAUCHAMP (Birmingham) supported the motion, the latter remarking that it would go a long way towards teaching consultants the art of prescribing.

Dr. TALBOT ROGERS said that his Committee would be very pleased if this motion were passed. It represented the type of argument they would like to use when they went to the Ministry.

The motion was agreed to.

Dr. A. M. MAIDEN (Lindsey) asked the Conference to agree, in view of the high cost of prescribing, that the Minister should make use of his powers to impose financial penalties on doctors who persistently prescribe at a cost grossly above the area average. He said that they were all concerned with the rising costs of the Service, and a resolution like this would show the Ministry that a responsible body of general practitioners was not disinterested in this matter.

Dr. F. GRAY (G.M.S. Committee) said that the Conference had shown most emphatically that it realized its responsibilities in the matter of economy in prescribing. None of them wanted excessive prescribing. But this Lindsey motion was not the way to do it. The motion referred to the Minister's powers. These were not the Minister's powers, they were their own powers. Lindsey was really asking that they should give away one of the most valuable safeguards they possessed, that professional matters should be dealt with by a professional body.

Dr. TALBOT ROGERS said that one of the things that had handicapped them in exercising any control was that they had not been able to have a comparison between areal and individual averages. Areal averages would soon be available, and he believed that this information would have a salutary effect and prevent in many instances the bringing in of sanctions.

After further discussion, Dr. MAIDEN said that there was no desire to short-circuit the present regulations. He thought it was implicit in his motion that any investigation would go through the routine procedure before coming to a Minister.

The motion was lost.

Dr. D. C. S. RENDALL (Berkshire) moved that all investigations into the prescribing of food and drugs should cease forthwith.

Dr. TALBOT ROGERS said that this was a most attractive proposition, but unfortunately it was not one that could be acceptable to the Ministry. He knew that none of them liked these inquiries, but if they did not have them some official would carry them out on a rule-of-thumb basis.

Dr. RENDALL said that the majority of the investigations were upon very controversial foods and drugs. These should be put into a hard and firm class. What they did want was more guidance as to what was a food and not a drug.

The motion was lost.

Dr. J. E. ELLIOTT (Buckinghamshire) asked the Conference to declare that the present extensive use of investigations into irregular prescribing under the Service Committee and Tribunal regulations was wasteful and undesirable.

Dr. TALBOT ROGERS said that they would all agree that the investigations were far from ideal. His Committee had taken what action it could to limit the time-lag, and was hoping to get the position much more to their satisfaction.

Dr. FRANK GRAY said that this was something they could not ask for. They knew in London particularly how much time was taken up with these investigations. They had had to deal with as many as fifty of these cases in a month, but that was one of the necessary results of keeping this matter in their own hands. While the work was considerable, it was a great safeguard.

Dr. ELLIOTT said that what they were pleading for was not that the investigations themselves should be abandoned, but only their extensive use.

The motion was lost.

Dr. ELLIOTT then further moved:

That real economy in prescribing would result from investigations by the local medical committee into the prescribing of those practitioners whose prescribing costs had been reported to the Committee to be consistently and appreciably above the average for their area.

Dr. A. BEAUCHAMP (Birmingham) said that a good deal of work had been done in his area by means of occasional letters in persuading doctors to prescribe economically and sensibly. That method was well worth trying. The next stage would be to provide doctors with their areal figures, and the third stage investigation by the local medical committee.

Dr. TALBOT ROGERS said that this was a resolution which the Committee would welcome. It was in line with the policy they wanted to carry out.

The motion was carried.

The Model Distribution Scheme

Dr. F. J. ROBERTSON (Newcastle-upon-Tyne) moved that the distribution scheme should provide for a monthly payment to all general medical practitioners without individual application. He said that the officials of all Government departments were paid on a monthly basis. General practitioners in the National Health Service stood alone as the only section not receiving a monthly cheque. This was not because they were considered to be self-employed. Their dental colleagues were paid monthly, and he thought that doctors should receive automatic monthly cheques.

Dr. C. O'DONOVAN (Leicester and Rutland) said that this motion as it stood would involve an immense amount of additional work at executive council offices. He thought people who wished to have monthly rather than quarterly payments should have them on application.

Dr. S. R. FEE (Stoke-on-Trent) said that ever since 1912 they had a monthly payment of accounts and there had never been any administrative difficulty. He certainly felt they should be paid monthly.

Dr. W. WOOLLEY (Bristol) considered that this was a matter for local action, and suggested that it be referred to the G.M.S. Committee.

The discussion was continued by Dr. N. NELSON (Dundee) and Dr. C. S. O'FLYNN (Sheffield).

It was agreed to refer the matter to the Committee.

Removal from List

Dr. E. G. WATSON (Birkenhead) asked the Conference strongly to deprecate the Minister's interpretation in E.C.L. 93/52 of the regulations regarding the removal of practitioners from a council list in certain circumstances, to wit:

"Where the practitioner has absented himself from his practice for a period of 12 months or more, even if he has informed the Council and made adequate deputizing arrangements, but where there is no apparent likelihood of his returning within the immediate future."

Dr. Watson said that his committee thought the word "immediate" was far too strong. Obviously the main reason for such absence on the part of the doctor would be a long illness. The phrase "immediate future" was unfortunate. Some conditions such as tuberculosis might incapacitate a man for longer than twelve months. He pleaded for a more generous phrasing.

Dr. TALBOT ROGERS said that he thought the representative of Birkenhead was being over-anxious about this matter. There was no intention on the part of the Ministry to act in the way suggested if a doctor had a reasonable chance of returning to his practice. If he was ill and had provided adequate deputizing arrangements he was quite certain that executive councils would accept the view that no action should be taken.

Dr. BEAUCHAMP pointed out that there were adequate safeguards in the local medical committee. He thought Birkenhead was over-sensitive about the word "immediate." The motion was lost.

Practice Vacancies

Dr. A. V. RUSSELL (Wolverhampton) moved that para. 75 of the Committee's report be referred back for consideration on the ground that local medical committees might render themselves liable to be mulcted of legal damages on the suit of an aggrieved doctor if they advised executive councils in of an conditions envisaged in the paragraph. This related to the increasing practice whereby partnerships have been formed between an established single-handed doctor who intended shortly to retire and a doctor who was new to both the practice and the district, with the intention of enabling the latter to secure the succession to what was essentially a single-handed practice. The Committee had felt that this was against the best interests of the Service, and that, apart from special circumstances, the Medical Practices Committee should not accept one partner as the logical successor to another who had died or resigned, unless the partners had been in active practice together for about a year. The mover described a case in support of his view that the position required clarifying. It should be placed beyond all shadow of doubt as to what the position of the local medical committee might be in these circumstances.

Dr. F. M. ROSE (G.M.S. Committee) said that there were a minority of doctors who for one reason or another attempted to defeat the machinery set up for the filling of practice vacancies. If the Medical Practices Committee acted properly there would be no trouble at all, and when something unexpected happened he was quite sure that imagination and humanity would be applied. But there was a minority of cases in which an attempt was made to get round the regulations, and para. 75 was so designed as to meet particular cases.

Dr. J. A. GORSKY (G.M.S. Committee) said that there was some disquiet over this matter. They were still waiting to learn whether an E.C.L. had any statutory authority. Until now neither an executive council nor the Medical Practices Committee had the power to declare a vacancy. This E.C.L. was not based upon any statutory instrument whatsoever. If this went through there would come a time when a vacancy would be declared in a case where a partnership deed had been entered into by two doctors, and there would possibly arise a conflict on this question of the deed. He intended to bring this matter up at the Cardiff meeting. If they allowed this to go through without second thoughts, they would be merely government by decree. He asked then it would be merely government by decree. He asked the Committee to take back para. 75 and reconsider it, and that they should await a decision as to whether an E.C.L. had statutory force or not.

The reference back was agreed to.

Machinery for Filling Vacancies

Dr. TALBOT ROGERS moved on behalf of the General Medical Services Committee:

That steps be taken to secure that:

- (i) The executive council should be responsible for appointing a successor;
- (ii) The decision as to whether a practice is to be dispersed or a vacancy is to be declared and advertised should remain with the executive council in consultation with the local medical committee;
- (iii) The Medical Practices Committee should act as an appeals body, and in hearing an appeal should be required to review all the applications originally submitted and not merely that of the appellant.

Dr. A. CAMPBELL (G.M.S. Committee) moved non-approval. He considered that this motion, which was passed by the Committee at a very thin meeting, put them in a very difficult and dangerous position. If para. (iii) were passed and the Minister agreed, he felt that lay members of executive councils would not dream of sitting in committees selecting a short list, because they would know

that they might be overruled by other people at a distance. The Minister, as was evident from his speech to the Conference, was worried about centralization, but this proposal meant more centralization.

Dr. P. J. GIBBONS (G.M.S. Committee) said that they could all agree that they were very fortunate in the present members of the Medical Practices Committee, but the same state of affairs might not obtain in ten years' time. The Committee's motion would also mean the centralization of power in London, which none of them liked.

Dr. D. F. HUTCHINSON (G.M.S. Committee) said that he thought the Conference would know that under the present system a great deal of trouble had arisen. The reason why it was suggested that the Medical Practices Committee should be an appeal body was very simple. The committee was composed very largely of general practitioners, who would have an understanding of the position which officials of the Ministry could not be expected to possess. He thought what was now proposed would be a real improvement on the position, which had caused so much trouble in the past.

Dr. D. C. S. RENDALL (Berkshire) felt that all these appointments must be made locally by people who knew what they were talking about.

Dr. TALBOT ROGERS pointed out that what they were asking here was that the local body should have the dominant say, in fact the only say unless there was an appeal. Then, and then only, would the Medical Practices Committee come in. At present the Medical Practices Committee decided the original application, and it decided it with an eye to a possible appeal.

The amendment moved by Dr. Campbell to withhold approval from the Committee's proposal was lost.

Dr. RENDALL (Berkshire) moved to amend para. (i) of the recommendation by inserting the words after "executive council," "after consultation with the local medical committee," and para. (iii) by the addition of the words "when an appeal is being heard representatives of the executive council concerned should be in attendance." This was just to make it certain that the local medical committee had its say as to who did the job.

The amendment was accepted on behalf of the Committee and by the Conference, and the recommendation of the Committee as thus amended was agreed to.

Service Committee Procedure

Dr. H. GUY DAIN, as chairman of the subcommittee which has been engaged on the study and proposed improvement of Service Committee and Tribunal Regulations, presented the report which was published in the *Supplement* of May 2 (p. 190). The report contained some 22 recommendations on modifications of procedure, but only those were separately moved to which amendments had been sent in by local medical committees. Dr. Dain said that the great value of the complaints procedure was that it presented an opportunity of airing complaints and getting rid of them, and in that way it was more frequently protective of the doctor—the person complained against—than punitive. An endeavour had been made to strengthen some weak places in the scheme and make it more satisfactory to everybody all round. He then moved the first of the recommendations, concerning the appointment of chairman and deputy chairman, so to modify the regulation as to leave the field open to non-members of the executive council, provided the person appointed was acceptable to both parties represented on the committee.

Dr. MICHAEL CUTLER (Hastings) desired the regulations to be amended to provide for the chairman of the committee to be a barrister or solicitor of not less than seven years' standing. The advantages would be the complete impartiality of such a person and his ability to give a lead to the committee.

Dr. W. WOOLLEY (G.M.S. Committee) pointed out that if Hastings wanted a barrister or solicitor they could have one, even if the recommendation was carried. But if it

was carried it would mean that service committees which did not wish to have a member of the legal profession as chairman must have one.

Dr. DAIN said that a number of local medical committees held the same view as Hastings had expressed, but still more desired a more flexible method of selecting their chairmen.

Dr. E. A. GREGG (Chairman of Council) said that experience in London in past years had shown that a chairman who was a member of the legal profession was not necessarily the best choice.

The amendment that the chairman must be a member of the legal profession was lost.

Dr. A. M. MAIDEN (Lindsey) spoke against the subcommittee's recommendation, his reason being that there might be constitutional difficulties if the chairman came from outside the membership of the executive council.

Dr. FRANK GRAY said that in London they had a chairman and deputy chairman neither of whom was a member of the executive council, and there had not been the slightest constitutional difficulty. He hoped the meeting would feel that the proposal was practical and wise.

The recommendation was adopted.

Dr. DAIN proceeded to move the second recommendation, that provision should be made in the Regulations that a member of the service committee who was an interested party should be required to disclose his interest.

Dr. MICHAEL CUTLER (Hastings) moved as an amendment to add the words that the interested party "shall, if either the complainant or respondent requires it, withdraw." He said that this brought the procedure into line with that of a court-martial.

Dr. DAIN considered the amendment entirely unnecessary. The amendment was lost, and the recommendation agreed to.

Dr. G. D. STILWELL (Kent and Canterbury) moved an amendment with regard to the bringing of complaints, that in the event of a decision to refer a case the Minister should be advised by a committee having a similar constitution to that of the medical advisory committee constituted under Regulation 11 (4).

Dr. DAIN said that he would like this amendment to be referred back for consideration. Without knowing all its implications, he could not say "Yes" or "No."

It was agreed to refer this back to the Committee.

The next recommendation moved by Dr. DAIN proposed that the chairman of a service committee should confer with a professional adviser who was not a member or deputy member of the committee, but selected from a panel nominated by the local professional committee.

Dr. W. F. HUDSON (Oxford) moved the omission of this recommendation. He thought it complicated the situation somewhat. The procedure it set out should either be deleted or remain permissive. The Oxford amendment was lost.

Dr. A. P. DAVIES (Walsall) moved to substitute the word "must" for "should" ("the chairman of a service committee must confer with a professional adviser"). There would still be some chairmen who would ignore the Regulation if it were merely permissive.

The Walsall amendment was carried, and the recommendation as thus amended was adopted.

Dr. DAIN next moved that the documents in the case should be sent out seven days (instead of three days) before the hearing and that they be sent also to the secretary of the local professional committee. This was designed to give deputies who were called upon to act in a case time to study the documents before the case came forward. It was another instance of making the machinery a little more efficient.

Dr. HUDSON (Oxford) moved an amendment whereby this provision would not apply to the secretary of the local professional committee. As it stood it meant that the circle of people who knew what was going on in the service committee was widened.

Dr. FRANK GRAY pointed out that it was already provided in the Regulations that the secretary of the local profes-

sional committee should have a statutory right to be present at the hearing. There was also a very strong moral obligation that he should be present. But if what Oxford wanted was done he might be forced to go to the meeting without the documents and knowing nothing of the case.

Dr. F. E. GOULD said that in Birmingham they had repeatedly asked practitioners who might receive a complaint to get in touch at once with the secretary of the local medical committee. From his experience of these cases he was quite certain that doctors only too often acted on their own account without consulting the secretary of their professional committee, and this might be a very unwise step.

Dr. HUDSON said that his only object in moving the amendment was to narrow so far as possible the number of persons concerned in the inquiry.

The Oxford amendment was lost.

Question of Legal Representation

Dr. DAIN then moved that the series of regulations relating to procedure before a local medical committee hearing complaints about prescribing or certification be amended so as to make it clear that the decision as to whether a practitioner might be represented by counsel or other paid advocate, or might call witnesses, rested with the local medical committee. The Regulations did not make any provision for counsel or solicitor.

Dr. CUTLER (Hastings) moved an amendment to the effect that a petitioner, independently of any reference to the committee, might be legally represented or call witnesses. He considered that the committee might make arbitrary decisions which led to injustice.

Dr. DAIN said that if the Conference felt that this amendment improved the recommendation he had nothing to urge against it.

Dr. W. WOOLLEY (G.M.S. Committee) asked whether it was not preferable for these inquiries to take place in as friendly an atmosphere as possible. In addition, how could a lawyer know whether a prescription indicated excessive quantities of a drug? That was a matter for doctors and doctors only. The other professions were very useful in their place, but this was not one of them.

Dr. CUTLER said that all he asked was that the doctor should have a right to call a lawyer, not that he was obliged to do so.

The Hastings amendment was carried.

Dr. DAIN then moved the approval of the remaining 15 recommendations. One of the recommendations provided for the amendment of the rule that if, in the course of a hearing, any new issue was introduced by the complainant the chairman had discretion to admit or exclude such issue as he thought fit, but if it was admitted the respondent might ask for an adjournment. It was proposed to amend this rule so as to make it obligatory to adjourn the committee if a new issue was admitted. The reason for this proposal was that the doctor was under a grave disadvantage if when the new issue came forward he himself was compelled to ask for an adjournment. This amendment would leave the service committee no option but adjournment if any new issue were brought forward.

Dr. A. D. STOKER (Derbyshire) moved to add to the recommendation the words "if the respondent so desires." It seemed to him very unfair that the whole proceedings should necessarily be adjourned and the practitioner be subjected to another month of suspense.

Dr. J. A. GORSKY supported the Committee's recommendation. The anxiety to which the previous speaker had referred would be much greater if the verdict went against him on the issues newly introduced and determined forthwith. The procedure proposed by the Committee was the one invariably followed at inquests.

Dr. FRANK GRAY supported the last speaker. He had seen several cases where a responsible doctor had been placed in a very difficult and embarrassing position by the ringing up of a new issue. If the doctor said that he

was not willing that the new issue should be considered at that hearing he knew that the committee would have it in their minds that he was compelling them to come back again on a later occasion. The present proposal transferred the embarrassment to the right quarter.

The Derbyshire amendment was lost and the recommendation agreed to.

Lodging of Complaints

Dr. D. SARLATVALA (West Bromwich) moved that any communication from an executive council to a doctor informing him that a complaint had been lodged against him by or on behalf of a patient, and inviting his comments thereon, should embody a clear warning that his reply would be produced at any inquiry which might follow, and might there be used as evidence.

This was immediately adopted without discussion.

Dr. A. D. DAVIES (Walsall) moved:

That the chairman of a service committee, before deciding that a prima facie ground of complaint is disclosed, must submit a statement of complaint to the practitioner concerned, giving him the opportunity of making observations at an early stage.

He said that now that the Conference had passed all the recommendations brought forward by Dr. Dain the position as regards the defendant practitioner had been very greatly improved and safeguarded, but it did seem common justice that at the first opportunity the defendant should be granted the courtesy of making any essential observations. It might prove that the case was obviously frivolous from the beginning.

Dr. DAIN drew attention to the First Schedule of the Rules of Procedure, which laid it down that the clerk of the council should as soon as practicable send to the chairman of the appropriate committee and to the practitioner concerned a copy of the complainant's statement and any ensuing correspondence on the matter. The doctor must be informed at the same time as the chairman of the committee was informed.

Dr. GORSKY pointed out that the Regulation did not say whether the clerk of the executive council should invite the comments of the doctor, or whether the letter be sent to the doctor before the prima facie case had been decided or not. The Walsall amendment was important, because it was necessary for the Minister to clarify this particular Regulation.

Dr. DAIN said that his Committee thought that the position was properly protected by the Rules of Procedure. The Walsall motion was carried.

Dr. CUTLER (Hastings) moved that the power of subpoena and the imposition of penalties for non-compliance therewith should be applied to proceedings before the service committees except so far as it related to costs.

Dr. DAIN said that the great majority of local medical committees were opposed to the power of subpoena in medical service committees. They agreed to the need for it at tribunal level.

The Hastings motion was lost.

Dr. M. CUTLER (Hastings) moved that the terms of service be amended so that a practitioner who had arranged for the temporary treatment of a patient by partner, deputy, assistant, or locum tenens should not be responsible for the default of such substitute. A breach of the terms of service should not result in a vicarious liability. It might be said that there were administrative difficulties, particularly so far as locum tenens were concerned, but surely such a matter could be under the control of the executive council.

Dr. J. A. GORSKY urged that this be referred to the Committee, which was well aware of these difficulties.

The motion was agreed to as a reference to the Committee.

Dr. B. HALFPENNY (Kent and Canterbury) moved that an amendment should be sought in the Regulations whereby a complaint should not be considered by the medical service committee unless and until it had been presented in the form of a statutory declaration.

Dr. DAIN said there were sound arguments against putting so severe a deterrent on the complainant. To confront him

with the need to consult solicitors and swear before a commissioner of oaths would not be advisable. Local medical committees were not in favour of appearing to stand so much in the way of making a complaint.

The motion was lost.

Suggested Penalties on Patients

Dr. A. J. JOHNSON (Norfolk) moved that the Ministry be urged to introduce legislation whereby patients who had been found by the appropriate service committee to have grossly abused the National Health Service should be subject to a fine or other penalty. This had been brought up before, but he hoped the Conference would reconsider it. It had been suggested that it should be possible to teach the public not to abuse the Service. But surely those people who were likely to be guided by propaganda were not the kind likely to abuse the Service, and it was necessary to have some remedy against gross abuse.

Dr. DAIN pointed out that this would require a new Act of Parliament. There was no provision in the present Acts for penalizing a patient. He hoped the Committee would not be asked to do something which was really impossible.

The motion was carried.

Elections

At this point it was announced that Dr. W. M. Knox had been re-elected Chairman of the Conference without a contest, and that the following had been elected by the Conference as members of the General Medical Services Committee: Dr. A. Beauchamp, Dr. J. A. Gorsky, Dr. I. G. Innes, Dr. J. A. Pridham, Dr. F. M. Rose, and Dr. W. Woolley.

The death was announced of a former member of the Committee, Dr. A. S. Winstanley, and the Chairman paid a warm tribute to Dr. Winstanley's services.

Inflation

Dr. A. B. MILLIGAN (Worcester) moved that, in order to assist in avoiding a recurrence of the recent inflation in doctor's lists, instructions be printed on the medical card stating that patients must notify to the executive council any change of address even within the same council area.

Dr. TALBOT ROGERS thought this a helpful suggestion. The original motion as amended was referred to the Committee.

A motion by Middlesex was also accepted that the words "change of name and/or address" be substituted for the words "change of address."

Demobilized Service Men

Dr. A. J. JOHNSON (Norfolk) moved that demobilized National Service men should automatically be replaced on their former doctor's list and issued with a medical card with the original doctor's name. He said that it was a very common experience that demobilized men did not trouble to re-register. The motion was supported by Dr. W. H. HAYES (Bristol), who said that it was not the Ministry of Health but other Ministries which were obstructive.

Dr. TALBOT ROGERS said that this might well be referred to the Committee. He could not promise too much, because there was a real fear of inflation at the Ministry.

The motion was referred.

Allocation of Patients

Dr. A. B. MILLIGAN (Worcester) moved that a practitioner should not, by reason of his terms of service, be compelled to take or retain on his list a patient accepting treatment from an unregistered practitioner or from another registered practitioner with whom he was not acting in consultation. This was in reference to the statement made in para. 92 of the report. In Worcester they felt that this matter should be given more attention.

Dr. TALBOT ROGERS said that, so far as the unregistered practitioner was concerned, this was the policy they had always followed, but the Act as it stood at present made it necessary for someone to accept National Health Service responsibility for such a patient. The Ministry had heard their views and received them sympathetically. With regard to treatment by another registered practitioner, here he was afraid they could take no action. It was surely a matter for ethical consideration by the local doctors.

The motion was carried.

Treatment of Service Men on Leave

Amendments in the name of Oxford and Northampton called for the placing of all Service personnel on leave on the lists of N.H.S. doctors as temporary residents, Northampton adding that Service departments should make a round sum contribution to the central pool to cover such cases.

Dr. TALBOT ROGERS said that they had had a message from the Ministry that in consultation with the Service departments they had been able to find a solution which overcame the difficulties in this respect. How exactly the difficulties were being overcome and to what extent he did not know.

The motions were withdrawn.

Mileage Payments

Dr. J. C. ARTHUR (Gateshead) moved that mileage payments be based on difficulty of access of the individual patient rather than upon any broad classification of types of practice. What they wanted to ensure was that there was no departure from the fundamental principle of mileage. He reminded the Conference that in the North of England, not to speak of Scotland or Wales, there were many practices in large industrial centres which had, closely adjacent, some of the bleakest and wildest country. The primary factor should still be difficulty of access to the patient.

Dr. C. F. R. KILLICK (G.M.S. Committee) said that a Government inquiry was taking place into the whole effect of mileage, and there might be a complete reclassification. The term "mileage fund," of course, was wrong; they had asked the Minister that the term should be "rural practices fund," but he could hardly think that practices in Gateshead would be looked upon as truly rural practices.

Dr. ARTHUR said that he was not suggesting that they should go into the individual requirements of every single patient. All he asked was that the fundamental principles should be maintained.

The motion was lost.

Dispensing and Prescribing

Dr. R. GREEN (East Sussex) moved to express concern that dispensing doctors, paid on the basis of the drug tariff, should continue to sustain financial loss when supplying a number of proprietary preparations, and to request the Committee to take action. The real object of the motion, he said, was to strengthen the Committee by a firm reminder that in some quarters there was resentment over arrangements about doctors who were compelled to dispense. The grievance was that the doctor who was paid on the drug tariff was relatively much worse off than the chemist, because he was unable to buy most of his drugs at the same advantageous price. But a large proportion of drugs were described as "medical products" or "specialties," and here the discount was 33½% to the chemist and 10% to the doctor. He gave examples of how this matter worked out to the doctor's disadvantage. One way in which the condition could be remedied was by persuading the drug houses to sell drugs for dispensing at the same rate to the doctor as to the chemist.

Dr. KILLICK said that this matter had been taken to the Ministry and discussed most fully. The Ministry had already agreed to the necessity for some action.

The motion was carried.

The Obstetric List

Dr. A. G. CHAMBERLAIN (Dorset) called for the abolition of the official list of general-practitioner obstetricians. They did not like the restrictive list at all. They were very disturbed when they heard it mooted that a circular should be sent to all executive councils recommending that one of the criteria for admission to the obstetric list should be a six months' course in obstetrics. It was unnecessary to have any list. England should be placed in the same position in this respect as Scotland and Northern Ireland. The only list should be that of people willing to do midwifery.

Dr. TALBOT ROGERS replied that there was a list in Scotland; it consisted of those who had not opted out. It must be remembered that there were some people who would not want to do this work or to be included in any list.

It was agreed to pass to the next business.

Representation of Assistants

Dr. TALBOT ROGERS moved on behalf of the Committee that local medical committees be asked to take such steps as would ensure that assistants in their areas were, wherever possible, represented on each local medical committee by at least one assistant.

This was agreed to.

Maternity Medical Services

Dr. R. B. L. RIDGE (Middlesex) moved to instruct the Committee to review the whole question of the maternity medical service, with particular reference to the relation of fees to the work done. Revision was required on the question of maximum requirements. These were quite unrealistic and far below the standard of obstetric practice which general practitioners considered satisfactory. Furthermore a practice was permitted, though not encouraged, which could only be described as "postal midwifery," the doctor having done his two antenatal examinations. The very low standard of minimum requirements was not without its effect on the fee payable.

Dr. TALBOT ROGERS said that a sufficiently good case had been made out for the acceptance of this motion, and the G.M.S. Committee would look into the matter.

The motion was agreed to.

Sale of Goodwill

Dr. TALBOT ROGERS moved on behalf of the Committee:

That the Conference, representing N.H.S. practitioners throughout the country, having considered the memorandum prepared by the Amending Acts Committee and the comments of the General Medical Services Committee and the Compensation and Superannuation Committee upon it, is not in favour of the optional return of the right to buy and sell goodwill of practices, which it believes to be impracticable.

He said that this did not mean that the Committee thought that the ownership of goodwill was necessarily a bad thing. But the optional scheme of restoration did not seem to be practicable. One of the amendments to his motion asked that the matter be deferred and reviewed from time to time. This would mean a good deal of extra work.

Dr. A. J. JOHNSON (Norfolk) moved an amendment "That, in view of the damage done to the tone and keenness of general medical services and the increasing difficulties of entering and changing practices caused by the loss of goodwill, the so-called impracticability of its retention should be overcome for the sake of a certain gain in the efficiency of the service." He said they felt in Norfolk that the Committee's recommendation closed the door finally.

Dr. H. H. D. SUTHERLAND (G.M.S. Committee) said that by instruction of the Representative Body the Amending Acts Committee had set out in a document the general principles of the whole matter of goodwill in its practical and theoretical aspects. This memorandum had not yet been submitted to the Council. It would be far better at

Dr. C. O'DONOVAN (Leicestershire) asked the Conference to declare that the shilling charge on prescriptions should be abolished. This charge, he said, had not been a success, and results had not justified the hopes entertained with regard to it. The Government should be asked to think again. There must be several other methods of keeping down this colossal expenditure. The public must be educated as to the uselessness of many of the drugs—tonics, older ones, must also be educated. A service of essential drugs should be substituted in place of the present scheme, and only such essential drugs should be free on prescription to the patients. That would help the public to see how few essential drugs, comparatively speaking, there were; it would also help pricing bureaux, because they would have fewer prescriptions to deal with. The poorer members of the public would gain, as the shilling charge was a drain on them, and they often neglected going to the doctor on account of it.

Dr. TALBOT ROGERS asked the Conference not to pass this motion in its present form. They would discuss with the Ministry how to check rising prices, giving information to which they would receive from their representatives as to how the shilling charge was working out. It might even be that the larger average quantities that were being prescribed during the past year were costing more than the total of shillings brought in. The Committee would take the matter up with the Ministry, and if the Ministry felt it wanted to make a change it must be left to it to do so. Political questions were involved, and they should not tie themselves to one particular policy at the Conference.

It was agreed to pass to the next business.

Dr. ARTHUR (Gateshead) moved that the prescription fee be greater for proprietary than for non-proprietary drugs. He thought that a little of the demand for the proprietaries might be curbed by this motion.

Dr. TALBOT ROGERS could not agree. Patients would still choose the proprietary drug if they had the choice.

The motion was lost.

The "National Formulary"

Motions by Buckinghamshire, Bristol, and Berkshire supported the Committee's view that there should be a return to the Latin system of headings in future editions of the *National Formulary*. Dr. J. E. ELLIOTT, in moving for Buckinghamshire, said that there were three good things about Latin headings: they were international; and the bulk of liked them (they had said so officially); and the bulk of general practitioners and consultants found them most convenient. There was about them a certain classical dignity which was not unbecoming to a profession such as theirs. He quoted: "He who uses the winning fan too strongly loses good grain as well as chaff."

Dr. D. F. WHITTAKER (G.M.S. Committee) said that pharmacology was taught in English, and the *British Pharmacopoeia* was published with English titles. There was an increasing population who had no Latin.

Dr. W. WOOLLEY (Bristol) supported the motion. He considered that Latin should be one of the things that young doctors had to know.

The motion was carried.

Dr. W. H. HAYES (Bristol) asked for more consideration and imagination to be given to the flavouring of *National Formulary* mixtures.

Dr. A. B. DAVIES said that a great deal of work was done on the improvement of flavours. Keeping properties and compatibility had to be considered. Every mixture in the *Formulary* at present had some flavouring agent or other which had been found by patient trial and experiment to be the best for that particular medicine.

Dr. WOOLLEY asked whether the synthetic flavouring agents now available had been tried out. Dr. DAVIES said that all had been tried. Many samples of these had been received from America.

The motion was lost.

The Minister said he would like also to refer to more general matters, and to consider what still lay ahead of them. One of the things they wanted to achieve was that more patients were treated in their own homes and, on the

whole, fewer in hospital. He did not put that forward on economic grounds, though these were a factor, but many patients would in fact benefit greatly if they could be treated in their own familiar surroundings and without the disturbance, stress, and anxiety of removal to hospital. If the cost of the hospital service continued to grow it would inevitably absorb more and more of the money set aside for the Health Service. They must strive to lighten the load on the hospital, provided this could be done without any detriment to the patient. The treatment of a greater variety of patients at home should add enormously to the value and interest of the work of the general practitioner. He believed that direct consultation with the consultant was of first importance, and he had no doubt that the vast majority of those present took full advantage of the opportunities which existed.

"One thing I regard as of vast importance, that a general practitioner should have direct access, not of charity but of right, to x-ray and pathological services. He should be told, and at once, when his patient leaves hospital, and when he refers the patient for consultation he should receive a considered opinion always from a senior member of the staff. He should be made always welcome in the hospital, and be considered part of the hospital service of his area in the fullest sense of the word. That is common practice in many places, but in too few, and that sort of welcome is not always extended to the general practitioner.

Liaison with Local Authority

"Let me turn to the liaison between the general practitioner and the local health authority, particularly in preventive work. I have been struck with the difference here as I go about the country. I find that in many areas there is close touch between health visitors and general practitioners, and usually in such places there is an able and energetic medical officer of health, but that is not true in other areas. Many feel that there are too many people concerned with the welfare of the patient, and that there is danger of the practitioner being crowded out. There is no danger of that, provided the general practitioner is recognized to be the clinical head of the whole team. If we can achieve that we shall have achieved the partnership we wish.

"We are engaged in a great experiment in social medicine, but it must not be strangled by too much administration or too much central direction. I know you feel that there is too much, and, believe me, I sympathize. It is because of circumstances and the financial position of the moment that I am forced to keep the reins as firmly in my hands as I do, but all my instincts are towards giving greater freedom, and all my efforts will be directed to that end, however crabwise you may think my movements may be.

Appeal for Co-operation

"It has been a very good thing for me to get to know you. The Minister of Health should be something more to this profession than just a name at the foot of one of those incomprehensible circulars you receive from time to time. I can at least say one thing in self-defence. I do not assume that when proposals are put to me by the medical profession they are either necessarily biased or necessarily wrong. I do not work on the assumption either that our own proposals are necessarily always right. I want to seek your help and the help of all the other professions engaged in the Service. This is not a job that Ministers or Departments can do alone. It is essentially something in which we must work together. I need your help, and I hope you too will feel that any help I can give is most willingly at your disposal. It is only in partnership that we are going to solve these problems and achieve the true potentiality of the National Health Service." (Loud applause.)

Dr. TALBOT ROGERS, in thanking the Minister, said that what he had put forward as the rights of the general practitioner were just the things that the profession had been working towards for many years.

CONFERENCE DINNER

At the conclusion of the Conference the representatives dined together at the Dorchester Hotel, Dr. W. M. KNOX presiding. In proposing the health of the General Medical Services Committee, who were the guests of the evening, Dr. F. E. GOULD (Birmingham) remarked that the *Journal* had stolen his ammunition by publishing in the preceding week an article on the functions and activities of the Committee. The Committee put in a great deal of work, for which it received no material reward. Its members had an inordinate number of documents to study, and they did study them to some purpose. To control such an expert, informed, and energetic body was no small task, and they were to be congratulated on having Dr. Talbot Rogers in the chair. He felt that the speeches he had made at the Special Conference and the Extraordinary General Meeting, as well as at the Annual Conference that day, were such as to rank him worthily with his predecessors in office.

Dr. TALBOT ROGERS, in responding, declared himself to be proud of his Committee—a good and a very necessary Committee. Had there been no General Medical Services Committee and no Insurance Acts Committee before it, the position of general practitioners under the present Service would be very different from what it was. Dr. Rogers further said how pleased they all were to have with them that evening the President of the Association, Dr. P. T. O'Farrell, who had come all the way from Dublin to attend; also certain members of the Medical Practices Committee.

As proof of what the "periphery" thought about the body representing it, it was significant that as a result of one change, and that was on account of the retirement of Dr. D. B. Evans, who had helped the Committee and its predecessor in the most valuable way during the last eleven years and would be greatly missed. It was sometimes said that the Committee was not interested in anything except remuneration, and that then it was on the side of the "big battalions." On the evidence presented to the Conference that day it would be difficult to believe that that was all it did. It was a committee of manifold duties and responsibilities, and he himself was very proud—and not a little surprised—to be its Chairman. He paid a tribute to its only treasurer of the Defence Trust. He thanked also the Scottish members who had presented the Chair with a handsome gavel on which were inscribed the names of the Chairmen of the Committee since its inception. Although the Insurance Acts Committee started in 1913, there had only been, including himself, seven Chairmen of the two Committees, and one of them, still happily vigorous, entered on his chairmanship thirty years ago—namely, Dr. Guy Dain.

Dr. A. S. WILSON proposed the toast of the Chairman of the Conference, and commented on his pleasant manner towards all who made their way to the rostrum. Dr. KNOX paid a tribute to the Association staff, who had made the Conference such a success by the amount of work they had put in behind the scenes, and he spoke particularly of the valuable services of the secretary of the Committee, Dr. D. P. Stevenson.

The collection for the Dain Fund brought in the handsome sum of £200.

UNIVERSITY DEGREE CEREMONY, CARDIFF

There is to be a congregation of the University of Wales from 3.15 to 4.45 p.m. on Friday, July 17, in the City Hall, Cardiff, for the conferment of degrees. It is understood that there will be a number of distinguished medical men receiving degrees, and the University invites the presence at the ceremony of members of the B.M.A. and their ladies. Any members wishing to be present are asked to apply for tickets to the Registrar, University Registry, Cathays Park, Cardiff, by June 30.

British Medical Association

AGENDA OF ANNUAL REPRESENTATIVE MEETING, JULY 9, 1953, IN THE CORY HALL, CARDIFF, AND JULY 10, 11, AND 13 IN THE CITY HALL, CARDIFF

CHAIRMAN: DR. S. WAND, Birmingham

PRELIMINARY BUSINESS

Items 1 to 7 relate to preliminary business.

REPORT OF AGENDA COMMITTEE

Grouping of Motions and Amendments

8. The Committee has arranged certain Motions and Amendments which cover substantially the same ground in groups and has selected in each group one Motion or Amendment (marked with an asterisk) on which it proposes that discussion should take place. The Representatives of the constituencies concerned have been informed of these proposals in accordance with Standing Order 21 (iii).

Order of Business

9. The Committee Recommends:

Recommendation: (1) That the first business on Friday, July 10, be the business under "Public Health," if not previously dealt with;

(2) That the business under "Overseas" be taken at 11 a.m. on Saturday, July 11;

(3) That "Other Motions by Divisions and Branches," if not previously dealt with, be considered as the first business on Monday, July 13, after the Official Vote of Thanks;

(4) That, with these exceptions, the order of the business be as set out in the Agenda.

STANDING ORDERS

10. Motion by the Chairman: That the Standing Orders (Doc. A.R.M. 5) as circulated with this Agenda be adopted as the Standing Orders of the Meeting.

PRELIMINARY

11. Motion by the Chairman of Council on behalf of the Council: That the Annual and Supplementary Reports of Council under "Preliminary" (Doc. A.R.M. 2, paras. 1-20 and Doc. A.R.M. 3, paras. 205-10) be received.

Election of Honorary Member

12. Motion by the Chairman of Council: That His Royal Highness the Duke of Edinburgh, K.G., K.T., be elected as an Honorary Member of the Association.

Election of a Vice-President

13. Motion by the Chairman of Council: That Professor Sir Henry Cohen, J.P., LL.D., M.D., F.R.C.P., F.F.R., be elected a Vice-President of the Association in recognition of his outstanding services to the Association.

President, 1954-5

14. Motion by the Chairman of Council: That Professor Sir John McNee, D.S.O., M.D., D.Sc., F.R.C.P., Glasgow, be elected as President of the Association for 1954-5.

Joint Annual Meeting, Toronto, 1955:

President, 1955-6

15. Motion by the Chairman of Council: That Thomas Clarence Routley, C.B.E., LL.D., M.D., F.R.C.P.(C.), Toronto, be elected as President of the Association for 1955-6.

Representative of the Medical Branch of the Royal Navy on the Council

16. Motion by the Chairman of Council: That Surgeon Rear-Admiral O. D. Brownfield, C.B., O.B.E., be elected as the representative of the Medical Branch, Royal Navy, on the Council for the period 1952-5.

Remainder of Report under "Preliminary"

17. Motion by the Chairman of Council: That the remainder of the Annual and Supplementary Reports of Council under "Preliminary" be approved.

WALES

18. Motion by the Chairman of the Welsh Committee on behalf of the Council: That the Annual Report of Council under "Wales" (Doc. A.R.M. 2, para. 183) be received.

19. Motion by the Chairman of the Welsh Committee: That the Annual Report of Council under "Wales" be approved.

SCOTLAND

20. Motion by the Chairman of the Scottish Committee on behalf of the Council: That the Annual Report of Council under "Scotland" (Doc. A.R.M. 2, paras. 169-82) be received.

21. Motion by the Chairman of the Scottish Committee: That the Annual Report of Council under "Scotland" be approved.

BUILDING

22. Motion by the Chairman of the Building Committee on behalf of the Council: That the Annual Report of Council under "Building" (Doc. A.R.M. 2, para. 137) be received.

23. Motion by the Chairman of the Building Committee: That the Annual Report of Council under "Building" be approved.

ARMED FORCES

24. Motion by the Chairman of the Armed Forces Committee on behalf of the Council: That the Annual Report of Council under "Armed Forces" (Doc. A.R.M. 2, paras. 150-4) be received.

25. Motion by the Chairman of the Armed Forces Committee: That the Annual Report of Council under "Armed Forces" be approved.

MEDICAL FILMS

26. Motion by the Chairman of the Film Committee on behalf of the Council: That the Annual Report of Council under "Empire Medical Advisory Bureau" (Doc. A.R.M. 2, paras. 189 and 190) be received.

27. Motion by the Chairman of the Film Committee: That the Annual Report of Council under "Medical Films" be approved.

MEDICAL BENEVOLENCE

28. Motion by the Chairman of the Charities Committee on behalf of the Council: That the Supplementary Report of Council under "Medical Benevolence" (Doc. A.R.M. 3, paras. 252-4) be received.

29. **Motion** by the Chairman of the Charities Committee: That the Supplementary Report of Council under "Medical Benevolence" be approved.

WORLD RELATIONS

30. **Motion** by the Chairman of the International Relations Committee on behalf of the Council: That the Annual Report of Council under "World Relations" (Doc. A.R.M. 2, paras. 192-6) be received.

31. **Motion** by the Chairman of the International Relations Committee: That the Annual Report of Council under "World Relations" be approved.

Export of Antibiotics to China

32. **Motion** by TOWER HAMLETS: That this Representative Body requests the Council of the B.M.A. to use its influence with Her Majesty's Government so as to allow the export of antibiotics to the medical profession of China.

OCCUPATIONAL HEALTH

33. **Motion** by the Chairman of the Occupational Health Committee on behalf of the Council: That the Annual and Supplementary Reports of the Council under "Occupational Health" (Doc. A.R.M. 2, paras. 90-3, and A.R.M. 3, paras. 236-9) be received.

Duties of and Ethical Rules for Industrial Medical Officers

34. **Motion** by HENDON: That the Representative Body cannot agree that industrial medical officers should be permitted to undertake continued treatment of workpeople, and instructs the Council not to depart from the rules at present in operation.

35. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting, while it wholeheartedly supports the Council's view that the continued treatment, even of minor conditions, by industrial medical officers *without consultation with the family doctor* is unethical, is of opinion that a letter sent to the family doctor shall be deemed adequate consultation in this connexion.

36. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting, while it wholeheartedly supports the Council's view that no case has been made out for the abolition of the existing ethical rules for industrial medical officers, urges that these rules should be specifically brought to the notice of all industrial medical officers, whether members of the Association or not, and hopes that these rules will be scrupulously observed.

Remainder of Report under "Occupational Health"

37. **Motion** by the Chairman of the Occupational Health Committee: That the remainder of the Annual and Supplementary Reports of Council under "Occupational Health" be approved.

FINANCE

38. **Motion** by the Treasurer on behalf of the Council: That the Annual and Supplementary Reports of Council under "Finance" (Doc. A.R.M. 2, paras. 127-36, and A.R.M. 3, para. 246) and Appendix V and the Financial Statement for the year ending December 31, 1952 (Doc. A.R.M. 3A), be received.

Membership Subscription

39. **Motion** by the Treasurer: That para. 134 of the Annual Report of Council be approved.

40. **Amendment** by TUNBRIDGE WELLS: That the membership subscription be modified for members who are assessed under Schedule E, so that the net cost of membership may be equitable throughout the profession.

41. **Amendment** by MID-CHESHIRE: That this Meeting considers that the reduced subscription of £4 4s. should be granted to all whole-time salaried members of the Association.

Remainder of Report under "Finance"

42. **Motion** by the Treasurer: That the remainder of the Annual and Supplementary Reports of Council under "Finance" be approved.

"BRITISH MEDICAL JOURNAL"

43. **Motion** by the Chairman of the Journal Committee on behalf of the Council: That the Annual Report of Council under "British Medical Journal" (Doc. A.R.M. 2, para. 125) be received.

44. **Motion** by the Chairman of the Journal Committee: That the Annual Report of Council under "British Medical Journal" be approved.

Composition of "Journal"

45. **Motion** by EASTBOURNE: That the composition of the Journal be altered so that at least one-third of the matter be devoted to clinical subjects of interest to general practitioners.

Reports of Divisional Meetings in "Supplement"

46. **Motion** by CHELSEA AND FULHAM: That the Representative Body considers that reports of Divisional meetings on subjects of general interest should be given more prominence in the *British Medical Journal Supplement* and be printed in whole or in part in large type.

"FAMILY DOCTOR"

47. **Motion** by the Chairman of the Family Doctor Committee on behalf of the Council: That the Annual Report of Council under "Family Doctor" (Doc. A.R.M. 2, para. 126) be received.

48. **Motion** by the Chairman of the Family Doctor Committee: That the Annual Report of Council under "Family Doctor" be approved.

49. **Amendment** by SWANSEA: That the *Family Doctor*, with the name of the British Medical Association on its cover, is advertising drugs of doubtful value for the purpose of swelling its income. This is an unethical practice, and, although it is stated that *Family Doctor* depends largely on its advertisement income for its existence, this meeting nevertheless calls for the cessation of this practice.

50. **Motion** by WINCHESTER: That this Meeting congratulates the editorial staff on the increased success of *Family Doctor* during the past year.

PUBLIC HEALTH

51. **Motion** by the Chairman of the Public Health Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Public Health" (Doc. A.R.M. 2, paras. 94-104, and A.R.M. 3, paras. 240-5) be received.

Arbitration Machinery

52. **Motion** by MID-HERTS: That this Meeting deplores the lack of a Whitley Court of Arbitration to which there should be a right of appeal by unilateral reference and instructs Council to take immediate and urgent action to obtain the necessary amendments of the Industrial Disputes Order to enable disputes to be reported by the Association to the Minister of Labour under that Order.

53. **Motion** by WESTMINSTER AND HOLBORN: That this Representative Body expresses its resentment and grave anxiety that there is still no agreement on arbitration. As amended and the B.M.A. is still excluded from this Order, thus precluding the Association from submitting any dispute to the Ministry of Labour, this Meeting therefore demands urgency, to ensure that arbitration machinery be set up. It further asserts that the requests for arbitration shall not be subject to the Minister's veto. It is imperative that

S.I. 1376 be amended in order to terminate the Association's present disability to refer a dispute to the Ministry of Labour. That this Representative Body pleads for the active support of all other professional bodies engaged in the N.H.S. whose position is likewise prejudiced by exclusion from the Order.

Infectious Diseases

54. **Motion** by CITY: That, since the frequency and rapidity of travel often makes vaccination against smallpox unnecessary in adult life, when there is a possibility of undesirable complications if the vaccination is then done for the first time, the Association do declare its continued belief that it is in the interest of every individual to be vaccinated in infancy, the Association take immediate measures centrally and through the Divisions to secure the vaccination of every person at least once during infancy and urge the Government to act for the same purpose.

Remainder of Report under "Public Health"

55. **Motion** by the Chairman of the Public Health Committee: That the remainder of the Annual and Supplementary Reports of Council under "Public Health" be approved.

Health Visitors

56. **Motion** by CITY: That the Association welcomes health visitors as a means by which general practitioners may increase the help they may give to their patients, and encourages health authorities to increase the number of health visitors, where necessary.

HOSPITAL AND CONSULTANT SERVICES

57. **Motion** by the Chairman of the Central Consultants and Specialists Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Hospital and Consultant Services" (Doc. A.R.M. 2, paras. 63-87, and A.R.M. 3, paras. 222-35) be received.

Review of Remuneration of Hospital Medical Staff

*58. **Motion** by NOTTINGHAMSHIRE: That this Meeting is of the opinion that an adequate betterment factor should be accorded to the consultants and specialists, in conformity with the intention of the Spens report accepted by the Government and profession and already implemented in the case of the general practitioners by the Danckwerts award.

59. **Motion** by KESTIVEN: That this Meeting recommends that the Spens report on remuneration for consultants be implemented so that the betterment factor be apportioned at an appropriate figure and awarded at an early date.

60. **Motion** by OXFORD: That the A.R.M. wishes to emphasize its support for the action taken as embodied in para. 65 of the Annual Report of Council.

61. **Motion** by SOUTHAMPTON: That in view of the consultants' and specialists' dissatisfaction with the implementation of the intention of the Spens report, this Representative Body appreciates the action which has been taken and expresses the hope for an early settlement.

62. **Motion** by MARYLEBONE: That this Meeting supports the Staff Side of Committee "B" of the Medical Whitley Council in their "betterment" claim.

The Whitley Machinery

63. **Motion** by MARYLEBONE: That in view of the frustration experienced in the Whitley machinery, this Meeting advises the Central Consultants and Specialists Committee and the Joint Consultants Committee to withdraw from Whitley, and to arrange a direct approach to the Minister.

Security of Tenure

64. **Motion** by SOUTH MIDDLESEX: (1) That no contracts made by the hospital regional board with its consultant

staff should be varied without prior consultation with the individual and medical committees of the establishments concerned.

(2) That all advertisements for consultant posts should contain full details of the appointments and duties of the individual concerned.

Reduction in Senior Registrar Establishment and Expansion of Consultant Services

65. **Motion** by MARYLEBONE: That this Meeting is of the opinion that the Minister should increase the number of part-time consultant posts in general medicine and general surgery.

Junior Hospital Staffing Difficulties

66. **Motion** by WEST BROMWICH AND SMETHWICK: That the Representative Body observes with concern that preference is being given to teaching hospital registrars in appointment of consultants and senior registrars. This policy has seriously affected the recruitment of registrars to the non-teaching hospitals, with an ultimate threat to their efficiency and the comprehensive training of registrars, and Council is asked to seek a remedy.

Senior Hospital Medical Officers

67. **Motion** by DARTFORD: That this Meeting is of opinion that senior hospital medical officers are not adequately represented at all discussions concerning their terms and conditions of service.

Whole-time Officers

68. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That para. 72 of the Annual Report of Council and para. 229 of the Supplementary Report be approved.

*69. **Amendment** by STIRLING: That this Meeting calls upon Council to promote the interests of whole-time hospital officers by endeavouring to secure for these officers full and direct representation on Whitley Committee "B."

70. **Amendment** by DORSET: That whole-time specialists should have reasonable representation on the Whitley Committee "B."

Legal Actions

71. **Motion** by EAST NORFOLK: That this Meeting requests Council to set up a committee to inquire at the highest levels into the increasing litigation against doctors.

72. **Motion** by WEMBLEY: That the Council of the B.M.A. be invited to consider the recent unfavourable legal decisions against medical practitioners and to examine the present legal procedure with a view to recommending some other method of determining cases imputing professional negligence.

73. **Motion** by REIGATE: That the B.M.A. should strengthen its organization in the medico-legal field.

74. **Motion** by BRISTOL: That Council be instructed to investigate the merits of the various ways in which medical evidence may be given and assessed in courts of law.

75. **Motion** by NEWCASTLE-UPON-TYNE: That this Division feels that the B.M.A. should give more support to their members in court cases and other cases where they are in trouble.

76. **Motion** by SOUTHAMPTON: That this Meeting is concerned with the position of casualty officers as the result of recent legal actions, and the effect that it will have on the future staffing of casualty departments of hospitals, and urges Council to continue its efforts to seek a solution to the problem.

77. **Motion** by SOUTH WARWICKSHIRE: That this Meeting, bearing ever in mind that medicine is not an exact science and that clinical phenomena never follow rigid laws, (i) asserts that medical practitioners should not be held responsible (and liable for damages) on account of an incorrect diagnosis, provided that reasonable care and attention have been given and no negligence has been proved, and (iii) urges that steps should be taken to re-establish this principle.

Provision of Diagnostic and Ancillary Facilities

78. **Motion** by CITY: That the Ministry of Health be urged to supply the means for pathological laboratories and radiological departments in hospitals to give direct service to general practitioners.

79. **Motion** by NORTH GLAMORGAN AND BRECKNOCK: That general practitioners have direct access to hospital physiotherapy departments where such arrangements existed prior to the National Health Service Act.

Fees for Lectures to Nurses

80. **Motion** by CITY: That the Ministry of Health be requested to order that fees for lectures by doctors to hospital nurses should be paid on the scale agreed retrospectively to July, 1948.

Domiciliary Consultation Arrangements

81. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That paras. 83 and 233 of the Annual and Supplementary Reports of Council be approved.

82. **Amendment** by SOUTHAMPTON: That Council be instructed to take urgent and strong action to implement Minute 218 of the A.R.M., 1952.

83. **Amendment** by ENFIELD AND POTTERS BAR: That this Meeting feels most strongly that fees should be payable to whole-time consultants and specialists for domiciliary visits.

Remainder of Report under "Hospital and Consultant Services"

84. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That the remainder of the Annual and Supplementary Reports of Council under "Hospital and Consultant Services" be approved.

Constitution of Central Consultants and Specialists Committee

85. **Motion** by SHEFFIELD and DERBY: That the following proposal be referred to the Council for consideration: "That the Central Consultants and Specialists Committee be composed of part-time and whole-time consultants in the same proportion as they exist in the National Health Service."

Appointment to Part-time Consultant Posts

86. **Motion** by WEST BROMWICH AND SMETHWICK: That the Representative Body of the B.M.A. observes with concern that vacant part-time consultant appointments are not being advertised, and are filled by seconding existing whole-time consultants to them, and asks the Council to consider the propriety of such policy and its ultimate consequences.

Dependants of Services Personnel and Hospital Waiting-lists

87. **Motion** by RUGBY: That a recommendation (not a "directive") be issued by each regional hospital board to the effect that the dependants of Services personnel (and possibly of others) who are posted from area to area when on civil hospital waiting-lists be sympathetically reviewed on arrival in the new area, and the time already on a waiting-list be taken into consideration.

Delays in Hospital Out-patient Departments

88. **Motion** by BIRMINGHAM: That the Council be requested to investigate (a) the long wait for appointments at hospital out-patient departments, (b) the long wait by general practitioners for reports on patients, and to make recommendations to remove the difficulties.

GENERAL MEDICAL SERVICES

89. **Motion** by the Chairman of the General Medical Services Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "General Medical Services" (Doc. A.R.M. 2, paras. 21-57, and Doc. A.R.M. 3, paras. 211-19), the Memorandum of Evidence submitted by the Council to the Committee on General Practice of the Central Health Services Council

(Doc. A.R.M. 7), and the Report of the Subcommittee on Service Committees and Tribunal Regulations (Appendix IV) be received.

The Dankwerts Award and the Small-list Practitioner

90. **Motion** by the Chairman of the General Medical Services Committee: That paras. 27 and 212 of the Annual and Supplementary Report of Council be approved.

91. **Amendment** by KENSINGTON AND HAMMERSMITH: That the extra loading should be placed on the first 1,000 as originally intended so as not to penalize the small-list practitioner and the new entrant to practice.

Filling of Vacancies

92. **Motion** by the Chairman of the General Medical Services Committee: That para. 32 of the Annual Report of Council be approved.

93. **Amendment** by CLEVELAND: That sections (a) (i) and (ii) of the paragraph be amended by the addition of the words "in consultation with the local medical committee."

*94. **Amendment** by SOUTH STAFFORDSHIRE: That Section (c) of the paragraph be referred back to Council.

95. **Amendment** by WESTMINSTER AND HOLBORN: That this Meeting expresses concern regarding para. 32(c) of Council's Report and requests Council to reconsider this matter. It encroaches considerably upon professional freedom and is liable to cause serious conflict between the liberties of individuals, for example, the right of two doctors to enter into partnership agreement based upon a contract governed by the provisions of the Partnership Act, and a "directive" of the Minister.

96. **Motion** by KESTIVEN: That when filling a vacancy in a partnership a partner(s) shall select a new partner for approval of the local executive council.

97. **Motion** by NEWCASTLE-UPON-TYNE: That the Minister be asked to advise that executive councils should give equal consideration to practitioners who have spent several years in hospital as to other applicants for practice vacancies.

Mileage

98. **Motion** by GATESHEAD: That mileage payments be assessed with regard to actual accessibility of patients rather than to broad classifications of types of practice.

99. **Motion** by WEST DENBIGH AND FLINTS: That the standard rate of payment in respect of mileage should apply to all practitioners who at present can claim for mileage allowance.

Inflation of Lists

100. **Motion** by the Chairman of the General Medical Services Committee: That para. 35 of the Annual Report of Council be approved.

101. **Amendment** by PADDINGTON: That persons removed in error from a doctor's list, whether by the "purge" or not, shall be reinstated when the error is discovered, and as from the date of their removal. They shall not be debarred from this by six months or any other limit.

Treatment of Services Personnel on Leave

102. **Motion** by the Chairman of the General Medical Services Committee: That para. 40 of the Annual Report of Council be approved.

103. **Amendment** by TUNBRIDGE WELLS: That this Meeting disagrees with the proposal to treat Service personnel as temporary residents.

Representation of General Practitioners in Hospital Administration

104. **Motion** by BATH: That this Meeting feels that general practitioners are not sufficiently represented on hospital management committees, and asks that the Council will approach the Minister and urge that he will allow at least two representatives from general practitioners to serve on all hospital management committees.

Sale of Goodwill

105. **Motion** by the Chairman: That para. 45 of the Annual Report of Council be approved.

*106. **Amendment** by MARYLEBONE: That, the Amending Acts Committee having recommended the restoration of the right to sell goodwill, this Representative Meeting requests the Council of the Association to consider the matter further and report to the Representative Body in 1954.

107. **Amendment** by WESTMINSTER AND HOLBORN: That as this question is one which concerns all other branches of the profession, as well as those doctors in practice under the N.H.S., this Representative Body, reaffirming its belief that ultimately the freedom of the profession rests on the restoration of the right to buy and sell the goodwill of practices, calls upon Council to reconsider the recommendations of the Amending Acts Committee and the G.M.S. Committee and to report on a practicable method of achieving the restoration of this right to the next A.R.M.

108. **Amendment** by SOUTH STAFFORDSHIRE: That it be an instruction to the Council to produce a scheme for the return of goodwill.

Charges for Prescriptions

109. **Motion** by GATESHEAD: That the prescription charge be greater for proprietary than for non-proprietary drugs.

Economy in Prescribing

110. **Motion** by the Chairman of the General Medical Services Committee: That para. 49 of the Annual Report of Council be approved.

111. **Amendment** by REIGATE: That this Representative Body deplores the attitude under para. 49 (iii) of the Annual Report of Council. That in the interests of national economy patients attending hospital regularly should have their medicines dispensed by the hospital and not by the family doctor.

Investigation of Prescribing

112. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That in view of the long interval that elapses between the issuing of Form E.C.10, and the raising of any objection thereto by the Pricing Bureau, a practitioner should not be liable to a fine for any further Forms E.C.10 issued for the same preparation during this latent interval.

113. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That Council be requested to consider forthwith the plight of practitioners who, having been asked by the Executive Council for clinical details of a patient (prior to the Council's decision whether a preparation prescribed on Form E.C.10 was a food or a drug) failed to get the patient's consent to such disclosure, and were consequently surcharged.

Medicines and Appliances for Doctors' Surgeries

*114. **Motion** by SWANSEA: That Form E.C.10A for the supply of stock orders for doctors' surgeries should be introduced in England and Wales in the same way as it is at present used in Scotland.

115. **Motion** by BUCKINGHAMSHIRE: That doctors in England and Wales should be permitted to prescribe drugs for use in the surgery on Form E.C.10A as in Scotland.

116. **Motion** by EAST KENT: That efforts be made to introduce Form E.C.10A for use in England as well as in Scotland.

Maternity Medical Services

117. **Motion** by DARTFORD: That the medical practitioner providing maternity medical services as laid down by the regulations should receive the full fees irrespective of whether the patient has attended for that pregnancy a previous practitioner.

*118. **Motion** by WORCESTER AND BROMSGROVE: That all women should be entitled to receive a maternity outfit wherever they are being delivered.

119. **Motion** by DUNDEE: That the maternity pack supplied by the local authority for use in domiciliary confinements be also supplied for confinements in nursing-homes.

Obstetric List

120. **Motion** by SOUTH STAFFORDSHIRE: That Council be asked to report the steps that have been taken to secure the abolition of the obstetric list.

Certification for Surgical Corsets

121. **Motion** by the Chairman of the General Medical Services Committee: That para. 57 of the Annual Report of Council be approved.

122. **Amendment** by SOUTHAMPTON: That evidence is already available that the demand for certificates on practitioners has increased and not decreased since the amended list of complaints which carry exemption from purchase tax was published; that this Meeting regards the change of name of splanchnoptosis for visceroptosis as absurd and misleading, and recommends that certificates should not be required from any medical practitioner for exemption of purchase tax.

National Formulary

123. **Motion** by the Chairman of the General Medical Services Committee: That para. 219 of the Supplementary Report under General Medical Services be approved.

124. **Amendment** by MID-CHESHIRE: That this Meeting considers that the revised *National Formulary* should adopt a clinical rather than an alphabetical classification.

125. **Motion** by STIRLING: That in future editions of the *National Formulary* preparations be listed alphabetically according to their Latin names.

126. **Motion** by WORCESTER AND BROMSGROVE: That when the *National Formulary* is next revised formulae should be listed in alphabetical order in Latin as in the editions previous to the present one, and that the metric system equivalents should be printed in parentheses.

Committee on General Practice of the Central Health Services Council

127. **Motion** by the Chairman of the General Medical Services Committee: That paras. 33 and 216 of the Annual and Supplementary Reports of Council and the Memorandum of Evidence submitted by the Council to the Committee on General Practice of the Central Health Services Council (Doc. A.R.M. 7) be approved.

128. **Amendment** by MARYLEBONE: That para. 14 of the memorandum of evidence be amended by the deletion of the words "and the small and diminishing amount of private practice" and the word "even."

(The first sentence of this paragraph of the memorandum would then read:

"The large and increasing proportion of the public availing themselves of general medical services under the Act does indicate that, allowing for changed economic conditions, the public is, by and large, well satisfied with the services given.")

Remainder of Report under "General Medical Services"

129. **Motion** by the Chairman of the General Medical Services Committee: That the remainder of the Annual and Supplementary Reports of Council under "General Medical Services" be approved.

Supply of Medicines to Private Patients

130. **Motion** by GLASGOW: That this Representative Body requests that further representations be made to the Ministry of Health to take immediate steps to allow the issue of medicines on Form E.C.10 to private patients.

131. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That action should again be taken to try to secure for private patients the right to obtain medicines, etc., on Form E.C.10, subject to the same conditions as those in force for National

Health Service patients, and to retention by the Minister of the same degree of control over the prescribing practitioners.

132. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That registered medical practitioners, although not in general practice under the National Health Service, should nevertheless be at liberty to prescribe medicines, etc., on Form E.C.10, provided that they agree to accept the current National Health Service terms of service and obligations in respect to prescribing so far as these be applicable.

Ophthalmic Services

133. **Motion** by DARTFORD: That Form O.S.C.1 should be abolished.

Period of Employment of Permanent Assistants

134. **Motion** by LEWISHAM: That this Representative Body do instruct Council to consider possible methods whereby a principal may not employ a permanent assistant for a greater period than, say, two years.

Private Certificates for Fitness for Employment

135. **Motion** by CARDIFF: That medical certificates required for fitness to undertake employment should be obtained from an independent medical referee at the expense of the prospective employers.

Notification to Executive Councils of Changes of Name

136. **Motion** by LEWISHAM: That Registrars of Births, Marriages, and Deaths be asked to notify executive councils of changes of name due to marriage in females in addition to their present actions on death.

Hours of Dispensing Pharmacists

137. **Motion** by LEWISHAM: That the Representative Body considers the hours of dispensing pharmacists in most cases inadequate—that they should be pressed to give more effective service during the evening, on early closing days, and at week-ends.

Payments to General Practitioners

138. **Motion** by MORPETH: That practitioners in the National Health Service be paid half quarterly as in the past.

Change of Practice

139. **Motion** by NORTH GLAMORGAN AND BRECKNOCK: That ways and means be explored to make it easier for general practitioners to change practice.

Employment of General Practitioners in Hospitals

140. **Motion** by TORQUAY: That it should be the policy of the British Medical Association to strive for the early establishment of general-practitioner hospitals; this objective taking precedence over the development of health centres.

Supply of Drugs to Doctors

141. **Motion** by BURTON-ON-TRENT: That this Meeting expresses the opinion that the supply of drugs to doctors should be on the same terms as the supply of drugs to chemists.

Trainers of Trainee Assistants

142. **Motion** by NEWCASTLE-UPON-TYNE: That a trainer of trainee assistants should only be allowed to function as such in alternate years.

Records of Institutional Midwifery Cases

143. **Motion** by NEWCASTLE-UPON-TYNE: That, following the Scottish suggestion, the appropriate Committee might discuss with the Minister of Health a similar suggestion for England—i.e., that maternity record cards in respect of patients confined in hospital be completed by hospital authorities and sent to the patient's own doctor immediately after the patient's discharge from hospital.

COMPENSATION AND SUPERANNUATION

144. **Motion** by the Chairman of the Compensation and Superannuation Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Compensation and Superannuation" (Doc. A.R.M. 2, paras. 58-60, and Doc. A.R.M. 3, para. 220) be received.

Payment of Compensation

145. **Motion** by the Chairman of the Compensation and Superannuation Committee: That para. 59 of the Annual Report of Council be approved.

146. **Amendment** by SOUTH MIDDLESEX: That compensation should be payable on demand.

147. **Amendment** by CITY OF EDINBURGH: That the Council be asked to open negotiations with the appropriate Government department for payment to be authorized from compensation due, when considerable improvements are made to surgery accommodation involving capital outlay.

148. **Motion** by MORPETH: That principals in general practice in the National Health Service, when taking a partner, be allowed to realize their practice compensation moneys relative to the share of the partnership given to the new partner.

Remainder of Report under "Compensation and Superannuation"

149. **Motion** by the Chairman of the Compensation and Superannuation Committee: That the remainder of the Annual and Supplementary Reports of Council under "Compensation and Superannuation" be approved.

Financial Position of Practitioners Retiring

150. **Motion** by GUILDFORD: That the Council be instructed to inquire into the financial position of members of the profession who retire at the age of 60 or later, with special reference to the position of those who were over 45 years of age on the introduction of the N.H.S.

General Practitioners with Hospital Contracts, and Superannuation

151. **Motion** by WORCESTER AND BROMSGROVE: That where one or more partners in contract with an executive council to provide general medical services also have hospital authorities be requested to credit the gross remuneration to the executive council concerned, who would then deduct superannuation from the partnership shares.

ORGANIZATION

152. **Motion** by the Chairman of the Organization Committee on behalf of the Council: That the Annual Report of Council under "Organization" (Doc. A.R.M. 2, paras. 155-68) be received.

Annual Conference of Secretaries

153. **Motion** by MORPETH: That the Secretaries' Conference be held in conjunction with the A.R.M.

Overseas Representation in the Representative Body

154. **Motion** by the Chairman of the Organization Committee: That the following recommendation of the Council be adopted:

Recommendation: That the representation of the overseas Branches in the Representative Body be modified to provide:

(a) That every Branch not in Great Britain or Northern Ireland shall form a constituency, except that the Branches in the Republic of Ireland shall together form one constituency.

(b) That each constituency thus formed shall be entitled to elect one Representative, together with an additional Representative for each complete number of 100 members in excess of 50 members, subject to a maximum of three Representatives.

(c) That provision be not made for the appointment of Deputy Representatives.

Amendments of Articles and By-laws

155. **Motion** by the Chairman of the Organization Committee: That the following recommendation of the Council be adopted:

Recommendation: That the Articles and By-laws of the Association be altered in the manner shown in Appendix III and that the Council be instructed to submit the amendment of Article 39 (2) to an Extraordinary General Meeting of the Association.

Autonomous Bodies

156. **Motion** by the Chairman of the Organization Committee: That the following recommendation of the Council be adopted:

Recommendation: That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1953-4.

That the Representative Body looks to these Committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not delay the work of the Association.

Remainder of Report under "Organization"

157. **Motion** by the Chairman of the Organization Committee: That the remainder of the Annual Report of Council under "Organization" be approved.

Appointment of Constitution Committee

158. **Motion** by WINCHESTER and MARYLEBONE: That an *ad hoc* Constitution Committee be formed to take evidence, consider, and report on a reorganization of the Representative Body.

159. **Motion** by WINCHESTER: That the Committee to be formed to consider the reconstitution of the Representative Body shall consist of twenty members, elected by this Meeting of the Representative Body, of which up to 50% may be members of Council. Members of the Committee shall be elected for their knowledge of the subject and not for any sectional interest.

160. **Motion** by WINCHESTER: That the Constitution Committee shall report its findings to a Special Representative Meeting within the next eighteen months.

Membership of Divisions and Branches

161. **Motion** by RUGBY: That members of the Association shall ordinarily be allocated, as hitherto, to the various Divisions (and Branches) purely on an address basis, but where by reason of ease of access, professional association, or for any other reason, a member finds it more convenient to attend the meetings of some other Division (or Branch) that member may, on application to Head Office, be transferred to the Division (or Branch) of his choice.

Branches of the Association

162. **Motion** by EAST KENT: That Council be requested to inquire into the position of Branches in the United Kingdom as intermediary between Headquarters and the Divisions, having particular regard to the increased efficiency and economy that might result from their abolition.

MEDICAL ETHICS

163. **Motion** by the Chairman of the Central Ethical Committee on behalf of the Council: That the Annual Report of Council under "Medical Ethics" (Doc. A.R.M. 2, paras. 105-8) and the Report of Council on Indirect Methods of Advertising (Appendix II) be received.

Indirect Methods of Advertising

164. **Motion** by the Chairman of the Central Ethical Committee: That the following recommendation to the Council be adopted:

Recommendation: That the revised statement on indirect methods of advertising be approved.

165. **Motion** by EAST YORKSHIRE: That this Meeting views with grave disquiet the tendency amongst certain members of the profession to allow their names to appear directly or the public notice in T.V. and sound radio programmes and in press accounts regarding illness in prominent national figures (other than the Royal Family), and considers that such actions are not in accordance with the ethical rules of the Association and urges the central Council to take action in accordance with these accepted rules.

166. **Motion** by HENDON: That the Representative Body deplores the paragraphs which frequently appear in the gossip columns of the Press giving estimates and details of the incomes of medical men, and requests that the matter be brought before the new Press Council as soon as possible.

Loan of Hospital Records to Government Departments

167. **Motion** by the Chairman of the Central Ethical Committee: That the following recommendation of the Council be adopted:

Recommendation: That the following amplified statement on the loan of hospital records to Government departments be approved:

(a) Medical records may be lent to Government departments only when written consent has been given by or on behalf of the patient. (b) The form of consent signed by or on behalf of the patient should include a statement that the disclosure of the information contained in the records will not necessarily be to the advantage of the claimant. (c) Wherever practicable, and particularly where disclosure of information may have an adverse psychological effect upon the patient, the practitioner who compiled the record, or, if he is not available, one nominated by the hospital authority for the purpose, should be consulted on the wisdom of disclosing to the patient all of the confidential information contained therein.

168. **Amendment** by CITY OF EDINBURGH: That the words "the medical officers employed by" be inserted after the words "lent to" in line 1 of Recommendation (a).

The first sentence of recommendation therefore to read "(a) Medical records may be lent to the medical officers employed by Government departments only when written consent has given given by or on behalf of the patient."

Remainder of Report under "Medical Ethics"

169. **Motion** by the Chairman of the Central Ethical Committee: That the remainder of the Annual Report of Council under "Medical Ethics" be approved.

PUBLIC RELATIONS

170. **Motion** by the Chairman of the Public Relations Committee on behalf of the Council: That the Annual Report of Council under "Public Relations" (Doc. A.R.M. 2, paras. 147-9) be received.

171. **Motion** by the Chairman of the Public Relations Committee: That the Annual Report of Council under "Public Relations" be approved.

Relationship of Public Relations Committee to B.M.J. Supplement

172. **Motion** by EAST HERTS: That with a view to improving the relations between the B.M.A. Central Organization and the periphery, the Public Relations Committee should co-operate in the publication of the Supplement of the British Medical Journal.

Annual Meeting of Public Relations Secretaries

173. **Motion** by EAST HERTS: That with a view to keeping the Public Relations machinery of the B.M.A. in readiness for an emergency, a meeting of the Divisional Public Relations Officers be held once a year.

PRIVATE PRACTICE

174. **Motion** by the Chairman of the Private Practice Committee on behalf of the Council: That the Annual Report of Council under "Private Practice" (Doc. A.R.M. 2, paras. 109-24) be received.

The Unattended Telephone

175. **Motion** by WORCESTER AND BROMSGROVE: That even stronger pressure be brought to bear on the G.P.O. in order that a satisfactory solution may be found speedily for the problem of the unattended telephone.

Life Assurance Forms

176. **Motion** by SWANSEA: That the fee for the long form of medical report for life assurance should be increased from £1 11s. 6d. to £2 2s.

Bonus-shift Certificates

177. **Motion** by LOTHIAN: That the Representative Body disapproves of the issuing of bonus-shift certificates to a miner, unless he has been actually attended by the doctor during his illness, and that the Council be asked to consider reopening the question with the National Coal Board.

Remainder of Report under "Private Practice"

178. **Motion** by the Chairman of the Private Practice Committee: That the remainder of the Annual Report of Council under "Private Practice" be approved.

Duration Certificates

179. **Motion** by RUGBY: That a practitioner should never comply with a request to issue a "Duration Certificate" (i.e., a medical report about the previous health and medical history of a person who has died shortly after having been accepted for life assurance (without prior medical examination)). Such a certificate could jeopardize, but could never be essential to establish the claim to, the assurance.

Road Traffic Act

180. **Motion** by PERTH: That the fee and mileage allowance under the Road Traffic Act, 1934, should now be reviewed.

Private Practice

181. **Motion** by GUILDFORD: That this Meeting deplores the absence again this year from the Annual Report of Council of any constructive step directed towards the encouragement of private practice, which still remains part of the stated policy of the B.M.A.

SCIENCE

182. **Motion** by the Chairman of the Science Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Science" (Doc. A.R.M. 2, paras. 138-46, and A.R.M. 3, paras. 247-9) be received.

183. **Motion** by the Chairman of the Science Committee: That the Annual and Supplementary Reports of Council under "Science" be approved.

Control of Therapeutic Substances

184. **Motion** by ISLE OF ELY: That this Meeting requests the British Medical Association to consider the advisability of seeking restrictions on the free sale of stilboestrol in view of the known dangers of this preparation and also in view of the known abuse of its present unrestricted sale to members of the public.

Press Announcements of New Drugs

185. **Motion** by PERTH: That this Meeting is concerned about the effect of premature and exaggerated reports in the public press about new drugs still on trial.

186. **Motion** by CONSETT: That this Meeting deplores the publication in the popular press of extracts from medical articles and newspaper articles of an irresponsible character praising new drugs without illustrating any potential dangers.

REFORM OF THE NATIONAL HEALTH SERVICE

187. **Motion** by the Chairman of the Amending Acts Committee on behalf of the Council: That the Annual Report of Council under "Reform of the National Health Service" (Doc. A.R.M. 2, paras. 88-9) be received.

188. **Motion** by the Chairman of the Amending Acts Committee: That the Annual Report of Council under "Reform of the National Health Service" be approved.

Co-operation Between the Four Divisions of the National Health Service

189. **Motion** by GREENWICH AND DEPTFORD: That this A.R.M. believes that greater co-operation between the four divisions of the Health Service—namely, local health authorities, regional hospital boards, teaching hospitals, and executive councils—is urgently necessary in the interests of (a) patients, (b) economy of man-power.

REVIEW OF GENERAL PRACTICE

190. **Motion** by the Chairman of the General Practices Review Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Review of General Practice" (Doc. A.R.M. 2, para. 61, and A.R.M. 3, para. 221) be received.

191. **Motion** by the Chairman of the General Practice Review Committee: That the Annual and Supplementary Reports of Council under "Review of General Practice" be approved.

GENERAL PRACTICE AND THE TRAINING OF THE GENERAL PRACTITIONER

192. **Motion** by the Chairman of Council on behalf of the Council: That the Annual Report of Council under "General Practice and the Training of the General Practitioner" (Doc. A.R.M. 2, para. 62) be received.

193. **Motion** by the Chairman of Council: That the Annual Report of Council under "General Practice and the Training of the General Practitioner" be approved.

OVERSEAS

194. **Motion** by the Chairman of the Overseas Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Overseas" (Doc. A.R.M. 2, paras. 184-8, and A.R.M. 3, paras. 250-1) be received.

195. **Motion** by the Chairman of the Overseas Committee: That the Annual and Supplementary Reports of Council under "Overseas" be approved.

EMPIRE MEDICAL ADVISORY BUREAU

196. **Motion** by the Chairman of the Committee of Management of the Empire Medical Advisory Bureau on behalf of the Council: That the Annual Report of Council under "Empire Medical Advisory Bureau" (Doc. A.R.M. 2, paras. 189 and 190) be received.

197. **Motion** by the Chairman of the Committee of Management of the Empire Medical Advisory Bureau: That the Annual Report of Council under "Empire Medical Advisory Bureau" be approved.

OTHER ASSOCIATION ACTIVITIES

198. **Motion** by the Chairman of Council: That the Annual and Supplementary Reports of Council "Other Association Activities" (Doc. A.R.M. 2, paras. 197-204, and A.R.M. 3, paras. 255-9) and the Memorandum of Evidence submitted to the Interdepartmental Committee on the Adoption of Children (Appendix VI) be received.

Remuneration of Civil Service Medical Officers

199. **Motion** by CARDIFF: That this meeting is concerned at the continued failure to adjust the salaries of our medical colleagues in the Civil Service, and recommends the Council to consider further action to be taken to resolve the dispute.

Committee to Examine the Problem of the Drug Bill

200. **Motion** by ST. HELENS: That in view of the failure of successive Governments effectively to assist the profession to reduce the Drug Bill, this Representative Body is called upon to appoint a committee to examine the problem and to make recommendations to the Ministry of Health.

Remainder of Report under "Other Association Activities"

201. **Motion** by the Chairman of Council: That the remainder of the Annual and Supplementary Reports of Council under "Other Association Activities" be approved.

OTHER MOTIONS BY DIVISIONS AND BRANCHES

Geriatric Units

202. **Motion** by LINCOLN: That this Meeting, realizing the pressing need for co-ordination of the various authorities caring for the aged, recommends the Minister to consider the establishment of geriatric units for that purpose, under the guidance of an experienced physician.

Whole-time State Salaried Service

203. **Motion** by MARYLEBONE: That this Meeting, representative of all branches of the profession, expresses its strong opposition to full-time salaried service, and reaffirms the resolution passed in May, 1946—"The medical profession is, in the public interest, opposed to any form of service which leads directly or indirectly to the profession as a whole becoming full-time salaried servants of the State or local authorities."

ELECTIONS

204. **Elect**: Chairman; Deputy Chairman; 10 Members of Council by R.B. as a whole; 2 Members of Council by Representatives of Scottish Constituencies; 1 Member of Council by Representatives of Constituencies in Wales (including Monmouthshire); and Members of Standing Committees and of Agenda Committee.

MINUTES

205. **Motion**: That the Chairman be empowered, on behalf of the Meeting, provisionally to approve the minutes of this Meeting.

206. Any other business.

COST OF AMBULANCE SERVICES

The second annual *Ambulance Services Costing Return*¹ for the year ending March 31, 1952, has been compiled by the Ministry of Health from information supplied by local health authorities. The return shows that, although authorities have tried to ensure that only patients who really needed ambulance transport were carried, the numbers of patients and of miles covered have increased.

	Patients	Mileage
1950-1	9,000,000	89,000,000
1951-2	11,000,000	92,000,000

To some extent the increase in the total number of patients carried is accounted for by the adoption by more authorities of the standard method of computation, defining a patient as "one patient carried once in one direction." Despite these increases the average number of miles run per patient has fallen from 9 to 8.3 and the average cost per patient has fallen from 15s. 6d. to 15s. 2d.

Voluntary Reinforcements

At the end of the year under review the ambulance services made available by local authorities and their agents comprised 4,411 ambulances and cars. A large number of

¹ *Ambulance Services Costing Return, 1951-2, H.M. Stationery Office, London.*

private cars provided voluntary reinforcements through the hospital car service, and many patients travelled by rail under arrangements by local health authorities. Of the total cost of £8,608,828 of the ambulance services in 1951-2, directly provided services cost £7,023,326 and agency services £766,432. The hospital car service cost £785,625 and rail journeys £23,445.

Analysis of Expenditure

Analysis of the expenditure is available only for the directly provided services. Of the total cost, 56.4% represented operational staff, 20.3% fuelling and vehicle maintenance, 6% provision of vehicles, 2.8% maintenance of buildings, furniture, etc., 1.2% provision of land and buildings, and 13.3% other expenditure, including administrative expenses. These percentages are roughly the same as for the previous year.

CENTRAL ETHICAL COMMITTEE

When the Central Ethical Committee met recently, under the chairmanship of Dr. R. FORBES, it had before it the memorandum on the future of the occupational health service which had been referred to it by the Council for comment. The Committee emphasized that the document ought to make clear that an industrial medical officer should undertake continued treatment of a patient only with the agreement of the patient's general practitioner. And the Committee discussed with representatives of the Occupational Health Committee the desirability of automatic notification of employers when an employee was receiving benefit under the National Insurance (*Industrial Injuries*) Act, 1946.

Undesirable Publicity

A statement drawn up after discussions with the Association of British Pharmaceutical Industry was before the Committee. It was about the undesirability of medical practitioners' names being associated in a prominent fashion with advertising material issued by pharmaceutical houses, and the Committee approved it. The Committee was glad to hear that substantial agreement had been reached in this matter and expressed gratitude to the A.B.P.I. for its consideration and help. It was generally agreed that in this country it was undesirable for the name of a practitioner to be displayed (as, for example, at the head of a reprint or abstract sent out with advertising material) in such a way as might suggest that some professional advantage might accrue to the practitioner.

Further discussions took place with a representative of the General Medical Services Committee on the ethical aspect of acceptance of the patients of a vacant practice by one who had acted as locum tenens.

The Committee learned that the proposals of the Council about an agreed statement on the loan of hospital records to Government departments had met with only partial acceptance in the Ministries of Health, National Insurance, and Pensions. Certain modifications were suggested, and discussions are continuing.

In addition, the Committee considered a number of requests for guidance from members.

THE DAIN FUND

REPORT OF THE TRUSTEES, 1952-3

During the year under review the Dain Fund has been able to give financial assistance to many most deserving cases. Certain of these have been helped in previous years, but in addition new applications have been considered and accepted.

Continuing grants ranging from £20 to £100 have been given in seven cases. When renewing such grants the Trustees have full details of the progress made by the

individual child together with a report from the appropriate responsible person—dean, headmaster, or headmistress. The expenditure on this group amounted to £404.

The Trustees received a number of new applications, two being for temporary help owing to a sudden and unexpected emergency. Both these applications were met, one case being a medical student, the other a schoolgirl. In addition, three other new cases were also accepted. Grants ranged from £24 to £100, and an amount of £272 was expended on the new cases. The total amount paid out by the Fund during the year was £676.

It is most gratifying to the Trustees to hear of the successes of the children to whom help has been given. During the year a boy has completed his medical studies, a girl has qualified as a physiotherapist, another girl has successfully passed a secretarial course, and a boy, having completed his school education, has been accepted by a London medical school. Two other children who have received grants during the past five years are now no longer needing help from the Fund, as under certain trust funds money has now become available which will ensure that their education at school and university can be completed. This case of two orphan children shows how the Dain Fund was able to provide very necessary financial assistance for an important period of their lives.

The Trustees wish to acknowledge the advice and assistance which they have received from other benevolent funds and from individuals. In addition, the continued interest shown by the gifts from local medical committees and individual doctors has made it possible for the Trustees to continue to assist many needy cases. It must be stressed, however, that the Fund in its present financial state cannot help all the applicants, and the Trustees appeal most earnestly for continued and new support.

H. GUY DAIN,
Chairman of the Trustees.

Notes and News

Hospitality for Foreign Children.—We have received several offers from French doctors who would like to arrange holiday exchanges for their children with children in this country. We have also received several requests from French doctors wishing to place their children as paying guests in British medical families, and several older girls would like to stay in this country *au pair* with British families.

Three Norwegian doctors would like their daughters, aged 15, 16, and 17, to exchange hospitality with the daughters of doctors in the United Kingdom.

Anyone interested in these inquiries should communicate with Dr. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Reciprocal Agreement with Italy on Social Insurance.—An Order-in-Council was published on June 3 bringing into operation a reciprocal agreement on social insurance between the United Kingdom and Italy. The agreement covers retirement pensions; widows' benefits and guardian allowances; unemployment, sickness, and maternity benefits; and all industrial injuries benefits. As a result of the agreement people who have qualified for National Insurance retirement pension, widows' benefits, or industrial injuries benefits will now be able to receive these benefits in Italy. Corresponding benefits under the Italian social insurance schemes will be paid to beneficiaries in Great Britain. The agreement also provides for each country to take account of insurance contributions paid in the other country so that people who go from one country to the other will not lose their benefit rights. The agreement affects only people who are either Italian citizens or citizens of the United Kingdom and Colonies.

SUCCESS IN CENTRAL WHITLEY APPEALS

The first central appeals made by the Association under the Whitley appeals machinery were heard at the Medical Whitley Council offices on June 18. In both cases the appellants had first appealed to their regional boards and then, under the Regional Whitley Appeals machinery, to the special Regional Whitley Appeals Committee. In neither case had the Regional Appeals Committee been able to agree; both, therefore, were referred centrally to Committee "B" of the Medical Whitley Council, which in such circumstances sets up a special appeals subcommittee. The Association was successful in both appeals.

Mileage Allowance

The first case was that of a part-time consultant pathologist, practising in a country district, whose laboratory was regarded as his private consulting-room. He was therefore not entitled to receive mileage for home-hospital journeys. He visits outlying hospitals and makes his journeys to them from his main hospital. The regional hospital board would not allow mileage between the hospitals, but allowed it for the shorter distance between his home and the subsidiary hospitals, on the grounds that the terms and conditions of service did not permit payment in any other way because his private consulting-room was at his main hospital. This strict application of the terms and conditions of service was disputed on the grounds that the journeys undertaken were essentially journeys in the service of the board and unconnected with any private practice.

The pathologist was in fact being penalized for carrying out his work efficiently. Had he travelled direct from his home to his subsidiary hospitals, the main hospital would have had to provide transport for his apparatus and materials kept there. This would have been far more expensive than paying the pathologist for his inter-hospital journeys. It was pointed out at the appeal that this was an example of administrative inflexibility and failure to interpret the terms and conditions of service with reason and common sense. The appeal was allowed.

Grading of Administrative Officer

The second case concerned an administrative medical officer who was previously assistant administrative medical officer to the Eastern Regional Hospital Board (Scotland). The Eastern, North-eastern, and Northern Regional Boards in Scotland are the only boards in the United Kingdom with only two administrative medical officers. The original appointments were made just before the commencement of the National Health Service, and before the final salary scales for administrative officers had been agreed, and were therefore provisional in nature. Following the announcement of the Medical Whitley Council ("B") with regard to revised salary scales of administrative medical officers, both the North-eastern and Northern Boards redesignated their assistant officers as assistant senior administrative medical officer. The Eastern Board did not do so, in spite of the fact that it is analogous to the other boards except that it administers a larger number of hospital beds. In view of the fact that the assistant from time to time has to deputize for his senior and take a measure of individual responsibility, the Association considered that the post warranted classification higher than the most junior type of appointment.

Furthermore, on account of the failure of the board to upgrade him, the officer concerned, who had resigned his post and obtained a new appointment in another region as an assistant senior administrative medical officer, automatically lost the seniority which he should have carried with him from his first appointment.

The appeal was allowed, and the officer concerned will therefore receive retrospective payment for his services with the Eastern Board, and his seniority will be adjusted in his present appointment.

Correspondence

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

Public Health Salaries

SIR,—The B.M.A. is to be heartily congratulated on having obtained for assistant medical officers in the public health service a revision of the 1950 salary award, a revision which, partially at any rate, rights an injustice to them. I hope the B.M.A. will now turn its attention to the case of senior members of the service.

The significant fact about the 1950 award was that it linked medical officers of health and their deputies much more closely with other local government officers than with the rest of the medical profession. If the B.M.A. is serious about the unity of the profession, it must endeavour to reverse this conclusion. Particularly important from the point of view of present injustice are the medical officers of health and deputies of the smaller county boroughs, the all-purpose authorities whose population size greatly limits the maximum salaries of the senior medical staff, but whose responsibilities are of the widest. The medical officers of health of some county districts, too, having joint county council appointments, are believed to be worse off than if they had remained simply medical officers of health of the district, a curious and illogical situation. It should be the aim of the B.M.A. to secure a broad measure of social equality within the profession for more or less comparable effort, responsibility, and seniority of service in the different spheres of medical practice, but this is far from being the case at present so far as the public health service is concerned. Unity within the profession cannot be maintained if this principle is not accepted. Acceptance involves a demand for further upward revision of the 1950 award.—I am, etc.,

J. H. WHITTLES.

Exeter.

Assistant Medical Officer Award

SIR,—I protest most strongly at the inequity of the revised award of the Industrial Court to assistant medical officers or medical officers in departments (*Supplement*, June 13, p. 278) on the following grounds.

The award is inadequate. It gives an increase at maximum of 85.7% over pre-war maximum compared with 100% increase to general practitioners under the Danckwerts award. The original award was from October 1, 1950, and any revision should have been retrospective to that date. Those officers now about to retire do not benefit as regards pension rights.

The maximum claimed by the Association at the Industrial Court in 1950 for assistant medical officers was £1,680 per annum. Under the revision the maximum claimed was £1,400 per annum, despite a substantial rise in the cost of living during the interval. Surely the Association has learned by now to claim for more than it expects to receive? One is forced to the conclusion that again our claim has been incompetently presented.—I am, etc.,

MAURICE B. GRIFFITH.

Darlington.

Temporary Residents

SIR,—In the last few months the fee for attending a temporary resident living at a camp at the coast has been reduced from 17s. to 5s.—not for each visit at the surgery, but for the total attention and service given by a doctor throughout the patient's stay. If he is staying at a hotel or at a house the full fee of 17s. is paid.

Many seaside resorts have a population made up of old retired people, landladies, and a few tradespeople. This means that the local general practitioner has a higher percentage of old people on his list than his town colleague.

Many of these elderly people can be classed as chronic sick, and require constant medical attention. They can come to the surgery in the summer, but in the winter they need to be visited regularly. In the summer many doctors attend holiday camps. Because of this and the large visiting lists in the winter, they require assistants or partners, although the nominal lists would not suggest this. As a result of the recent increase in the capitation fee these doctors hoped to take their assistants into partnership, but now this sudden reduction of remuneration has made them think again, and their assistants are again "on the look out"—with all its implications.

It seems to me somewhat unfair that if a patient is seen at a holiday camp the professional work done is worth 5s., but if seen in a town it is worth 17s. This incongruity has been decided not by the Government but by our colleagues. All will admit that we see many trivial cases where one visit at 17s. is very generous, but in others, where several visits are required, it is rather the opposite, and one usually cancels out the other. If there is any ill feeling about these fees—let the remuneration be on a graded scale, as in emergency treatment, and let it apply equally in town and country. Let us be fair. What the town general practitioner gets in larger nominal lists the seaside practitioner gets in temporary residents. In the past we asked the Government for fair play, now we ask our colleagues. Give us the same scale of fees you give yourselves and help the establishment of practitioners as principals, don't hinder it.—I am, etc.,

DOUGLAS MACLEOD.

Prestatyn.

Workmen's Compensation

SIR,—I was delighted to read the report on occupational dermatitis (*Supplement*, May 23, p. 230). The problem of P.D.24.B is very difficult, and I see both sides of this as a consultant in a large dermatological out-patient department in an industrial city and as a member of a medical appeals tribunal.

One great weakness, in my opinion, in the Act is that the claimant receives injury benefit on the certificate of the examining medical practitioner, and in many cases such injury benefit should not be paid. By the time the claimant is examined by a dermatologist the man will have received compensation, and it is much more difficult after a lapse of time to be quite certain of the cause of the trouble. If the payment is stopped because he has in fact some constitutional condition, the workman has a very real grievance, which would not be so acute if payment had never been made. That this is true was seen under the Workmen's Compensation Act of 1925 when often the decision of the certifying surgeon was reversed by the medical referee, but since no payment had been made pending the referee's decision there was no feeling of injustice.

Notification of cases is only of assistance if one can be quite sure that the cases are correctly diagnosed.—I am, etc.,

H. R. VICKERS.

Sheffield.

Remuneration of Hospital Staffs

SIR,—Having read Dr. A. Arnaud Reid's letter (*Supplement*, May 30, p. 258), I can only hope that "The Others" to whom his letter is dedicated will express their views on similar lines as an encouragement and stimulus to the negotiating committee. One cannot help feeling that the minority to whom Dr. Reid refers have successfully pulled a fast one by being allowed to present their claim alone, when the obvious course was to let a more competent unbiased authority adjudicate upon Spens's figures and the betterment factor as they affect the whole profession.

I agree with Dr. Reid that a majority of the public, and even of Members of Parliament, are of the opinion that specialists were either included in the Danckwerts award or else are able, by virtue of private practice, to exist on a 1939 salary plus 20%.—I am, etc.,

SOUTHAMPTON.

Demands of Whole-time Specialists

SIR.—Specialists generally are becoming exasperated at the delaying tactics of the Management Side of Whitley "B" and its failure to agree to the proper implementation of the Spens Report. Whole-time officers in particular are disgruntled to learn that the Management Side refuses to grant them any satisfaction in the matter of car and telephone expenses and has only promised to look into the question of income-tax relief on the expense of keeping up to date. The Government policy of charging the whole-time specialist 50% purchase tax (until recently 66½% purchase tax) on the cost of a new car which he requires for his work, paying him less than one-tenth of the cost of using it on official business, and then refusing him any income-tax relief is one of the greatest social injustices ever inflicted on any professional class. This treatment is causing bitter resentment and a sense of frustration which augur no good for the future of the Service among whole-time officers, who do one-third of the consultant work in it.

General practitioners secured the Danckwerts award because they threatened to withdraw from the Service. Whole-time officers should now consider not using their cars and telephones on official business unless they are adequately paid for this service.

It would be an act of wise statesmanship for the B.M.A. to form a section of whole-time specialists (as they have done for whole-time research workers and non-professional teachers, who number only 1,000), so that specialists could present a united front to the Minister and take effective action if he does not agree to their just demands.—I am, etc.,

Farnborough, Kent.

LEO GILCHRIST.

The G.P. and the Industrial Medical Officer

SIR.—Dr. R. P. Liston (*Supplement*, June 6, p. 270) and Dr. Ronald Peters (*Supplement*, June 13, p. 280) both refer to the wish of industrial medical officers to modify the Ethical Rules for industrial medical officers. That these were approved by the Association in 1949 is surely not, at Dr. Peters implies, a reason why such a change should not be sought by those most closely concerned.

I speak only for myself, but I think the chief reason industrial medical officers feel the present Rules to be unsatisfactory is precisely that stated by Dr. Liston: "We are all qualified doctors, qualified to practise medicine in all its aspects." A patient with a septic finger, consulting his works doctor in a well-equipped surgery, will not consider it reasonable that the penicillin he requires, and could easily be given immediately, should be withheld until he has spent an evening sitting in his general practitioner's waiting-room, or until his doctor has found time to reply to a letter asking his permission for the treatment to be given.

To my mind the convenience of the patient is far too often overlooked when this subject is discussed. It is the good fortune of the industrial medical officer that he usually has at his disposal staff and equipment of a high standard, and that he is easily accessible to his patients with a minimum of waiting and has more time to listen to and advise them than his colleague in general practice. Rigid adherence to the Ethical Rules in their present form would go far to deprive the patient of these benefits, whose extent perhaps can only be appreciated to the full by those who have themselves been working-class N.H.S. patients. Do general practitioners, many of whom complain with justice that in present conditions of practice they often cannot devote to consultation and examination the time they feel they should, realize how many patients are discouraged from consulting them by their crowded waiting-rooms, and gladly avail themselves of alternative facilities?

It is, I repeat, the good luck, not the merit, of the industrial medical officer that he is in a position to help. He is glad to do so and the normal rules of professional courtesy will ensure that he keeps the patient's doctor fully informed, and does not act unilaterally and without consultation interfere in treatment which the latter has begun. But a situation calling for good will and voluntary co-operation cannot be dealt with by any printed code—least of all one which

seems to be inspired by the notion that the industrial medical officer is some inferior kind of doctor who must be restrained from taking unfair advantage of his position. The wording of some of the Rules can only be described as insulting.

I am with Dr. Liston in deploring the fragmentation of the profession, and agree that general practitioners who are sufficiently interested can make valuable contributions to industry. I agree with Dr. Peters on the need for close co-operation, and in my own work have done all I can to achieve this. But co-operation implies concessions from both sides, and, although most industrial medical officers have the friendliest relations with individual general practitioners, it is a matter for regret that their spokesmen on the various committees concerned are not disposed to make concessions. If it is necessary at all to control the action of the industrial medical officer by a printed code, should there not be a similar set of rules governing the general practitioner in his relations with the industrial medical officer? And would it not be greatly preferable to recognize that one cannot produce good manners by legislation.—I am, etc.,

Birmingham.

F. H. TYRER.

Association Notices

Diary of Central Meetings

- 30 Tues. JUNE
Joint Committee of Psychological Medicine Group and R.M.P.A., 2 p.m.
- 1 Wed. JULY
Disabled Persons Committee, 10.30 a.m.
1 Wed. Staff Side Committee C, 11 a.m.
1 Wed. Local Arrangements Committee, First World Conference on Medical Education, 11 a.m.
- 2 Thurs. Radiologists Group Committee, 2 p.m.
3 Fri. Ophthalmic Qualifications Committee, 1.45 p.m.
3 Fri. Ophthalmic Group Committee, 2 p.m.
6 Mon. Registrars Group Executive Committee, 2 p.m.
- 9 Thurs. Annual Representative Meeting (at Cardiff)
10 Fri. Annual Representative Meeting (at Cardiff)
11 Sat. Council (at Cardiff), 9 a.m.
11 Sat. Annual Representative Meeting (at Cardiff)
13 Mon. Annual Representative Meeting (at Cardiff)
13 Mon. Annual General Meeting (at Cardiff), 12.30 p.m.
13 Mon. Extraordinary General Meeting (at Cardiff), conclusion of A.G.M.
13 Mon. Council (at Cardiff) at conclusion of A.R.M.
13 Mon. Board of Trustees, British Medical Guild (at Cardiff), at conclusion of Council.
13 Mon. Adjourning Annual General Meeting and President's Address (at Cardiff), 8.15 p.m.
22 Wed. Transport Medical Standards Subcommittee Occupational Health Committee, 2.30 p.m.

Branch and Division Meetings to be Held

- DUDLEY DIVISION.—At Guest Hospital, Dudley, Tuesday, June 30, 7.30 p.m., clinical demonstration; 8 p.m., clinical meeting. Dr. D. E. Oakley: "Dermatological Diagnosis."
- MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Royal Oak Hotel, Alderley Edge, Cheshire, Monday, June 29, 8.30 p.m. annual general meeting.
- NORTH-EAST ESSEX DIVISION.—At Colchester Maternity Hospital, Lexden Road, Tuesday, June 30, 8.15 p.m., meeting.
- NORTH-WEST WALES DIVISION.—At the Clinic, Sackville Road, Bangor, Sunday, July 5, 3 p.m., meeting. Address by Dr. Francis Jarman on the Rhondda Fach Scheme for investigation of the incidence of tuberculosis; followed by a discussion on the visit of the Mass Radiography Unit to Caernarvonshire.
- PADDINGTON DIVISION.—Thursday, July 2, 2.15 p.m., visit Cadby Hall, W.
- SHROPSHIRE AND MID-WALES BRANCH.—At Royal St. John's Infirmary, Shrewsbury, Tuesday, June 30, 8.30 p.m., general meeting.
- SUSSEX BRANCH.—At Warne's Hotel, Worthing, Thursday, July 2, 1 p.m., thirty-first annual general meeting and luncheon.
- TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Wednesday, July 1, 8.30 p.m., meeting.
- WEST SOMERSET DIVISION.—At Musgrove Park Hospital, Taunton, Monday, June 29, 8.30 p.m., annual general meeting.
- WEST SUSSEX DIVISION.—At 73, Richmond Road, Worthing, Sunday, July 3, 3 p.m., general meeting.
- WORCESTERSHIRE AND HEREFORDSHIRE BRANCH.—At Memorial Hall, Vowchurch, Herefordshire, Tuesday, June 3, 3.15 p.m., annual meeting.